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**SERIES “MANAGEMENT, ECONOMIC
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DETERMINANTS OF FOREIGN DIRECT INVESTMENT (FDI) IN PAKISTAN'S AGRICULTURAL SECTOR

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Abstract

Pakistan is an agricultural based economy, therefore, agricultural sector is one of the most important sectors of Pakistan as it provides employment opportunities to millions of people, contributes significantly in GDP, fulfills local demand for food items, export variety of commodities to foreign countries, boosts foreign exchange reserves and eventually enhances economic growth rate of Pakistan's economy. This study has investigated the determinants of FDI in agricultural sector of Pakistan. The results have shown that GDP and trade openness have positive and significant relationship with FDI inflows in Pakistan agricultural sector whereas government debt has negative and significant relationship. The results have further revealed that inflation has positive whereas exchange rate has negative relationship with FDI inflows in Pakistan's agricultural sector but both of these variables have insignificant relationship with FDI.

Key words: agricultural sector, foreign direct investment (FDI), Pakistan.

INTRODUCTION

Within the last few years, lots of discussion has been made regarding the contribution and function of FDI in economic growth of developing countries since it offers investment capital, increases employment opportunities, provide managerial capabilities to local residents in addition to technological improvements. All of these activities results in economic expansion [1]. Because of significance of FDI in economic growth, the underdeveloped nations competed with each other to attract greater FDI inflows for expansion and growth of their industrial sectors. The procedures are developed, revised and improved for making it suitable for investors to invest in their markets. Some countries succeed and some failed in this process which directs to investigate the factors which influence the inflows of FDI.

The inflows of FDI are extremely important for Pakistan's economy also due to shortage

of saving and investment capital and deficiency of capital for developmental projects. The foreign capital is decisive for Pakistan's economy for growth of industries, reducing unemployment, technological up-gradation which may eventually results in economic development and growth. The agricultural sector of Pakistan is one of the most important sectors as it provides employment opportunities to millions of people, contributes significantly in GDP, fulfills local demand for food items, export variety of commodities to foreign countries, boosts foreign exchange reserves and eventually enhances economic growth rate of Pakistan's economy. The economy of Pakistan has extremely appealing environment for overseas investment especially in agricultural sector because government of Pakistan has allowed 100% equity investment within this sector.

The economy of Pakistan has attracted inflows of FDI amounting to 5409.8 million

dollars in year 2007-08, which shows an increase of 5.27 percent in comparison to year 2006-07 and 53.64 percent greater in comparison to year 2005-06. In year 2007-08, the inflows of FDI in agricultural sector amounted to 903.5 million dollars, which represents only 16.70 percent of Pakistan's aggregate inflows FDI, whereas, in year 2006-07, the inflows of FDI within agricultural sector were amounted to 33 percent of aggregate FDI inflows. Main purpose of this research paper is to examine the economic determinants of FDI in Commodity-Producing Sector of Pakistan. Therefore, the main objective of this study is to determine the relationship of GDP, inflation rate, trade openness, government debt and exchange rate with inflows of foreign direct investment in agricultural sector of Pakistan through OLS regression model for the period of 2000-2010. The rest of the study has been organized as follows: literature review has been presented in section 2; research methodology has been described in section 3; results have been described in section 4; whereas, conclusion has been discussed in last section.

Different researchers have investigated the factors which influence inflows of foreign direct investment. For example, [2] in his study analyzed the determinants and trends of inward FDI to South Africa for the period of 1975-2005. He pointed that exchange rates, openness and financial progress were key variables to determine FDI inflows in long run. Financial development and increased openness attracted FDI while depreciation of exchange rates deterred FDI inflows to South Africa. The market size variable appeared short run determining variable for FDI inflows though it was decreasing in magnitude. [3] identified variables which enhanced or impaired Greece's FDI attractiveness via OLS technique for covering period 1976-2004. The variables assessed were size of market, relative interest rate, exchange rates, technical capability, human capital, intensity of capital, imports, exports, endowment of natural assets, economic activity, labor cost per unit and membership of Greece in EU. The crucial variables lowering FDI stock were public governance

inefficiency, higher taxes, infrastructural inefficiency and general macroeconomic situations.

[4] probed locational determining variables of FDI in Switzerland by utilizing Cointegration along with ECM techniques over period of 1980-2001. The variables tested were home market size, openness of economy, infrastructure, domestic market attractiveness, external economic stability and internal economic stability. The authors described that external economic stability, internal economic stability, infrastructure and economy's openness had positive correlation whereas home market size and domestic market attractiveness had negative correlation with FDI stock. [5] explored major determinants of FDI in MENA countries by employing random and fixed panel data methodologies for period ranging from 1975-2006. The findings revealed that host economy size, size of government, institutional factors and natural resources significantly influenced FDI inflows within MENA countries. [6] investigated effects of economic variables on FDI for Kyrgyz Republic, Armenia and Turkmenistan through least squares methodology for period from 1991 to 2009. The variables which were incorporated in model were market size, inflation and official development assistance. Findings indicated positive influences of market size, official development assistance and negative influence of inflation for FDI. Findings further indicated that official development assistance variable in Armenia and inflation in Kyrgyz Republic demonstrated insignificant association.

Researchers have also investigated determinants of FDI in Pakistan, e.g. [7] assessed relative importance of variables that attract FDI in telecommunication sector of Pakistan by utilizing regression analysis for the period of 2000-2006. The variables which were tested included the market size, competition, literacy rate, foreign trade and per capita income. The results depicted that all the factors had significant and positive impact on FDI inflows in telecommunication sector of Pakistan. [8] evaluated the influence of political instability and human capital on

FDI stock in Pakistan for the period ranging from 1971-2005 by utilizing least square method. This paper found a positive and significant link between human capital and FDI stock, while the correlation between political instability and FDI was positive but statistically insignificant. [9] studied the economic determinants of FDI inflows in Pakistan for the period of 1971-2005 by using OLS technique. The factors which had been considered to explain the FDI patterns included market size, wholesale price index, custom duty on imports, average annual exchange rate and exports of goods. He found that GDP, volume of exports, tariffs on imports and whole sale price index were positively related while exchange rate was negative related to FDI inflows. [10] observed the impact of infrastructure on FDI flows in Pakistan along with market size and exchange rate covering the period of 1975-2008 through utilizing ARDL and ECM econometric techniques. The results depicted that infrastructure and market size significantly and positively affected inflows of FDI in Pakistan both in short term and long term periods, whereas, exchange rate significantly and negatively affected FDI both in short term and long term periods.

[11] determined the relationship of market size along with corporate tax rate and exchange rate on inflows of FDI in Pakistan for the period ranging from 1984 to 2008. They used error correction model (ECM) and ARDL techniques to determine that relationship and found the market size as the most significant variable which positively affected FDI inflows, whereas, the exchange rate negatively and significantly affected FDI. The corporate tax rate did not have any influence of FDI inflows in Pakistan. [12] examined the association between macroeconomic variables and FDI inflows in Pakistan covering the period of 1972-2005. The relationship concerning size of host economy (measured by population), democracy, real exchange rate, manufacturing products, real exports, secondary level school enrollment and import duty was determined through OLS regression technique. The results demonstrated that size of host

economy, secondary level school enrollment and democracy had significant positive influence on FDI inflows while real exchange rate, manufacturing products, import duty and real exports had significant negative impact on FDI in Pakistan.

It is obvious from the literature review that there are very few studies which have investigated the determinants of FDI in agricultural sector of Pakistan. Therefore, the main objective of this study is to determine the relationship of GDP, inflation rate, trade openness, government debt and exchange rate with inflows of foreign direct investment in agricultural sector of Pakistan through OLS regression model for the period of 2000-2010.

MATERIALS AND METHODS

In The data for the period of year 2000 to year 2010 has been collected form SBP reports, Pakistan's Economic Surveys and United Nations Statistical Division Database. The OLS regression model has been applied in order to determine relationship FDI with political instability, terrorism, gas shortage and economic factors. The objective of this study is to explore the relationship of political instability, terrorism, gas shortage, inflation, GDP, trade openness, exchange rate and incentives offered to overseas investors with inflows of FDI in Pakistan.

The regression model which has been estimated is as follows:

$$\text{LnFDI} = \beta_0 + \beta_1 \text{LnGDP} + \beta_2 \text{Inf} + \beta_3 \text{Trade} + \beta_4 \text{GovtDebt} + \beta_5 \text{Exch} + U_t$$

Where:

LnFDI = FDI inflows in Pakistan's agricultural sector in million rupees

GDP = GDP in million rupees

Inf = Annual inflation rate expressed as %

Trade = Ratio of exports to imports

GovtDeb = Government Debt in million rupees

Exch = Growth rate in exchange rate of Rupee/\$

Ut = 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 as follows:

Table 1: Model Summary^b

Model	R	R Square	Adj. R Square	Std. Error of Est.	Durbin-Watson
1	0.97 ^a	0.94	0.88	0.311	2.266

a. Predictors: (Constant), LnGDP, Inf, Trade, GovtDebt, Exch.

b. Dependent Variable: LnFDI

Table 2: ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
Regres	8.162	5	1.632	16.795	0.004 ^a
Resid	0.486	5	0.097		
Total	8.648	10			

a. Predictors: (Constant), LnGDP, Inf, Trade, GovtDebt, Exch.

b. Dependent Variable: LnFDI

Table 3: Coefficients^a

Model	Unstandard. Coefficients		Stand. Coeff.	t	Sig.
	B	Std. Err	Beta		
(Constant)	15.3	10.1		1.50	0.19
LnGDP	4.13	1.31	2.039	3.152	0.025
Inf	.063	0.043	0.365	1.462	0.203
Trade	.063	0.027	0.341	2.364	0.064
LnGovtDebt	-5.31	1.61	-1.851	-3.297	0.022
Exch	-.011	0.022	-0.077	-.516	0.628

a. Dependent Variable: LnFDI

The results of table 1 have shown that the value of adjusted R square is 0.888 which indicate that the independent variables which have been used in this model have explained around 88.8 % of the variations occurring in FDI inflows in agricultural sector of Pakistan. The value of Durbin Watson statistics is 2.266, which indicate 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 show that P-Value is 0.004, which describes that the overall model is significant to explain FDI inflows in agricultural sector of Pakistan and the mathematical form of the model is correct. The results of Table 3 describes that the variable of GDP positively and significantly associated with FDI inflows in agricultural sector of Pakistan. It means that if GDP value will increase, it will also cause and increase in FDI Inflows. The variable of trade openness is also positively and significantly correlated with FDI inflows. It indicates that if the vale of trade openness will increase, it will also results in increase of FDI inflows. The results further indicate that the variable of government debt is negatively and significantly affecting FDI inflows in Pakistan’s agricultural sector. It means that if government debt will be decreased, it will results in increase of FDI inflows. Moreover, the variable of inflation is positively, whereas the variable of exchange rate is negatively related with FDI inflows in agricultural sector of Pakistan but both of these variables are insignificantly influencing FDI inflows.

CONCLUSIONS

Foreign direct investment plays a significant role in the development and growth of developing countries. The main purpose of this study is to investigate the impact of GDP, Inflation rate, trade openness, government debt and exchange rate on inflows of FDI in agricultural sector of Pakistan. The results have shown that the variables of GDP and trade openness are positively and significantly affecting FDI inflows, whereas, the variable of government debt is negatively and significantly influencing FDI inflows in agricultural sector of Pakistan. Furthermore, the variables of inflation rate and exchange rate have insignificant affect on FDI inflows in Pakistan’s agricultural sector. Based on the empirical findings, the following recommendations have been put forward: first of all, the growth rate of GDP should be increased in order to improve FDI inflows in agricultural sector of Pakistan. Secondly, the

level of trade openness should also be improved to strengthen FDI flows. Finally, the level of government debt should be reduced to improve FDI inflows.

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RESEARCH CONCERNING MORPHO CHARACTERISTICS OF ROMANIAN BLACK SPOTTED BREED IN CONDITION OF S.C. BIOTERA FARM, ALBA COUNTY

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Abstract.

Researches regarding morpho characteristics of Romanian Black Spotted breed were performed on 56 cows bull daughters in testing and candidate as bull's mother, raised and exploited in SC Biotera SRL farm from Alba county and has as database, records of evaluation for reliability cows between 2004 -2009 from UARZ – Alba county. Analyzing the results we can see that for Romanian Black Spotted breed, size increases from the average of 142.92 cm in first lactation to 145.64 in the third lactation. Similar happens with the height at rump wich from 143.54 cm in first lactation reach to 146.86 in the third lactation.

Key words: animal exterior, conformation, constitution, morphological characteristics

INTRODUCTION

In our country, if until about decades ago, the selection was made exclusively or very largely on the exterior [1], in the present appreciation and selection of animals is based on a set of criteria and indicators (ascendant, production, ancestry, constitution and exterior) that are taken into account differently depending on the breed and purpose. The indications provided by the exterior are extremely valuable both in selection work [2] and for the detection of deficiencies in technology growth and exploitation of animals. The importance of characters taken into account, in what concern the body format, is given by the fact that the linear description of exterior characters of the Romanian Black Spotted breed - Holstein Friesian type, they account for 20% [3] of the total score for the exterior.

MATERIALS AND METHODS

Analysis of morphological characteristics of Romanian Black Spotted breed has as database records of evaluation for reliability cows between 2004 -2009 from UARZ -

Alba. So, were gathered 56 sheets of evaluation from daughter bull cows in testing and candidate as bull's mother cows, raised and exploited in SC Biotera SRL farm conditions from Alba county. So from evaluation sheets, beside the conformation-constitution traits, expressed through udder and total points, were extracted and processed values for the following body measurements: height at withers (HW), height at rump (HR), chest area, chest depth and weight body.

RESULTS AND DISCUSSIONS

At first seen we can notice that the height at withers raises from 142.92 cm in first lactation to 145.64 cm in third lactation, and the height at rump shows an increase between the first and third lactation of 3.32 cm. The averages values of body measurements followed for the entire farm shows a number of animals of medium to big size (HW=145.64cm; HR=146.86 cm) with an average body weight of 678 kg wich suits the weight wanted limits desired for this breed (600-700 kg).

Table 1. Average values and variability of conformation constitution – characteristics, on Romanian Black Spotted exploited in S.C. Biotera S.R.L Farm

Sample statistics	Total Points			Udder Points		
	First Lactation	Second Lactation	Third Lactation	First Lactation	Second Lactation	Third Lactation
<i>n</i>	28	15	13	28	15	13
\bar{X}	84,92	84,91	85,42	34,49	34,2	34,38
$\pm S \bar{X}$	0,42	0,35	0,32	0,20	0,18	0,2
<i>s</i>	1,52	1,36	1,70	0,74	0,69	1,04
<i>V %</i>	1,79	1,60	1,99	2,14	2,00	3,01
<i>Min.</i>	82	83	82	33	33	32
<i>Max.</i>	87	88	89	36	35	36

Table 2. Average values and variability of body format characters, on Romanian Black Spotted exploited in S.C. BioteraS.R.L Farm

Lactation	Conformation constitution – characteristics	Sample statistics						
		<i>n</i>	\bar{X}	$\pm S \bar{X}$	<i>s</i>	<i>V %</i>	<i>Min.</i>	<i>Max.</i>
First Lactation	Size (cm)	28	142,92	2,10	6,29	4,40	132	154
	Rump height (cm)	28	143,54	1,26	6,68	4,65	133	152
	thorax perimeter (cm)	28	208,23	1,04	5,48	2,63	196	216
	Chest depth (cm)	28	77,92	0,47	2,47	3,16	74	83
	Weight (kg.)	28	633,92	10,58	55,97	8,83	560	751
Second Lactation	Size (cm)	15	143,80	1,20	4,63	3,22	133	152
	Rump height (cm)	15	145,13	1,40	5,41	3,73	136	155
	thorax perimeter (cm)	15	202,47	3,60	13,95	6,89	180	220
	Chest depth (cm)	15	82,54	1,09	4,23	5,12	75	93
	Weight (kg.)	15	659,40	27,56	106,75	16,19	475	800
Third Lactation	Size (cm)	13	145,64	0,82	2,97	2,04	139	151
	Rump height (cm)	13	146,86	0,82	2,95	2,01	140	153
	thorax perimeter (cm)	13	204,71	2,74	9,89	4,83	185	220
	Chest depth (cm)	13	83,07	1,32	4,76	5,73	75	95
	Weight (kg.)	13	678,93	26,51	95,58	14,08	512	830

Given the good average values of body dimensions showed by the exploited herds in this farm, also the maximum of the individual values reached at these animals of 151 cm for HW, 153 cm for HR, 95 cm for the chest depth, 220 for TP and 830 kg for body weight we can say that through a proper selection and a appropriate exploiting technology in short time can be reached and even exceed the established objectives for this breed, regarding the body development. Regarding the scores obtained by creditworthiness cows,

we can see that the animals meet in terms of body conformation to the breed to which they belong, yielding total scores in average of 84.92 ± 0.42 in first lactation. Regarding points awarded for udder conformation is seen that they vary between 34.2 and 34.49 udder points. The coefficient of variation for scores is quite small between 2% and 3.01% which shows actual homogeneous cows on body conformation.

CONCLUSIONS

From the analysis of the morphological characteristics, we can conclude that the number of studied taurines have a good corporal development, even very good, that offers a biological platform favorable for a productive life. Concerning the score obtained from the examined cows, we can observe that the animals correspond from the point of view of the corporal conformation with the breed they come from.

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CURRENT DEVELOPMENT STRATEGY OF ROMANIAN AGRICULTURE

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Abstract

Analysis of the current situation of the agricultural sector in Romania indicate the need to accelerate restructuring and modernization of rural areas especially, given its economic and social importance for ensuring integrated and sustainable economic development. Simultaneously, it is necessary to rethink agricultural policy in the context of sustainable development by focusing on protecting and conserving natural resources, maintaining biodiversity, natural habitat, rural and urban job creation through efficient and sustainable use of the natural environment.

Key words: agriculture, agricultural development strategy, common agricultural policy, natural resources

INTRODUCTION

National agriculture is an important branch of the Romanian economy. The contribution of agriculture, forestry, fisheries in gross domestic product stands at around 6% of GDP and the EU Member States stands at about 1.7% [5].

With the investment and external demand to withdraw economic goods produced in Romania is decreasing, it is necessary an internal potential analysis and concentrating it to cover the largest possible measure of internal consumption

Such an analysis aims to identify the relative advantages of the Romanian economy as a whole and at sectoral level compared to the EU economy. This may lead to the identification of sectors whose efficient operation will generate, on the one hand, competitive advantages and, on the other hand, achieving an optimal level of production.

MATERIALS AND METHODS

The proposed strategy envisages a model of multifunctional agriculture and rural development. The basic principle in the application of this model is to promote the development of rural agricultural functions accompanied by equally promoting non-

agricultural functions of these areas. This model is compatible with economic and social policy of the European Union, whose main objective is to reduce development disparities among EU regions and thus in reducing development gaps between rural and urban. Rural development strategy based on SWOT analysis [2] of agricultural and rural sector and proposes that measures are taken to solve the first problem of rural infrastructure, and structural problems of agriculture, on the other hand.

Among the policies and programs that have the effect of agricultura development can be mentioned:

- National program for renewal of tractors and agricultural machines autopropelled;
- The project "Irrigation Rehabilitation and Reform";
- Research projects funded by the World Bank;
- Implementation of law package "energy-climate". National Action Plan on Renewable Energy (PNAER);
- National Strategy for t reducing the drought effects, prevention and combating land degradation and desertification for the short, medium and long term;
- Programs on exploitation and soil conservation;

- Programs to promote and support organic farming systems etc.[5]

RESULTS AND DISCUSSIONS

In Romania, agriculture may be a branch whose efficient operation could generate added value for several reasons:

1. in Romania the share of agricultural area is relatively high, 62% compared with other EU countries, Romania's arable land - 9.427 million hectares - representing 64% of the agricultural area of Romania amounting to 14.722 million ha 23% of the arable central and eastern European countries and 12.6% of the arable EU countries;
2. potential of natural resources, especially water;
3. potential of use alternative energy resources in many parts of Romania, such as river valleys, Dobrogea, Bărăgan, Oltenia ;
4. exploitation potential of the existing workforce and to attract those through adaptation programs.

All these advantages are extensive in nature that can only be transformed into competitive advantages through efficient combination of production factors and the growth of investment. It also aims to increase the incidence of structural funds in order to increase the development of Romanian agriculture, as, at least in the current economic downturn, the only way to attract financial resources.

As shown, agriculture enjoys a high potential but is not added value due to lack of strategic vision and long term . This strategy should consider the following:

- Conservation of productive potential [4]. In this regard, it will allocate investments managed by public-private partnerships to restore or build irrigation networks, technical capital endowment leads to increasing agricultural productivity;
- Conservation and attracting labor.

Farming population is aging in Romania or has no access to financial resources to launch economic activities. The main shortcomings of the agricultural population are fewer

opportunities for schooling, low qualifications, skills and professional skills mismatch in the current market specific agricultural products. In this regard, local authorities should support rural education process and motivations or facilities to attract labor in agriculture.

- Development of network processing agricultural products as family associations than or craft production that is complementary medium and large farms [10]

- Completion of legal agricultural population to the possibility of accumulation of production factors to form the medium and large farms dimensions.

- Building land market to form a real price of production factors land, favoring accumulation and production.

- Operation of agricultural products market competition mechanisms to favor domestic producers for the purposes of their access to markets.

- Supporting farmers through a system of subsidies linked to the actual cost of document production, aimed to encourage production and marketing.

- Possibility of accessing loans with preferential interest rates for farmers.

- Encouraging the practice of intensive agriculture on a large scale by mechanized means to increase productivity and achieve economies of scale.

- Discourage practices that generate self consumption, economic demotivation, impaired physical and mental health of workers.

- Raising the rank of field agriculture profitable activity, effective at the expense of the current attitude of marginalization, discrimination, degradation.

Romanian economy should be encouraged to exploit their economic resources without becoming self-sufficient, neither could achieve this in terms of use and particularly liberalization of being in an integrated economy, such as the European Union.

Taking into account the need to adapt Romanian agri-food sector to EU by promoting an effective and viable sector of economic and social integration context, the

strategy sets out the main directions for the development of agriculture and forestry. Thus, the key issues facing the Romanian rural area in general are:

- Large number of semi-subsistence farms and subsistence, which are not viable, with an average size of holding of only 1.7 ha [3];
- Low productivity and quality of agricultural production due to lack of financial resources, insufficient and inefficient use of available resources, lack of trained personnel for practicing modern agriculture, lack of or insufficient managerial and marketing knowledge and inadequate technical infrastructure;
- Gap between import and export of agricultural products (mainly recorded exports of low value-added products);
- Lack of an organized market networks, farmers are forced to sell their own products or sell them to "intermediaries" at very low prices, leading to a huge gap between the prices of raw agricultural products sold by farmers processors and price finite;
- Poor state of basic infrastructure;
- There are significant areas of land (approx 1/5) severely affected by risk factors natural: floods, landslides, high seismicity, desertification, reduced water resources. These goals will be achieved by reducing the number of people who earn their living from agricultural activity, a direct effect of these actions is the issue of land, which will lead to consolidation and strengthening of viable farms. This will increase the efficiency of Romanian agriculture to promote managerial skills of farmers and farming orientation towards profitable investments, including integrated projects.

Given the current situation of the agricultural sector and rural areas and limited funds at their disposal, it requires rational and efficient use them in a fair distribution of funds for rural development and fisheries, the priorities and actions carefully selected.

In this regard, have identified the following *general objectives*:

1. Development of the agricultural and forestry sector competitive knowledge-based and private initiative, able to adapt to long-

term changes, which take into account the Community rules, preserve the environment and enhances processing sector [1];

2. Maintaining the quality and diversification of rural and forestry to achieve a balance between human activities and natural resource conservation;

3. Improving living standards in order to ensure sustainable occupation of rural areas and contribute to territorial balance both economically as well as socially;

4. Implementing a pilot program effective realization of natural resources, biodiversity and creating jobs.

An important role in addressing some of these issues it is the implementation of national policies and programs, and European programs, implementing the *acquis communautaire* concerning the Common Agricultural Policy and related policies and specific priority problems for the sustainable development of agriculture and rural areas of Romania [9].

Through national policies and programs in the agriculture, Romania aims to fulfill the following objectives:

➤ completing the reform of land ownership - is proposed completion of land property restitution or fair compensation in cases where return objectives can not be made in kind;

➤ encourage conversion of farms into family farms, commercial, middle-class formation in rural areas.

➤ "Farmer Program": agriculture in Romania will be able to access EU funds of about 12 billion euros in 2007-2013. Since 2010, Community support will be provided only Romanian agriculture farms, not family farms, how far. Ministry aims through the farmer to turn a large number of subsistence farms with commercial family farms;

➤ life annuity - provides premises for land consolidation, financial support is given to people over 62 years who own up to 10 hectares of land, the equivalent of 100 euro / year per hectare alienated and 50 euro / year per hectare leased.

Great practical importance has FADN (Farm Accounting Data Network), whose information is aggregated into a Standard

Results database available for the following dimensions: Time (year), geographic (Country, Region), Typology (Type of Farming, TF8/TF14 and economic size ES6).

We can observe that the economical efficiency indicators (like profit, net income, gross and value added) are synthetic expressions of farm profitability. Also some indicators from FADN data base (like specific costs) don't contain a series of elements and some indicators (like labor costs) are only estimated.

In Romanian FADN data base over 94% of the farms have less than 4 ESU (European size unit) and only 1.08% over 100 ESU. The medium utilized agricultural area per farm is 10.17 hectares [12]. Subsidies system for agricultural producers has an important role in

raising the economical efficiency of Romanian farms. Due to the low productivities and chain organizational problems, the vegetal and animal farms are very dependent of this system[7].

Starting from this basis for setting priorities for action national policies and programs for rural development and community support. National and National Rural Development Programme (RDP) funded by the European Agricultural Fund for Rural Development (EAFRD) occur in a complementary manner. The overall strategy aims to develop economic competitiveness of rural areas, preserving the environment and emphasizing the presence of people.

The general purpose is divided as follows in table 1:

Table 1. Overall strategy for to develop economic competitiveness of rural areas

Economic competitiveness of rural development, preserving the environment and emphasizing this population	Strengthening economic and employment	Modernization, development and structuring of production tools to improve competitiveness
		Improving human capital
	Preserving and enhancing natural resources	Strengthening the necessary economic activities
		Ensure sustainable management of resources
	The emphasis of this population in rural	Enhancement of the natural heritage
		Keeping people in difficult areas
	Development of local government	Improving quality of life in rural
		Introduction of local development strategies

Source: own processing on the basis of data from http://eufinantare.info/Instrumente_structurale_UE

To make permanent actions under SAPARD measures that meet the following objectives will be resumed by EAFRD:

- sustainable development of a competitive agribusiness sector by modernizing and improving the processing and marketing of agricultural and fishery for both adding value to agricultural raw materials of nature and the creation of new local distribution in rural areas with a positive impact on the income of those working in this sector. Priority is given to measures to improve market efficiency, quality and health standards [8];

- rural economy through creation and modernization of fixed assets from the private farming and forestry, development and diversification of economic activities in rural areas in order to maintain and / or create jobs and alternative income within households;
- HRD improving vocational training for farmers and forest land owners;
- rising living standards in rural areas by improving and developing the necessary infrastructure and social planning sustainable agriculture.

Measures proposed to be funded through the National Plan for Agriculture and Rural Development can provide only a proportion of

25 to 30% solve the problems facing the Romanian rural area such as the absence of viable farms, processing units to be modernized lack of rural infrastructure, insufficient development services, rural population aging, increased migration to the urban youth and women etc.

In these circumstances it is appropriate to continue the National Rural Development Programme 2007 - 2013 of measures such as those relating to: modernization of agricultural holdings (measure 3.1), adding value to agricultural products (m.1.1) and

forestry (m.3.5), training farmers (m.4.1), supporting producer groups (m. 3.2), agri-environment (m.3.3), diversification of non-agricultural activities (m. 3.4), encouragement of tourism activities (m.3.4), first afforestation of agricultural land (m.3.5).

Joining the Community guidelines for Romanian rural development strategy to identify specific areas of intervention EAFRD in Romania, and ensure a balance between the 4 axes (table 2):

Table 2: Strategy for identify specific areas of intervention EAFRD in Romania

	Axis 1 - Transfer of knowledge - Modernization, innovation, quality	Axis 2 -Biodiversity, conservation / development of high nature value areas and traditional agricultural landscapes -water -climate changes	Axis 3 - Creation of jobs - Conditions for growth	Axis 4 -Improving Governance -Potential for endogenous development
Romanian rural development strategy	FEADR specific intervention areas in Romania (sub-objectives)			
Modernization, development and structuring of production tools to improve competitiveness	- Restructuring and development of agricultural and forestry - Restructuring and development of agricultural and woodworking industries	Conservation and development of forest	Economic multifunctional development of rural areas	Conduct of actions to meet these objectives in the local development strategies
Improving human capital	Improving professional skills and management capacities of agricultural and forestry operator		Forming rural actors	
Strengthening the necessary economic activities			Developing infrastructure and services (for companies)	
Ensure sustainable management of resources	-Awareness on sustainable management through training -Consideration of environmental requirements for investments in modernization	Sustainable management practices and forest land		
Enhancement of the natural heritage			Enhancement of the natural heritage	
Keeping people in difficult areas		Ensuring a balanced occupation of the territory		
Improving quality of life in rural			Development of infrastructure and services (for individuals) -Conservation and enhancement of cultural and architectural heritage	
Introduction of local development strategies			Improving implementation of local development strategies	
Indicative allocation of resources	45%	25%	30%	2,5%

Source: own processing on the basis of data from http://eufinantare.info/Instrumente_structurale_UE

Priorities for action around which is organized by the EAFRD support generally contribute to EU rural development objectives, as follows[11]:

- Restructuring and development of agricultural and forestry production to improve competitiveness;
- Restructuring and development of agro-food industry and the timber industry to improve competitiveness;
- Multifunctional economic development of rural areas;

- Improving professional skills and management capacity of farmers and forest holders.

CONCLUSIONS

Common Agricultural Policy (CAP) is a tool not only for food production and rural development, but also to preserve biodiversity. However, environmental protection measures under the CAP so far failed to stop the general decline of biodiversity. Under these

conditions, the CAP should be redirected to compensate farmers for compensating farmers for providing public goods because, at present, the market fails to "integrate economic value of public goods that agriculture can produce."

European budget 2014 - 2020, Romania hopes to receive more funds for agriculture to 21 billion euros, of which the most money will be used to direct payments.

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IMPORTANCE OF STRATEGIC ALLIANCES IN COMPANY'S ACTIVITY

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Abstract

Strategic alliance is an agreement between two or more organizations to cooperate in a specific business activity, so that each benefits from the strengths of the other, and gains competitive advantage. The formation of strategic alliances has been seen as a response to globalization and increasing uncertainty and complexity in the business environment. Strategic alliances involve the sharing of knowledge and expertise between partners as well as the reduction of risk and costs in areas such as relationships with suppliers and the development of new products and technologies. A strategic alliance is sometimes equated with a joint venture, but an alliance may involve competitors, and generally has a shorter life span. Strategic partnership is a closely related concept. This article analyzes definition of strategic alliance, its benefits, types, process of formation, and provides a few cases studies of strategic alliances. This paper tries to synthesize the scope and role of marketing functions in the determination of effectiveness of strategic alliances. Several propositions from a marketing viewpoint concerning the analysis of alliance process are formulated. On the basis of the propositions, a framework is developed for future research.

Key words: *strategic alliance, strategic management, types of strategic alliance*

INTRODUCTION

Strategic alliances developed and propagated as formalized inter organizational relationships, particularly among companies in international business systems. These cooperative arrangements seek to achieve organizational objectives better through collaboration than through competition, but alliances also generate problems at several levels of analysis.

Strategic alliances are critical to organizations for a number of key reasons:

1. Organic growth alone is insufficient for meeting most organizations' required rate of growth.
2. Speed to market is essential, and partnerships greatly improve it.
3. Complexity is increasing, and no single organization has the required total expertise to best serve the customer.
4. Partnerships can defray rising research and development costs.
5. Alliances facilitate access to global markets.

The main purpose of the article is to analyze the importance of strategic alliances in a company's activity.

MATERIALS AND METHODS

Strategic alliances are becoming an important form of business activity in many industries, particularly in view of the realization that companies are competing on a global field. Strategic alliances are not a panacea for every company and every situation. However, through strategic alliances, companies can improve their competitive positioning, gain entry to new markets, supplement critical skills, and share the risk and cost of major development projects.

For the study of economic events, have been used such methods as an economic research: historical, graphic and economics and statistics.

RESULTS AND DISCUSSIONS

Strategic alliances are agreements between companies (partners) to reach objectives of common interest. Strategic alliances are

among the various options which companies can use to achieve their goals; they are based on cooperation between companies (Mockler, 1999). Strategic alliances are agreements between companies that remain independent and are often in competition. In practice, they would be all relationships between companies, with the exception of a) transactions (acquisitions, sales, loans) based on short-term contracts (while a transaction from a multi-year agreement between a supplier and a buyer could be an alliance); b) agreements related to activities that are not important, or not strategic for the partners, for example a multi-year agreement for a service provided (outsourcing) (Pellicelli, 2003). Strategic alliance can be described as a process wherein participants willingly modify their basic business practices with a purpose to reduce duplication and waste while

facilitating improved performance (Frankel, Whipple and Frayer, 1996). A strategic alliance has to contribute to the successful implementation of the strategic plan; therefore, the alliance must be strategic in nature. The relationship has to be supported by executive leadership and formed by lower management at the highest, macro level. While the following does not represent a comprehensive definition for a strategic alliance, at this stage, one might define a strategic alliance as a relationship between organizations for the purposes of achieving successful implementation of a strategic plan. In simple words, a strategic alliance is sometimes just referred to as “partnership” that offers businesses a chance to join forces for a mutually beneficial opportunity and sustained competitive advantage (Yi Wei, 2007). A literature review of the definitions of strategic alliances is given in Table 1.

Table 1. Definitions of strategic alliances*

Porter, 1990	Strategic alliances are long-term agreements between firms that go beyond normal market transactions but fall short of merger. Forms include joint ventures, licenses, long-term supply agreements, and other kinds of inter-firm relationships.
Dussauge & Garrette, 1995	An alliance is a cooperative agreement or association between two or more independent enterprises, which will manage one specific project, with a determined duration, for which they will be together in order to improve their competences. It is constituted to allow its partners to pool resources and coordinate efforts in order to achieve results that neither could obtain by acting alone. The key parameters surrounding alliances are opportunism, necessity and speed.
Faulkner, 1995	A strategic alliance is a particular mode of inter-organizational relationship in which the partners make substantial investments in developing a long-term collaborative effort, and common orientation.
Yoshino & Rangan, 1995	A strategic alliance is a partnership between two or more firms that unite to pursue a set of agreed upon goals but remain independent subsequent to the formation of the alliance to contribute and to share benefits on a continuing basis in one or more key strategic areas, e.g. technology, products.
Douma, 1997	A strategic alliance is a contractual, temporary relationship between companies remaining independent, aimed at reducing the uncertainty around the realization of the partners' strategic objectives (for which the partners are mutually dependent) by means of coordinating or jointly executing one or several of the companies' activities. Each of the partners are able to exert considerable influence upon the management or policy of the alliance. The partners are financially involved, although by definition not through participation, and share the costs, profits and risks of the strategic alliance.
Gulati, 1998	Strategic alliances are voluntary arrangements between firms involving exchange, sharing, or co-development of products, technologies, or services.
Phan, 2000	Alliances are long-term, trust-based relationships that entail highly relationship-specific investments in ventures that cannot be fully specified in advance of their execution.

*Source: adapted by Yi Wei, 2007

When a strategic alliance is proposed within an organization, the following questionnaire

should be used as an initial assessment of the opportunity:

- Does the proposed alliance contribute to the mission or vision of the organization?
- Does this proposed alliance allow the organization to achieve its objectives more effectively or more efficiently?
- Are there competitive advantages to forming this alliance? For example, will this allow the organization to mitigate risks, penetrate a new marketplace or take advantage of a new opportunity that otherwise would not likely come to fruition?
- Is this alliance important enough to be included in the strategic plan? Is this alliance important enough that it will continue to receive the support and attention of upper management, even after its formation?
- What were the key drivers in seeking a strategic alliance instead of doing it alone?
- What were the key objectives that the company sought to achieve through the alliance?
- What channels and mechanisms were used to identify a potential strategic partner?
- What are some of the key attributes that were looked for in a strategic partner?
- How important has the design focus of the company been in attracting alliance partners?
- What was the typical life cycle of a strategic alliance and how did it end?
- Which aspects of the strategic alliance(s) worked well?
- What were the barriers that had to be overcome in order to establish a strategic alliance?
- What aspects of the strategic alliance(s) were the hardest to work with?

Strategic alliances have some characteristics:

1. Two or more organizations (business units or companies) make an agreement to achieve objectives of a common interest considered important, while remaining independent with respect to the alliance.
2. The partners share both the advantages and control of the management of the alliance for its entire duration.
3. The partners contribute, using their own resources and capabilities, to the development of one or more areas of the alliance (important for them). This could be technology, marketing, production, R&D or other areas.

Strategic alliances yield better results under certain conditions (Pellicelli, 2003):

1) When each partner recognizes the need to have access to capabilities and competencies it cannot develop internally.

2) When a gradual approach is preferable in accessing resources, capabilities and competencies. Uncertainties about the future evolution of demand and technology often advise flexibility. The alliance can provide this.

3) When it is not possible to acquire another company in order to achieve particular development goals. It is a fairly common belief that the management of an alliance must have qualities different at least in part from those of the parent company (the partners). The reason is simple. The management of a strategic alliance is profoundly different from that of a company that acts independently.

Creating strategic alliances has evolved quickly over the last few decades:

- In the 70's, the main factor was the performance of the product. Alliances aimed to acquire the best raw materials, the lowest costs, the most recent technology and improved market penetration internationally, but the mainstay was the product.

- In the 80's, the main objective became consolidation of the company's position in the sector, using alliances to build economies of scale and scope. In this period there was a true explosion of alliances.

- In the 90's – according to Harbison and Pekar (1998) – collapsing barriers between many geographical markets and the blurring of borders between sectors brought the development of capabilities and competencies to the centre of attention. It was no longer enough to defend one's position in the market. It became necessary to anticipate one's rivals through a constant flow of innovations giving recurrent competitive advantage.

Regardless of the broad variety of definitions for strategic alliance, all have certain similarities (Spekman, 1998):

- each has goals that are both compatible and directly related to the partner's strategic intent;

– each has the commitment of, and access to, the resources of its partners and;

– each represents an opportunity for organizational learning.

Table 2. The factors leading to alliances*

1970's	1980's	1990's
Product performance	Position in the sector	Capabilities and competencies
Produce using the most recent technologies.	Construct position in the sector.	Access to new opportunities through a constant flow of innovation.
Marketing beyond national borders.	Consolidate position in the sector.	Anticipate rivals to maximize the creation of value.
Sales based on product performance.	Economies of scale and Scope.	Reduce total cost for the product or client segment.
		Acquire advantages in responding to changing conditions and emerging opportunities.

*Source: adapted from Harbison and Pekar, 1998

There are four potential benefits that international business may realize from strategic alliances (Bernadette Soares, 2007):

Ease of market entry: Advances in telecommunications, computer technology and transportation have made entry into foreign markets by international firms easier. Entering foreign markets further confers benefits such as economies of scale and scope in marketing and distribution. The cost of entering an international market may be beyond the capabilities of a single firm but, by entering into a strategic alliance with an international firm, it will achieve the benefit of rapid entry while keeping the cost down. Choosing a strategic partnership as the entry mode may overcome the remaining obstacles, which could include entrenched competition and hostile government regulations.

Shared risks: Risk sharing is another common rationale for undertaking a cooperative arrangement - when a market has just opened up, or when there is much uncertainty and instability in a particular market, sharing risks becomes particularly important. The competitive nature of business makes it difficult for business entering a new market or launching a new product, and forming a strategic alliance is one way to reduce or control a firm's risks.

Shared knowledge and expertise: Most firms are competent in some areas and lack expertise in other areas; as such, forming a strategic alliance can allow ready access to knowledge and expertise in an area that a

company lacks. The information, knowledge and expertise that a firm gains can be used, not just in the joint venture project, but for other projects and purposes. The expertise and knowledge can range from learning to deal with government regulations, production knowledge, or learning how to acquire resources. A learning organization is a growing organization.

Synergy and competitive advantage: Achieving synergy and a competitive advantage may be another reason why firms enter into a strategic alliance. As compared to entering a market alone, forming a strategic alliance becomes a way to decrease the risk of market entry, international expansion, research and development etc. Competition becomes more effective when partners leverage off each other's strengths, bringing synergy into the process that would be hard to achieve if attempting to enter a new market or industry alone.

In retail, entering a new market is an expensive and time consuming process. Forming strategic alliances with an established company with a good reputation can help create favourable brand image and efficient distribution networks. Even established reputable companies need to introduce new brands to market. Most times smaller companies can achieve speed to market quicker than bigger, more established companies. Leveraging off the alliance will help to capture the shelf space which is vital for the success of any brand.

Biggs (2006) identifies the following as key factors that determine the success of a strategic alliance, which are presented in Figure 1.

It may well be that the advantages of alliance have been stressed, and sometimes over-emphasized, without a balanced presentation of costs and risk. In the situation of a small

innovative organization, in an alliance with a larger company whose core strength is in its physical asset base, competitive outcomes can quickly be determined by who has the easiest access to the complementary assets – be it specialized marketing, manufacturing or distribution.

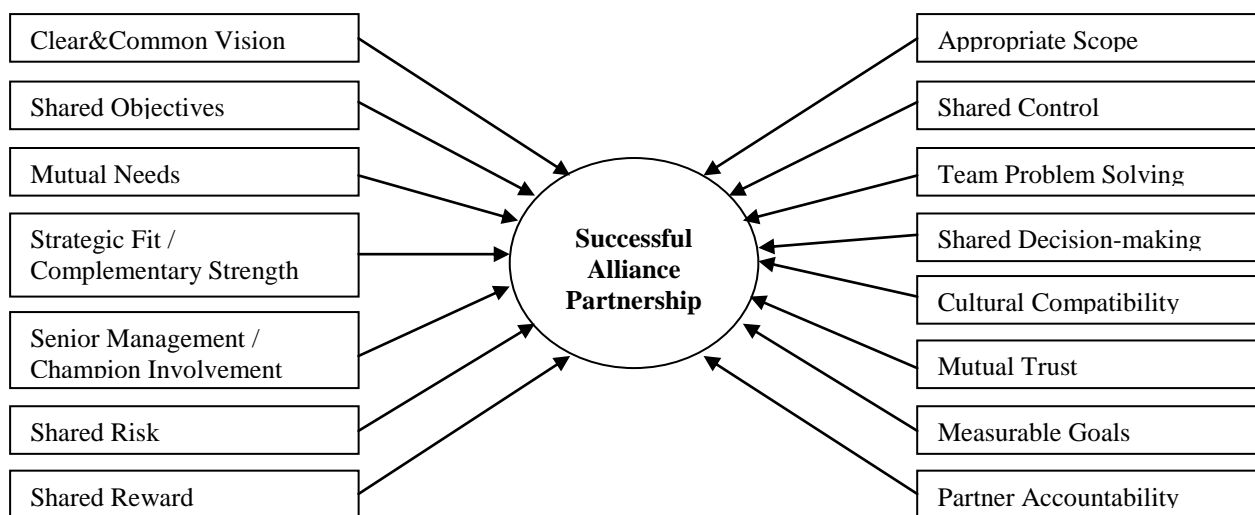


Figure 1. Critical Success Factors affecting Strategic Alliances (Biggs, 2006)

There are a lot of types of strategic alliances, which are listed below:

Joint Ventures. A joint venture is an agreement by two or more parties to form a single entity to undertake a certain project. Each of the businesses has an equity stake in the individual business and share revenues, expenses and profits.

Outsourcing. The 1980s was the decade where outsourcing really rose to prominence, and this trend continued throughout the 1990s to today, although to a slightly lesser extent.

Affiliate Marketing. Affiliate Marketing has exploded over recent years, with the most successful online retailers using it to great effect. The nature of the internet means that referrals can be accurately tracked right through the order process.

Technology Licensing. This is a contractual arrangement whereby trade marks, intellectual property and trade secrets are licensed to an external firm. It is used mainly as a low cost way to enter foreign markets. The main downside of licensing is the loss of control over the technology – as soon as it enters

other hands the possibility of exploitation arises.

Product Licensing. This is similar to technology licensing except that the license provided is only to manufacture and sell a certain product. Usually each licensee will be given an exclusive geographic area to which they can sell to. It is a lower-risk way of expanding the reach of your product compared to building your manufacturing base and distribution reach.

Franchising. Franchising is an excellent way of quickly rolling out a successful concept nationwide. Franchisees pay a set-up fee and agree to ongoing payments so the process is financially risk-free for the company.

R&D. Strategic alliances based around R&D tend to fall into the joint venture category, where two or more businesses decide to embark on a research venture through forming a new entity.

Distributors. If you have a product one of the best ways to market it is to recruit distributors, where each one has its own geographical area or type of product. This ensures that each

distributor's success can be easily measured against other distributors.

Distribution Relationships. This is perhaps the most common form of alliance. Strategic alliances are usually formed because the businesses involved want more customers. The result is that cross-promotion agreements are established.

A typical strategic alliance formation process involves these steps:

- **Strategy Development:** involves studying the alliance's feasibility, objectives and rationale, focusing on the major issues and challenges and development of resource strategies for production, technology, and people.
- **Partner Assessment:** involves analyzing a potential partner's strengths and weaknesses, creating strategies for accommodating all partners' management styles, preparing appropriate partner selection criteria, understanding a partner's motives for joining the alliance and addressing resource capability gaps that may exist for a partner.
- **Contract Negotiation:** involves determining whether all parties have realistic objectives, forming high caliber negotiating teams, defining each partner's contributions and rewards as well as protect any proprietary information, addressing termination clauses, penalties for poor performance, and highlighting the degree to which arbitration procedures are clearly stated and understood.
- **Alliance Operation:** involves addressing senior management's commitment, finding the calibre of resources devoted to the alliance, linking of budgets and resources with strategic priorities, measuring and rewarding alliance performance, and assessing the performance and results of the alliance.
- **Alliance Termination:** involves winding down the alliance, for instance when its objectives have been met or cannot be met, or when a partner adjusts priorities or reallocated resources elsewhere.

The advantages of strategic alliance includes: 1) allowing each partner to concentrate on activities that best match their capabilities, 2) learning from partners & developing competences that may be more widely exploited elsewhere, 3) adequacy and

suitability of the resources & competencies of an organization for it to survive.

CONCLUSIONS

1. Strategic alliances are no longer a strategic option but a necessity in many markets and industries. Dynamic markets for products and technologies, coupled with the increasing costs of doing business, have resulted in a significant increase in the use of alliances.

2. Strategic alliances are increasingly becoming an important part of overall corporate strategy, as a way to grow product and service offerings, develop new markets and leverage technology and R&D.

3. Strategic alliances are an indispensable tool in today's competitive business environment. No longer can companies afford *ad hoc* approaches to alliance formation and management, any more than they can rely on a small number of talented alliance managers.

4. Many global companies have multiple alliances, some global, requiring coordination with numerous partners. Companies are also finding benefits to partnership with competitors. How are these companies managing this competition? What are they doing to develop a working relationship yet still protect them? The must be created by creating customer value through partnerships, managing alliances with competitors, managing global alliances.

5. New insights on alliance management tools and strategies, focusing on: leveraging differences with partners to create value, dealing with the internal challenges of making your partnerships succeed, managing the day-to-day challenges of alliances with competitors.

6. Risk management is a company wide concern and strategic alliances have their share of risks. Insights on managing risks in alliances including: managing reputation and relationship risks; risk assessment and legal issues in alliances; intellectual property protection; dealing with breaches of alliance contracts; termination triggers; restructuring versus termination; when and how to exit an alliance with minimal risk.

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ANALYSIS OF LIVESTOCK AT REGIONAL LEVEL IN ROMANIA

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Abstract

In Romania the livestock sector generates significant outputs for the agricultural and the national economy. Geographical distribution of the livestock production systems varies between regions of development, due local traditions, production conditions, and consumer choices options. This paper analysis the livestock sector at regional level for all animal species considered for production. For the research method, based on regional analysis has been considered statistical approach, based of national database for year 2011. The results indicates different concentration of livestock at regional level, even if animal density per 100 ha was calculate in order to consider the different dimension of agriculture land of each region.

INTRODUCTION

The livestock sector is economically significant due its account in agricultural gross product, its capacity to employ people, and its contribution on food market. As Samuel Jutzi said, livestock make a vital contribution as generator of cash flow and economic buffers [1]. Some authors consider that livestock have to be considered in relation with biodiversity and sustainability. In this respect Irene Hoffman [2] indicate that small scale livestock keepers are the targets of poverty alleviation and rural development programs but they also need incentives to start improved genetic resource management at an earlier stage in economic development. The development of livestock in Romania should be considered taking in consideration its impact on environment. Milne J.A. [3] consider that intensification of poultry, pig and dairy cow production systems can lead to air and water pollution associated with nitrogen and phosphorus emissions and losses from manure. The role agricultural consulting system for the husbandry breeding was underlined by Mugnier [4] who found that different sources of advice should be maintained to correspond with the various

strategies farmers use to acquire information. The level of livestock in a region is in relation with traditions of production, farmer preferences for livestock products, the available land for livestock production systems, fodder production, the number of population located in the rural areas of a specific region.

MATERIALS AND METHODS

In order to characterize the evolution of livestock, the following indicators were used: number of cattle, pigs, sheep, goats and horses stock and their density per 100 ha. The analyses have been focused at regional level and national level comparative with The European Union. The period analyzed in this study is 2006-2012. The data are provided by Eurostat, National Institute of Statistic Romania and Ministry of Agriculture and Rural Development, and have been statistically processed and interpreted.

RESULTS AND DISCUSSIONS

In Romania, the livestock is divided within eight regions of development. The major livestock production systems are specialized in meat production from poultry and eggs production, meat and milk production from

sheep and pig production. The poultry has the highest level of livestock due to good level of price for slaughtered chickens (around 150 euro/100 kg). This sector has high potential of development, related with attractive opportunities generated by consumer interest for this meat, low cost of production for integrated systems, short production cycle and export potential.

In Romania the poultry sector has achieved during last decade an improvement of technical and economical performance.

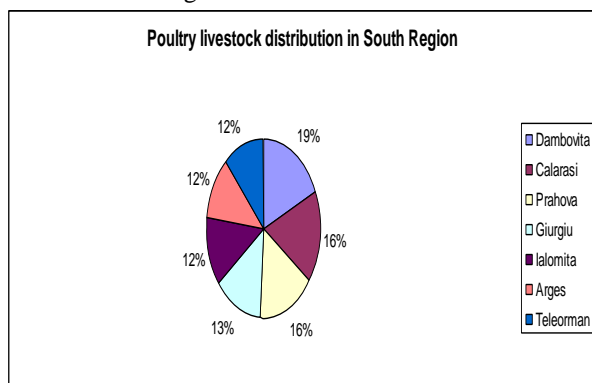
Table 1. Poultry livestock per 100 ha of land at regional level in Romania in 2011

Regions	Heads	Percent from total (%)	Poultry livestock per 100 ha at region level (heads/100 ha)
TOTAL	79841651	100	562.92
North West Region	8626527	10.80%	425.68
Centre Region	8060624	10.10%	436.44
North East Region	13906237	17.42%	670.62
South East Region	12488619	15.64%	562.97
South Region	20563160	25.75%	870.71
Bucharest Ilfov Region	586022	0.73%	571.80
South West Region Oltenia	10170919	12.74%	591.69
West Region	5439543	6.81%	296.45

Source: Own calculations based on data NIS Romania

The implementation of new welfare of poultry have increased the costs, but this sector is well developed in agriculture regions as South Region, where the feeds for poultry is not so expensive, at least in integrated production systems.

Fig.1. Poultry livestock distribution between counties of South East Region in 2011



In The South Region of Development, which had the largest livestock of poultry between regions in 2011, the Dâmbovița County had more than 18.4 % of total livestock of region with 3.78 millions heads, while Călărași was in second place with 16.5 %, corresponding to 3.39 millions heads.

The second largest livestock is recorded in the sheep production. In this sector, producers may receive €21/head or €16.8/head if the milk is sold on market. An additional premium of €7/head is granted in less-favored areas where sheep production constitutes a traditional activity. Also, some additional payments are eligible for Romania as member of EU. The amount of complementary national direct payment for sheep sector in Romania valued 40.8 lei per each sheep and the total amount allocated for sheep and goats was about 350 millions lei. Only part of it was paid to farmers in 2012 when despite efforts made by associations of sheep and goats, financial support remained the same as in the years 2010 and 2011, but at an exchange rate Lei/Euro significantly lower.

The sheep livestock in 2012 was 17 % higher than in 2006, but the highest number of sheep, about 9.14 million, was recorded in 2009.

Table 2. Sheep livestock per 100 ha of land at regional level in Romania in 2011

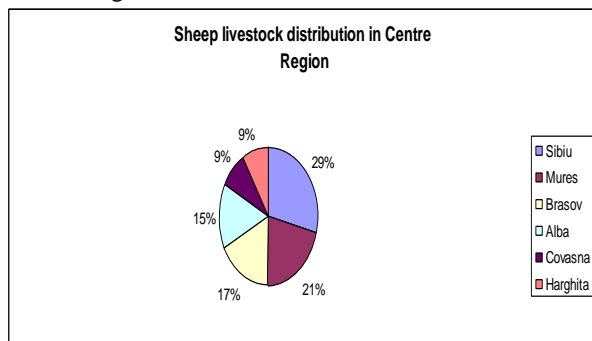
Regions	Heads	Percent from total (%)	Sheep livestock per 100 ha at region level (heads/100ha)
TOTAL	8533434	100	60.16
North West Region	1330825	15.60%	65.67
Centre Region	1931589	22.64%	104.59
North East Region	1258352	14.75%	60.68
South East Region	1302978	15.27%	58.74
South Region	812676	9.52%	34.41
Bucharest Ilfov Region	25352	0.30%	24.74
South West Region Oltenia	610385	7.15%	35.51
West Region	1261277	14.78%	68.74

Own calculations based on data NIS Romania

In The Centre Region of Development, which had the largest livestock of sheep between regions in 2011, the Sibiu County had almost 29 % of total livestock of region with more

than 558 thousand heads, while Mureş was in second place with more than 21%, corresponding to 409 thousand heads.

Fig.2. Sheep livestock distribution between counties of Centre Region in 2011



The third sector in range considering livestock dimension is pig production. This sector is supported by traditional consumer's options for this kind of meat. If we consider the livestock trend we should consider the year before Romanian integration in EU (2006), the year 2007, and recent evolution. It is also necessary to consider some transition periods that were offered for Romanian farmers or producers, and the deadlines of these periods (2009 in many cases) which generate decrease of livestock due high criteria and standards that couldn't be adopted in time.

In Romania, the number of pigs recorded also the highest value before 2007. From 2006 to 2011 the pigs' livestock decrease by 22 %, from 6.81 million to 5.36 million. In terms of livestock of pigs, Romania was in 2011, with 5.3 millions heads, the ninth in the European Union after Germany (27.4 millions heads), Spain (25.6 millions), France (13.9 millions), Poland (13 millions), Denmark (12.3 millions), the Netherlands (12.1 millions), Italy (9.3 millions) and Belgium (6.3 millions), but before the neighbors from EU: Hungary (3 millions) and Bulgaria (0,6 millions). In terms of density per 100 ha of land, Romania (60 heads/100 ha) was followed by countries such as Greece (58 heads/100 ha), Czech Republic (58 heads/100 ha), Finland (57 heads/100 ha), Slovakia (43 heads/100 ha), Lithuania (37.1 heads/100 ha) or Bulgaria (19 heads/100 ha), the highest density of pigs per 100 ha being recorded in Netherland (1195 heads/100 ha), Belgium

(758 heads/100ha) and Denmark (504 heads/100 ha)

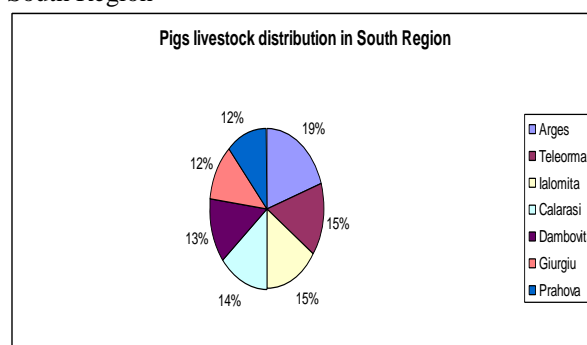
Table 3. Pigs livestock per 100 ha of land at regional level in Romania in 2011

Regions	Heads	Percent from total (%)	Pigs livestock per 100 ha at region level (heads/100 ha)
TOTAL	5363797	100	37.82
North West Region	681074	12.70%	33.61
Centre Region	534442	9.96%	28.94
North East Region	580468	10.82%	27.99
South East Region	869479	16.21%	39.19
South Region	948429	17.68%	40.16
Bucharest Ilfov Region	126677	2.36%	123.60
South West Region Oltenia	690887	12.88%	40.19
West Region	932341	17.38%	50.81

Own calculations based on data NIS Romania

In 2012 was recorded a slight increase of livestock, from 5.36 millions to 5.37 millions of pigs. In The South Region of Development, which had the largest livestock of pigs between regions in 2011, the Argeş County has almost 20 % of total livestock of region with more than 189 thousand heads, while Ialomiţa and Călăraşi took second and third place with around 14 % for each, corresponding to more than 141 thousand heads.

Fig.3 Pigs livestock distribution between counties of South Region



In terms of cattle livestock, Romania was in 2011, with almost 2 millions heads, the tenth in the European Union after France (19 millions heads), Germany (12.5 millions heads), UK (9.6 millions), Ireland (5.9

millions), Spain (5.9 millions), Italy (5.8 millions), Poland (5.5 millions) the Netherlands (3.9 millions) and Belgium (2.4 millions). In terms of density per 100 ha of land, our country (14.8 heads/100 ha) was in the same year among the last, followed by Hungary (13.8 heads/100 ha) and Bulgaria (11.7 heads/100 ha), the highest density being recorded in Netherland (214 heads/100 ha), Belgium (185 heads/100 ha) and Ireland (141 heads/100 ha).

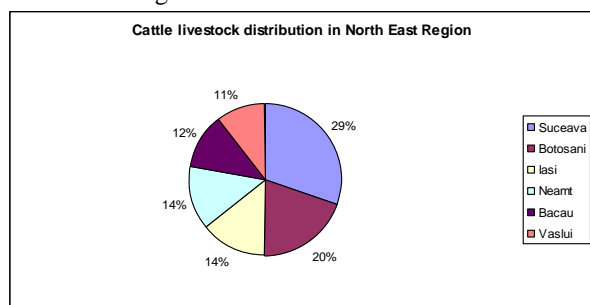
Table 4. Cattle livestock per 100 ha of land at regional level in Romania in 2011

Regions	Heads	Percent from total (%)	Cattle livestock per 100 ha at region level (heads/100 ha)
TOTAL	1988939	100	14.02
North West Region	347662	17.48%	17.16
Centre Region	313255	15.75%	15.46
North East Region	510817	25.68%	25.21
South East Region	231879	11.66%	11.44
South Region	237696	11.95%	11.73
Bucharest Ilfov Region	7171	0.36%	0.35
South West Region Oltenia	196712	9.89%	9.71
West Region	143747	7.23%	7.09

Own calculations based on data NIS Romania

At national level the number of cattle decreased between 2006 and 2011 by 33 %, from 2.93 million to 1.98 million. In 2012 was recorded the first increase of livestock up to 2.02 million.

Fig.4. Cattle livestock distribution between counties of North East Region



In The North East Region of Development, which had the largest livestock of cattle between regions in 2011, the Suceava County has 29 % of total livestock of region with

more than 155 thousand heads, while Botosani was in second place with 20 %, corresponding to more than 102 thousand heads.

In terms of sheep and the goat livestock, in 2011, Romania, with 9.7 millions heads ranked fourth among EU Member States, after the United Kingdom (21.9 millions heads), Spain (19.6 millions heads) and Greece (13.7 millions heads), before countries as France (millions heads) and Italy (8.9 millions heads). In terms of density of goats' livestock per 100 ha of land, Romania, with 72.5 heads/100 ha was situated after Greece (668 heads/100 ha), United Kingdom (124 heads/100 ha), Spain (103 heads/100 ha), Portugal (88 heads/100 ha), Italy (84 heads/100 ha) and the Netherlands (82 heads/100 ha) but before EU neighbour countries Hungary (23 heads/100 ha) and Bulgaria (36 heads/100 ha).

The goats husbandry is the only livestock sector which recorded an obvious increase between 2006 and 2012, from 0.72 million to 1.35 million, which means 85 % livestock increase. In Romania the goats rearing can be considered a new business comparative with national tradition in sheep and cattle breeding.

Table 5. Goat livestock per 100 ha of land at regional level in Romania in 2011

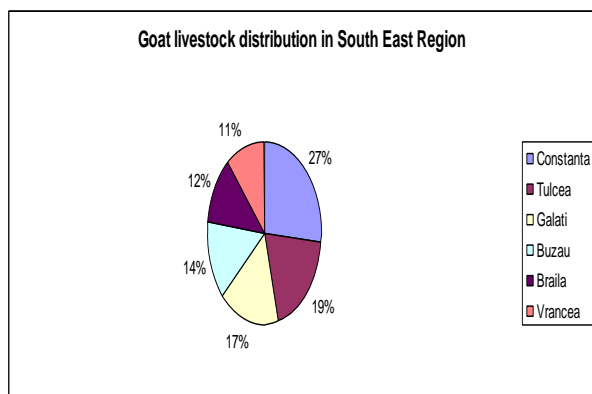
Regions	Heads	Percent from total (%)	Goat livestock per 100 ha at region level (heads/100ha)
TOTAL	1236143	100	8.72
North West Region	90643	7.33%	4.47
Centre Region	105768	8.56%	5.73
North East Region	198332	16.04%	9.56
South East Region	317218	25.66%	14.30
South Region	224370	18.15%	9.50
Bucharest Ilfov Region	8935	0.72%	8.72
South West Region Oltenia	235949	19.09%	13.73
West Region	54928	4.44%	2.99

Own calculations based on data NIS Romania

The goat products have the advantage of an emergent market, based on new consumer choice and buying option. In The South East Region of Development, which had the largest

livestock of goats between regions in 2011, the Constanța County had 26 % of total livestock of region with more than 84 thousand heads, while Tulcea was in second place with 19 %, corresponding to more than 60 thousand heads.

Fig.5. Goats livestock distribution between counties of South East Region



The horses livestock has suffered changes considering the role of horses in the past as work factor to its increasing nowadays role of entertainment. In The North East Region horses still have their primordial role in agriculture and are also used for transport. The highest density of horses per 100 ha is recorded in the South East Region of Development where the horses are also important for local transport in rural areas and other activities related with agriculture.

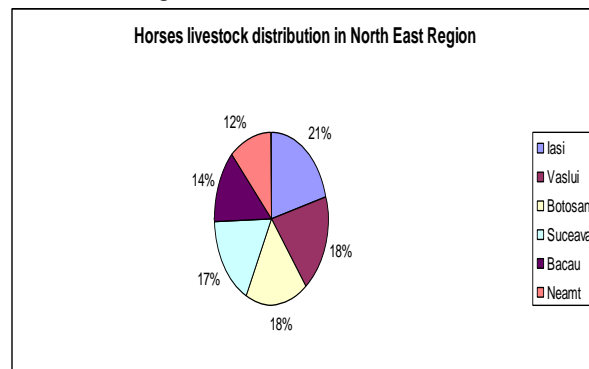
Table 6. Horses livestock per 100 ha of land at regional level in Romania in 2011

Regions	Heads	Percent from total (%)	Horses livestock per 100 ha at region level (heads/100 ha)
TOTAL	1236143	100	8.72
North West Region	90643	11.88%	4.47
Centre Region	105768	12.22%	5.73
North East Region	198332	26.21%	9.56
South East Region	317218	16.25%	14.30
South Region	224370	13.89%	9.50
Bucharest Ilfov Region	8935	0.61%	8.72
South West Region Oltenia	235949	13.60%	13.73
West Region	54928	5.35%	2.99

Own calculations based on data NIS Romania

In The North East Region of Development, which had the largest livestock of horses between regions in 2011, the Iași County has almost 21 % of total livestock of region with more than 32 thousand heads, while Vaslui County was in second place with 18 %, corresponding to more than 28 thousand heads.

Fig.6. Horses livestock distribution between counties of South East Region



The livestock level is in relation with the feed resources at regional level.

Table 7. The land fond by use at regional level in Romania in 2011 (ha)

Regions	Arable	Hayfields	Pastures	Total
TOTAL	9352252	1553543	3277656	14183451
North West Region	1023457	387444	615641	2026542
Centre Region	721990	486383	638520	1846893
North East Region	1380705	200638	492293	2073636
South East Region	1826987	62575	328790	2218352
South Region	1965228	108419	288019	2361666
Buch. - Ilfov Region	100101	58	2328	102487
South West Region Oltenia	1244971	96824	377167	1718962
West Region	1088813	211202	534898	1834913

Source: NIS Romania

The South Region and South East have the largest areas of arable land, while Centre Region and North West Region of Development have the largest areas covered by hayfields. In the North West Region and

Centre Region can be also find the largest areas covered with pastures, favourable to sheep breeding.

CONCLUSIONS

The level of incomes and trends in population food preferences besides other aspects as the level of subsidies, livestock diseases that can pass to humans and the increase of input prices for animal sector are factors that affect the national livestock for different species. In Romania, the livestock of cattle and pigs has continuously decreased during the period 2006-2011 and slightly increased in 2012.

The livestock of goat has the most significant growth, followed by sheep. The horses' livestock is suffering a continuous decline since 2007 while the poultry livestock change each year, usually depending on market conditions and productions restrictions. At region level The North East Region of Development has the highest livestock for cattle and horses due its conserved production traditions and its richness in pastures and meadows. The South Region of Development has the highest livestock of poultry and pigs due its modern livestock production systems for poultry and large floodplain area dedicated to pig production along Danube River. The Centre Region concentrated the highest livestock of sheep while the South East region developed the largest effective of goats.

AKNOWLEDGEMENTS

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CALCULATION AND USE OF THE PEDOCLIMATIC INDEX (PCI) IN THE ESTIMATION AND MODELLING OF WHEAT PRODUCTION DEPENDING ON THE TECHNOLOGICAL PROCESSES INTENSITY (TPI) IN ROMANIA

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Abstract

The Pedoclimatic Index (PCI) calculated by us is the product between the Aridity Index (AR) and the soil fertility status expressed through number of creditworthiness points (CW_S – Creditworthiness of Soil): $PCI = AR \times CW_S$. Was used AR calculated after UNEP (United Nations Environment Programme) instead of the older De Martonne index. Determinations were performed in 6 different pedoclimatic areas, in which PCI has varied from 12 to 47. Taking into account that AR varies between 0,20 and 1,00 in Romania, while CW_S is between 0 and 100, theoretically PCI can range in the interval 0-100 and practically from 10 to 50. For each PCI was calculated the wheat production according to the Technological Processes Intensity (TPI), Creditworthiness (CW_S), them also with marks from 1 to 10, and the wheat production pattern was made based on the two parameters. It appears that at a very reduced and reduced index of the technological processes (TPI between 1-4) the wheat yields level is very slightly influenced by the pedoclimatic quality of the culture area. In the areals of culture with PCI below 15 the production can't reach 30 q/ha, irrespective of the quality of technological processes. At PCI of over 40 the production achieves 60 q/ha if there are applied superior technologies and if the working capital is optimum used. At PCI between 30 and 40 the maximum yield that can be reached in conditions of highest technical and qualitative value of production slightly exceeds 50 q/ha. All these models and nomograms are useful to agricultural management in order to estimate the production, but also for her optimization.

Key words: indicators, modulation, pedoclimatic index, technological processes, wheat production

INTRODUCTION

There is a whole range of indicators that, taken separately, are influencing either the climate, either the relations between the climate and other activities. In tourism, for example, there is a touristic climatic index [4], which characterizes the extent to which the climate is favorable for tourism.

According to the National Institute of Meteorology and Hydrology there are many indicators that characterize the climate, namely:

- values of temperature for the heat factor;
- values of precipitations for water factor;

- Potential Evapotranspiration (PET) for the plant's water consumption;
- Aridity Index (AR) that expresses the ratio between temperature and plant's water consumption etc.

University of Bucharest [12], but also ENEA [6] and Gherghina [7], provide us the Standardized Precipitations Index (SPI). It was conceived as an identification and characterization instrument of drought, but in the same time it was designed for analyzing the excess of rainfall from a certain areal [10]. Other indices used are those of aridity. Most frequently are used two of them, namely:

- a. De Martonne Aridity Index (DMAI) developed by De Martonne in 1926 [3], having the following formula:

$$\text{DMAI} = \frac{P}{T * 10}, \text{ where:}$$

P = precipitations

T = temperature values

b. UNEP Aridity Index (AR),
expressed by the formula

$$\text{AR} = \frac{P}{PET}$$

To calculate PET, although there are many methods, most famous being the one of lysimeter, today is widely used the Penman-Monteith method which, using a very large number of parameters, offer estimations extremely similar to the direct ones (lysimeter) [2] [6] [8].

All indicators presented above influence the wheat plant culture and the achievement of their yields. However, they doesn't represent complete models because aren't taken into consideration the plants-soil relations [1].

To be able to assess the soil quality, researchers turn to the creditworthiness soil index (CW_S), which ranges from 0 to 100 points. The indicator is internationally recognized. It is noticed, therefore, that the plants get their harvests at the interference between the main meteorological parameters and the soil quality indicator [11] [9].

As a consequence, we proposed ourselves (through simplification) to calculate such an indicator that could express in a single figure the pedoclimatic characteristics in which the crop carries out its cycle and achieves its production.

The yield of the culture is also closely linked by the technological processes indicators, which in our opinion express in a numeric way the intensity of the technological processes progress in that areal. It can be considered as an index of agricultural intensification and it was described by us in the creditworthiness form with notes from 1 to 10 (Table 1).

We believe that Pedoclimatic Index (PCI) may be expressed by the product between the UNEP Aridity Index (AR) and the creditworthiness index of the soil (CW_S), that is:

$$\text{PCI} = \text{AR} * \text{CW}_S$$

Also considering that in the Romanian territory AR varies between 0,2 and 1,0 from Dobrogea and up in the mountain area, it follows that PCI practically varies within the interval 12-50. In theory, it can range between 0 and 100, but the extremes are not encountered in Romania and, in any case, can't make the object of agricultural production.

Through this simplification the plant production remains under the influence of 2 indicators (PCI and TPI) and can be easily subjected to the statistical calculations that lead to estimation bidimensional models, to yield calculation in general and, in our particular case, to the calculation of wheat production.

MATERIALS AND METHODS

It started from the idea that wheat is grown in soil's most arid zone because the most part of its vegetation period is outside the consumption through evapotranspiration.

In order to make this study, were conducted production surveys in a number of 54 points in 5 repetitions and 9 creditworthiness of the technological processes, the tenth not being present in the large territory of wheat crop in Romania.

The aim of the research was to create mathematical models that should express the relation between the wheat production and the unique pedoclimatic parameter (PCI) by taking into consideration the intensification of technological processes index (TPI), which has a great importance in today's agriculture.

Were selected 6 aridity indices (0,30; 0,40; 0,55; 0,55; 0,55 and 0,80), also divided on 6 categories of soil quality (40, 55, 64, 75, 86 and 41 points, the last being located in the wet region, with acidic soils and with a short profile). For all these were probed 9 steps of technological processes intensity and of the working capital use (see Table 1).

Table 1. Creditworthiness – the intensity in agriculture (I_A) (Berca M., original)

Creditworthiness note	Working capacity from the needs	Description
1	10 %	<ul style="list-style-type: none"> → reduced activity on soil; → mostly, the plots have small dimensions and the basic works are made with a plow trailed by animals; → the sowing is done manually or with tools like in the Middle Ages; → chemicals or organic fertilizers are not used; → the maintenance of crops is made through weeding; → the harvesting process involves improvised machines; → subsistence agriculture.
2	15 %	<ul style="list-style-type: none"> → the soil is treated with more attention; → the plowing is done mechanically, with mono-tractors or with tractors ≤ 40 HP; → it doesn't aim the quality; → as fertilizer, only the manure from the household animals is used; → plant protection means are not applied; → the harvesting is made with rented old combines; → subsistence agriculture.
3	25 %	<ul style="list-style-type: none"> → the land is organized in larger plots; → the basic works are done with small tractors, with the plow with maximum 2 furrows; → for the soil preparation, the disc is used, as well as old seeders – type SU29; → organic fertilizers are applied and sometimes even small amounts (10%) of chemical fertilizers; → occasionally herbicides are applied, but not fungicides or insecticides; → the harvesting is made with old combines; → semi-subsistence agriculture and for the market.
		<ul style="list-style-type: none"> → typical agriculture for small commercial farms of 15-20 ha; → better equipment is used, purchased through projects ⇒ farmers have a certain of technology; → it begins the using of certified seed;

4	40 %	<ul style="list-style-type: none"> → there is a bank account; → chemical fertilizers are used ≤ 20-25% of plants consumption; → herbicides are used, as well as other pesticides; → the equipment is poor: the sowing is made with SU29 and other similar machines; → the harvesting is made with combines; → the production is sold on the market.
5	50 %	<ul style="list-style-type: none"> → enterprise surfaces increase up to 50-150 ha; → they are appealing to projects and credits; → more efficient machinery (50-70 HP) are bought, with soil processing machines and with higher precision drills; → protection products are used up to 40% and chemical fertilizers up to 50% of requirements; → rotations are introduced and monoculture is starting to be avoided.
6	60 %	<ul style="list-style-type: none"> → enterprises (farms) are around 500-1000 ha and they have an appropriate equipment, but not a modern one; → the plowing is still practiced; → more working is done with discs and with good precision sowing machines; → rotations are used in proportion of 50%; → inputs are applied to the lower limit (pesticides) and chemical fertilizers only around 60%; → the harvest goes on the market.
7	70-75 %	<ul style="list-style-type: none"> → normal enterprises (farms), up to 3000 ha; → greater attention paid to equipment, but also to crop rotations; → very large machines are used (tractors of 80-500 HP), combines of 8-12 m wide; → diggers (scarifiers), Tigers and performant machines are also used for pesticide application; → inputs are applied: fertilizers 70% and pesticides 80%; → the harvesting is made with large, performant machines.
		<ul style="list-style-type: none"> → this is the same as in the 7th position; → the difference is the management intention of using alternative options for nitrogen nutrition;

8	80-90 %	<ul style="list-style-type: none"> → the focus is on soil biology, on nutrient needs and plants protection cover, respectively 80%; → the harvesting is made with highly performant machines; → efficient management.
9	90-100 %	<ul style="list-style-type: none"> → similar conditions with the ones in position 8; → differences: green fertilizers, total removal of plow and its replacement with conservative works ; → biocomposts are also applied in order to stimulate the biological activity; → the degree of input coverage is approaching 90%; → very efficient management.
10	100 %	<ul style="list-style-type: none"> → this creditworthiness wasn't found in Romania; → it involves, in addition to the latest technologies on the flow, a special management in the relation with the environment; → require conservation agriculture both in tillage and in inputs ⇒ the production remains intensive due to the expenses decrease on the technological flow (seed, fertilizer from bag, pesticides, diesel etc.); → this is still not present in Romanian practice, for this reason this mark couldn't be given to any real combination of AR and soil.

From the overlapping of the 2 maps has resulted the Pedoclimatic Index (PCI):

$$PCI = AR * CW_s$$

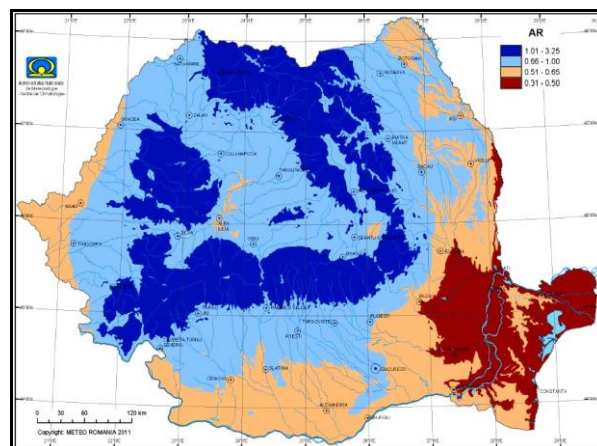


Fig. 2. De Martonne Aridity Index - DMAI (1961-2010)

The number of variants that results is:

$$6 * 9 = 54$$

The total number of surveys is

$$54 * 5 = 270$$

The period of research was of 10 ± 2 years, in which for some variants, especially for the ones from the bottom part of the creditworthiness processes, the production values lacked, being necessary intrapolation of evaluation.

The data, once collected and brought to STAS wheat production, were subsequently entered into a bifactorial table in 5 repetitions in order to be statistically analyzed.

The statistical processing was performed with a personal program of Anova type, being calculated the variants and the factors individual contribution, as well as the interactions between them.

Since for an easier understanding the graphic method was used in the bifactorial version, the 2DV5.01 program was also used, while for modelling in trifactorial [$z = f(x*y)$] it turned to a 3DV4.0 program

All the results were presented as graphical models in 2D and 3D.

The Aridity Index (AR) was chosen using the map of UNEP Aridity Indexes [12], while Soil Indices were taken from the land distribution map on creditworthiness classes [11] [9] [5] (Fig. 1 and Fig. 2).

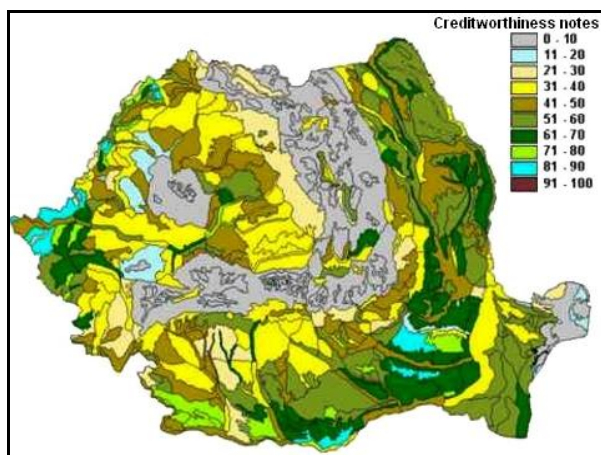


Fig. 1. Romania's land distribution by creditworthiness classes

RESULTS AND DISCUSSIONS

The effect of technological processes intensity (TPI), that also include the working capital, is presented, at first, in six 2D graphs for the six studied Pedoclimatic Indicators (PCI) (Fig. 3, Fig. 4, Fig. 5, Fig. 6, Fig. 7, Fig. 8).

In the conditions of a low Pedoclimatic Index (PCI = 40), which indicates an arid climate, but also inferior quality soils, the wheat production varies between 10 and 29 q/ha for the weakest technological variants and under 30 q/ha for the highest intensification processes.

For most technologies used in Romania, at this PCI value, the production doesn't exceed 20-25 q/ha (Fig. 3).

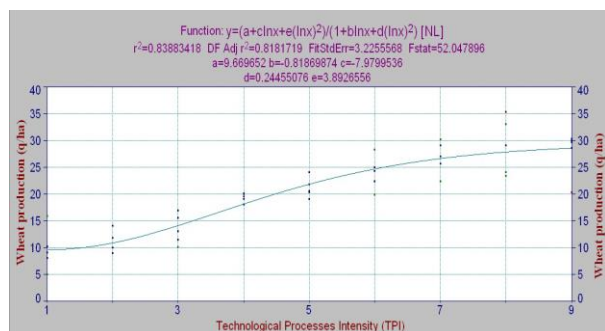


Fig. 3. Wheat production (q/ha) according to the TPI for a PCI = 12 (original)

The Pedoclimatic Index increase at PCI = 22 obtained from a more reduced aridity (AR = 0,40), but also from soils better qualitative (CW_s = 55), the yield level remains low for the very poor technologies, but it slightly increases to over 50 q/ha for the best variant of technology (Fig. 4).

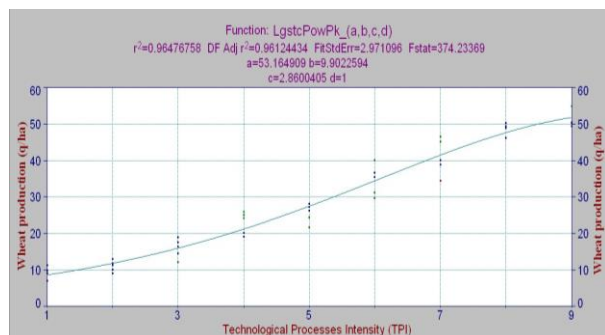


Fig. 4. Wheat production (q/ha) according to the TPI for a PCI = 22

The curve, statistically ensured at the level of very significant, reveals that for the majority, the processes intensity used in our country at this PCI, the average production ranged between 2500 and 4000 kg/ha. We mention that sometimes the yield difference recorded in neighboring units, identically equipped, varied with up to 10 q/ha wheat (from the analysis of rehearsals), which means that in the processes intensity (TPI) there are always elements of uncontrolled variation, mainly caused by the working capital part (fertilizers, pesticides, soil tillage and so on).

If the Pedoclimatic Index (PCI) increases by the improving of moisture status (reducing of aridity) and by soil's quality parameters (CW_s) grow to the values $0,55 * 64 = 35,2$, the variable wheat production at this parameter depending on the technological processes intensity is presented in Fig. 5 – the graph of the complex function, which is a Chebyshev Rational Order 3/3, has a very significant statistical assurance.

Until the 6th note from the creditworthiness grid (TPI), the production evolution is quite similar to the previous function.

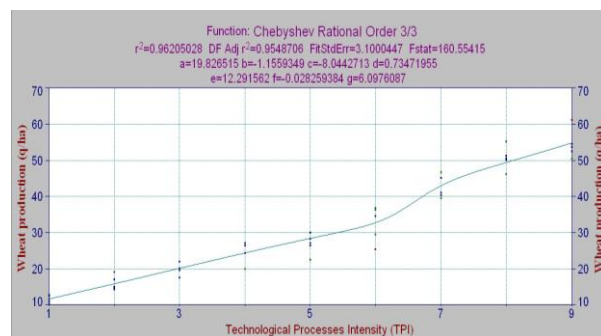


Fig. 5. Wheat production (q/ha) according to the TPI for a PCI = 35,2

Although we are going to repeat ourselves, we want to point out once again that the Pedoclimatic Indicator (PCI) is slightly favorable to the production in case of insufficient technologies. Starting from TPI 6 (TPI > 6), the curve logarithmically sprints, the yields corresponding to the notes 7, 8 and 9 rising from 4500 kg/ha to 5500 kg/ha. Because the last creditworthiness include some elements of soil conservation, their effect is felt in the production level and in its quality (Fig. 5).

Keeping constant the AR value (AR = 55), but taking into consideration a soil of a superior quality ($CW_s = 75$) we achieve a $PCI = 41,25$. In this improved agronomical framework (Fig. 6) the production slightly increases, even under poor technological works (+5 q/ha) and this growth compared to the previous version is transmitted on the function flow also up to the note 6.

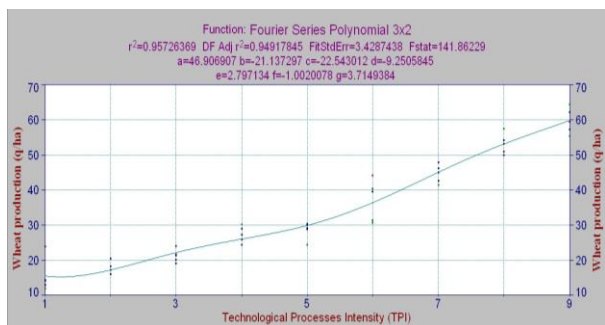


Fig. 6. Wheat production (q/ha) according to the TPI for a $PCI = 41,25$

The function is a Fourier Series Polynomial $3*2$ and also it is very statistically assured. The logarithmic jump that follows after the note 6 makes the production to reach up to 60 q/ha at the note 9 (on average for 10 years), these being yields achieved in more agricultural points around the country and which are over 3 times higher than the national average, standing at the average level of the European Union in wheat production. On the background of an AR index maintained at AR = 55 and of an increased $CW_s = 86$, $PCI = 47,30$ is obtained, that is with nearly 6 units more than in the previous case (Fig. 7).

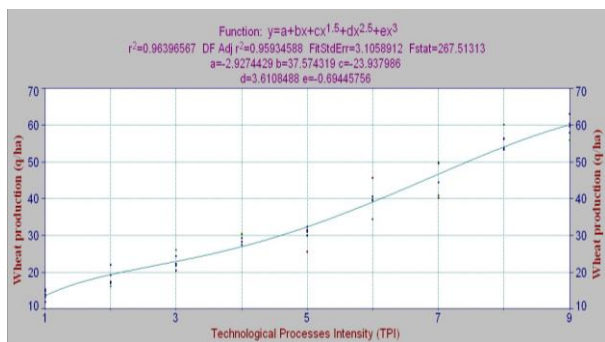


Fig. 7. Wheat production (q/ha) according to the TPI for a $PCI = 47,3$

It should be withhelded that the polynomial function that describes the graph is also

statistically assured in a very significant way ($r^2 = 0,96$). It should be noted, in the same time, that both as aspect and conformation, the function is not significantly different from the one in Fig. 6.

The yield oscillates between 14 q/ha in the version with TPI = 1 and 60 q/ha in TPI = 9 variant, the emphasis of the production growth also starting from the 6th note in the technologies intensity evaluation system.

The lack in the increase of technologies efficiency in relation to the soil quality growth it is explained by the water intake stagnation in the system.

Limiting the water flow can't lead to a further increase of harvests, no matter how good the soil quality would be.

In Fig. 8 we have a reverse situation, in which the area cultivated with wheat is a moist one, bringing enough water in the production system. However, the soils are poor, acidic and physically deficient:

$$PCI = 0,80 * 41 = 32,80$$

This 32,80 is very close to the $PCI = 35,2$ (Fig. 5) and the yields variation is similar, ie from 14 to 56 q/ha. The function is also statistically assured, with a more emphasized growth in the second part of TPI values.

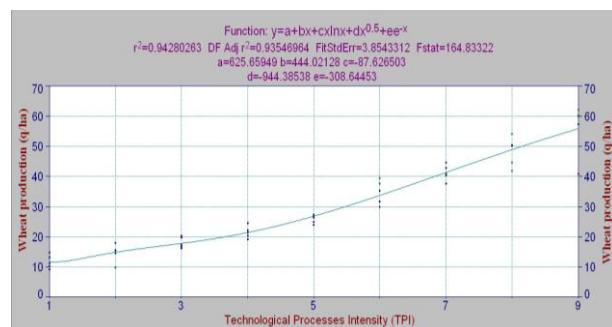


Fig. 8. Wheat production (q/ha) according to the TPI for a $PCI = 32,8$

The comparison between the two curves (Fig. 5 and Fig. 8) also demonstrates a process of factors' substitution. If the soil is poorer but there is water, the adapted technological processes can substitute the lower quality of soil.

We could say that water dictates the yield level to a high technological processes and to a proper exploitation of the working capital.

If we set all the 6 curves corresponding to the 6 levels of PCI (Fig. 9) we see that only PCI = 12 permanently maintains its production below 30 q/ha. The limitative factor is exclusively the water.

No matter how good the technological values would be, the water scarcity is blocking any increase of technological processes and sometimes the productions are not even able to cover all the costs.

If the irrigations won't be able to be introduced, the necessity of water alternative sources becomes imperative.

PCI = 22 it is also found under the majority of the curves, but much closer to them, especially at high values of the technical intensity indicator. The best evolution of production is provided by PCI = 47,3, followed by PCI = 41,25 and PCI = 32,8.

Fig. 9 serves equally as a nomogram for predicting yields according to PCI. For example, at a TPI = 6, in average for the 10 years, a production of 40 q/ha can be obtained both to PCI = 47,3, as well as to PCI = 32,8, the last one being built on a background of high humidity.

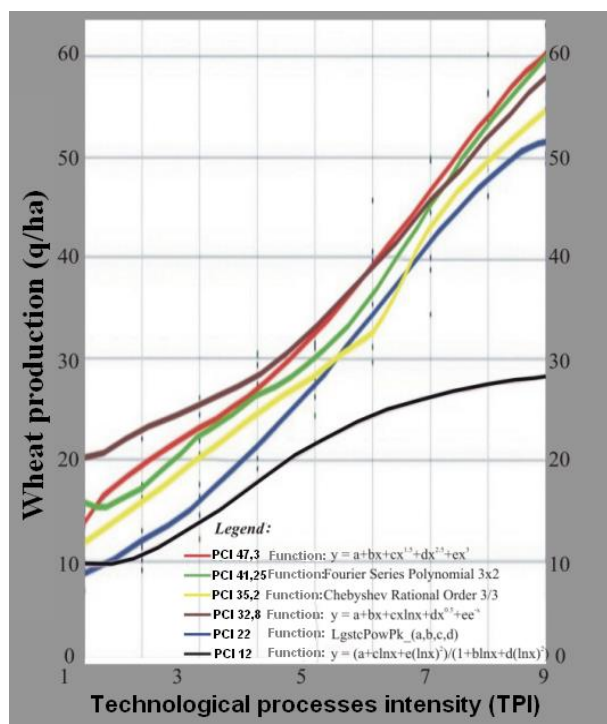


Fig. 9. Wheat production (q/ha) according to TPI and PCI – in cumulative nomogramme

In Fig. 10 the 3D model of the wheat production was made, according to the Pedoclimatic Index (PCI) and of the Technological Processes Intensity - TPI (1 - 9). The function is a Fourier Series Bivariate Order 2*2.

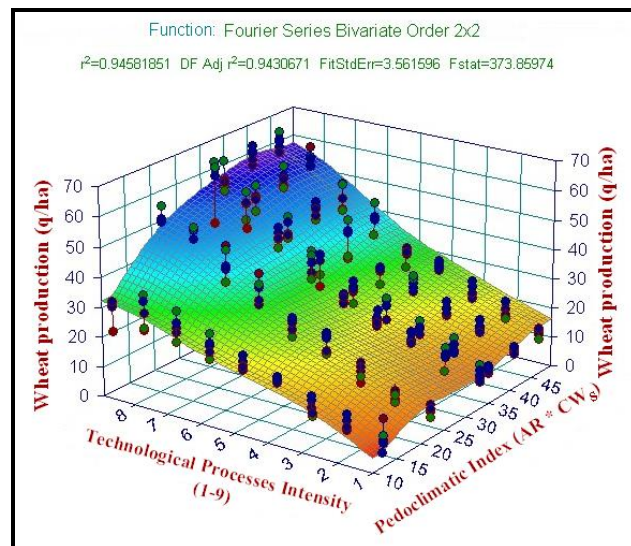


Fig. 10. The model of wheat production formation in Romania according to PCI and TPI between 2002-2012

Analyzing the model presented we reach the following conclusions:

- No matter how good is the Pedoclimatic Index (PCI) on the domain 12 – 47, the yield remains in an insignificantly field until the intensity of processes get to 3-4 (red line).
- There is a transitional period between the values 4 and 6 of the Technological Processes Indicator (TPI) and to a Pedoclimatic Index (PCI) of 12-30. This reduces to processes indicators → 3-4 at high Pedoclimatic Index (PCI).
- Good values of wheat production are obtained at reduced indices of the processes, starting with PCI > 20. The areal marked with green color also falls down to the right once it begins to increase the PCI.

The best results are obtained in the areas colored in blue, ie at Pedoclimatic Indexes (PCI) that are over 30 and Processes Intensity (TPI) more than 7. The frequency of high

yields can descend to the right at high values of PCI.

CONCLUSIONS

1. The Pedoclimatic Index (PCI) may serve as a synthesis indicator in the relations between plants, agricultural crops and pedoclimatic conditions. It is calculated using the relation

$$PCI = AR * CW_S$$

2. The reduced Pedoclimatic Indexes (PCI), especially by their arid component, lead to the harvest limitation under 30 q/ha regardless of the Technological Processes Intensity (TPI).
3. Starting with $PCI > 30$ the presence of some statistically assured productions begins at the $TPI > 6$.
4. There is a substitution phenomenon between water and soil quality at values of $PCI > 35$, on the background of an $AR > 70-80$.
5. The use of some super-technologies $TPI > 8$ can lead to average yields of 50-60 q/ha, on condition that $PCI > 20$. Here, the issue of a good water preserving is raised, as well as the one of a soil ecologization necessary to the reduction of water specific consumption and simultaneously of the Potential Evapotranspiration (PET).
6. In order to be able to create a PCI map field researches are still needed. Climatic changes require the introduction of a constant for the indicators modification and even for the created module.

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THE INFLUENCE OF AGRICULTURAL ACTIVITY ON THE STRUCTURE AND CRITERIA OF STOCKS CLASSIFICATION

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Abstract

The literature on specialty and scientific researches in the domain of bookkeeping recommend various criteria of stocks delimitations and component elements of these ones. Although a part of respective criteria are on the basis of organizing of the bookkeeping and providing necessary information for stocks financial administration none of them derives from the specific nature of agricultural activity. The application of classification criteria of the recommended stocks facilitates the synthetic and analytic bookkeeping, practicing of control on respective actives circulations, analysis and budgeting of essential activity as well as the evidence of material factors that determine the creations, development, care and protection of biological actives.

Key words: agricultural activity, bookkeeping, control, stocks.

INTRODUCTION

The contents and criteria of the stocks classification are approached indifferent way in economic contemporary literature, being generally determined by the object submitted to the research. At the agricultural enterprises the make-up and delimitation criteria of respective assets are pregnant influenced by the biological progresses within these ones as well as by the combination in certain entities of the commercial activity at the same level with production one.

MATERIALS AND METHODS

The study is based on the existent problems in the domain of financial administration of the stocks at agricultural enterprises. As a methodological base of the researches served the universal cognition method of matter, phenomena, processes as well as other scientific methods according preference to the following methods: monographic, analysis and synthesis, comparison and generalization.

RESULTS AND DISCUSSIONS

The agricultural activity is the transforming process of biological assets in agricultural

products and/or supplementary biological assets. This transformation within agricultural enterprises does not proceed accordingly with the nature laws, but under the man guidance and participation representing in fact a conductible transformation. At the same time in the valuation plan the financial administration of agricultural activity is impossible without consumptions of materialized and alive work that embody the contribution of human factor and existent technico-material basis in the transforming oriented process of the biological assets. Moreover, the obtaining of animal and vegetal products is connected both with the land utilization and a great volume of material resources in the composition of which a considerable weight is belonged to the stocks. The stocks make-up of agricultural enterprises is influenced by agricultural peculiarities and namely:

- obtaining of a significant part of stocks (for example, seeds and fodder) directly on the lot, with the possibility of renewal of these ones only a time per year –at the moment of harvesting. This feature has a particular importance for establishing of the directions of later utilization of the given stocks, as a part of them must be reserved in stock for the next production cycle;

- unique obtaining of the agricultural products and supplementary biological assets that increases the localization period of the means in stocks. In such conditions a significant part of material values as for example the seeds, planting material, the forage and organic fertilizer are frequently renewed within economical circuit at the expense of own means. These ones are neither being consumed and nor marketed but they remain in the stocks make-up for the next production cycle generating so the increase of rotation length of the means. With other words the total recuperation for instance, of the seeds will occur only after concluding of the obtaining process of products from these seeds.

In the zootechnical sector the means circuit begins from the moment of forage stocks formation. The materialized means in such stock increase essentially the recuperating length of these ones.

But the given peculiarity has not an universal character. Thus, in the case of cows breeding for milk the essential products are homogeneously obtained during the year without significant seasonal fluctuations but the consumed resources are practically recuperated at the same time with concrete products in the form of milk with a certain content of fat. That is why the cycle length of production in the given subarea is reduced enough, being determined exclusively by the time between the moment of animals nutrition and the moment of products obtaining.

This means that the daily supported consumptions in the process of horned cattle maintenance for milk is also daily recovered except the effectuated consumption in the period of seasonal rest. Thus, the length of production cycle in this subarea oscillates from several hours till 2 months.

As a result the length of the means circuit and production cycle in zootechnical sector are being distinguished through the period of assets localization in the stocks of products, money available and material resources with production destination.

Since the period of the means localization in the form of products and money means is insignificant, results that these ones are being

materialized, in stocks of materials with production destination.

Starting with those mentioned above one may conclude that the stocks represent both the indispensable element of directed transformation of the plants and animals, and the result of this transformation. A part of stocks (for example, the seeds and planting material) contributes to the formation of carriers biological assets providing the multiple obtaining of the agricultural products.

1. Other types of stocks (for example, forage) have a more various destination and participate both at the creation and next developing of the biological assets;

2. As a result, some stocks of materials are utilized in the agricultural cycle only a single time but other ones dot permanently, becoming in fact a condition of a normal proceeding of this one.

Besides in some subareas the stocks capitalized by the biological assets are being recovered with new products, practically, at the same time (for example, with milk) and other times – only at the moment of harvesting that may occur a single time or several times per year. In such cases the stocks are being localized in the form of production during the execution a long period of the year.

On the other hand the transforming of plants and animals themselves generates new stocks which accordingly with the destination and natural form can be placed in the category of products, materials with agricultural destination or animals for growing and fattening.

The composition of the utilized stocks in the basic activity of agricultural producers as well as those obtained of respective activity is determined preponderantly by the biological processes that are proceeded within these ones. The catalogue of the stocks is also influenced by combining in some entities of commercial activities with production one. In this connexion at the majority of agricultural enterprises the stocks reunite the next elements: material, animal for growing and fattening, the production during its execution, products and goods.

One of the existent problems generating uncertainties in the domain of stocks book-keeping consists in that the autochthonous literature of speciality does not recommend specific and univocal criteria of delimitation of these assets for facilitating analytic and synthetic book-keeping application of the control of the circulation of these ones, the forecasting of the necessary volume for the basic activity of the enterprise as well as in a purpose of an efficient financial administration. This gap is also characteristic for the majority of scientific researches. The stocks variety kept by the enterprises imposes the necessity of such a grouping which would provide the management background with useful and exhaustive informations for a successful financial administration of current material values.

Then are exposed the most frequent criteria of the stocks classification approached by the foreign authors [6] with specifying in case of necessity their applicative value. Depending on the taken form the stocks are being divided in material and unmaterial ones. This criterion is at the basis of the stocks book-keeping depending on their material nature. For example the services to be executed have an incorporeal form and represent unfinished production at the end of the financial administration period.

In accordance with their destination they are distinguished stocks for production necessities and destined stocks for sale.

Such stocks delimitation permits to determine more objectively the payment capacity indicators of the enterprise.

As a origin source the stocks are being delimited in bought stocks and obtained ones on the place. The given grouping may be utilized for example to the elaboration of purchases budget, the planning of the pecuniary payment structure etc.

Depending on the phase of exploiting cycle they are distinguished stocks being in supplying stage, stocks being in the production stage and stocks being in the market one. Actually the applying sphere of this criterion of the stocks classification is limited in the methodological plan, as the supplying and market phases are not reflected

in distinct account (like they were proceeding for example till 1998 year) but the stocks being in producing phase are being expressed by supported consumptions in the process of utilizing of these ones.

Depending on belonging they are being distinguished own stocks and tertiary ones. The first ones are checked by the enterprises and reflected in the current assets make-up, but the last are received for preserving treating and are recorded in extra balancing accounts.

Depending on the keeping place they are being distinguished stocks being in the enterprise ware house and stocks being for temporary keeping or in custodian at the tertiary. Such a classification is necessary for pointing out of the financial administrators, responsibilities and degree of influence on the stocks integrity. Depending on the forecast peculiarities the stocks are being limited in current stocks, stocks for conditioning and security ones. The given criterion is relevant firstly, for forecasting of the purchase and materials utilization. One must mention that in conditions of the planned economy the volume of the security stocks constituted about 50 % from the current stocks quantum. But actually such an approach practically is inadmissible as the majority of the agricultural producers are in a hard financial situation and can not direction supplementary means for safety stocks constitution in such commanding proportions.

At the same time one must mention that none of concise examined above criteria does not reflect the stocks origin. For the agricultural producers the criterion of the stocks origin has a major importance, as besides the stocks of industrial origin (mineral fertilizers, means of phytosanitary use etc.) it is also being utilized stocks of biological origin for production necessity (for example, seeds, forage, etc.) that is not characteristic for the majority enterprises from other branches of the national economy.

Each of the mentioned criteria has its role in book-keeping organizing, in effectuating of analysis and basic activity budgeting as well as in providing of the financial administration check. But starting with S.N.C. provisions

„Stocks of goods and materials” we consider that the most relevant criteria of classification for book-keeping at the agricultural enterprises are criteria of destination, origin and stocks belonging.

Namely these three criteria are at the basis of analytic and synthetic book-keeping, exercising of check over respective goods circulation, writing down reports of internal and external use. The criteria of stocks classifying generally or of the component parts of these ones (for example, of materials, animals at their growing and fattening etc.) served as a subject of study both in the autochthonous didactic literature and in scientific researches from their domain, without resulting every time with adequate conclusions. Thus, the authors group under supervising of the professor A. Nedeřița [5] suggested to classify the materials in raw materials and consumable ones. The raw materials in the opinion of the nominated economists include the goods participating directly to the products manufacturing and they are being integrally or partly recovered in the make-up of these ones either in initial state or in transformed one. In its turn, the consumable materials represent those categories of goods of current assets nature participating directly in the producing process, without recovering themselves as a rule in the material content of the manufactured products. But in our opinion although such a delimitation of the materials has an innovational character and takes into account in a large measure of the technologic process peculiarities it is yet questionable. Only the raw material alike with consumable materials are being integrally consumed, even it is completely being recovered or partly in the new created product. So, the raw materials also should be qualified as consumable materials.

The classifying criteria of materials are also approached in the publications from abroad.

Thus the economists from the Russian Federation: R. Alborov [1], L. Horujii, S. Contevaia, A. A. Belov, A. N. Belov [2], Babaev [3] suggested to classify the materials in accordance with on exercised role in the production process in the essential materials

form its content or physical mass of the products, but those auxiliary contribute to the rhythmic unfolding of the technologic processes. The assignment of the materials to one or another group is determined by the function exercised by these ones in the process of the products manufacturing.

Depending on the origin the nominated authors distinguish the purchased materials and obtained materials on the place.

According to the place in which there are the materials at the given moment the above economists differ the materials present at the depository, the materials under way of supplying and materials being at the tertiaries for processing or keeping. This classifying criterion has a practical importance in the conditions when materials are being kept both at the enterprise and outside. In exchange the materials book-keeping in the supplying phase is doubtful as such data can not be book-kept because of absence of some authentic informations operatively confirmed in explanatory documents.

In accordance with destination the materials can be utilized for the basic activity, auxiliary unities, administrative necessities, goods and products marketing, effectuating of capital and current reparations as well as for assets creating on the long term. But in our vision this criterion of classifying can not influence on the book-keeping methodology and the way of evaluation of the gone out materials as the accommodation of these ones (especially for internal necessities) is effectuated of the basis of certain unique documents, the mode of processing of which does not depend on the goods destination.

After all the criteria of classifying of previous examined materials have a certain cognitive value and can be connected to the informational necessities of the enterprises.

At the same time none of them does not reflect the peculiarities of the agricultural activity and the way of materials utilizing in the process of directed transforming of biological assets in products and/or supplementary biological assets. Thus, it was ascertained for certain that the length of the action of one or other types of materials on the modification of the plants and animals is

not identical. For example the mineral and organic fertilizers differing of the fuel or nutrients besides their current action in the financial administration year also possess a significant postaction contributing to the increase of the agricultural crops productivity during several consecutive years after their incorporation in the soil [4]. But this feature of the fertilizers utilization is actually neglected, and this the assignment of their value in the phytotechnics consumptions is being integrally effectuated and only a single time falsifying by this the cost of obtained products from one or other crop-rotation. Starting with those mentioned above we consider necessary to utilize in book-keeping goals three classifying criteria focused on the peculiarities of their utilization by the agricultural enterprises and namely:

1. Depending on the exercised function in the process of products obtaining and/or supplementary biological assets;
2. Depending on the action length on the consumption biological assets and carrier biological ones;
3. Depending on the necessary quantity for obtaining of programmed volume of products and/or supplementary biological assets.

Depending on the exercised function by materials in the process of products obtaining and/or supplementary biological assets they can be delimited in:

- basic materials that directly participate to the formation (creating) of the biological assets or contribute to the development, caring and protection of these ones (for example, the seeds, forages, fertilizers, oil products, plants protection means etc.);
- auxiliary materials that do not constitute the existence conditions of the biological assets but provide the normal unfolding of the transforming process of these ones (for example, spare (part) building materials and so on).

At the same time one must mention that the materials delimitation in basic materials and auxiliary ones to a certain extent has a conventional character being influenced by the destination and volume of the utilized respective stocks for obtaining of one or other

type of products, by the technologic process peculiarities etc.

Depending on the length of materials action on the biological assets of consumptions and carrier biological ones they may be grouped in:

- materials with current action (for example, seeds, forage etc.);
- materials with long action that surpass a financial administration period (for example, organic and mineral fertilizers, autotyres, accumulators etc.).

Depending on the necessary of materials for obtaining of the programmed volume of products and/or supplementary biological assets one can distinguish: normative stocks; security stocks.

The normative stocks represent the normative quantity of materials that is necessary for forming (creating) and transforming of biological assets (for example, the normative quantity of seeds for sowing of the sugar beet).

The security stocks represent the minimum quantity of materials reserved at the enterprise in order to cover the normative requirements in problematic conditions of providing (for example, the creation of a minimum stock of forages in connection with the forecasting of unfavorable climatic conditions). But the formation of the security stocks conditions the increase of afferent expenses to the respective materials holding. That is why one must maximalize their size as for as one can, starting with the seasonal fluctuations, the length of the phase of production, stability of existent supplying relationships etc.

In our opinion the utilizing of recommended classifying criteria provides the following advantages:

- it is favourable for increasing informational capacities of the book-keeping system and taking correct managerial decisions in order to the forecasting of the materials necessary, writing internal reports etc.;
- facilitates synthetic and analytic book-keeping as well as the elaboration of the stocks catalogue. In this catalogue are being included the names of all types of utilized materials at the enterprise, but to each of the type is assigned a permanent number from

several figures for its operative identifying. Besides, the respective assets are being delimited in the catalogue in the basic materials and auxiliary ones but within these ones-by groups, subgroups and concrete types. For example, group-fertilizers; subgroup-organic fertilizers; type-dust coop; adequately shows clearly up the agricultural activity peculiarities and materials factors that determine the creation, development and protection of the biological assets

CONCLUSIONS

1. The stocks represent both indispensable element of directed transformation of the animals and plants, and the result of this transformation. Thus, a part of the stocks contributes to the formation of the carrier biological assets and another part both to the creating and next developing of these ones;
2. The variety of possessed stocks by the agricultural enterprises imposes, the necessity of such a classifying of the given assets that would provide a book-keeping in accordance with the requirements of internal and external utilizes of information. Although the existent stocks classifying criteria in the didactic literature and scientific researches in this area have an applicative value and may be connected to the informational necessities of the entities, these ones do not derive from the peculiarities of agricultural activity as well as from the mode of materials utilizing in the process of directed transformation of the plants and animals;
3. The application of the classifying criteria of recommended stocks facilitates synthetic and analytic book-keeping, the check exercising on the circulation of respective assets, analysis and basic budgeting as well as book-keeping of material factors determining the creation, development, care and protection of the biological assets.

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A NEW APPROACH TO THE ANALYSIS OF VISITOR PERCEPTIONS TOWARDS A TOURISM DESTINATION: THE ROLE OF FOOD AND WINE EXPERIENCES

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Abstract

The study aims to propose a new approach to analyse visitor perceptions and experiences in a tourism destination. The purpose is to discuss how the discrete choice models can contribute to the analysis of the tourism destination in the visitor experience perspective. The study pays particular attention to the role of food and wine supply in the tourism experience and the destination perception. This research deepens the theoretical approach to the analysis of visitor perceptions for a tourist urban destination. The proposed framework has been applied to the city of Verona. The findings concern an exploratory survey and the subsequent building of the causal analysis. The discrete choice model application and the development of the experimental design are discussed, in order to take the role of food and wine attractions into account. The exploratory survey identified seven relevant themes for visitors. Among them, food and wine specialties may play a relevant role in the assessment of a tourist destination. Attributes and levels have been outlined to apply the discrete choice models. A survey questionnaire has been developed to be submitted to a large sample of visitors or potential visitors of Verona. The methodological contribution of this study is the application of the discrete choice models to the study of tourism experiences. The empirical innovation consists in a different marketing perspective for an urban tourist destination, whose competitiveness is strengthened by the agro-food industry.

Key words: agro-food industry, destination marketing, Discrete Choice Models, experience economy, visitor demand analysis

INTRODUCTION

This paper offers a new perspective to analyse the visitor's perceptions towards a tourist destination, and the role that the food and wine industry can play in this regard.

Some new trends are characterising the link between destination attraction and its food and wine supply: i) the visitor demand of a multidimensional experience in recreation, culture, customs, traditions and diving in the daily life of the population; ii) the demand for a urban destination of well-being, health, genuineness, authenticity; iii) the importance of a destination branding process able to convey a distinctive experiential supply; iv) the agro-food businesses' search for a new way to communicate their link with the territory. Tourism benchmarks are not only suppliers of experience for visitors, but also become names, images or symbols in the

branding and labelling process for the consumer's experience.

The beginnings of consumer experience research come from the tourist field. Csikzentmihalyi [1] first studied 'the experience' in the context of leisure and play, and proposed the concept of the 'optimal experience' [2]. Arnould and Price [3] recognised the importance to design the experience, the extraordinariness of the tourist service and its hedonic and symbolic attributes.

Ritchie and Hudson [4] exhaustively traced the development of consumer/tourist experience research, identifying the evolutionary trail of experience thinking. They asserted the importance to explore the specific nature of tourism experience, but the insufficient efforts by scholars to achieve a better understanding of the different types of

tourism experiences, and the visitor perception criteria [5].

According to Ritchie *et al.* [5] the analysis of the tourism experience is one of the most relevant issues in the design and management of tourism. Visitors choose the tourist destination considering their experiential, cognitive and emotional expectations [6].

The measurement of tourism experiences are a preliminary tool for destination marketing, management and branding [5]. In a highly competitive market for tourist destinations, characterised by high visitor propensity to destination substitution, cities and territories are facing the building of their brand positioning [7]. It can become a source of competitive advantage for tourism organisations, as well as for the other local stakeholders. Global competition takes place between businesses and between territories, encouraging strategies and practices in destination management by the different local subjects [8]. Also in tourism research many scholar observed that the consumers' decision set consists in a small range of destinations [9]. The main elements that allow a destination to be included in the visitor's decision set have not been surveyed yet. In this perspective, the analysis of the link between destination personality and visitor experiences could be a research field to develop, in order to outline the identity of a destination.

According to Sartori *et al.* [10], the analysis of destination brand equity should involve the territorial stakeholders. The researchers emphasised the contribution of internal marketing policies in stimulate the participation and the organizational commitment of the local stakeholders, considered the first customers of a destination brand.

In corporate management and marketing fields, the contribution of the experiential approach is to provide pleasurable experiences to customers [11]. Pine and Gilmore [12] proposed four broad experience categories: Entertainment, Escapism, Esthetics, Education (the 4Es).

In recent years, the food and wine industry has been involved in this approach. The

purposes are diverse: to enrich the supply with new contents, to improve the relationships with the customer, to create new source of added value and to deal with new organisational and strategic approach.

This approach multiplies its values in the context of food and wine tourism demand because of the complex link between consumer, food and wine supply, business and territory [13]. For wine, Getz and Brown [14] identified three relevant issues in determining tourism experience: product, destination appeal and culture.

In rural areas and wine in particular, the tourist experience is characterized by further experiential contents. The research is mainly empirical, deepening case studies [13] [15] [16] [17] [18].

Scholars have not yet well deepen the opportunities that food and wine tourism services can offer in a wider geographical context than the rural destination. The demand for nature, well-being, health, local traditions, food and wine comes not only from the visitors which choose a wine tourism destination. Even those who choose an urban destination require culture and entertainment, linked to the local food and wine offer. These connections have not been completely studied yet. From the consumer point of view, scholars should understand the importance of these aspects for the destination choice. From the food and wine industry point of view, they should capture new development opportunities and a higher bargaining power with the Destination Marketing Organisations (DMOs) and the tourism businesses.

The researchers stated the need for a more encompassing view of the experiential nature of food and wine tourism, considering the managerial benefits of this vision [13].

Fiore *et al.* [19] identified the main business components to improve the relationship with the consumer and the visitor, and provided practical suggestions to combine each of the 4Es with the most appropriate marketing tools, especially for small rural businesses.

The existing studies analyse the food and wine experience itself, in the context of rural tourism, trying to extract its components, expressed in 4Es. The role of food and wine

experience has not been yet examined as a part of the whole tourist offer, in which food and wine contribute with many other attributes to destination perceptions.

This study aims to propose a different perspective, in which the consumer experience concerns a tourism destination and its local food and wine supply is an experiential attribute.

This paper proposes a framework to explore the importance of the food and wine experience in the choice of a tourism destination. This topic is important for local food and wine small enterprises, because the food and wine industry could identify new vehicles for involvement and promotion within the bundle of experiential opportunities for an urban tourism destination.

The objective of this paper is to propose a new approach to the analysis of visitor perceptions towards a tourism destination. This study discusses the methodological and operational implications of the following topics: i) the innovative contribution of the discrete choice models to the study of the tourism destination in the perspective of visitor perceptions; ii) the destination attributes able to build choice sets based on visitor experiences; iii) the multidimensional characteristics of visitor experiences; iv) the contribution of food and wine industry to tourism experience; v) the tourism experience feedback able to generate new food and wine experience opportunities.

According to the perspective of this study, food and wine are not the main goal of the tourism experience, but a quality attribute of the destination. This perspective is not new itself, but in aiming at effective marketing strategies and in understanding the role of wine and food experience in the visitor destination choice set.

MATERIALS AND METHODS

According to Ritchie and Hudson [4], the studies about tourism experience have not deepen the methodological analysis. Most studies about tourism experience used qualitative research methods and information analysis. The most used techniques in

information collection are in-depth interview and focus group [20]. Other less common qualitative instruments have been used, like the collection of immediately recalled leisure experiences, the critical incident technique, by showing pictures, the Zaltman Metaphor Elicitation Technique and repertory test with laddering analysis [4] [20] [21]. Few studies use quantitative scales to measure experience [4]. Among them, Oh *et al.* [6], developed a multi-item measurement scale that taps the experience dimensions of Pine and Gilmore [12].

In tourism experience analysis, it appears that so far no study has used the discrete choice models, one of the most advanced methods to explain the consumer choice behaviour [22]. They are consistent with the Lancaster theory [23], according to which the utility for a good (the tourist destination) is not given by the good per se, but by the utility perceived for its attributes. They can be applied on individual revealed choices, directly observed by the researcher, or stated choices, resulting from hypothetical situations proposed by the researcher to the respondent.

Discrete choice models have been successfully applied to tourism economics, because they satisfy the need to study the tourism product as a bundle of attributes that consumer chooses to have the highest utility [24].

Recently, the applications of discrete choice models combine tourism and environmental economics, in order to analyse the recreational activities. The focus is on providing the local institutions with programmatic indications about the management of the natural resources, the visitor interest toward the protection actions, the effects of human interventions and the environmentalist attractiveness of the destination [25] [26] [27] [28] [29].

The discrete choice models can contribute to advance in experience theory, especially the tourist experience, because they are able to structure the experience in its different aspects, to evaluate the utility perceived by tourist for them, and to order the different tangible and intangible elements that are part

of the experience, estimating the willingness to pay for each of them.

The methodological steps of this study are: i) the exploratory survey through a qualitative on line questionnaire by a sample of Italian and foreign previous or potential visitors; ii) the identification of conceptual dimensions to synthesise the main topics resulted from the exploratory survey; iii) the proposal of a large-scale survey questionnaire able to analyse the visitor experiences; iv) the identification of alternatives, attributes and levels and the elaboration of the experimental design to apply the discrete choice models.

The city of Verona has been chosen to empirically test the proposed framework. Verona lies in the Veneto region, in the north-east of Italy, in an equidistant position from Venice and Milan. It attracts about 660 thousand of visitors every year, with an average length of stay of 2 days. It has a pedestrian Old Town, suitable for tourists, with a rich supply of art and architecture of the main Italian historical periods; the 'city of Verona' has been included in the World Heritage list of Unesco.

Verona is located in a wide wine region, whose production is of national relevance in terms of production quantity, especially for denomination of origin wines, and is known worldwide thanks to some wines with strong export propensity (Valpolicella, Amarone, Soave, Bardolino, Lugana). One of the most important wine exhibitions in the world, Vinitaly, takes place in Verona. The agro-food industry characterises Verona with a wide range of local specialties (fruit and vegetable, cheese, extra virgin olive oil). Some of the biggest Italian food companies in meat, baked products and pasta play in Verona.

The choice of Verona is considered suitable to respond to the research objectives, because it sums up both touristic attractions, and interests related to food and wine tourism. Despite the increasing touristic flow and the reputation of its wines, the city has not yet developed destination management actions and food and wine tourism activities are lacking.

RESULTS AND DISCUSSIONS

The study started with an exploratory survey, in order to have a first view about the image of Verona in Italy and abroad. A qualitative questionnaire was developed. Its questions were short, easy to fill and allow respondents to freely express their opinions. Most of them were open-ended. The questions analysed the respondents associations of ideas for Verona and Italy. Those who have already visited the city explained: the purpose of their visit (tourism or business), their satisfaction level and the most significant elements that represent Verona. Those who have not yet visited it have expressed their intention to visit and their expectations.

The questionnaire was on line submitted, through an announcement launched in the Facebook. The questionnaire was available in four languages (English, Italian, Spanish and Portuguese) and was accessible from 16th to 31st July 2012. The collected questionnaires were 95, of which 12 invalid because incomplete. The valid sample consisted of 83 respondents. Most of them is Italian-speaking (40%), 33% answered in Spanish, while the remainder is made up of Portuguese and English in equal parts. The obtained information has been represented through dimensions and subdimensions that identify: the key issues, the components of each issue, the association of ideas and the links among them.

The respondents' opinions were grouped into seven dimensions (Table 1). Six of them are common for all respondents (Arena, Romeo and Juliet, Monuments, Landscape, Atmosphere, Food and Wine). The dimension People was enucleated by Italian respondents, which are facilitated by the language and the same citizenship in the knowledge of the population and in the relationship with it.

These dimensions represent the reference points for visitors, and they can be considered generators of experiences: i) the artistic and cultural attractiveness of the city, which is based on the main landmark as representations of Italian culture and aesthetics; ii) the link with Shakespeare and the Romeo and Juliet drama, which attracts

visitors to the devoted sites and to the immersion in the atmosphere of the tragedy; iii) the intangible qualities of the landscape and the atmosphere, which derive from tangible and intangible elements; iv) the character of the resident population for Italian respondents, who highlight favourable and unfavourable evaluations to the relationship; v) the interest toward the local food and wine production, the knowledge of typical supply, their match with the traditional cuisine, and their links with Mediterranean cuisine, the well-being and the 'made in Italy'. This latter unexpected dimension is very interesting, because it offers a starting point for the discussion about the role of food and wine in shaping the tourist experience for a destination.

Table 1. Dimensions and subdimensions of the city of Verona

Dimensions	Subdimensions
Arena	shows; opera (music, Italy); place; comet and nativity; (history)
Romeo and Juliet	Shakespeare; places; love (romanticism, tragedy)
Monuments	Catholic art; churches; buildings; towers; city gates; statues; bridges (river, panorama), square and alleys; (architecture, history)
Landscape	panorama (river, bridges); square and alleys; hill; surroundings; Old Town (small, pedestrian, tourists in the streets, clean)
Atmosphere	personality (small); quiet; Roman; Middle age; kindness; friendliness; classical; beauty; elegance; walk; tourists in the streets
People	hospitality; daily life; attention to detail; entrepreneurship; coldness
Food and Wine	food specialties (Italy); wine region, typical wines (Valpolicella, Soave, Bardolino)

Note: the associations of idea are in brackets

The exploratory survey has outlined the core of the visitor experiences in the urban tourist destination. Starting from them, the discrete choice models have been used.

The quantitative survey will: i) weigh the importance of the visitor's lived or expected experiences in setting the perception for the tourist destination; ii) focus on the role of local food and wine in the perception of the destination quality; iii) highlight tangible and intangible elements of image, recognized as unique for the tourist destination.

The survey questionnaire has been structured into three main sections, with a final section dedicated to the socio-demographic characteristics of respondent (Table 2).

The first section investigates the respondent's propensity to travel. The second section aims to survey the tourist perceptions towards Verona. The third section is devoted to the experimental design, to apply the discrete choice models.

Table 2. Survey questionnaire structure

Main topics	Survey elements
Do you like travel?	Intention to travel; travel purposes; the most preferred tourism destination
Do you like Verona?	For previous visitors of Verona: travel purpose; other destinations reached; level of satisfaction For the other respondents: degree of interest to visit Verona; interests; expectations For all respondents: Information sources; assessment on the main tangible and intangible features of Verona
What experiences would you live if you were in Verona?	9 choice sets with four unlabelled alternative visit choices with a no choice alternative
Socio-demographic characteristics	Gender; age; country; city; education level; income level; job; family size, number of children

The dimensions and subdimensions of Verona represent the 'product' characteristics supplied by the city of Verona to its customers/visitors. The experimental design has been built identifying the five major attributes and their levels for Verona (Table 3).

The choice of the attributes was carried out by assuming the hypothesis that the visitor spends an afternoon in the city of Verona. The experience attributes were identified in: i) location; ii) activity; iii) atmosphere; iv) goal; v) price.

Considering the attribute location, the exploratory survey identifies the four most known tourist attractions for the visitors. The Arena is the first level. It is a Roman amphitheatre, located in the Old Town. It is the most visited tourist attraction in the city. The Arena hosts the opera, musicals, concerts and other events of international level, like the

exhibition of cribs. The second level is represented by the Juliet's balcony. The troubled love story written by Shakespeare made Verona famous around the world. The churches of Verona are the third level of the experimental design. They are an expression of the main streams of the Italian Catholic architecture. All the churches have been grouped in a unique level to simplify the experimental design and in consideration of the same experience provided. The fourth level is represented by the squares of Verona, grouped together to make the design easier and because they convey the visitor an analogue experience.

Table 3. Attributes and levels of the choice experiment

Attributes	Levels
Location	Arena Juliet's balcony One of the churches of Verona One of the squares of Verona
Activity	Guided tour Free walk Attend an event Taste typical wine and food
Atmosphere	Elegant Lively Quiet
Goal	Have fun Learn new things Dive myself in a new situation See something beautiful
Price	50 euros 150 euros 250 euros

The second attribute is the activity that the tourist does in a certain location. It is represented by four levels in the experimental design: to take guided tours of the main attractions, to freely walk in the principal places of interest and do the shopping, to take part in events or to taste wines and local products.

The third attribute is added to enrich the described experience with the atmosphere that the tourist lives, summarized in three levels: elegant, lively and quiet.





The levels of the fourth attribute come from the 4Es of Pine and Gilmore [12] and they represent exhaustively the experiential purposes [13].

The fifth attribute is the price. It includes three balanced levels. It has been based on the

potential amounts that a tourist could spend in the enjoyment of a particular experience developed in an afternoon in Verona.

The choice experiment has been build using the software Ngene 1.1. A fractional factorial orthogonal design was used to construct 36 different choice sets composed by four unlabelled alternatives. The fifth alternative has been added to allow respondent to choose none of the previous four alternatives in the choice set. In fact, one of the advantages of the discrete choice models is the possibility to include the no choice alternative and, in this way, to make the stated choice as real as possible [22]. In Table 4 an example of choice set are reported.

Table 4. Example of a choice set included in the questionnaire

Set 1				Please make your choice	
Choice 1		I would be in one of its churches . I'd like to take a guided tour . The atmosphere is elegant . I'd like to learn new things.	250 €	<input type="checkbox"/>	
Choice 2		I would be in one of its squares . I'd like to taste typical wine and food . The atmosphere is quiet . I'd like to have fun .	50 €	<input type="checkbox"/>	
Choice 3		I would go to the Juliet's balcony . I'd like to take a guided tour . The atmosphere is elegant . I'd like to see something beautiful .	150 €	<input type="checkbox"/>	
Choice 4		I would go to the Arena . I'd like to attend an event . The atmosphere is quiet . I'd like to have fun .	150 €	<input type="checkbox"/>	
Choice 5		None of these choices		<input type="checkbox"/>	

The blocking procedure has been applied to split 36 choice sets in four groups. In this way, each questionnaire will contain nine choice sets for which respondents will indicate their preferred alternatives.

CONCLUSIONS

This questionnaire will be used in a large-scale survey to be submitted online, through social media, among people who express their interest for Italy.

The application of the discrete choice models structures the experience into its components, to estimate the consumers' utility for them and the willingness to pay, and to segment the consumer/visitor according to the propensity towards the different experiences.

The methodological innovation of this study is given by the application of the discrete choice models to the study of tourism experience. This represents a new analysis perspective that seeks to bridge the methodological gaps highlighted by Ritchie and Hudson [4].

The empirical innovation of this study consists in a different marketing perspective for Verona, the tourism businesses and the other local stakeholders. This will contribute to a branding process of the city, which has not been undertaken yet, but it is essential in a highly competitive environment.

The application of the discrete choice models in this context will implement a branding strategy in line with the consumers/visitors perceptions, because it will come from their preferences. The brand communication can convey an understandable and correct message, consistent with visitors' expectations. In this context, food and wine supply has a dual role: on the one hand, it is recognised as an experience attribute for Verona, on the other hand it could have a new catchment area in the tourists interested in the experiential utilities from Verona. Despite some initiatives implemented by local agro-food businesses are already channelled to this trend (food and wine whose label or brand recall characters or references to the city, food and wine events in the main squares of Verona), there is still much to be done to ensure that the local food and wine supply can enjoy the notoriety of the city from the tourism point of view.

If the survey will prove that the food and wine offer has a role in creating tourism utility for Verona and willingness to pay for it, a process of strategic development for the promotion of rural tourism can begin, which should connect the city with the Veronese appellation of origin areas and transform the food and wine offer into an element of brand personality for the city. This implies a

commitment in destination management by the different stakeholders, and in particular by the local authorities, the tourism businesses, and the agro-food and wine businesses, starting from the creation of a collective decision-maker.

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THE PERSPECTIVE OF INNOVATION CLUSTERS

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Abstract

The paper studied the perspective, particularities and advantages of innovation clusters, the impact of innovation clusters on the country economics. The successful examples of cluster formation on the global level are been considered. The paper indicated the necessities of conversion the economy of Republic of Moldova to the innovation way of development, the necessities of using scientific achievements in the real sector of economy, the necessities of science, technology and innovation. There are allocated perspective industries, which can be prospective for innovative enterprises in Republic of Moldova. The paper is identified priorities for the clusters creation in Moldova.

Key words: clustering, development, information technology, innovation, Innovation cluster

INTRODUCTION

In the condition of permanent changes in the economic environment, and in condition of competitive environment between the different economic agents, both at the level of the national and international economy the role of creating innovation clusters increases, and their prospects increases too. The main elements of market economy are small and medium enterprises, it is therefore necessary to strengthening their competitiveness.

The strengthening of competitiveness can be achieved by concentration of efforts. The concentration of efforts is a prerequisite for creation different types of cluster formation. The cluster formation can be considered as a formation factor of new industrial zones and innovative environment. In modern conditions significant factors of innovative activities become cluster.

The concept of a "cluster" was introduced by M.Porter in 1990: a cluster is a geographically proximate group of companies and associated institutions in a particular field, linked by commonalities and complementarities [1].

The concept of "cluster" is just beginning to be into practices in Republic of Moldova, although the definition was given six years

ago in the Law of Moldova № 138 of 21 June 2007 "On science and technology parks and innovation incubators", which served as basis for the development of production and innovation infrastructure.

According to this law, the science and technology cluster – is a "group of individuals and legal entities, established by the merger agreement concluded between the accredited organizations in the field of science and innovation and / or accredited higher education institutions, other non-profit organizations on the one hand, and economic actors, local public authorities, foster associations or professional associations, individuals, financial institutions, international organizations, domestic or foreign investors, on the other hand, in order to carry out activities in the field of scientific research, education and technology transfer research results and innovations, their development through economic activity" [2].

In the 1990s, clusters specialized in the production of consumer goods. At the beginning of the new millennium appears innovative orientation of clusters, which later became a key feature which is responsible for the competitiveness of these regions. The

innovative activity of companies in the cluster is higher than outside the cluster.

Innovation clusters means groupings of independent undertakings - innovative start-ups, small, medium and large undertakings as well as research organisations - operating in a particular sector and region and designed to stimulate innovative activity by promoting intensive interactions, sharing of facilities and exchange of knowledge and expertise and by contributing effectively to technology transfer, networking and information dissemination among the undertakings in the cluster.

MATERIALS AND METHODS

Some of the materials used in the research are national and international legal acts, textbooks, monographs, national and international conference proceedings and other publications specific to the theme. The study is performed on selected data and processed by the authors based on the statistical yearbooks of the Republic of Moldova, Eurostat and other publications that have provided meaning and relevant explanations in relation to phenomena or processes that are produced on the food market from our country.

In the research were applied specific methods and techniques of economic investigations.

RESULTS AND DISCUSSIONS

The specificity of innovative clusters is that their products are mainly for export, because of their competitive on the world market.

The perspective of innovative clusters results from a huge concentration in one area of industry, business, investment, and research centers and this concentration develops such advantageous traits for competitiveness as receptivity to innovation, faster growth of productivity, streamlining business, environmental management, etc.

Innovative cluster are characterized by following advantageous features:

- the division of labor and specialization;

- the stable system of dissemination of new knowledge, technologies and technological networks;
- the emergence of specialized suppliers;
- the cooperation between firms;
- the creation of consortia between groups of firms;
- the availability of financial resources;
- the interaction with the infrastructure of knowledge;
- the availability of quality human resources;
- the entry of region to the world market with competitive products.

In world practice, there are many innovative clusters that demonstrate performance through successful activity on the national and international market.

For example, Silicon Valley in USA, main products of which are computer hardware and software, microprocessors, mobile devices, biotechnology and other. The creators of Silicon Valley are, supposedly, the pioneers in the application of the cluster approach. On the territory of Silicon Valley are located about 87 000 companies, 24 research centers and 4 major universities. About 180 venture capital firms provide services and 700 banks finance their activities of individual companies. Silicon Valley is a classic example of fruitful cooperation of academia and business and personnel exchanges between research centers and the business sector. Silicon Valley is the leader of the country's exports, and many developed and developing countries are trying to copy it experience. Silicon Valley shows prospect creation and functioning of innovation clusters. The perspective of cluster is evidence by the fact that in the USA more than half of the enterprises work within the framework of cluster, and the share of GIP produced in them, is more than 60% [3]. Successful examples of innovation clusters are reflected in table 1.

At present, the European Union pays considerable attention to cluster strategies as to an effective instrument of innovation development in the region.

Over the past two decades, the dynamics of the formation of new clusters has increased.

Table 1: Successful clusters on the global level

Country	Cluster	Main product
Germany	Baden–Wurttemberg	Automobiles
Pakistan	Sialkot	Surgical instruments
Brasilia	Sinos Criciuma BentoGoncalves	Shoes Ceramics Furniture
India	Bangalore Tiruppur, Ludhiana	Electronics and software Textiles

Source: Riccardo Leoncini, Development and Local Systems of Production

According to the majority of economic experts, in the developed countries clusters contribution to GIP income is more than 50%. The number of clusters by country is as follows:

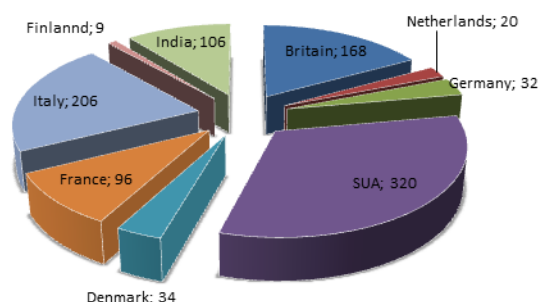


Fig.1. Number of clusters in some countries.

Meanwhile in some countries the process of clustering is focused on one or few branches of economy that are considered as strategic sectors for their development.

Thus innovative cluster in a certain region are very specialized as, for example, in Chile there are wine and salmon clusters that demonstrates successful activity.

Due to some similarities within main exports of the countries we will consider Chile as the new wine region, which becomes possible because the clusters were formed.

Wine production has grown by 63% in the period from 1990 to 2000, also increased significantly revenues from exports of wine: in 1984, the amount of income from exports

was U.S. \$ 10 million, while in 2002 already stand for 602 million dollars [4]. Chile becomes one of the leading countries-exporters of wine, overtaking Germany, Portugal and the USA. By volume of wine production Chile is on the 11th place in the world, behind countries such as Portugal and South Africa.

Significantly increased the area covered by vineyards: in 1996, the area amounted to 56,003 hectares in 2001 - 106,971 hectares. [5] The creation of the wine cluster contributed to this.

Chile’s wine innovative cluster is formed from a large number of interdependent actors such as:

- Association (Corporacion Chilena del Vino, Vinas de Chile, Wines of Chile)
- Educational institutions (8 universities Chile strongly related to wine industry)
- Governmental organizations and agencies
- Research centres (Centro de Vino UC, Fundacion Chile and other)
- Specialized programs of interaction
- Industry media
- Suppliers and contractors
- Vineyards and wineries.

The experience of wine innovative cluster in Chile shows:

- ✓ the availability of natural conditions and support from the state
- ✓ the wine cluster is oriented on the export of production, the selected orientation on exports initially is correct
- ✓ in wine cluster is a group of dominant wineries
- ✓ essential role play organisation, association
- ✓ in wine cluster are installed quality standards for wine
- ✓ educational and research segment of the cluster is well developed
- ✓ state pays attention to the development of winemaking industry

Thus, we can conclude that the Chilean wine cluster is a combination of the qualities of agricultural clusters and clusters of natural resources, export-oriented.

Another successful example of wine innovative cluster could be considered the is Australian wine cluster. Onwards is illustrating the history of development of the Australian Wine Cluster:

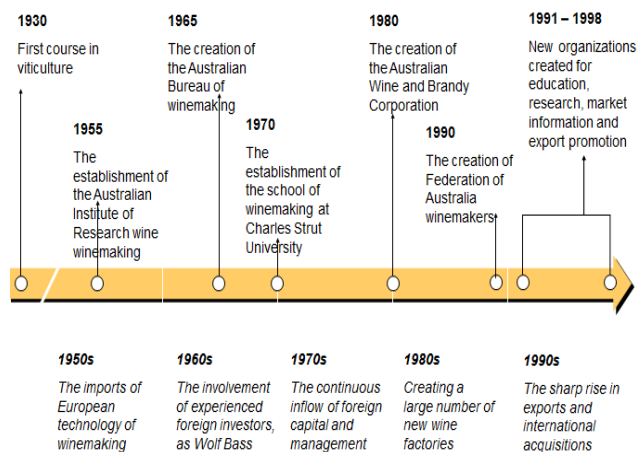


Fig.2. The history of development of the Australian Wine Cluster.

Thus we can observe that the process of cluster development usually took from 50-ty to 60-ty years period. During this time cluster system must pass several mandatory steps, where each previous one is just a milestone on the long way of development and each new one is coming as a necessity for all involved in this process in order to evolve into an industrial district.

The successes of the Australian Wine Cluster demonstrate trade data as in figure 3:

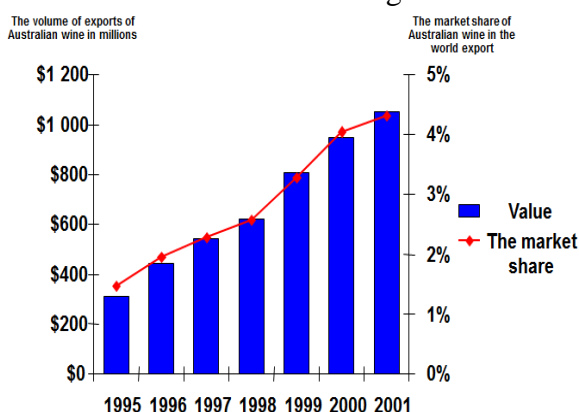


Fig.3. The trade data of the Australian Wine Cluster
 Source: UN statistics about trade

Experience of Republic of Moldova

There are many debates on clusters in Republic of Moldova. Some international agencies like UNDP consider the existence of production clusters while others conclude just

a concentration of similar companies that hardly could be viewed as the minimum condition for clustering process.

At the present time in the economy of Republic of Moldova there are a small number of economic agents which lead innovative business.

Innovative entrepreneurship in Moldova is underdeveloped. This can be explained by low consumer demand, underdeveloped research potential of the national economy, the deficiency of venture capital and firms that have been able to finance risky innovation activity. Moldovan experts consider as more innovative following industries, which could become a priority for entrepreneurship development: information technology, food production, agriculture, tourism, telecommunications, wine making, construction materials, nanotechnology and new materials, design and beauty industry, biotechnology, and medicine.

The Academy of Sciences of the Republic of Moldova was developed in August 2010 and proposed for public comment a draft concept of innovative entrepreneurship up to 2020, the implementation of which should lead to a restructuring of the Moldovan economy and accelerating the development of innovative business [6].

In October 2010, in Chisinau a round table providing subject "The creation and development of clusters in RM" was organized, within the framework of which was identified the following priorities for the creation of clusters in Moldova:

- introduction of the concept of "cluster" in the documents defining the economic strategy of the RM
- selection of public institutions, which should be the basis of future clusters
- identification of industries, which will benefit the state support in the creation of clusters
- identify areas of enterprise development, which is planned to provide state support for "clustering"
- elaboration of educational materials to create clusters to assist entrepreneurs

Innovative enterprises in Moldova just began to be developed.

Moldova doesn't have innovative clusters, but there are three "scientific-technological park" and innovative incubator, designed to enhance the effectiveness of the implementation of research results into production, bringing to the consumer competitiveness of industrial products and services based on innovation. The creation of innovative clusters in agriculture seems to be the most appropriate for Moldova.

Table 2: Characteristic of science and technology parks, innovation incubator of Moldova.

Name of science and technology parks, innovation incubator	Specialization	Number of residents
«Academica»	Universal	26
«InAgro»	Intensive and ecologic agriculture	17
«Micronanoteh»	Microelectronics and nanotechnology	Selection of residents
«Inovatorul»	Universal	7

Source: <http://aitt.asm.md>

Among the main economic activities in Moldova that meet somehow main criteria for cluster is wine industry.

The wine industry is one of the most important industries in the Republic of Moldova. The creating of wine innovative clusters for Moldova is the most affordable. Wine and related (distilled) products represent Moldova's second most important foreign exchange earner, after workers' remittances. It accounts for roughly one-fourth of total (gross) merchandise exports and for an even greater percentage in value-added terms. The share of this sector in industrial employment is roughly 25 percent, and probably even higher if the cluster as a whole (including bottles, labels, laboratories, and the like) is considered. Semi-dry and semisweet wines account for 75 percent of total production, dry table wines for 10 percent, sparkling wines for another 10 percent, and fortified wines for 5 percent. Some 93 percent of total production is exported [7].

The creation of wine innovation cluster can be a powerful input for economy development of RM. For developing of this cluster it is necessary to collect all engaged structures. The creation of wine innovation cluster is important step for the competitiveness increase of wines of RM. The creation of wine cluster will strengthen the position of the export market.

For the creation of wine innovation cluster in RM almost all the components has, namely:

- The companies, factories producing wine (226)
- 147 000 hectares of vineyards
- Wineries
- Technological equipment (61 companies)
- Laboratory equipment (5 companies)
- The Academy of Science of RM
- National institute of wine and grape
- Exporter and producers Association of Moldovan wines
- Oenologists Union of Moldova
- Public and state unions and organizations
- Moldovan wine guide
- Auxiliary materials for wine treatment (22 companies)
- Glass packaging (10 companies, 1 Glass factory)
- Closures materials (18 companies)
- Labels (10 companies)
- Cardboard packaging (3 companies)
- Transport services
- Nurseries (37 companies)

An integral part of the wine cluster must be scientific support, and scientific institutions should be directly involved in cluster formations.

The viticulture and winemaking enterprises should work close with academic institutions serving on the principles of scientific marketing and targeted funding. The organs control for wine cluster should be created, such as board of directors, which would coordinate the work of wine cluster.

If a wine farms and wine enterprises will form a wine cluster then own financial infrastructure it's possible to be created and the special service centers of various

activities, which can successfully complete on the market. The cluster model of organizing the viticulture and wine production will contribute development of viticulture and winemaking enterprises and regions of Moldova, increase competitiveness of Moldovan vine and wine products in the domestic and global market that will only favor the growth of the economy of Moldova in general.

In the creation of wine innovation clusters Moldova must refer to the international experience, namely the wine cluster Chile and Australian wine cluster.

CONCLUSIONS

For successful clustering Republic of Moldova need to develop measures that will contribute to the development of innovative business that can be achieved by:

-improvement of legislation and the development of innovation infrastructure

-formation in the country techno parks, business incubators, research centers

-engaging in innovative sphere of private capital, including sources of small businesses

It is necessary to develop innovative projects, which subsequently lead to the creation of innovation clusters. As part of an innovative project it is necessary developing of the basic elements of the cluster, as follows:

-financial infrastructure (private investors, venture capital funds and direct investment)

-scientific and educational infrastructure (research universities, institutes, laboratories), which is a supplier of the necessary specialists, developers of new knowledge and ideas

-supporting infrastructure (business incubators, technology parks, industrial parks), which create the conditions for the rapid development of innovative projects

-information structure, which create conditions for the effective exchange of information, knowledge and experience

Minimum condition for the success of clustering is the development of comprehensive measures which determine the interaction of 3 components:

- business environment

- scientific environment

- government

It is also necessary to establish effective communication, especially innovation and entrepreneurial environment that contribute mutually beneficial cooperation.

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REFLECTIONS ON FOOD MARKET FROM THE REPUBLIC OF MOLDOVA

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Abstract

In the conditions of changed ratio of public and private property, reduction of the direct involvement of public authorities in the national economic system that's marked by dynamism, often by uncertainty and risk, sometimes even by hostility, making and development of market relations based on mechanisms and economic instruments is an imperative. The article reflects on the internal market of food products, studies the import and export of food products, pursuant to which the authors come up with some proposals that would change the situation on the domestic food market for the better.

Key words: agriculture, efficiency, export, import, market, mechanisms, politics

INTRODUCTION

To qualify the transition to the market economy - is mentioned in the Moldovan Parliament decision of 26 July 1990 - as a model of management and the main measure to the economic recovery of the country. On 22 January 1991 our country's Parliament provided guarantees and protection of the right to private property.

On 15 February 1991 was taken the decision on the concept of agricultural reform and socio-economic development of the village, which meant "performing in series some changes in land ownership rights" in order to radically change economic, organizational and legal relations existing in village.

However, the agricultural reform was conceived as a construction that was expected to be built on an empty space, a thing that never happened. In addition, reforms were made in the space mentality inherited from the old system, with methods and tools, at least doubtful. Therefore peasants, getting the owner right, were waiting to become rich.

This Romantic period has passed very quickly and the same peasants became desperate when they faced with reality, especially with those

generated by market relations, which are the subject of this study.

Aspects regarding the study of food products market can be found in national and international research [1, 2, 3, 5]. Still, even if this problem has been studied, discussed at various official meetings in our country, addressed at scientific sessions, presented in various national and international publications, the study of the opportunities to the efficiency of the agricultural market remains present and important in the period of reformation of the national economy.

MATERIALS AND METHODS

Some of the materials used in the research are national and international legal acts, textbooks, monographs, national and international conference proceedings and other publications specific to the theme. The study is performed on selected data and processed by the authors based on the statistical yearbooks of the Republic of Moldova, Eurostat and other publications that have provided meaning and relevant explanations in relation to phenomena or processes that are produced on the food market from our country.

In the research were applied specific methods and techniques of economic investigations.

National market for food products

In all countries, usually, food production is addressed, primarily, to the domestic market.

RESULTS AND DISCUSSIONS

Table 1. Retail sales value in the national commercial units

	1995	2000	2005	2006	2007	2008	2009	2010	2011
Total, billion lei	2.76	6.01	11.03	13.62	16.97	21.39	19.96	25.10	33.81
Including: Food products	1.27	2.74	3.61	4.29	5.49	7.09	7.06	8.05	10.17
% of total	46.2	45.6	32.7	31.5	32.5	33.2	35.4	32.1	28.9
From which:, fresh vegetables and fruits	-	-	0.9	0.7	0.9	1.0	1.3	1.4	1.5
Meat and derivates	8.5	7.0	5.2	4.7	4.4	5.2	6.1	4.9	4.0
Bread, pastry and confectionery	10.6	6.0	6.3	5.9	6.2	6.3	6.4	5.9	5.0
Beverages	7.4	7.4	9.2	9.3	9.1	8.7	9.3	8.0	6.8
Other food products	5.3	6.0	9.6	9.5	10.5	10.4	10.7	10.3	9.8

Source: elaborated by the authors based on the statistical yearbooks of Moldova [7]

If the value of retail sales (Table 1) through the national commercial units increases from 2.76 billion lei in 1995 to 33.81 billion lei in 2011 or 12.25 times, then the value of food products retailed in those years increased only 8 times.

The share of food products in the total of the retail sold products decreased from 42.6% in 1995 to 28.9% in 2011, or by 17.3 percentage points. In other words, on the domestic market has reduced the demand for food. Moreover, the demand structure has changed considerably.

If in 1995 in the structure of retail food products sold through commercial units dominated the bread and pastries and confectionery (10.6%) followed by meat and meat products (8.5%) and alcoholic beverages (7.4%), then in 2011 structurally dominated alcoholic beverages (6.8%), followed by bread, pastry and confectionery(5%) and meat and meat products (4.0%).

Food products sales declined, mainly, at the expense of bread and meat, which is highly dangerous for any human being.

Domestic market demand, including food, is limited by the number of consumers and their purchasing power. According to the Statistical Yearbook of the Republic of Moldova in 2012 our population stood at 3559,5 thousands,

including in rural areas 2073,8 thousands or 53.8%. Domestic market demand is conditioned by the purchasing power of the population.

The average monthly income disposable of the population (Table 2) increased from 185.8 lei in 2000 to 586.6 lei or 3.6 times in 2005 and 1444.7 lei in 2011 or 2.54 times compared with 2005. Monthly average pension in 2000 made only 45.8% of monthly disposable income in 2005 - 67.4% and in 2011 respectively - 60.5 per cents. In other words the average monthly pension increased faster relatively to the disposable monthly incomes of the population.

However, is also rapidly growing the average monthly value of the minimum subsistence level per person from 766.1 lei in 2005 to 1503.0 lei in 2011 or about 2 times.

The monthly average disposable income of the population doesn't cover the minimum subsistence average level per one person, even if their report rose from 51.4% in 2001 to 74.2% in 2005 and to 96.1% in 2011. Only 26.2% of the population's total, inclusively 13.4% in rural areas, in 2011 had incomes which exceeded the disposable average level of 1600 lei, in other words overcame the minimum subsistence average level per one person.

Table 2. Main indicators which characterize the population's capacity of bying

	2000	2005	2006	2007	2008	2009	2010	2011
Disposable incomes (DI) of the population, lei	185.8	568.6	839.6	1018.7	1188.6	1166.1	1273.7	1444.7
Average monthly pension,(AMP) lei	85.1	383.2	442.3	548.3	646.4	775.5	810.9	874.1
Minimum subsistence level, (MSL) lei	-	766.1	935.1	1099.4	1368.1	1187.8	1373.4	1503.0
DI/MSL, %	-	74.2	89.8	92.7	86.9	98.2	92.7	96.1
AMP/MSL, %	-	50.0	47.3	49.9	47.2	65.3	59.0	58.2

Source: elaborated by authors based on the statistical yearbooks of Moldova [7]

Definitely, both in urban and rural areas dominate the expenses on food products and soft drinks. Thus, in 2010 in cities food expenses formed 37.8%, while in rural areas, 44.1% of the total.

In consequence, our country that has a domestic food market sufficiently limited is condemned to commercial relations with the oriental and occidental countries, as well as with the neighbour countries, and with those from other continents. For our country

extremely important becomes the external market.

Export and import of the food products

For our country which has a domestic food market sufficiently limited, the important role should be entrusted to the external market [6]. However, if the total exports (Table 3) increased from 471.5 mil USD

Table 3. Exports by sections, mln USD

	2000	2005	2006	2007	2008	2009	2010	2011
Total export	471.5	1091.2	1051.6	1341.8	1591.2	1287.5	1541.5	2216.8
Including agro-food products	291.0	582.9	464.0	533.8	595.0	609.2	732.2	917.1
From which: animals ş animal products	22.8	17.2	16.2	13.6	10.1	9.1	27.0	38.0
Vegetable products	65.9	131.9	136.5	162.9	210.1	268.4	340.7	471.0
Fats and oils	3.9	37.8	34.9	55.3	62.9	50.7	47.6	77.5
Food products, alcoholic beverages and soft drinks	198.4	396.0	276.4	276.0	311.9	281.0	316.9	330.6

Source: elaborated by authors based on the statistical yearbooks of Moldova [7]

in 2000 to 2216.8 mil USD in 2011 or by 4.7 times, then the food products export, in the specified years rose only by 3.15 times. The share of originating agro-food products in total export decreased from 61.72% in 2000 to 41.37% in 2011, or with 20.35 percentage points.

Structurally, there were made changes in the export of agricultural products in the

analyzed years. If in 2000 categorically (by 68.2%) prevailed food products, alcoholic and soft drinks, followed by vegetable products (22.6%), animals and animal products (7.8%), then in 2011 the largest share (51.4%) had vegetable products, followed by food products, alcoholic and soft drinks (36.0%), fats and oils (8.5%).

Total import increased from 776.4 mil USD in 2000 to 5191.3 mil USD (Table 4) or by 6.7 times. With tempos slightly lower (6.3 times) in the years of analysis increased the

import of food products, which caused reduction of agro-food products originating in total imports from 14.1% in 2000 to 13.2% in 2011.

Table 4. Imports by sections, mil USD

	2000	2005	2006	2007	2008	2009	2010	2011
Total import	776.4	2292.3	2696.2	3689.9	4898.8	3278.3	3855.3	5191.3
Including agro-food products	109.6	279.6	315.6	466.0	631.3	513.7	591.4	687.8
From which: animals and animal products	10.7	57.2	51.9	61.7	100.3	75.3	94.7	107.8
Vegetable products	25.3	65.0	72.8	150.4	166.7	132.6	168.8	199.1
Fats and oils	2.4	9.9	11.1	16.0	20.9	16.1	19.3	25.1
Food products and beverages	71.2	147.5	179.8	237.9	343.4	289.7	308.6	355.8

Source: elaborated by authors based on the statistical yearbooks of Moldova [7]

The import's structure of these products didn't suffer any major changes. Therefore, both in 2000 (with 65.0%) and in 2011 (with 51.7%) dominated the import of food products,

alcoholic and soft drinks, followed by vegetable products (i.e. by 23.1% and 28.9%) and animals and animal products (respectively 9.8% and 15.7%).

Table 5. Covering degree of imports by exports, %

	2000	2005	2006	2007	2008	2009	2010	2011
Total	60.7	47.6	39.0	36.3	32.5	39.1	40.0	42.7
Including agro-food products	265.5	208.5	147.0	114.5	94.2	118.6	123.8	133.3
From which: animals and animal products	213.1	30.1	31.2	22.0	10.1	6.8	28.5	35.2
Vegetable products	260.5	202.9	187.5	108.3	126.0	202.4	201.8	236.6
Fats and oils	162.5	381.8	314.4	345.6	300.9	314.9	246.6	308.8
Food products and beverages	278.6	268.5	153.7	116.0	90.8	97.0	102.7	92.9

Source: elaborated by authors based on the statistical yearbooks of Moldova [7]

Both for the national economy and for the agro-food sector of any state, including our country, extremely important is to be ensured a balance between import and export. Covering degree of total imports with total exports (table 5) in 2000 made 60.7 percent, decreasing to 47.6% in 2005 and 42.7% in 2011. Even if exporting food products, in the reference years, exceeds their import, the coverage degree of imports by exports of food

products reduces from 265.5% in 2000 to 208.5% in 2005 and 133.3% in 2011.

Least had to suffer vegetable products, degree coverage of imports by exports fell from 260.5% in 2000 to 236.6% in 2011. Definitely, this indicator decreased in animals and animal products, from 213.1% in 2000 to 35.2 percents in 2011.

It is significant that in our country, which is mainly agro-economic with a significant share of food, alcoholic beverages and soft drinks

the coverage degree of imports by exports decreases from 278.6% in 2000 to 92.9% in 2011. The Republic of Moldova has reached to import more food, alcoholic and soft drinks than it exports.

A major interest is the geography of export that can be traced on fruits and vegetables. We export fresh fruits and vegetables, frozen and processed. Their export market is oriented to the market of the European Union countries

(EU) and the Commonwealth of Independent States (CIS). The value of exported fruit and vegetables to CIS countries (table6) increased from \$ 33.3 mil USD in 2001 to \$ 146.5 mil USD in 2010 or by 4.4 times.

More modestly increased the amount of fruit and vegetables exported to the EU states, from 24.4 in 2001 to 67.9 mil \$ in 2010 or by 2.8 times.

Table 6. Export and import of fruits and vegetables, mil USD

	2001	2005	2006	2007	2008	2009	2010
Export							
Fruits and vegetables - in EU states	24.4	51.5	54.9	93.8	52.6	55.6	67.9
- in CIS countries	33.3	53.9	49.2	72.7	78.2	112.5	146.5
Vegetables, plants, roots and tubers	3.2	4.8	5.7	2.6	4.0	4.1	8.8
Including: - in EU states	0.4	2.3	1.6	0.9	0.5	0.5	0.6
- in CIS countries	2.4	1.9	2.9	1.6	2.9	3.2	8.0
Edible fruits	24.1	60.9	64.6	92.8	85.4	125.4	167.6
Including: - in EU states	16.5	33.5	38.0	47.0	36.1	36.8	49.2
- in CIS countries	5.1	23.1	20.3	39.2	41.6	78.2	104.7
Preparations of vegetables, fruits	34.1	46.5	42.3	79.5	51.4	50.1	52.3
Including: - in EU states	7.5	15.8	15.4	45.9	15.9	18.0	17.6
- in CIS countries	25.9	29.5	26.5	32.8	34.5	31.4	33.9
Import, mil USD							
Fruits and vegetables - in EU states	6.2	17.3	19.1	27.0	31.0	34.4	56.2
- in CIS countries	1.6	6.9	9.0	13.5	13.4	12.0	11.0
Vegetables, plants, roots and tubers	3.5	8.7	10.5	19.1	27.3	24.9	30.2
Including: - in EU states	2.0	2.4	3.0	6.2	11.0	9.7	13.8
- in CIS countries	0.1	0.05	0.2	2.7	0.9	2.6	0.9
Edible fruits	5.5	17.7	20.5	28.7	29.5	40.3	58.0
Including: - in EU states	2.0	9.8	9.6	10.7	7.5	15.6	33.1
- in CIS countries	1.2	1.3	2.3	3.3	2.6	1.7	1.6
Preparations of vegetables, fruits	2.6	13.6	14.5	20.9	30.1	20.0	22.7
Including: - in EU states	1.8	4.9	6.5	9.6	12.2	9.2	9.0
- in CIS countries	0.2	5.6	6.5	7.4	9.9	7.8	8.4

Source: elaborated by authors based on statistical yearbooks of Moldova [7]

Opposite situation was created to import. Thus, the fruit and vegetables value imported from CIS countries increased from \$ 1.6 mil \$ in 2001 to \$ 11 mil \$ in 2010 and gives to those imported from EU states that increased from 6.2 mil\$ (by 3.8 times more than in the CIS) to 56.2 mil\$ in 2010 (by 5.1 times than in the CIS). In fact, the increase of imports is alarming for our country.

If in 2001 the import of fruit and vegetables from CIS was as 4.8% and from the EU states

- 2.5% compared to exports, and 7.5% respectively in 2010 and 82.8 percent.

The values of exported edible fruit increased from \$ 24.1 mil \$ in 2001 to 167.6 mil \$ in 2010 or by 6.9 times. If in 2001 dominated the export of edible fruit in the EU states (68.5% of total), then in 2010 dominated their export to CIS countries, forming 62.5% out of total.

Edible fruit imports increased significantly from \$ 5.5 mil \$ in 2001 to 58 mil \$ in 2010 and by 10.5 times. Dominates the edible fruit import from the EU that in 2001 was by 1.7

times, and in 2010 –by 20.7 times higher than that from the CIS.

Even if the value of vegetables, plants, roots and tubers exported increases from 3.2 mil \$ in 2001 to 8.8 mil USD in 2010 and by 2.75 times, it remains insignificant. If their import in 2001 was almost equal to export, then in 2010 import exceeded export by 3.4 times. It dominates the export of these products in CIS countries.

Export of vegetables and fruit preparations for the reference years increased from 34.1 to 52.3 mil\$ or by 1.5 times. Their importance has increased respectively from 2.6 to \$ 22.7 mil \$ or by 8.7 times. If prepared fruit and vegetable export is oriented mainly to EU countries, then they are imported primarily from CIS countries.

Certainly, what happens in domestic agriculture, domestic market, export and import of agro-food products is caused by several factors, among which, we consider, determined at the moment, and are the market mechanisms.

National market mechanism of the agricultural products

A. Administrative regulations / or direct/ that provide:

a. **Standards.** In the national system of certification of agricultural products are certified in accordance with the requirements of European and international standards (Guide ISO/IEC and E no. 45001 - 450013), 7 certification bodies and 28 testing laboratories in various fields. It is developed the review of normative documents and the identification of standards in the agroindustrial complex branches.

Efforts being made to formulate development programs or replace them with national standards tailored to European and international standards. It was elaborated the National Standard SM-01-4 "Technical regulations. General principles."

b. **Technological rules.** The great diversity of nature brings with it the fact that an agricultural measure in a locality may be correct, while in the other, on the contrary, wrong. Since man created general principles, recommendations and guidelines on how to obtain organic agricultural food, extremely important is to consider technological compliance for each culture adjusted to actual conditions and vocation skills that manufacturer shall be responsible to handle the rules and natural resources.

B. Levers and economic instruments of market intervention which include:

a. **Price** is a very important tool in balancing consumer and producer interests, which are to be found in the report of the selling price to the cost. We will pursue the influence of price on consumer's and producer's interests on the example of grapes and of the products processed from them. For us, a wine and grape must exporting country, the price of realisation is crucial.

Selling price of grapes in farms increased from 382 lei/tonne in 1995 (Table 7) to 1388 lei/tonne in 2000, or by 3.6 times. Then it went up to 3181 lei/tonne in 2005 or by 2.3 times in comparison with 2000 and 3258 lei/tonne in 2010 and by 1.02 times in comparison with 2005.

Table 7. Selling prices of grapes actually formed in agricultural enterprises, lei/tonne

Indicators	1995	2000	2005	2006	2007	2008	2009	2010	2011
Selling price	382	1388	3181	2754	2724	2467	1782	3258	3260
Cost price	373	916	2410	2384	2346	2361	1809	3361	2514
Selling price/ Cost price	102.4	151.5	132.0	108.0	116.1	104.5	98.5	96.9	129.6

Source: elaborated by authors based on the statistical yearbooks of Moldova [7]

In other words, tempos of growth of the selling price of grapes in agricultural enterprises have a clear tendency to decrease.

The cost price of the grapes in those periods increased by 2.24, 2.63 and 1.39 times. To be

noted is that after 2000 the tempos of cost price growth exceed the selling price.

The complex of vine and wine develops normally if the production price exceeds its cost. In the last years, as follows in table 7, has outlined a dangerous trend of the costs and selling price report. If from 1995 till 2000 the report selong price: cost price was increasing forming by the end of this period 1.5 to 1, then in 2005 it was 1.3 to 1, reaching in 2010 to be 0.97 la 1.

Obviously, the report which was formed between cost and price can not provide the

manufacturer profitable activity. It even brings him to losses and bankruptcy.

Indisputable, in such circumstances when the cost price is bigger than the selling one, grapes manufacturer is not motivated, imposinghim to seek other work or to grub up the vineyards and cultivate other plants.

External market price is influenced by the developments taking place in the country which are sold vine products.

Decaliter price of exported wine and grape must (Table 8) fell from 13.36 \$ in 2009 to 10.95\$ in 2011.

Table 8. Dal price of wine grapes in export and import, USD

Indicators	2009		2010		2011	
	export	import	export	import	export	Import
Wine and grape must	13.36	19.65	10.94	7.44	10.95	8.89
Including in: - UE	17.95	9.39	16.36	6.12	14.04	8.54
- CIS	12.98	-	10.31	2.28	10.23	-
- other countries	9.85	14.20	11.80	10.04	14.00	11.15
Sparkling wine, total	24.57	10.12	21.87	6.46	23.74	7.15
Wine from grapes, total	13.06	15.36	10.59	6.63	10.50	7.38
Other grapes must	7.84	-	2.08	-	6.61	-
Vermouths and other wines	15.00	28.55	15.94	33.66	19.04	37.85

Source: elaborated by authors based on selection from the Foreign Trade of Moldova, 2011[7]

The price of a decaliterof wine exported both in the European Union declined from 17.95\$ in 2009 to 14.04\$ in 2011, or 21.8%, and the Commonwealth of Independent States - and from 12.98 \$ to 10.23\$ or 21.2%. However, the price of a decaliter wine and grape must exported to EU Member States 2009 was higher than in the CIS countries - 38.3% and in 2011 - 37.24 percent respectively.

Thus, a careful selection is required for the export market or a range price protection that includes various forms of subsidies, such as, for example, payments applied to export price. Simultaneously, there can be applied other economic mechanisms as the subsidies, tariff protection, and others.

b. **Taxes and fees** are important tools in the regulation of agricultural producers' activity. In agriculture are applied such direct taxes as

income tax and land tax, which fulfill regulatory and stimulation functions. Special fees, excises and value added fees perform the fiscal function, being oriented towards the formation of incomes in the budget and of extra-budgetary funds.

A major source of the budget coming from the agro-food sector is the value added fee, which is on the first place with 44% in 2006 and 59% in 2009 in the structure of the taxation system of agricultural enterprises (Table 9) and it tends to increase from 265.6 in 2006 to 435.8 mil lei in 2009. Definitely, the income tax decreased from 17853 thousands lei in 2006 to 1080 thouands lei in 2009. Land tax which equals 1.5 lei per grand-hectare of agricultural land, regardless of income level, in the reference years decreased slightly.

Table 9. Dynamics and taxation structure of agricultural enterprises, Lei thousands

	2006	2007	2008	2009
Income tax	17853	10317	4722	1080
Value Added Tax	265645	343641	482281	435842
Tax on property	4370	3733	3773	3044
Land tax	62847	57237	65486	56435
Income tax of the physical persons	29959	29304	31499	27085
Fee on territorial planning	3589	3059	2813	2410
Water fee	1380	2644	1937	1213
Road use fee	1094	875	850	568
Payment of social contributions	173269	144380	168546	173023
Other taxes and fees	37845	54203	68456	40616
Total taxes, fees and compulsory payments	597851	649393	830363	741316
Income from sales revenue	4145300	4184200	5639300	4730000
Share of taxes, fees and sales in the income from sales revenue, %	14.4	15.5	14.7	15.67

Source: elaborated by authors based on the statistical yearbooks of Moldova [7]

The fiscal burden on agriculture basically remains at the same level. If in 2006 the agricultural sector contributes with 14.4% of sales revenue, then in 2009 the share of taxes and fees formed 15.67%.

The share of agriculture's contribution to the state budget is higher than the share of this sector in GDP, which speaks of a relatively high tax pressure and it obviously influences negatively on the development of this very important segment of the national economy.

c. Subsidies are another tool that significantly influences the situation in agriculture. Grants, compensations and subsidies from the budget for the agricultural enterprises from the Republic of Moldova (table 10) increased from 76740 thousands lei in 2005 to 413354 thousands lei in 2009 or by 5.4 times.

On the rationality of using the support provided to agricultural producers, who in 2009 formed 67.8 percent of total support depends largely the efficiency of agricultural holdings activity.

Table 10. Grants, compensations and subsidies from the Republic of Moldova budget for agricultural enterprises, lei thousand

	2005	2006	2007	2008	2009
Total	76740	72022	357532	328623	413354
Including: - grants for agricultural production and reimbursement	254	3214	24888	30733	18675
Subsidizing agricultural producers	-	-	188287	200158	280265
Compensation of costs for planting perennial plantations	42588	24076	-	-	9561
Compensation for loss of agricultural enterprises that have suffered from natural disasters	30749	43437	41536	7465	9102
Other grants, compensations and subsidies	-	-	102683	90267	94931

Source: elaborated by the authors on the base of the PhD thesis in economics manuscript "Improvement of state regulation of the agricultural sector of the Republic of Moldova", developed by Cimpoieş Liliana, Chisinau, 2011[4].

The current system of subsidizing Moldovan agriculture, which can be characterized by reduction/ in real worth/ of financial allocations and ad-hoc non-monetary support, intends short-term objectives and does not

reflect in any way the general objective of the subsidies which is to increase agriculture development by correcting market failures. Therefore, according to the authors' opinion, regrettable is that in 2009 only 2.3% of total

support was intended to offset expenses for planting perennial plants.

According to the State Budget Law for the year 2012 for development of agriculture there are provided 775967.8 thousands lei, representing 3.5% of total expenditures provided in the national budget. From the sum granted to the development of agriculture 40617.6 thousands lei (5.2%) are special means and 112561.2 thousands lei (14.5%) refers to projects financed from external sources.

The allocated amounts from the public budget for agriculture subsidies in our country, does not meet the demand. In addition, the mechanisms of subsidies sharing do not ensure fairness, and certainly, there is no efficient use of resources intended for the subsidization.

CONCLUSIONS

As a result of the study we conclude:

1. Domestic demand, including food products, is limited by the number of consumers and their purchasing power, which condemns us to export.

2. Export of agro-food products is increasing while their share in total exports has a clear tendency to decrease.

3. Import of agro-food products is increasing and covering degree of imports by exports of agro-food products reduces with an accelerated speed.

4. Enforcement mechanisms and levers used both on the domestic market and on the export and import of agro-food products are not efficient enough.

In order to change the situation on the market of agro-food products in our country we consider appropriate:

1. To adjust the country's agricultural sector to the market's demand and judiciously select foreign markets and products with which our country would have success in markets showing a more constant stability as the EU common market.

2. To adapt mechanisms and levers applied to our country's agro-food products market to the requirements of the EU Common Agricultural Market as follows:

- To apply the "*guaranteed price*" which covers product costs and provides profit, the agricultural producers need to renew agricultural activities. When the quantity of agricultural products causes the price collapse on the market public authorities purchase (buy) from the agricultural producers the excess of products at a guaranteed price for storage and/or processing and sets them up for sale when the market is in favor of the request.

- To apply reduced VAT rates on products and services such as: basic food, water supply, agricultural products and other products and activities related to our country's agro-food sector.

3. In order to optimize national agriculture subsidies:

- to stimulate the agro-food products export through preferential exchange rate. Every euro obtained by changing the ratio of export is changed to the increased rate with 1-2 lei compared with the existing one.

- to give up the *ex ante* before getting production support/and *ex post* government intervention/after which the production is acquired/. The *ex post* type of support can be provided through two mechanisms:

a. The state subsidizes a part of the market price covering production costs;

b. The state purchases the production at the negotiated price but higher than the cost. The production is then sold, including to the processing industry, at a price that may be lower than that paid for the farmers in order not to affect the purchasing power of the population.

- it is subsidised the production realised on the market and especially on the foreign markets.

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ADVANTAGES OF AN INFORMATION SYSTEM MONITORING AND STOCKS AGRICULTURAL PRICES. CASE STUDY – ROSIM

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Abstract

Abstract agricultural policy in our country is based on information dispersed, especially because there is no centralized monitoring system, who to provide reliable information, while the agricultural and food market is experiencing a general feeling of instability - basically, it consists of channels and a dysfunctional organizational structure, based on communication systems do not operate in real time.. An integrated on-line monitoring of prices of agricultural products is of great interest due to the integration of computer technology (communications and agricultural sciences, based on specific concepts: client / server architecture, the integrated platform software, decision support, database distributed relational distance communication through the web, object oriented programming, mathematical modeling, interactivity etc.).

Key words: agricultural, information system, market, monitoring, prices

INTRODUCTION

It is known that the Internet has revolutionized many sectors of the economy and restructured and provided new targets of their activity, generating opportunities and challenges for existing businesses and start-ups that have direct relationships with customers. In supply chain intermediaries were new, while others have been replaced. Novel business models have emerged which showed how organizations use technology to achieve a competitive advantage and an income to match.

An ecommerce platform that is based on a market information system can become a support level of individual decision makers that are on the food chain product, especially agricultural policy needs to adapt to the distribution and changes of demand and supply market. Such a structure can integrated people and IT tools aiming at collecting, sorting, analysis, evaluation and distribution of accurate and real-time information to support decision makers in their planning activities, implementation and control marketing[1].

New models must solve the problem of client satisfaction for the achievement value and product quality. Integrated Monitoring System (ROSIM) pursue an integrated software, which provides information on the state of food prices in markets, in each county and then to ensure the transmission of information to a national administrator of the markets. Basically, data collection and processing is done in agricultural markets in order to report in real time and provide quick and reliable solutions regarding the prices of agricultural products.

MATERIALS AND METHODS

The system is an application of this type database accessible online with a web portal to support the collection and dissemination of data, based on concepts, methods and modern solutions.

ROSIM has distributed databases (local, regional and central) that provides collection, storage, processing and transmission distance, the structures and specialized areas designed as a virtual space where they can be accessed

in the shortest time in the best conditions. For the project we considered ROSIM

software solution based on LAMP (Linux-Apache-MySQL-PHP) platform is working best option, especially due to two key factors, namely: the combination has been demonstrated on many popular websites and the technology is free to use[3]. These factors are those due to which many people have chosen this combination to launch website production base. LAMP system have full control over both their own web server, and remote access, which enables easy administration of Linux server from any location[3],[4]. In addition, Linux provides the ability to run (execute) the services required to run without Graphical User Interface and therefore it uses fewer system resources - resources that could be used to speed up the delivery process website audience[2].

As software and hardware requirements for running ROSIM, software configuration runs on LAMP (Linux-Apache-MySQL-PHP) or similar, and the configuration WAMP (Windows-Apache-MySQL-PHP)[5],[6].

Hardware and programming environments software system are included, minimal, on hierarchical levels:

1. Minimum requirements for the central

- Central computer system contains the central database with replicas of each local database.

2. Minimum requirements for the regional (county)

- Territorial systems have databases that can contain, finally, with the development of market-wide integrated system, each local database replicas;

3. Minimum requirements for local, integrated system for development by including, in terms of information and food markets

- Local markets systems that transmit data collected in the first phase, fax or other means of transmission, the development, the system will have PCs with databases, placed in food markets that will ensure data transmission Internet.

RESULTS AND DISCUSSIONS

Features a ROSIM

Integrated system to monitor stocks and market prices of agricultural products

(ROSIM) is a collaborative process management for marketing agricultural products market to provide an overview on supply, demand, distribution channels and price stocks of agricultural products. With this system you can better manage the market, offering the opportunity to request orientation, can make decisions based on accurate information. Thus, it is a decision support in development:

- orientation strategies and support measures to support competitiveness;
- marketing plans farmer level;
- assessments consumption of agricultural products.

Integrated management facilitates decision making at different levels (strategic, tactical and operational) for the purpose of taking effective decisions that lead to optimization and stabilization activities on agricultural pricing. The decision to form specific higher information processing, aims to establish actions or commands on the operation or modification of the prices of agricultural markets and its monitoring.

ROSIM was founded in order to:

- general information mainstream farmer level,
- provide a viable mechanism for storing information about: prices, stocks and networks marketing of agricultural products market.

ROSIM is made and used in an architecture of client / server distributed relational database, in the first instance county level (agricultural directions, prefectures, etc..) And central level (ministries and central agencies etc.). As basic functions it allows acquisition, storage, processing and transmission of data for monitoring agricultural prices, remotely through the Internet network.

The integrated, functional and managerial levels used gives a new dimension to quality management by creating a framework for optimal coordination and monitoring of agricultural prices. The integrated system comprises the components (subsystems) and functional links between them, all activities which contribute to the process of price monitoring.

Database structure

Integrated interface is shared working environment, using in this context - as a way of cooperation - elements such as shared databases as data integrator, intranet / internet, hypertext, e-mail, videoconferencing, chat, shared applications in real time, working synchronously (at the same time with activities such as video conferencing etc.) and asynchronous work (coordinating action within a period of time such as through e-mail).

Databases satisfy the information needs and decision regarding the monitoring of agricultural prices, data are recorded, updated and searched:

- type
- variety
- price
- quantity
- place
- statistical data
- economic and financial data etc.

Computer applications at the local level will replicate data at the local level (county) which - in turn - will replicate data at central level.

System generates two types of applications:

- *applications for the management of distributed databases*, local and central, which function definition, consulting and querying databases, entry, modification and deletion of data as well as data transmission procedures for updating the central server;
- *monitoring applications specific agricultural prices*, based on mathematical models and algorithms that reflect the phenomena of markets for agricultural prices, the calculation procedure of specific indicators.

Territorial levels and central processing queries and consultations include the calculation of synthetic indicators and statistics, price forecasts, studies on data archive, retrieve data from local servers, dissemination of data on web sites, located throughout the country (county).

- Making convenient multiple applications through multitasking;

- Providing a high degree of security against both accidental hardware failures, software errors, and unauthorized intrusion;
- Ensuring accessible interfaces for system engineers, network administrator and database administrator;
- Providing software support for database management;
- Cooperation and communication network components.

The operating system provides functions of management software applications (input, modification, query, fitrare, sequencing etc.).

Integrated on-line monitoring of agricultural prices (ROSIM) developed and used in an architecture of client/server distributed relational database, initially, at the county level (agricultural directions, prefectures etc.) and central level (ministries and central agencies etc.), purchase, store, process and transmit data for monitoring agricultural prices, remotely over the Internet. The system is based on working with the web. Internet operates under client/server (browsing a user accesses data from a web server via a client application, web browser) leading to DBMS-R's (Database System Management-Relational) involvement in web applications.

Integrated monitoring system consists of distributed databases in different points of the territory (cities, districts) to store data for monitoring agricultural prices.

Ways to use the system

The hierarchical structure of the integrated system has organizational levels of decision processes aimed at monitoring agricultural prices. System users are decision makers place on different levels of expertise, professionals who need several variants of decision analysis and students are trained in matters of agriculture.

The database is multi-modular is structured as follows (fig. 1):

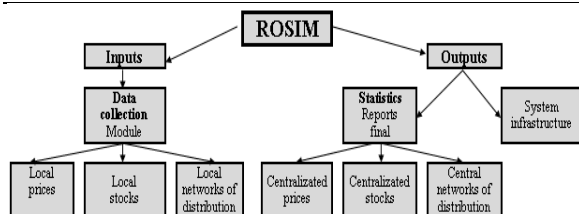


Fig.1. Modular structure of the platform ROSIM

Integrated web system operation is based on:

- running web server software, program that understands and responds to HTTP requests made by a web client;
- uniform view on different monitors, documents made public on the web, made in a special way;
- definition of browser or browser running on the computer;
- achieve a set of computers connected to the network.

ROSIM system is designed for a wide range of users:

- decision makers in central and local authorities (Ministry of Agriculture and Rural Development, Agricultural Departments, municipalities etc.).
- farmers
- processors
- distributors
- Research and education
- other users

Below are the main windows ROSIM system. In the main window, on the left there is a navigation menu that allows selection above modules, namely:

- *General information*

Figure 2 presents some general information about the system and in Figure 3 are instructions for users of computer platform.

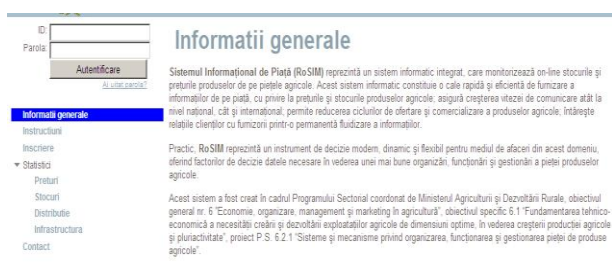


Fig. 2 - General Information

Source: <http://www.rosim.infoagroturism.ro/?page=home>

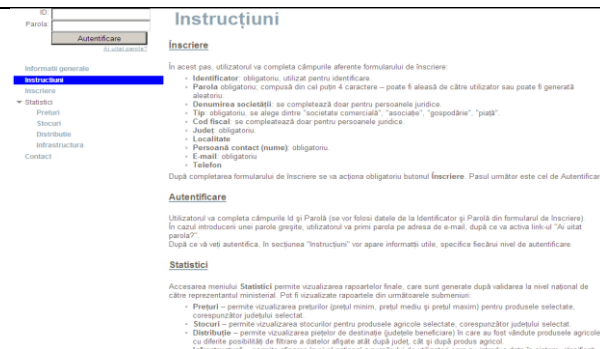


Fig. 3 – Instruction for users

Source: <http://www.rosim.infoagroturism.ro/?page=instrucțiuni>

• *Registration / Log in*

Module registration / authentication - in this mode there are two sections, namely (fig. 4): a) Section authentication - allowing users already registered login for entering data; b) Registration section - which allows registration of new users of the system. In this section, users who wish to enroll must complete a form that includes: name of company or agent; kind (company, association, individual household or agent). Following completion and registration, the user will receive a user name and a password, which will then log in to the system.



Fig. 4 Module registration / login

Source: <http://www.rosim.infoagroturism.ro>

• *Data Collection - Prices, Stocks, Distribution networks*

Data collection module (figures 5, 6, 7) - consists of 3 submodules, namely: prices, inventory and distribution.

Submodule Prices - within its data is collected agricultural prices over a period of time. The user chooses the reporting date, the product and price.



Fig. 5 Submodule Prices
 Source: <http://www.rosim.infoagroturism.ro/?page=preturi>

Submodule Stocks - stocks collects this sub products that have been previously entered sales prices. Here, the user has the choice reporting period. In stock collection window, the user must enter: product name, initial stock (if any), inputs, outputs (sales), followed by the system to calculate the final stock, end stock will be reported as initial stock in the near Next.

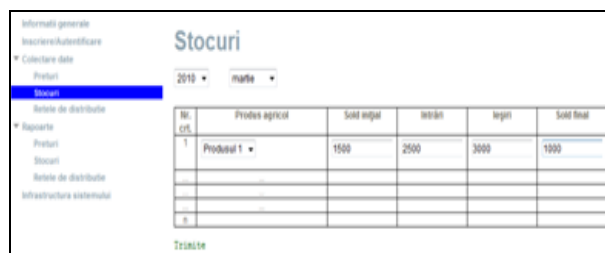


Fig. 6 Submodule Stocks
 Source: <http://www.rosim.infoagroturism.ro/?page=stocuri>

Distribution networks submodule - allow location-tracking product movements (county) and destination (processor, consumer, distributor). This is particularly important as it allows finding the size of demand of a product or multiple products in a certain area of the country, enabling fast and effective decisions to regulate it.



Fig. 7 Submodule Distribution networks
 Source: <http://www.rosim.infoagroturism.ro>

Next image shows the Sales window where users can select the date, county, agricultural product categories, quantities, prices, beneficiary, destination.

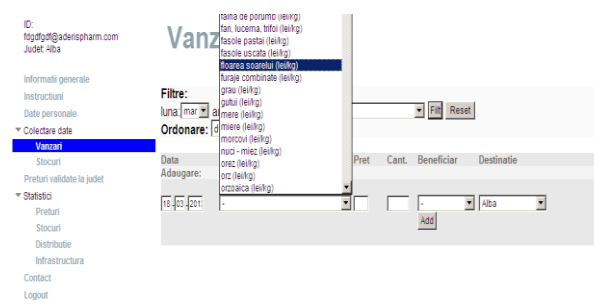


Fig. 8 Sales window
 Source: <http://www.rosim.infoagroturism.ro/?page=vanzari>

- *Reports - Prices, Stocks, Distribution networks*
- *System infrastructure*

The last section of the program, system infrastructure is actually a database summarizing some information on the number of markets, family farms, associations and companies registered in the system.

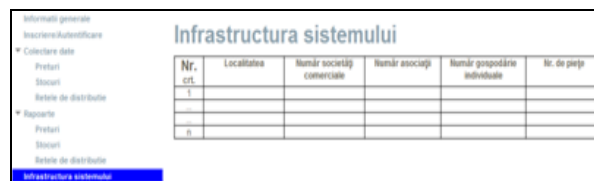


Fig. 9 Infrastructure system
 Source: <http://www.rosim.infoagroturism.ro/>

Price data monitoring must take into account the circumstances in marketing because sales conditions and dynamics can impact the price of the product.

CONCLUSIONS

ROSIM was created so that it becomes a support level decision makers are on different branch of the food, especially agricultural policies need to adapt to changes in supply and demand and supply in the market. ROSIM was created with the intention of bringing together scattered elements and raw data and to distribute them in the form of coherent information.

Established experimental model system structure and its components, working as a cooperative decision support and web assisted in architecture client / server to connect to the Internet, distributed databases and software applications to achieve process monitoring prices of agricultural products.

Such a system is not a lot of data and information organized, it is also a tool that provides ways of interpretation. Thus, ROSIM is intended as an IT personnel structure and tools aimed at collecting, sorting, analyzing, evaluating and distributing accurate and real-time information to support decision makers in their action planning, implementation and control marketing activities.

Making software ROSIM shows wide possibilities offered by this product information to process on-line data, Internet data collection, processing and transmission of agricultural prices in food markets at county level and ministry in the decision-making.

The integrated system has a systemic character, open that allows development and enlargement by including all markets, nationally and connection to the European Union to meet the requirements of the acquis communautaire, effective management processes in agriculture. and integration in Europe. The integrated system achieved a unitary concept, a platform with distributed databases in client/server architecture, network connected to the web at the national level and, in the future, possibly at European level to ensure the discretion, the advice and information for institutional bodies and other agricultural organizations.

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LOGISTICS ALTERNATIVE IN SIMULATION AND OPTIMIZATION THE SUPPLY CHAIN

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Abstract

The purpose of this work is the presentation a general framework to support the operational decisions for supply chain networks using a combination of optimization model and discrete-event simulation. The simulation model includes nonlinear and stochastic elements, whereas the optimization model represents a simplified version. Based on initial simulation runs cost parameters, production and transportation times are estimated for the optimization model. The solutions of the optimization model are translated into decision rules for the discrete-event simulation. This procedure is applied iteratively until the difference between subsequent solutions is small enough. This method is applied successfully to several test examples and is shown to delivery competitive results much faster compared to conventional mixed-integer models in a stochastic environment. It provides the possibility to model and solve more realistic problems (incorporating dynamism and uncertainty) in an acceptable way.

Key words: logistics alternative, optimization model, supply chain management

INTRODUCTION

In recent years intra-company supply chains have been growing significantly spanning production and distribution sites all over the world. At the same time global competition has increased, such that there is a strong demand for new decision support tools on strategic, tactical and operational levels of supply chain.

MATERIALS AND METHODS

As a basic material for research served the sources and specialty literature, the author investigations in the field on supply chain optimization.

During the study were used both the traditional research methods, quantitative and qualitative analysis, comparative analysis and logic synthesis and generalization.

RESULTS AND DISCUSSIONS

Biswas and Narahari (2004) classified the relevant research on such decision support systems into the categories:

1. Optimization models mainly for multi-echelon inventory control. In most cases these models are deterministic and used for strategic or tactical decisions.

2. Analytical performance models, which consider a dynamic and stochastic environment. They are used to investigate design or principal management decisions. Such systems are represented as Markov chains, Petri nets or queuing models.

3. Simulation and information models which are used to analyze complex dynamic and stochastic situations and to understand issues of supply chain decision making.

For the first and second categories, it is often necessary to make several simplifications from the real – world case in order to develop solvable models. Nevertheless the problem size is usually very limited.

In this paper we develop a new solution, so we are able to combine the advantages of models from all categories mentioned above by considering a detailed representation of a dynamic and stochastic environment and allow the application of optimization methods in this context.

Our investigations are based on a general supply chain network model with different

facilities (suppliers, manufacturers, distributors) and different transportation modes connecting these facilities.

The goal is to reduce costs by simultaneously optimizing the production/ transportation schedule and reducing inventory levels. We are aiming for a robust solution, in the sense that a stochastic environment is considered. Comparing our problem to the tasks in the supply chain matrix (Stadtler, 2005), the problem is a combination of several operational tasks: production planning, distribution planning and transport planning.

Our goal is to achieve an optimal operation plan for supply chain network by combining optimization models and simulation models. We do not use the optimization on top of the simulation, where an optimization algorithm uses the simulation model as a black – box (Glover et al., 1999). Instead we include simulation and optimization in a interactive process in order to gain the advantages of optimization (exact solution) and simulation (nonlinearities, complex structure, stochasticity). We analyze in detail the advantages and disadvantages of this approach and presents results for different test cases.

The supply chain is represented as a discrete event model (D-E model) and a simplified version is modeled as an optimization model. We start by performing several stimulation runs in order to get average values of the parameters (e.g., unit transportation costs) which are then fed into the optimization model. After solving the optimization model the result is transformed into decision rules that are used in the discrete – event model.

Aspect of the integration of transport and production planning within supply chains have been investigated in several papers (Erengc et al., 1999). Combined planning approaches for different decision levels (e.g. tactical and operational decisions) can be found in Mayr (2002) and Schneeweiss (2003). In general the problems solved with MIPs include several simplifications in order to keep them solvable.

In the field of supply chain simulation Kleijnen (2005) gave a short overview of simulation tools and techniques used for supply chains. He distinguished between four

different approaches: spreadsheet simulation, system dynamics, discrete – event dynamic systems simulation, and business games. Numerous software packages for discrete – event simulation are available, both very specialized ones for a specific part of the supply chain and general ones with a high functionality in modeling and visualization of supply chain (Kelton et al., 2002; Kuhn and Robe, 1998). They used an agent – based approach, where each member optimizes its own operations in the sense of an advanced planning system. But there is no interaction between simulation and optimization.

The general description of the supply chain originates from case study about a supply chain in the paper industry (Gronalt et al., 2007). Several production sites are used to manufacture different paper products, which are delivered either directly or via hubs to customers all over the world. The main task in this case study was to develop a 1 - year plan from production quantities and transportation links. In this case study a static model was developed, which was used to get rough estimates quickly.

Inspired by this case study we formulate the following problem setting. The basis for our supply chain model is a predefined network, i.e., the location of all actors and the connections between them are given within the network we differentiate between three types of participants connected by transportation links:

- Suppliers providing raw materials;
- Customers who demand certain products at a specific time;
- Production/ warehouse sites where production, stoking, and transshipment takes place.

The whole supply chain is order – driven, that means products are manufactured or transported only if a subsequent member of the supply chain requests it so the origin for all activities is the predefined deterministic demand of the customers.

All activities are based on time periods, which might be days or shorter time periods.

Module supplier.

Simulation model. This module is used to generate certain products, store them, and

deliver them if demanded. It has one input port to receive orders for products and one output port to deliver products. If this module receives an order through the input port, then it sends the requested amount of products via the output port. If the amount exceeds the current inventory level, only the available amount is sent. As soon as new products whole order has been fulfilled. The costs arising in this module are only inventory costs for storing products prior to delivery. These costs may have any user-defined functional form. According to the given parameters in each period, new products are generated and added to the stock.

Optimization model. We also developed a simplified representation as an optimization model. We denote by J_s the set of suppliers within a network, by P the set of products and by T the number of periods. The representation of the supplier's behavior in the optimization model can be formulated as follows (If p and t are free indices, i.e. not used as a summation index, then the set of equation is meant to be valid

$\forall t = 1, \dots, T, p \in P$):

$$TC_i^S = \sum_{p \in P} \sum_{t=1}^T out H_i^p (out l_i^p(t))$$

$$\forall i \in J_s, (1)$$

$$out l_i^p(t) = out l_i^p(t-1) - out f_i^p(t) + S_i^p(t)$$

$$\forall i \in J_s, (2)$$

$$out l_i^p(t) \geq 0 \quad \forall i = J_s, (3)$$

The overall cost of supplier i is denoted by TC_i^S , consisting only of the holding cost $out H_i^p$ (.) of the output inventory, expressed by the right – hand side of (1). Equations (2) are the inventory balance equations for the output inventories $out l_i^p(t)$. The stock is diminished by the outflow of materials $out f_i^p(t)$, and increased by the given supply $S_i^p(t)$ the last set of constraints (3) guarantees that the inventory level cannot be negative.

The simulation and optimization model are connected via the holding costs in (1) which represent the user-defined cost function in the simulation.

Module customer

Simulation model. According to a given demand table, the customer places orders at the production sites. Due to stochastic features within the simulation, it is not possible to time delivers exactly. Therefore the customer has an input inventory, which is used to satisfy the demand. The inventory level can be negative (shortage), as well as positive (oversupply). In both cases penalty costs occur, which are higher for shortages. The models has one output port for sending requests and one input port for receiving products. The orders are sent either according to the demand table (including a standard delay time for transportation) or according to the solution of the optimization model.

Optimization model. The organization model for the customers' behavior can be written as follows (we denote by J_c the set of customers nodes in the supply chain network):

$$TC_i^C = \sum_{p \in P} \sum_{t=1}^T R_i^p (in b_i^p(t)) \quad \forall i \in J_c, (4)$$

$$in l_i^p(t) - in b_i^p(t) = in l_i^p(t-1) -$$

$$in b_i^p(t-1) + in f_i^p(t) - D_i^p(t) + r_i^p(t) \quad \forall i \in$$

J_c

$$, (5)$$

$$in l_i^p(t) = 0 \quad \forall i = J_c (6)$$

In (4) we calculate the cost at the supplier which consists only of penalty cost for back orders $in b_i^p(t)$. Equations (5) are the inventory balance equations where the customers' demands $D_i^p(t)$ are considered. It is assumed that all customers are *just – in – time* customers. Therefore, constraints' (6) ensure that no oversupply (positive stock level) is possible, i.e. it is not allowed to send more products that demanded by the customers. This JIT (e.g. just – in - time) assumption may be dropped and holding costs for positive stock may be included. In the simulation model the JIT assumption is weakened, because stochastic transportation times may cause an unwanted early delivery. These early deliveries are penalized.

The differences between the simulation model and its representation as an optimization model are the penalty cost factors in (4) and the JIT assumption expressed in (6).

Connecting the optimization with the simulation in the supply chain. In order to couple the optimization model and the simulation model, we first have to define the required data and the way they should be exchanged. We decided to use an MS Access database to store all necessary information which is:

- General network structure: This includes the number of actors in the supply chain and the according links between them.
- General parameters used in the simulation and optimization models: These sets of parameters include all capacity limitations, resource parameters, bill –of –materials, predefined supply at the suppliers, and predefined demand at the customers.
- Results of the optimization model (parameters for the simulation): The results of the optimization used as decision rules in the simulation are production and transfer quantities, as well as transportation amounts’.
- Results of the simulation model (parameters for the optimization model): The main results of the simulation experiments used in the optimization model are the cost parameters and the delays for production, transfer and transports.

CONCLUSIONS

Implementing a simulation model means to arrange the according modules and connect them.

The whole supply chain is order – driven, that means products are manufactured or transported only if a subsequent member of the supply chain requests it so the origin for all activities is the predefined deterministic demand of the customers.

All activities in the supply chain are based on time periods, which might be days or shorter time periods.

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THE CREATION OF THE FOOD SECURITY SYSTEM OF THE REPUBLIC OF MOLDOVA

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Abstract

Food security has a complex determination which is dependent both on the agricultural sector policies and on the general macroeconomic framework, the revenue sharing policies, fiscal policies, social, commercial policies, etc. The concept of food security determines the main directions of the policy that favors the population' welfare, poverty overcoming, changing of the consumption structure, demographic development, human health protection and improvement. In order to assure the foodstuffs of plant origin it was necessary to sow 741808, 85 hectares in 2012 year. The livestock of hens needed to assure the production of eggs for internal consumption, incubation and quantity of meat for 2012 year is 14, 5 million capita. The livestock of pigs needed to assure pork for consumption and the livestock for reproduction and export is 440076, 45 capita.

Key words: *agro-industrial complex, average daily gain of pigs, egg yield, food problem, national food security, milk yield, productivity of agricultural crops*

INTRODUCTION

Agriculture and food, as a problem, are of the global and European interest, both itself and regarded as a subsystem of other "challenges" on the worldwide (globalization, poverty, sustainable development, competitiveness and so on) and, more recently, as a part of the financial and economic crisis in progress.

The essential peculiarity of the European economic space is that agriculture and food "consume" the main "part" of the Community budget, this sector claims adjustment reforms, both to the requirements of the international trade, made by the World Trade Organization, and to the requirements of real convergence of the European economies [2].

National food security is a food supply system which is independent of the changes of the external environmental factors and which helps to assure the sufficient quality of vital food needs of the population obtained from internal sources [5].

National food security is an element of the global food security. Prosperous countries in terms of food security are seen as stabilizers on the world market and sources of support of the food security for the states that have

unfavourable natural and climatic conditions for agriculture [6].

Food security has a complex determination which is dependent both on the agricultural sector policies, and on the general macroeconomic framework, the revenue sharing policies, fiscal policies, social, commercial policies, etc. Food security insurance supposes, on the one hand, the available food offer that is established by the internal agricultural production, the global market situation, prices and trade policies of importing food availability and the existence of financial resources for it.

Secondly food security insurance involves the ensuring of the access to food on a regular basis and for the whole population, which implies the existence of the purchasing power or in other words, the existence of the incomes, especially for the poor population, with a high nutritional risk. The third factor that influences food security is the individual behavior regarding food acquisition and consumption, because food security is ultimately a problem of families and individuals [3].

MATERIALS AND METHODS

Official statistics were used as data and information sources.

For analysis and wording of the documentary opinions own calculations of the insurance model with food of vegetable origin (bread, sugar, oil, potatoes, vegetables and fruits) and of animal origin (milk, eggs, poultry, pigs and cattle) were done. This was possible using such methods as analysis, synthesis and comparison of the results presented in tabular form. The data were processed in the QM program.

RESULTS AND DISCUSSIONS

Successful settlement of food security problem supposes the need to keep at the most the specialization directions of the agriculture that have to correspond fully to the natural and economic conditions of the country. It is necessary for the country to take measures to increase the competitiveness of the production, to broaden the capacity of the internal market and its protection. Complex measures must create a balance between the demand and offer on the food market and to substitute imports with domestic products.

As the problem of food security and food insurance can be approached through the strict relationship with environmental issues, agricultural and socio-economic context of each country, the offer of the ecological products must adapt to new market realities, to the changes appeared during market evolution and trade norms, to the demand and consumer's preferences.

The efficient practice of some agricultural enterprises from our country shows that in competitive market economy, the achievement of high efficiency per hectare, the increase of labor productivity and of economic efficiency of production consumptions and finally the achievement of competitive and sustainable economic results depend both on the sizes, structure, quality and administration with maximum efficiency of the technical and material resources and on the need of some mitigation measures of the fluctuating environmental factors.

The main problem of the agro-industrial complex is the increase of the processing industry competitiveness and the increase of the export potential.

To obtain stable insurance of population with food staffs and the growth of the processing industry competitiveness it is necessary to modernize the material and technical basis of this industry, to accelerate the innovative development that will recover the external trade balance. The use of the new technique, progressive resources and saving power technologies allow increasing the food production, expanding its assortment, reducing production consumptions, and increasing the production competitiveness on the internal and foreign markets.

The revival of the branch must be done by complex programs establishment focused on the growth of its competitiveness. Switching to innovative development requires large investments. The activation of innovative activity can be achieved by improving the financial situation of organizations, state supporting of scientific research and technological activity, stimulation of investment for innovation and high technology incentives to invest in, attraction of private and external investment.

One of the forms of investment in the modernization of processing industry production can be the purchase of the efficient technological equipment by the companies.

It is necessary to accelerate the creation of large companies who will dominate the internal market and will advertise their products vigorously, but these companies should not be in great numbers, 1-3 in each branch for example.

They should form the development policy of the respective branch and the marketing activity abroad, establish recover and finance principles, and decide the loads for technical and technological modernization of production for companies who have consolidated on the base of their own capital.

The main purpose is the dynamic growth of the incomes and profits, the orientation of production on the market, selling and creating consumer demand.

For small local producers it would be necessary to associate in order to exploit production as the competition in EU remains high.

It is also necessary to form food reserves in order to avoid their deficit or rapid growth of retail prices. It is necessary to guide the national producers to increase production volume and sale that is more competitive than that which is imported (alcoholic beverages, fruits, oilseeds, cereals, sugar). This fact is very important for the consolidation of the country's alimentary independence.

Enterprises providing with highly productive equipment and new technologies allow broadening the assortment of production. A great attention should be paid to the launch of new types of products with improved consumption properties, rich in fat, vitamins and micronutrients.

An efficient way to coordinate and promote agricultural production is the contractual agriculture. It can be defined as an agreement between farmers and processing industry or marketing companies on the production and supply of agricultural products under future agreements, often at established prices. These agreements are based on a mutual pledge: the farmer offers the goods in quantities and quality standards set by the customer and the buyer company supports the farmer's production by granting technical assistance and purchasing the goods. The agriculture based on the contract can be a solution for crisis mitigation on the agricultural markets.

In the situation of the global economic crisis the achievement of the export potential is a difficult task. This is determined by the following factors:

- the concentration and monopolization of raw materials and food export by the exporting countries, strengthening their dominant positions on the market;
- the growing need for qualitative foods established by the normative acts focused on national priority;
- the increase of production processing as the sale of the raw materials is not highly efficient;

Internal conditions that block the exports of the agricultural products are: the low level of

the production stability, high risks caused by the natural conditions, the low level of innovation development of the brunch, the low level of the efficiency and its competitiveness.

The achievement of export potential requires not only increase of the agricultural production volume and its quality, but also the improvement of the sale system.

Global competitiveness and productivity show the performances of the sectors in continuous transformation determining their role in the economy.

The technological changes such as biotechnology and the improvement of transport and information systems contribute to the increase of the food system competitiveness and lead to the reduction of the food costs. Trade's liberalization, consumer's requirements and the concern for the environmental quality play an essential role in the dynamics of the food system. Lately there have appeared a growing concern for food safety and a growing demand for half-processed products. The new challenge for the food systems is to provide safe products at reasonable prices to consumers, produced without damaging the environment. This challenge means that the economic agents have to adapt to new technologies and improve their managerial and organizational knowledge.

In order to stabilize the economy and achieve a balance between offer and demand for food and agricultural raw materials on the internal market a complex of measures established by the state agrarian policy is necessary. The purpose of this policy is to create efficient production which assures the population with food-stuffs, the industry - with raw material in necessary volumes for economic growth and social stability. Achieving this strategic purpose requires the following measures:

- a) the establishment of concrete programs of restoration and development of agro-industrial production highlighting the short and medium term actions of the state;
- b) introducing an efficient mechanism for creating food resources and raw materials, based on the economic stimulation of the producers and the development of market

infrastructure, revising foreign economic policy and the insurance of the autochthonous producers;

c) the establishment of the prices regulation mechanism of the agricultural and industrial production, the creation of the modern system for planning and forecast of the agricultural production;

d) the stimulation of cooperation and integration development of all types of enterprises of different form and production;

e) innovative production development, storage, processing, sale of outputs, improvement of management system;

f) creating economic conditions to improve the rural population's lifestyle;

g) food problem settling by the restoration and development of the agro-industrial complex;

h) increasing the skill degree of the agriculture workforce and attracting young people into agricultural and non-agricultural activities;

i) the restoration and development of the scientific potential, economic stimulation of scholars and experts;

j) state financial support of the scientific and technical programs.

The food security conditions are: physical and economic access to food of the population, rational consumption of high quality foodstuffs in a sufficient quantity by the power value and balanced in vital elements.

The development measures system of the specialized branches should distinguish the necessity of reducing the consumptions, production assortment renewal, improving packing, marketing development that is to ensure competitive production.

Food security strategy involves achieving the efficient level of economic development, including the agro-industrial complex guaranteeing population with stable supplies of food in the quantity that corresponds to the scientifically grounded parameters and which creates a rational consumption of food independent from the state of international relations or the situation on the international market.

Successful resolution of the food problem involves the necessity to preserve the main directions of the agricultural specialization

that corresponds fully to the natural and economic conditions of the country.

The achievements of the agro-industrial complex and the potential of the agricultural sphere allow both the insurance of the food security and the promotion of the exports development. The alternative strategy based on import is unacceptable because on the one hand it reduces the economic security, negatively influences the state of currency reserves challenging the increase of the external debt, and on the other hand – it creates food markets and internal prices at the imports' expense which acts depressively on the economy.

Solving the problem of food security at national level, we should not ignore the growing trend of the globalization of the world economy that is growing rapidly as a result of the liberalization of agricultural production trade under the rules of the General Agreement on Tariffs and Trade and World Trade Organization.

The innovations in food sphere should ensure the passage of its development strategic purpose from production which ensures hunger and malnutrition dangers prevention to products' production that enhance life quality and consolidate the population's health.

The agricultural aspect of the innovation development includes technological and productive innovations that are achieved from scientific researches. These are implemented in the production of new types of agricultural foodstuffs, providing the essential improvement of its quality and the increase of agricultural efficiency.

Agriculture must become a real priority for the government of the Republic of Moldova to insure the population's food security and supply many activities with raw materials.

Under the dates of FAO experts till 2030 wheat production will increase by 20-21% and its total volume will reach 2149-2150 million tons at the necessity of 2675 million tons. Meat production will increase (especially pork and broiler meat) to 50-80 millions tons, that is to 230-260 millions tons at the necessity of 300 million tons. The use of sea products will keep at 100 million tons demand at the necessity of 168 million tons.

The growth of foodstuffs will reduce, which constituted 30 million tons till 1985, in the years-1985-1995- it was 12 million tons, in the years 1996-2030 it supposes to be not more than 9 million tons per year. The dynamics of the demand will be directly opposite, since the world population in 2030 will make be about 8, 9 billion people (annual increase-90 millions) and it will be characterized by an irregularity in the world regions. Food insurance will worsen because the states will tend to improve the quality of food which is not available at present to approximately one billion people. In terms of some relative development trends of the world agriculture, wheat deficit can constitute 526 million tons, meat deficit-40 million tons and the deficit of sea products-68 million tons. According to other data food situation will be even tenser. In particular, the World Development Report in 2008, prepared by the International Bank for Reconstruction and Development (IBRD), indicates that it is necessary to increase wheat production by 50% and meat by 85% for the period 2000-2030.

In experts' opinion the total necessity of foodstuffs in the world will increase twice till 2025. The content of the modern concept of multifunctionality of agriculture allows highlighting three essential components: basic connection with the environment and long-term development of rural areas; the interdependence between the stable increase of production volumes and the food security; mutual relationship between agricultural development processes and international trade. A more significant factor of wheat dynamics is the growth of population's number. Apart from this, in the most populous countries (China, India), on the background of economic growth, living standards are rapidly increasing, more and more meat is consumed, which in its turn increases demand for feed wheat. In some countries the growth of prices for wheat and for the products resulted from wheat processing is related to the growth of biofuel production.

World production volume of agricultural production in the next fifteen years will increase by 2, 2% annually, including the

agricultural crops volume - by 2%, the grain volume -only by 1%. The biggest part of the production is produced in developed countries (67%), while a quarter of a century ago this share was in half. Although production volume increases, the need for food will outrun its production.

Under global warming, profound actions on the external environment, production instability and growing demand for agricultural raw materials and biofuels, solving of food security problem is getting more difficult. It will be difficult to guarantee food access and food security for the countries oriented to food import whose volume will increase twice till 2030 year. The agriculture will satisfy the growing demand for food if a rational policy and investments that will assure the rational development of the branch are carried out.

Food security can not be achieved through the orientation based solely on own production. Optimizing its level requires the development of external commercial relations based on a sufficient competitiveness of production. The balance of food resources necessary for food security and optimal export calculated in power units according to their formation and consumption directions should be within the following limits: own production - 80-85%, import- 15-20 % and export-15-20% .

The most accepted criterions of national food security evaluation are:

- the satisfaction level of the population's physiological needs for rational energetic content and components of the food ration;
- the compliance with the restrictions concerning the presence of the substances harmful to the population's health;
- the physical and economic access to food;
- the degree of dependence of the country's food supply and of the provision of the agro-industrial complex with national resources in as against import deliveries;
- the size of current and strategic food reserves, their compliance with normative requirements.

The concept of food security determines the main directions of the policy that favors the population' welfare, poverty overcoming, change of the consumption structure,

demographic development, protection and enhancing of the human health. The main way to solve the problem is the stability of agricultural production and food stuffs based on stable development of agriculture. The achievement of food security level combines two ways of solving the problem: the first, maintaining the provision at the necessary level for healthy nourishment, and its accessibility to all social groups, the second-eliminating import dependence and protecting the interests of producers.

Food security strategy is the guaranteed and stable insurance with raw materials and foodstuffs which are not influenced by unfavorable internal and external actions. The state ensures food security by creating economic and social conditions related to both the development of the agriculture and the entire food complex, and stable social and economic development of the country. Agriculture is the most powerful balance factor in harmonizing the economic development therefore this branch of the national economy should enjoy further substantial financial support and correct actions, influencing not only food ensuring, but also the society by creating new jobs and increasing unagricultural activities and correct use of natural resources.

The settlement of food problem strategy involves a determined sequence:

- the first stage is related to achieving an established level of production. In this period the strategy of agricultural policy is developed, it adopts normative acts that settle the functioning of different types of property and administration.
- the second stage assures the durable development of agro-industrial complex which is necessary to balance the internal market on the basis of proper production. This period is related to finishing the reforms of the branches and enterprises of the agro-industrial complex, the development of production that substitutes the import, improving the relations of the agro-industrial sector and other branches and creating necessary conditions for further development of the social sphere of the village.

- the third stage involves the innovative development of the agro-industrial complex which assures the production of agricultural production by applying new and more effective technologies, sufficient for food supply and achieving the optimal level of foreign economic activity of the agro-industrial complex.

This implies that food security strategy is fully realized and it is necessary to elaborate a new strategy aimed at a much higher level of life in which the nourishment not only meets normal vital human needs, but also allows improving health and its potential.

Each stage of implementation has certain directions of resources formation:

- producers of goods produce their goods having economic benefits;
- the government and local bodies of the executive power establish the share of purchases for state needs, guarantee purchase of production at the prices which assure the incomes of producers.

Food balance policy should assure maximum satisfaction of the population with foodstuffs, of the industry- with raw materials based on the rational use of the agro-industrial complex and settlement of many problems, the most important being:

- improving the consumption structure in accordance with the rational food needs, assortment's diversity, increasing the quality of goods and ensuring the balance between solvent demand and supply;
- reducing to the minimum the deviation of consumption of the main foodstuffs, increasing the readiness degree of the products.

In planned economy the structure of cultures, and accordingly the surfaces that were to be planted with different species of plants were established by law. In market economy the manager of the enterprise decides the areas that will be cultivated with various species in the following year according to a series of criteria: agricultural, technical, zone, endowment, own resources, the surface that will be cultivated next year.

The food security model of the vegetable sector is

$$\min F(x) = x_1 + x_2 + x_3 + x_4 + x_5 + x_6$$

where:

X1 - area of wheat, hectares;

p1- wheat productivity, quintals;

$p_1 \times x_1$ - total wheat production necessary for production of bread, quintals;

$p_1 \times x_1 \times 0,1$ - wheat production required for state reserve, quintals;

$p_1 \times x_1 \times 0,1$ - wheat production required for seed fund, quintals;

x2- area of sugar beet, hectares;

p2-productivity of sugar beet, quintals;;

$p_2 \times x_2$ -total production of sugar beet, quintals;

x3-surface of sunflower, hectares;

p3-productivity of sunflower, quintals;

$p_3 \times x_3$ - total production of sunflower, quintals;

$p_3 \times x_3 \times 0,1$ - sunflower production required for seed fund, quintals;

x4-area of potato, hectares

p4-potato productivity, quintals;

$p_4 \times x_4$ -total potato production, quintals;

$p_4 \times x_4 \times 0,1$ -production required for seed fund, quintals;

x5- area of vegetables;

p5-productivity of vegetables, quintals;

$p_5 \times x_5$ - total production of vegetables, quintals;

x6-surface of fruit bearing plantations, hectares

p6-productivity of fruits and berries, quintals;

$p_6 \times x_6$ - total production of fruits and berries, quintals;

The values of the production constants from the right part represent the needs of foodstuffs of X type estimated upon the number of population [1, 4]. The area of 762000 hectares is the value for these types of cultures for 2011.

The restrictions:

$$p_1 \times x_1 > 8983739,57 + p_1 \times x_1 \times 0,1 + p_1 \times x_1 \times 0,1$$

$$p_2 \times x_2 > 4020480,00$$

$$p_3 \times x_3 > 732310,20 + p_3 \times x_3 \times 0,1$$

$$p_4 \times x_4 > 3374974,44 + p_4 \times x_4 \times 0,1$$

$$p_5 \times x_5 > 4013689,20$$

$$p_6 \times x_6 > 2925143,80$$

$$x_1 + x_2 + x_3 + x_4 + x_5 + x_6 < 762000$$

$$x_1 > 0; x_2 > 0; x_3 > 0; x_4 > 0; x_5 > 0; x_6 > 0.$$

or

$$0,8 \times p_1 \times x_1 < 8983739,57$$

$$p_2 \times x_2 < 4020480,00$$

$$0,9 \times p_3 \times x_3 < 732310,20$$

$$0,9 \times p_4 \times x_4 < 3374974,44$$

$$p_5 \times x_5 < 4013689,20$$

$$p_6 \times x_6 < 2925143,80$$

$$x_1 + x_2 + x_3 + x_4 + x_5 + x_6 < 762000$$

$$x_1 > 0; x_2 > 0; x_3 > 0; x_4 > 0; x_5 > 0; x_6 > 0.;$$

The average productivity of crops calculated for 2007-2011 is: wheat - 22,9 quintals, sugar beet - 262, 3 quintals, sunflower - 13,4 quintals, potato - 91,5 quintals, vegetables 86,02 quintals, fruits - 33,34 quintals. The data were processed in the QM program. The column of Table 1 entitled "R1" contains the results of inclusion in the model of the average productivity of the crops for the years 2007-2011, hectares, R2 - the results of inclusion in the model of the average productivity of the crops increased by 5%, hectares R3 - the results obtained from inclusion in the model of the average productivity of the crops increased by 10 %, ha

Table1. The results of the food security model of the vegetable sector

	R1	R2	R3
F(x)	741808,85	706393,16	674406,83
X1	490378,79	466930,33	445843,16
X2	15327,79	14597,63	13934,36
X3	60722,24	57844,41	55185,40
X4	40983,30	39030,58	37255,49
X5	46659,95	44438,54	42419,04
X6	87736,77	83551,67	79769,40

Analyzing the data of the table we can say that according to the model in order to satisfy the need for the foodstuffs of plant origin it was necessary to sow 741808, 85 hectares for the year 2012. If the productivity of all the crops increases by 5%, the total area planned for sowing in 2012 reduces by 35415,69 hectares in absolute size or by 4,77 p. p. in relative size. If the productivity of the crops included in the model increases by 10%, the total area that had to be sown in 2012 to satisfy the domestic consumption and seed fund reduces by

67402,02 hectares in absolute size or by 9,09 p.p. in relative size.

The data from the above table show that if we increase the productivity of wheat in the amount of 22, 9 quintals by 5%, the area of this crop will be reduced by 23448, 46 hectares in absolute size or by 4, 78 p.p. in relative size, but if that productivity increases by 10%, the surface will decrease by 44535, 63 hectares in absolute size or by 9, 08 p.p. in relative size.

The model of provision with milk and beef production

$$(max)F(x) = x1 + x2 + x3$$

where:

$x1$ -cows livestock, capita;

$p1 \times x1$ -total milk production, liters;

p - average annual milk yield calculated per one cow, liters;

$p1 \times x1 \times 0,1$ - the quantity of milk needed to feed the calves during their lactation, liters;

$p1 \times x1 \times 0,01$ - milk production for export, liters;

$x2$ -beef cattle livestock, capita;

300-the amount of meat obtained after slaughtering one cow, kilograms;

$300 \times x2$ -total beef production, kilograms;

$300 \times x2 \times 0,05$ - beef production for export, kilograms;

$x3$ - cattle livestock for export;

387795600- milk quantity calculated in accordance with Government Decision, liters;

23756676- the amount of meat calculated in accordance with Government Decision, kilograms;

170200 - average livestock of cattle calculated for 2007-2011, capita

The Restrictions:

$$p1 \times x1 < 387795600 + p1 \times x1 \times 0,1 + p1 \times x1 \times 0,01$$

$$300 \times x2 < 23756676 + 300 \times x2 \times 0,05$$

$$x2 < 0,1 \times x1$$

$$x3 < 0,1 \times (x1 + x2 + x3)$$

$$x1 + x2 + x3 < 170200$$

$$x1 > 0; x2 > 0; x3 > 0.$$

or

$$0,89 \times p \times x1 < 387795600$$

$$285 \times x2 < 23756676$$

$$-0,1 \times x1 + x2 < 0$$

98

$$-0,1 \times x1 - 0,1 \times x2 + 0,9 \times x3 < 0$$

$$x1 + x2 + x3 < 170200$$

$$x1 > 0; x2 > 0; x3 > 0.$$

Average annual milk yield calculated per one cow for the years 2007-2011 is 2954 liters. The data were processed in the QM program. Columns R1, R2 and R3 contain the results of the model, and namely:

R1- the results of inclusion in the model of the average annual milk yield calculated per one cow in size of 2954 liters, for the years 2007-2011, capita;

R2- the results of inclusion in the model of the average annual milk yield calculated per one cow that is increased by 5%, capita;

R3 - the results of inclusion in the model of the average annual milk yield calculated per one cow that is increased by 10 %, capita.

Table2. The results of the model of the provision with milk and beef production

	R1	R2	R3
F(x)	170200	170200	163892,57
X1	147503,52	140479,69	134093,92
X2	14750,35	14047,97	13409,39
X3	7946,13	15672,34	16389,26

Analyzing the data from the above table, we can see that the livestock of cattle planned to satisfy the need for milk for internal consumption, food for calves, export, as well as the meat quantity for consumption and export makes up 170200 capita. If the average annual milk yield calculated per one cow increases by 5%, the cows livestock will decrease by 7023, 83 capita in absolute size or by 4,76 p.p. in relative size. Obtaining an average annual milk yield calculated per one cow by 10 percent more compared to the historical average will reduce the cows' livestock with 13409, 6 capita in absolute size or by 9, 09 p.p. in relative size.

The model of provision with eggs and chicken meat

$$(max)F(x) = x1 + x2 + x3$$

where:

$x1$ -the livestock of hens necessary to obtain the chicken for consumption, capita;

0,01 – the average daily overweight of one hen, kilograms

180-number of days of maintenance, 0,01 × 180 × x1-total production of chicken meat, kilograms

18052824 – meat necessary for internal consumption calculated in accordance with the Government Decision, kilograms

x2-livestock of hens for eggs, capita; P- average annual production of eggs per one layer hen, pieces

p2 × x2- total production of eggs, pieces. 782935200 – need for eggs for consumption calculated in accordance with the Government Decision, pieces

p2 × x2 × 0,1- production of eggs for incubation;

x3- livestock of hens for export, capita

The restrictions:

$$0,01 \times 180 \times x1 > 18052824$$

$$p2 \times x2 > 782935200 + p \times x2 \times 0,1$$

$$x3 < 0,1 \times (x1 + x2 + x3)$$

$$x1 + x2 + x3 < 14500000$$

$$x1 > 0; x2 > 0; x3 > 0.$$

or

$$1,8 \times x1 > 18052824$$

$$0,9 \times p \times x2 > 782935200$$

$$-0,1 \times x1 - 0,1 \times x2 + 0,9 \times x3 < 0$$

$$x1 + x2 + x3 < 14500000$$

$$x1 > 0; x2 > 0; x3 > 0.$$

The average annual production of eggs per one layer hen, calculated for the years 2007-2011 is 219 pieces. The data were processed in the QM program.

Table 3. The results of the provision model with eggs and chicken meat

	R1	R2	R3
F(x)	14500000	14500000	14500000
X1	10029346,67	10029346,67	10029346,67
X2	3972273,97	3783026,67	3611158,16
X3	498379,36	687626,66	859495,18

Analyzing the data of table 3 we can conclude that the livestock of hens needed to assure the production of eggs for internal consumption and incubation and quantity of meat for 2012 is 14,5 million capita. If average annual production of eggs per one layer hen increases by 5%, the livestock of hens will be reduce by

189247,3 pieces in absolute size or by 4,76 p.p. in relative size.

The model of provision with pork

$$(max)F(x) = x1 + x2 + x3 \text{ where:}$$

x1-the livestock of pigs necessary to obtain meat for consumption, capita;

p × 180 × X1- total pork production, kilograms;

20515572- the pork necessary for consumption calculated in accordance with the Government Decision, kilograms;

0,01 × p × 180 × X1-pork production for export, kilograms;

p-the average daily overweight of pigs, kilograms;

180- number of days of maintenance, x2-livestock of pigs for reproduction, capita;

x3- the livestock of pigs for export, capita; 478000 - livestock of pigs from the year 2011, capita.

The restrictions:

$$p \times 180 \times x1 < 20515572 + 0,01 \times p \times 180 \times X1$$

$$x2 < 0,1 \times (x1 + x2 + x3)$$

$$x3 < 0,01 \times (x1 + x2 + x3)$$

$$x1 + x2 + x3 < 478000$$

$$x1 > 0; x2 > 0; x3 > 0.$$

or

$$0,99 \times p \times 180 \times x1 < 20515572$$

$$-0,1 \times x1 + 0,9 \times x2 - 0,1 \times x3 < 0$$

$$-0,01 \times x1 - 0,01 \times x2 + 0,99 \times x3 < 0$$

$$x1 + x2 + x3 < 478000$$

$$x1 > 0; x2 > 0; x3 > 0.$$

The average daily overweight of pigs, calculated for the years 2007-2011 is 0,291 kilograms.

The data were processed in the QM program. The following table reflects the results of the model of the provision with pork,

where

R1- the results of inclusion in the model of the average daily overweight of pigs calculated for the years 2007-2011, capita

R2 – the results of inclusion in the model of the average daily overweight of pigs increased by 5%, capita

R3- the results of inclusion in the model of the average daily overweight of pigs increased by 10%.

Table 4 The model of provision with pork

	R1	R1	R1
F(x)	440076,45	419189,03	400055,61
X1	391668,04	373078,23	356049,49
X2	44007,65	41918,90	40005,56
X3	4400,77	4191,89	4000,56

As shown in Table 4, the livestock of pigs needed to assure the pork for consumption and the livestock for reproduction and export is 440076,45 capita. If the average daily overweight of pigs increases by 10% the number of pigs for meat production will decrease by 35618, 55 capita in absolute size or by 9, 09 p.p. in relative size.

CONCLUSIONS

National food security is a food supply system with is independent of the changes of the external environment factors and helps to assure the sufficient quality of vital food needs of the population obtained from internal sources.

Agriculture is the most powerful balance factor in harmonizing the economic development therefore this branch of the national economy should enjoy an important financial supporting, further substantial financial support and correct actions, influencing not only food provision, but also the society by creating new jobs and increasing non-agricultural activities and correct use of natural resources

An effective way to coordinate and promote agricultural production is the contractual agriculture.

One of the forms of investment in modernization of production of processing industry can be the purchase of the efficient technological equipment by the companies. According to the data of FAO experts till 2030 wheat production will increase by 20-21% and its total volume will reach 2149-2150 million tons at the necessity of 2675 million tons.

In accordance with the model for provision of the foodstuffs of plant origin it was necessary to sow 741808, 85 hectares for the year 2012. If the productivity of all the crops increases by 5%, the total area planned for sowing in the year 2012 reduces by 35415,69 hectares

in absolute size or by 4,77 p. p. in relative size.

The livestock of cattle planned to satisfy the need for milk for internal consumption, food for calves and export makes up 170200 capita. If the average annual milk yield calculated per one cow increases by 5%, the cows livestock will decrease by 7023, 83 capita in absolute size or by 4, 76 p.p. in relative size.

The livestock of hens needed to assure the production of eggs for internal consumption and incubation and the quantity of meat for the year 2012 is 14,5 million capita. If the average annual production of eggs per one layer hen increases by 5%, the livestock of hens will be reduced by 189247, 3 pieces in absolute size or by 4, 76 p.p. in relative size.

The livestock of pigs needed to assure the pork for consumption and the livestock for reproduction and export is 440076, 45 capita. If the average daily overweight of pigs increases by 10% the number of pigs for meat production will decrease by 35618, 55 capita in absolute value or by 9, 09 p.p. in relative value.

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THE WORMS COMPOST - EFFECTIVE FERTILIZER FOR IMPROVING DEGRADED SOILS

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Abstract:

Management of organic waste is a difficult, complex and intractable in Moldova, according to international standards. Acute problem of organic matter from livestock sector waste is generated by storing them in unauthorized areas. Organic waste management strategies require different methods. One of them is organic waste bio conversion technology by worm's cultivation. As the main natural wealth of the Republic of Moldova, soil requires a special care. Agriculture, in particular, should pay attention to the soil's humus and nutrient status – and restore losses of humus and the nutrients used by crops. This requires measures to improve soil fertility. Land use provides, first of all return losses of humus and nutrients used by plants. Therefore measures required to improve soil fertility. The essence of the research was to highlight the role of worms compost improve the soil. To this end, in ETS "Maximovca" was organized an experiment that included three groups (two - experimental, to fund worms compost and one - control the natural background). Observations on soil fertility have been conducted over three years. The soil samples were collected by usual methods determined values of organic matter and humus. The results of the investigations, to determine the values of organic matter and humus samples collected from surface and depth 15 cm exceeded that of the sample control group to 29,7%; 11,4% and 34,3%; 37,1% in experimental group I and 9,3%; 11,6% and 45,5%; 45,5% in experimental group II. Therefore, worms compost embedded in a dose of 3-4 tons / ha during three years, has improved the fertility of the soil

Key words: fertility, humus, organic fertilizer, soil, worms compost

INTRODUCTION

Soil degradation means loss of biological and economic productivity, whether through natural causes or injudicious management. In Moldova, exploitative land use over the last thirty years has increased soil erosion and landslides, salinity and sodicity, deterioration of soil structure and compaction, and a negative nutrient balance through inadequate application of manure and fertilizer [1]. The amount of humus in soil is one of the main indices of fertility; it has a big influence on soil chemistry, hydro-physical and biological activity, holding 98 per cent of nitrogen reserves, 60 per cent of phosphorus, 80 per cent of sulphur and essential quantities of other micro- and macro-nutrients [6]. There is a risk that the humus content of in the following decades to decline in arable soils,

decrease on average by 10-25 percent with the very harmful to effects on the physical condition of soil, even biodiversity of soil microorganisms [8].

Research worldwide on reducing harmful substances entering the environment and production of green organic fertilizer from organic wastes using the *California red Hybrid (Eisenia andrei)* indicates that the resultant worms' compost is an effective natural fertilizer – dark brown, granular, odourless, hygroscopic and long-acting [2], [3], [5].

The researches at Maximovca ETS demonstrated that incorporation of 3-4 tons/ha worms' compost increases nutrient status, soil moisture and soil biological activity, reduces soil density and decreases the content of nitro compounds.

MATERIALS AND METHODS

Study of organic waste management was made under the practical conditions of Technological-experimental station "Maximovca". For recovery and neutralization of organic waste was held territory for worm culture, which included five sections with dimensions 1 m x 50 m for worm cultivation. Each sector was divided into 25 sections with dimensions of 1m x 2m. Research materials were served cattle manure, and were under investigation by California red hybrid rhyme (*Eisenia foetida andrei*), biotransformed of organic waste.

After the spraying, the substrate prepared for worm cultivation was tested for analysis performed by the purpose of determining the quality and nutritional value. Initially and during experimental both, nutrient nutrition substrate used for worm culture and in the final product (worm's compost) obtained as a result of organic waste of bioconversion were determined following indices: active acidity (pH), ammonia nitrogen content, total nitrogen, organic matter, potassium, calcium, magnesium, phosphorus and bacterial flora. Also for determining the quality of nutritional substrate was used the test "50 rhymes". According to test, a box of dimension 50 cm x 50 cm were placed 3 kg of nutrient substrate, and in it were placed 50 rhymes. If within 24 hours rhymes do not leave the substrate and they are active, then it is confirmed that nutritional substrate is beneficial for worm cultivation.

For determination the role of worms compost to improve soil fertility in ETS "Maximovca" was organized an experiment in field conditions. The experiment used three groups (two experimental and one control group), with a surface would. The experimental groups, before sowing, was built worms compost (because of 3 tons/ha - experimental group I and 4 tons/ha - experimental group II), organic fertilizer, obtained in the result of bioconversion of organic waste by growing worms (Table 1).

Table 1: Scheme of the experiment

Groups	Conditions of experiment
I- experimental	Worms compost - 3t/ha
II- experimental	Worms compost - 4t/ha
III – control	Natural background

Before you incorporation of fertilizer into soil was determined by the quality of worms compost and also in each group were taken samples of soil from surface and 15 cm depth, to determine the amount of organic matter and humus in his third year of action of fertilizer.

Research methods: Worms compost and soil quality was assessed according to the methods set out in manual of E. Petuhova and Standard GOST 26213-84 Soils [4]. Statistical processing was carried out by the book E. Merkureva [7].

RESULTS AND DISCUSSIONS

As a result of bio conversion technology use by worm cultivation of waste was obtained valuable organic fertilizer - worm's compost. The quantity and quality depended on the quality of nutritional substrate. That a tone of organic substances is produced 400-600 kg of worms compost. The quantity of worms compost obtained in the experiment was about 124 tons. Thus, the share of worms compost obtained from a ton of organic waste in the experiment was 62%.

The worms compost is one of the final products of bio conversion of organic waste by worm cultivation.

Investigations were conducted to determine the role of worms compost to improve soil. At the initial stage of the experiment was determined quality worms compost (Table 2) used as organic fertilizer.

It was found that the amount of active acidity (pH) was $7,23 \pm 0,02$ units, humidity - $61,08 \pm 0,05\%$, organic matter - $36,40 \pm 4,20\%$ and humus - $30,85 \pm 1,65\%$. On this basis for incorporation into the soil used two doses of fertilizer: the experimental group I - 3 tons/ha, the experimental group II - 4 t/ha. In the control group was kept natural background.

Table 2: Quality indices of worms compost

Indices	Values of worms compost, (M±m)
Active acidity (pH), units	7.18 ± 0.01
Organic mater, %	32.29 ± 0.15
Total nitrogen, %	2.32 ± 0.01
Potassium, (K ₂ O), %	1.20 ± 0.03
Magnesium, %	1.88 ± 0.02
Phosphors, (P ₂ O ₅), %	1.57 ± 0.08
Calcium, %	0.62 ± 0.02
Humus, %	30.16 ± 1.20
Non-pathogenic acterial flora, colonies/g	2x10 ¹²

In the third year of action the worms compost from each batch, from the surface and at depth of 15 cm, soil samples were taken for the determination of soil elements (value of organic matter and humus).

As a result of the investigations it was found that, after three years of action the worms compost in soil samples of the collected from surface experimental group I (Table 3) and experimental group II (Table 4), the organic matter, has exceeded the one of up to incorporation fertilizer, respectively by 29,7% and 9,3%. In samples collected from a depth of 15 cm this value was 11,4% in group I and 11,6% in samples collected from group II.

Table 3: The content of organic matter and humus in soil fertilized with worms compost (experimental group I)

Nutritive elements	The sample collection	Conditions of experiment, worms compost - 3 tone/ha		
		Before fertilization	After three years of fertilization	%, of initial
Organic matter,%	Surface	3,7±0,26	4,8±0,10	129,7
	15 cm	4,4±0,10	4,9±0,02	111,4
Humus, %	Surface	3,5± 0,18	4,7±0,15	134,3
	15 cm	3,5± 0,01	4,8±0,07	137,1

The humus in the soil samples collected from experimental groups I and II from surface, three years after the incorporation of worms compost, surpassed that of samples collected at before of the fertilization, respectively to 34,3% and 45,5%. The quantity of humus in samples collected from groups I and II at 15cm depth varied insignificantly from one batch to another, but exceeded that of soil samples collected at before of the fertilization, corresponding to 37,1% and 45,5%.

Table 4: The content of organic matter and humus in soil fertilized with worms compost (experimental group II)

Nutritive elements	The sample collection	Conditions of experiment, worms compost - 4 tone/ha		
		Before fertilization	After three years of fertilization	%, of initial
Organic matter,%	Surface	4,3±0,10	4,7±0,02	109,3
	15 cm	4,3±0,10	4,8±0,11	111,6
Humus,%	Surface	3,3±0,12	4,8±0,01	145,2
	15 cm	3,3±0,07	4,8±0,15	145,5

The results obtained on organic substance and humus values of samples collected at levels above the experimental groups compared with samples collected from the control group were also different (Table 5 and Table 6).

In samples of soil collected from surface of experimental group I (Table 5) after incorporation of worms compost, the organic substance and humus surpassed that of the control group, corresponding to 26,3% and 34,3%; those from dept 15cm by 11,4% and 37,1% .

Table 5: The content of organic matter and humus in soil fertilized with worms compost (the experimental group I) in comparison with control group

Nutritive elements	The sample collection	Conditions of experiment		%, compared to control
		Control group - natural background	Group I- worms compost, 3 t/ha	
Organic matter,%	Surface	3,8±0,03	4,8±0,10	126,3
	15 cm	4,4±0,02	4,9±0,02	111,4
Humus,%	Surface	3,5±0,07	4,7±0,15	134,3
	15 cm	3,5±0,07	4,8±0,07	137,1

The same regularity was found in samples of soil investigation result of collected from the surface and at depth of 15 cm of the experimental group II (Table 6). In these samples, three years after incorporation of worms compost, the organic substance was appropriately 23,7%; 9,1% and humus with - 37,1% and 37,1% higher than in samples increased collected from the control group. From the above we may conclude that worms compost obtained as a result of organic waste bioconversion by worms cultivation, used acting as organic fertilizer in the third year of action, influenced the revival of soil increasing values of organic matter and of humus.

So, in research of result was found, that incorporation of worms compost improved soil fertility, increasing quantity of organic matter and the humus.

CONCLUSIONS

Bioconversion technology of organic waste by worm cultivation resolves a number of problems that are present in agriculture: recovery and neutralization of organic waste, environmental protection, improving soil fertility, obtaining an ecological agricultural production.

In the worm's compost is well-balanced content of macro-and microelements which allows the dose reduction by incorporation into the soil of 8-12 times compared with ordinary compost. Incorporating of worm compost in soil experimental groups I and II, that has helped to increase, respectively by 29,7; 9,3% (surface) and 11,4%; 11,6% (at 15cm depth) the organic substance and by 34,3%; 45,5% (surface) and by 37,1% and 45,5% (to a depth of 15cm) humus value, compared with their content at the before fertilization.

The results of the investigations, to determine the values of organic matter and humus samples collected from surface and depth 15cm exceeded that of the sample control group, respectively by 26,3%; 34,3% and 11,4%; 37,1% in experimental group I and 23,7%; 37,1% and 9,1%; 37,1% in experimental group II.

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STUDY REGARDING THE EVALUATION AND CAPITALIZATION OF THE TOURISTIC POTENTIAL IN VRANCEA COUNTY

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Abstract

The main goal of the present survey is the modernization of the touristic product in Vrancea area. The first part of the study consists of a detailed analysis of the natural and anthropical touristic potential of the tourism patterns that can be developed based on the former and the present capitalization way. Despite a remarkable value of the potential, the insufficiency and, in some cases, the inexistence of adequate improvements, the old-fashioned or undersized infrastructure determine that numerous areas remain un-capitalized, although they are extremely attractive from a touristic point of view. Taking into account the existing proclivities of the tourism market at the European level and also the particular situation of Vrancea County, the second part of the study purposes to establish several development guidelines with the corresponding investments to be enclosed in an average and long term strategy which should mainly address the population section having a low income. On the other hand, the modernization of the infrastructure in general and, especially of the roadways as well as of the water supply and sewage systems represents an advantageous and strategic investment where the touristic function must be equally correlated with the economic one.

Key words: areas un-capitalized, development guidelines, modernization of the infrastructure, touristic function, touristic product

INTRODUCTION

Located in between the historical regions of Moldavia and Muntenia, the county spreads over an area of 4.863 km², Focșani being its main residency city. The hydrographic network of Vrancea County measures 1756 watercourses. The main watercourses crossing it are: Siret (between Adjud and Nămolosa), Șușița, Putna, Milcov and Râmnicu Sărat (from Ciorăști all the way to its influx into Siret). The Lăcăuț (1776 m) and Goru (1784 m) peaks register the highest altitudes. Disposed in levels from west to east, the landscape consists of Vrancea Mountains (with Greșu and Lepșa, their basins inside the mountains), the Sub-Carpathian Hills and the flatland of the Inferior Siret, bordered towards North-East by the Moldavian Plateau (Tutova Hills) and at South-East by the Râmnicu Plain. In Vrancea there are 16 natural reservations spread over an area of 2862 hectares, among which Tișița Channels, Putna waterfall, The Red Gully, the Black Lake, Năruja Channels, Zabala depressions and the

Glowing Fire from Andreiașu are the most popular ones. The agricultural land of Vrancea County spreads over the strip located between the right margin of Siret River and the laps of the Sub-Carpathian Hills of Vrancea Mountains. Although the climate is adequate for plain cultivations, the most favourable one is the one of grape vine (9.95% of the Romanian vineyards) and wine production, Vrancea being the country's biggest vine-bearing and wine-growing county which exports to Europe, United States of America and Japan [1].

MATERIALS AND METHODS

For purposes of efficient promotion of the touristic offer of Vrancea area, in order to establish the guidance directions of the specific needed investments, the first step to be taken is its evaluation. As far as the quality evaluation of the touristic offer is concerned, one must taken into consideration the importance of each integrant element as well as the contribution intensity of these elements in constituting the offer. Given the researches

on this topic carried out by other studies as well as the specific characteristics of Vrancea County, it was estimated that the integrant elements of the touristic offer take part in establishing its functionality with the following rates:

- Natural touristic resources	35%
- Anthropical touristic resources	15%
- Elements of touristic functionality	10%
- Technical and material ground	15%
- Infrastructure	25%

Factors which are part of the structure of each element have been appreciated on a scale with values from 0 to 3, depending on quality, authenticity, competitiveness (as may be). As a result, each value has been attributed the following significances:

- **0** - inexistence of the factor, underprivileged factor as a result of degradation, pollution;
- **1** - reduced quality, non-competitive factor on a national level;
- **2** - satisfactory quality, factor of national interest;
- **3** - Factor that favours the development of international tourism.

RESULTS AND DISCUSSION

Lately considered as one of the primary domains of the economy, tourism can truly stand as an alternative for under-privileged areas or for those areas affected by reorganization and un-employment. The absorption of laid off manpower by means of creating new jobs, the population's income growth, the modernization of general and specific infrastructure are a few consequences that derive from developing tourism [Bran, 2007].

Vrancea County benefits of numerous favourable conditions which allow the development of a diversified touristic activity. These conditions constitute the premises that justify the enforcement of an investment program, as follows:

- The territorial arrangement of the county, along important roadways (DN 2- E 85) and railways (thoroughfares 500 and 600 that connect the South-Eastern part of Europe with the Republic of Moldavia, Ukraine and Russia) which represent important access

ways especially for tourists from abroad; from the county's territory, there are also the following ramifications from E 85: the E 581 artery (Focșani - Albita limiting point – the Republic of Moldavia) and DN 2 D (Focșani – Putna Valley – Tulnici – Ojdula – Tg. Secuiesc) a conjunction couloir between Galati area - Brăila and Transylvania, about 80 km shorter than the neighbouring routes, DN 12 A or DN 10 [4].

- The existence of a diversified and valuable natural touristic potential, created by an attractive natural landscape (narrows, channels, waterfalls, stocks of wood, natural lakes), by the existence of important hydro-mineral resources in Vizantea, Jitia or Vintileasca and by the availability of an exceptional fishing and hunting stock;

- Reservations and natural monuments with touristic valences (the Glowing Fire, Tișța Channels, The Pine reservation in Gălăciuc etc);

- Anthropical touristic reservations: sites and historical monuments, etnofolkloric tourist attractions, touristic villages;

- A technical and economic potential which is representative for tourism: trout farms, famous vineyards, wine production composites, tourist wine cellars, wine collections and famous vineyards, Vrâncioaia seismic station;

- The low pollution level, except the Eastern part of the county (the areas of Focșani, Mărășești, Adjud, Panciu, Odobești towns);

- The existence of touristic structures that can become competitive by modernization;

- The existence of a general and specific infrastructure (access ways, telecommunication systems, water supply networks, electrical energy and natural gas) and some utilities that can sustain a touristic activity by modernization [2, 3].

Starting from the existing premises, by means of an adequate development, Vrancea area can gain access to standards which would allow answering a tourist demand at the European level.

Within the structure of each element constituting the touristic offer, we have taken into account the following factors:

I. Natural touristic resources

- Landscape: the variety of forms and picturesque scenery;
- Climate: weather, amount of precipitations divided by seasons, the number of sunny days, etc;
- Hydrographic network: waterways and edges of water;
- Treatment cures: mineral waters, choke damp, muds, salt mines;
- Fauna: hunting and fishing stocks;
- Flora: forests, specific vegetation;
- Natural reservations.

II. Anthropical touristic resources

- Cultural and historical touristic resources

- Art and historical monuments of religious nature: churches, monasteries, hermitages;
- Art and historic monuments of laic nature;
- Archaeological remnants;
- Museums, exhibitions, memorial houses;
- Ethnographical values: garbs, costumes, practices, craftsmanship, folklore manifestations.

• Economical and technical touristic resources:

- Fruit-growing centres
- Trout farms
- Wine-growing centres

III. Elements of touristic functionality of the territory

- Capitalized by creating a material base specific for the touristic activity:
 - Beaches, nautical agreement
 - Winter sports
 - Rest, relaxation
 - Balneary treatment
 - Camping
- Taken over by the touristic offer from other activities:
 - Hunting, leisure fishing
 - Conventions, conferences

IV. Technical and material base

- Reception structures: hotels, guesthouses and agro-touristic farms;
- Food service structures for tourism: restaurants, pubs etc either classic or specialized (with traditional food);

- Touristic structures for balneary treatment: resorts or other establishments for balneal treatment;
- Amusement structures: independent, specially developed locations; relaxation and amusement parks, concert halls, etc.

V. General infrastructure

- Access ways: roadways, railways, aerial ways;
- Networks: water supply, sewage, natural gas supply, electrical energy, heating.

A global attractivity parameter has been defined for purposes of evaluating the attractivity level of a territory, based on the following relation:

$$g = \sum_{i=1}^m q_i \times p_i$$

Where:

p_i = partial attractivity index of each element of the touristic offer calculated as an average of the quality values assigned to the constituent factors of the respective element;

q_i = participation coefficient of each element in establishing the touristic functionality;

m = Number of the elements of the touristic offer (5).

As the value of the factors is enclosed in the interval 0-3, the conclusion is that the existence area of the two attractivity indexes will be enclosed within the same limits with the following significations:

- For the 0-0.99 interval, the touristic offer is not significant;
- For the 1 – 1,99 interval, the touristic offer has a value on a national value;
- For the 2 – 3 interval, the touristic offer has a high value, competitive on the international level;

Evaluation of the attractivity factors

Complying with the presented methodology, the attractivity factors have been evaluated as shown under Table no. 1. We would like to specify that the below table used the following symbols:

- A – Tulnici Area
- B – Soveja Resort
- C – Jitia – Vintileasca Area
- D – Vizantea Resort
- E – Andreiașul de Jos Area
- F – Vrâncioaia Area

Table 1. Evaluation of the tourist attractivity factors

Elements of the touristic offer	A	B	C	D	E	F	G	H	q_i
0	1	2	3	4	5	6	7	8	9
I. Natural touristic resources									35%
• Landscape	3	2	3	2	2	2	1	1	
• Climate	3	3	3	3	2	2	1	1	
• waterways, water planes	3	2	3	2	2	2	1	1	
• treatment factors	1	3	2	3	0	0	0	0	
• flora	3	3	3	3	3	2	1	1	
• fauna	3	1	2	1	1	1	0	1	
• natural reservations	3	2	2	0	3	2	0	0	
<i>Partial attractivity index „p_i”</i>	2,71	2,29	2,57	2,0	1,86	1,57	0,57	0,71	
II. Anthropical touristic resources									15%
- Historical and cultural touristic resources									
• Religious art and historical monuments	1	1	1	1	2	1	2	1	
• Historical and art monuments of laic nature	0	1	0	0	0	2	3	0	
• Archaeological remnants	0	0	0	0	0	0	1	0	
• Museums	0	1	0	0	1	0	2	1	
• Ethno-folklore values	3	2	3	1	2	1	1	1	
-Technical and economical touristic resources									
• Orchards	0	0	0	1	1	1	0	1	
• Trout farms	3	0	0	0	0	0	0	0	
• Wine-growing lands	0	0	0	0	0	0	2	3	
<i>Partial attractivity index „p_i”</i>	0,88	0,63	0,50	0,38	0,75	0,63	1,38	0,88	
III. Elements of touristic functionality									10%
Capitalized by creating a material base specific for the tourist activity:									
• Beaches, nautical amusement	0	0	0	0	0	0	1	0	
• Winter sports	2	2	1	0	0	0	0	0	
• Repose, relaxation	3	3	3	3	1	1	1	2	
• Balneal treatment	1	2	2	3	0	0	0	0	
• Camping	3	3	3	1	2	1	0	0	
Taken over from the touristic offer of other activities:									
• Hunting, leisure fishing	3	2	2	1	1	1	0	0	
• Conventions, conferences	1	2	0	0	0	1	2	1	
<i>Partial attractivity index „p_i”</i>	1,86	2,0	1,57	1,14	0,57	0,57	0,57	0,43	
IV. Material and technical base									15%
Reception structures									
• Hotel structures	2	2	0	0	0	0	2	0	
• Guesthouses and agro-touristic farms	3	2	2	1	1	0	0	0	
Tourism food service structures	1	2	0	0	0	0	3	1	
Balneary treatment touristic structures	0	2	0	0	0	0	0	0	
Amusement structures	0	2	0	0	0	0	2	0	
<i>Partial attractivity index „p_i”</i>	1,20	2,00	0,40	0,20	0,20	0,00	1,40	0,20	
V. General infrastructure									25%
- Access ways									
• Roadways	3	2	1	1	1	2	3	2	
• Railways	0	0	0	0	0	0	3	1	

• Aerial ways	0	0	0	0	0	0	0	0	
- Networks									
• Water supply	2	3	1	1	1	2	3	2	
• Sewage	1	3	0	0	1	1	3	2	
• Natural gas supply	0	0	0	0	0	0	3	1	
• Electrical energy	3	3	2	2	2	2	3	1	
• Heating	3	3	2	2	2	2	3	3	
Partial attractivity index „p_i”	1,50	1,75	0,75	0,75	0,88	1,13	2,63	1,50	
Global attractivity index „g_i”	1,82	1,83	1,38	1,09	1,07	0,98	1,33	0,83	

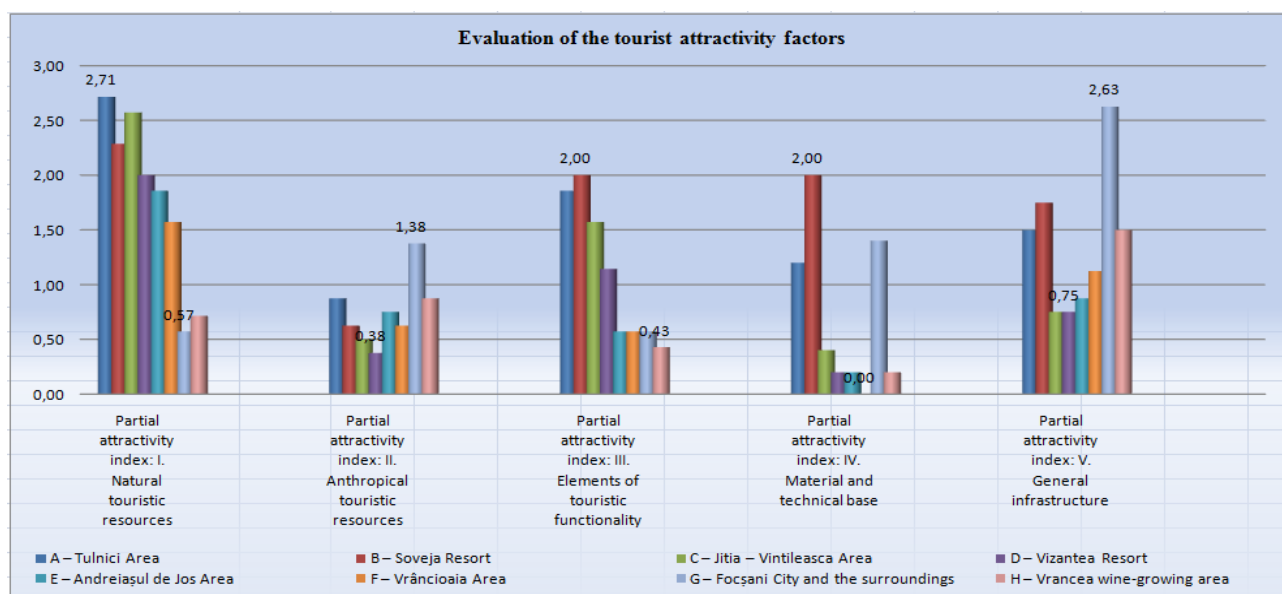


Fig. 1. Evaluation of the tourist attractivity factors

Table 2. Structure of evaluation of the tourist attractivity factors, at every component region

Elements of the touristic offer	A – Tulnici Area	B – Soveja Resort	C – Jitia – Vintileasca Area	D – Vizantea Resort	E – Andreiașul de Jos Area	F – Vrâncioaia Area	G – Focșani City and the surroundings	H – Vrancea wine-growing area	q_i
Partial attractivity index: I. Natural touristic resources	2,71	2,29	2,57	2,00	1,86	1,57	0,57	0,71	35%
Partial attractivity index: II. Anthropical touristic resources	0,88	0,63	0,50	0,38	0,75	0,63	1,38	0,88	15%
Partial attractivity index: III. Elements of touristic functionality	1,86	2,00	1,57	1,14	0,57	0,57	0,57	0,43	10%
Partial attractivity index: IV. Material and technical base	1,20	2,00	0,40	0,20	0,20	0,00	1,40	0,20	15%
Partial attractivity index: V. General infrastructure	1,50	1,75	0,75	0,75	0,88	1,13	2,63	1,50	25%
Global attractivity index	1,82	1,83	1,38	1,09	1,07	0,98	1,33	0,83	

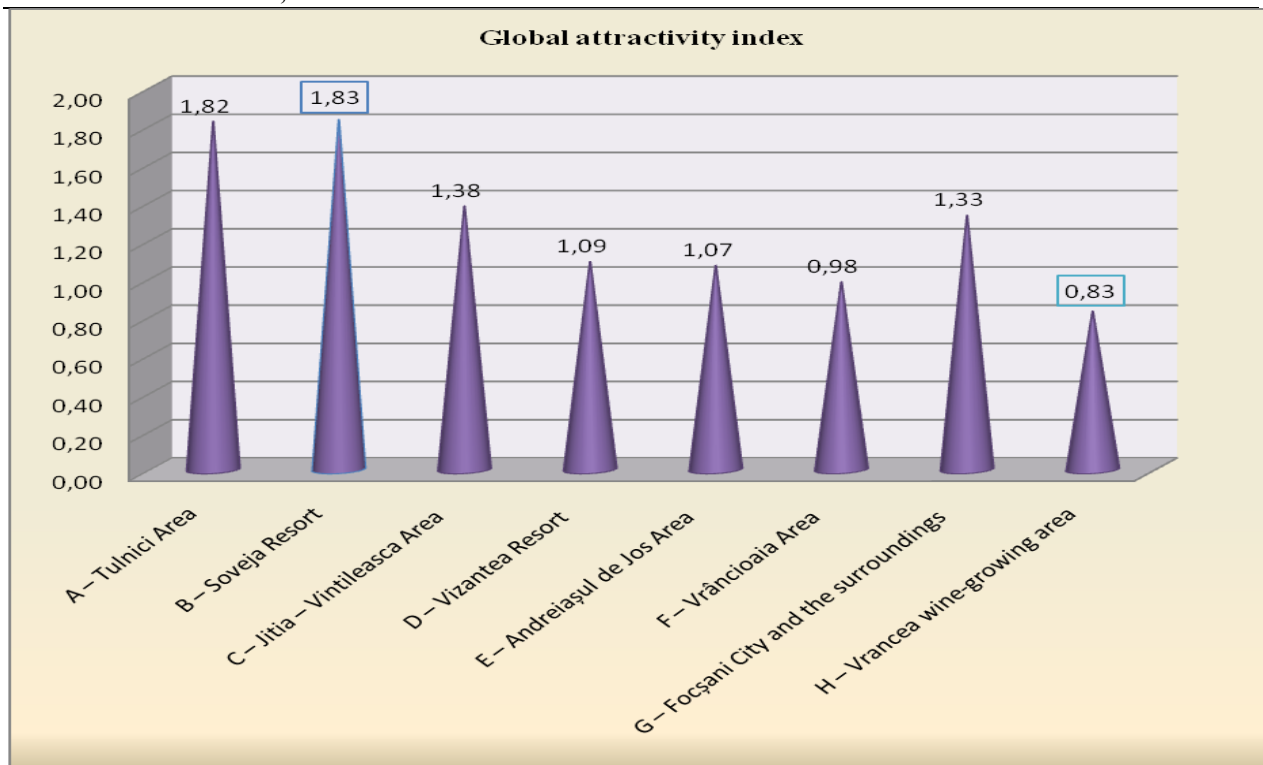


Fig. 2. Structure of Global attractivity index at each region

CONCLUSIONS

Soveja Resort has registered the highest global attractivity index (1.83), being placed within the category of the offer designed for the national tourism. The resort disposes of valuable natural touristic resources, but the touristic structures and the infrastructure are old and they do not ensure a competitive offer at an international level. The proposals for the touristic development of the resort must mainly consider the modernization and diversification of the existing touristic structures, in the same time with increasing the quality level of the offered services.

Tulnici Area – Although the constituent localities are not certified as touristic resorts, the area has registered a global attractivity index very close to the one of Soveja Resort (1.82). The natural touristic resources of the localities within this area are of an international interest, taking into consideration the partial attractivity index registered, that is 2.71 – the highest of all the studied areas. The natural touristic resources of the area cannot be capitalized to the maximum due to the low competitiveness on the international level of the anthropical

resources, the elements of touristic functionality, the existing touristic structures and the general infrastructure which are not entirely correlated with the elements of touristic functionality.

Jitia – Vintileasca area is occupies the third place (1.38) from a global attractivity index point of view. Despite the fact that the partial attractivity index for natural touristic resources has a value of 2.57 (therefore it can stand as an offer for the international tourism), the inexistence of the general infrastructure and of the touristic structure diminishes the value of the area's attractivity. We have to highlight the fact that Jitia and Vintileasca villages dispose of natural treatment factors which are only used on a local level. By beheading and developing the existing hydro-mineral resources, the two villages can become balneary resorts of regional interest. The development of Jitia - Vintileasca area for practising tourism by specific improvements supposes, first of all, solving the problems related to access. This is the main reason why this beautiful area is not capitalized from a touristic standpoint. The touristic development of this area requires a global approach, an efficient cooperation of

all factors involved and calls for very high investment efforts.

Focșani City locates its touristic offer in the area of traffic tourism and, especially, of transit tourism. Its establishment on the E 85 European road encourages its comprisal in national touristic programs, which represents an ace up the sleeve for developing and modernizing the touristic structures and lining up the associated services with the competitive standards on an international level. Based on what it can offer, Focșani city represents a touristic destination also for business, gatherings and conventions tourism. Following the study carried out, **Andreiașu de Jos and Vrâncioaia areas** have registered a global attractivity index close to 1. Each of these areas are interesting as far as their anthropical and natural potential is concerned, but they are scarce when it comes to infrastructure and material and technical base and, implicitly, the elements of touristic functionality.

Although **Vizantea Resort** benefits of a hydro-mineral potential of national importance that situated it amongst the famous balneary resorts of Europe at the beginning of the century, this does not provide presently any kind of developments or facilities that would enable the practise of any kind of tourism form. The necessary investments to be made must take into consideration the general and specific infrastructure, as well as the touristic structures and the corresponding utilities.

Vrancea wine-growing area, studied as such due to its location in the hilly area of the county, all along a north-south alignment, has registered a global attractivity index of 0.83. Currently, Vrancea wine-growing centres are capitalized at a smaller scale through the circuit national programs (Panciu and Odobești) and due to the lame development of infrastructure and touristic structures. The capitalization of these wine-growing centres from a touristic point of view involves specific developments to result into their integration in thematic national touristic circuits or organizing vacations for the rural tourism.

By putting into practise the goals of the hereby study, there will be achieved competitive touristic products that can be integrated in international and national touristic programs.

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THE HOREZU VALLEY - AN EXCELLENCY EUROPEAN DESTINATION

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Abstract

This study is the result of significant accumulation, made in a long series of initiatives and collaborations. The Partners for Local Development Foundation and partner communities from Horezu microregion, have joint activities by several years. These activities relates to education, training, facilitation of participatory strategic planning processes and animation of local development. Horezu Depression Association ADH (Intercommunity Development Association, whose members are Horezu city and rural community Costești, Măldărești, Slătioara and Vaideeni) initiated a program to develop local Horezu microregion. Their were joined mayors of Bărbătești, Franțești Oțeșani, Slătioara and Tomșani, FPDL Partners for Local Development Foundation, Resource Centre for Public Participation CeRe, Prefecture and County Council Vâlcea.

Key words: Horezu Depression Association, Horezu microregion, local development, strategic planning processe

INTRODUCTION

Local development is the process by which is identify, is mobilize and is coordinate the use of local resources (often undervalued and underutilized) in order to achieve change positive economic and social, in parallel with efforts to protect the environment.

The Horezu microregion lies in the central and north-western part of the Vâlcea county, between the Căpățâni Mountains to the north, the Cerna river to the west. The relief consists of mountains reaching altitudes of up to 2124m in the Ursul Park, two rows of hills and depressionary corridors, among which stands out the Horezu Valley.

MATERIALS AND METHODS

In order to characterize the Horezu microregion, the following indicators were used: **markers of land structure and livestock** breeding activities per inhabitant such as: agricultural land, arable, the number of cattle, sheep, swine, fowls, also were made measurements and observations about the

genetic diversity especially for vegetation and wildlife.

Another method utilized was the **Swot Analysis** based on Culture and Heritage.

Also, it was pointed the **evolution of the accomodation structure** from the Horezu town, in a period of six years, where were analized the main type of units such as hotels, campings, and touristic pensions, by means of public information from the oficial website of National Institute of Research - Development in Tourism – INCDT.

RESULTS AND DISCUSSIONS

Natural resources: Land - The mountain: five of the targeted localities have as a main characteristic the fact of being situated at the very foot of the mountains, their inhabited part consisting only of a small portion in the south, much of the area being occupied by uninhabited forest or alpine regions. The alpine area is the object of development plans of the "holiday village and ski tracks" type. Most of the communes register large areas of pasture lands and hay fields (even more than 75% of the entire land used for agriculture).

Table 1 Markers of land structure and livestock breeding activities per inhabitant

	Costești	Tomșani	Vaideeni	Horezu	Măldărești	Slătioara
Agricultural land	0,55	0,69	1,92	0,59	1,05	0,67
Arable	0,18	0,23	0,07	0,08	0,40	0,11
Pastura land/hay field	0,29	0,32	1,70	0,46	0,56	0,51
Orchards	0,08	0,13	0,15	0,06	0,09	0,06
No. of cattle/inhabitant	0,56	0,63	0,77	0,26	0,50	0,57
No. of sheep/inhabitant	0,34	0,05	5,85	0,41	0,12	0,04
No. of swine/inhabitant	0,48	0,52	0,42	0,19	0,40	0,42
No. of fowls/inhabitant	4,55	4,32	2,57	2,94	4,93	3,39
Arable-pastura land/ no. of cattle	0,84	0,88	2,30	2,08	1,93	1,09
Pasture land/no. of sheep	0,85	6,34	0,29	1,13	4,57	14,51

Mineral reserves:

Industrial and Building Limestone - in the Arnota Massif on the territory of the Costesti commune, it was opened the Bistrița quarry, from where it is extracted the limestone used in the chemical industry, to fulfill the local needs, as well as the limestone filler, the fodder limestone, the limestone mosaic or the asphalted mixture.

Genetic diversity - Vegetation and wildlife:

The abundance of protected plant species- endangered, vulnerable, rare, endemic, protected plants. These regions are the home of numerous rare plants, species of warm, sub-mediterranean climate species, as well as of relict, englacial, endemic species, which therefore have to be protected. But also in the region there are several protected natural areas. The main one, both from the point of view of its importance (category II IUCN- a national park) and from that of its surface (approximately 4500 ha) is the Buila-Vânturarița National Park, Romania's 12th national park. In the Horezu Microregion have been suggested 2 sites: Buila Vânturarița and North of the Eastern Gorj – special areas of conservation- created according to the Habitats Directive, a part of the Natura 2000 European Network, an ecological network of protected natural areas.

Cultural Heritage: in the microregion there are:

- ✓ 1 UNESCO monument (1 of the 7 in Romania)- the Hurezi Monastery complex

- ✓ 128 historical monuments- according to the Ministry of Culture (16% of the historical monuments of Vâlcea county).

The immaterial cultural heritage is especially present in the following fields: oral traditions and expressions; show arts, social practices, rituals and festive events, knowledge and practices connected to nature and the universe; traditional handcrafts.

The Horezu ethnographical area blends elements specific of several civilizations:

- The clay civilisation - famous potters
- The wood civilization- talented wood-carves
- The pastoral civilisation- sheepfolds on the alpine meadows and authentic pastoral folklore.

SWOT Culture and Heritage Analysis

With concern to the area's cultural heritage, there have been identified the following:

Positive aspects: -the existence of a rich and diverse ensemble of assets having the value of immobile cultural heritage, disposed in a balanced way on the territory;

Negative aspects:

- ✓ A great number of objectives in a precarious conservation state.
- ✓ The lack of funds for supporting the owners;
- ✓ Unauthorized interventions;

✓ Wooden churches, many of whom have been removed from their functions years ago, have been abandoned by the communities they have attended to, the possibilities of financing their restoration being virtually inexistent at the local level.

✓ The lack of assessment personnel in the public institutions and the lack of experts.

✓ Strategic and managerial deficiencies under the aspect of the perception and promotion of the cultural activities as products destined to the cultural consume, appearing under the form of reduced promoting activities;

✓ Small fund-raising activity.

✓ Reduced implementation of the specific actual norms and methodologies at European level.

Opportunities:

- The creation of new jobs and the diversification of the occupational typology in the field of research, conservation, restoration, use and reuse of the historic monuments, ensembles and sites;

- The intensification of consume and the diversification of the market interested in the assets and services in the field.

- Protecting by specific means of the law the intellectual property right of the communities over the traditional forms of expression created within them and who express their spiritual identity - in the Horezu microregion it is previewed the protection of the craftsmen and folk creators in the Bărbătești, Costești, Frâncești, Vaideeni areas.

Threats:

Natural risks: -earth and floods –there are studies such as "areas of natural risks"- within the Plan of Organization of the National Territory.

Anthropic risks: - are considered the main threats against the historical monuments:

✓ The abandonment of the monuments or of the cultural heritage objectives by the local authorities, their owners or administrators (natural persons or legal entities, clergy).

✓ Vandalization or robbery

✓ The lost of interest on the part of the public

✓ The decrease of the budgetary allowances, and implicitly, of the financing possibilities.

Infrastructure:

The general level of equipment of the territory and localities is appreciated according to the presence of the technical and public utility networks and to the social-cultural equipment. From the point of view of utilities, the studied area has electrical networks (the electrification of the households is probably 100% ensured), telecommunication networks (including mobile phone access) and in a certain way water and sewage access, at local level. The area is entirely lacking natural gas supplies, even though there have been made for a long while for its connection to the main transportation pipes, that are maximum distances of 30-40 km.

Production Capacities:

Material goods offered by the forest fund can be divided into two groups: related and unrelated to wood:

a) *Wood-related products:* are majority in the forest economy, which is a natural phenomenon, if we consider that one of the forest's function is the "timber production". The volume of timber that can be obtained every year from the forests is approved by a decision of the Government – Minister's Order so as to preserve an equilibrium between the wood produced in a year and the one removed.

An analysis of the financial results based on balance-sheet data of the communities and private forestries, that exploit most of the region's wood, reveals:

- The significant potential of creating new jobs that this industry has in the area- the number of jobs in the Horezu community has increased from 1 to 21 in three years;

- The constant annual income growth;

- The decrease of the actives is problematic, nevertheless, when it comes to the economic potential of this enterprise on medium and short term.

b) *Products unrelated to wood:* the game on its territory, the fish in the mountain waters;

berries and edible mushrooms; medicinal and aromatic herbs; forest seeds; resin. The collecting of the products follows certain times of the years and specific traits, which imposes a certain restrictioning and the obeying to several norms in the forests field. For instance, hunting and fishing can only be done by authorized persons.

Agricultural exploitation:

Most of the agricultural exploitation are sustenance farms, there are anyway 55 exploitation with juridical personality. Cultures: Cereals are cultivated in the comunes of the southern part of the

microregion: Frâncești, Oteșani, Slătioara and Stroești, mostly wheat, on relatively small surface that remain constant through time. Most of the cultures have registered a slight decreases of the cultivated areas. Fruit-tree cultivated areas have registered a slight decrease in the 2008-2010 period, nowadays having an increase tendency, as can be seen in the table and chart below. A constant growth has been registered by the culture of potatoes and vegetables (most likely for personal use). Strawberry areas, though constantly growing, remain modest.

Table 2 Evolution of cultures in agricultural exploitation

SPECIFICATION	Corn	Potatoes	Leguminous	Vegetables	Strawberries	Fodder plants	Fruit Trees	Natural Pastures	Natural grassland
Microregion total	2007	3842	570	37	239	49	1101	3005	8218
	2008	3828	541	253	255	70	1228	2960	15745
	2009	3771	651	48	310	64	907	2744	5495
	2010	3636	692	46	326	64	877	2205	14014
	2011	3868	656	12	540	108	1118	2629	10625

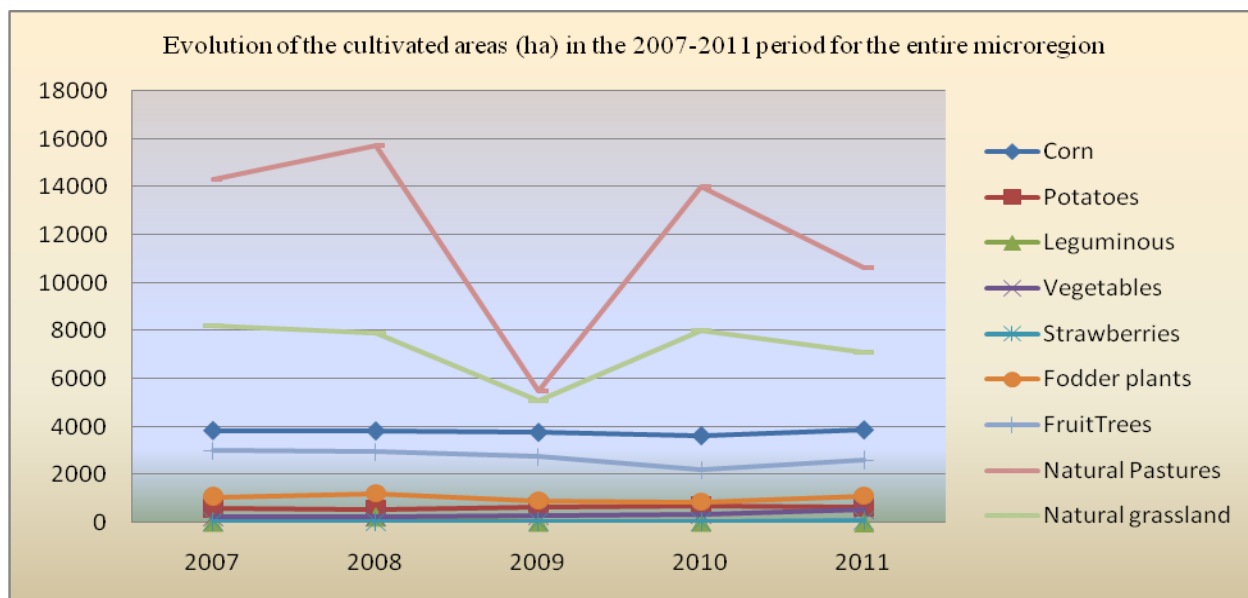


Fig.1 Evolution of cultures in agricultural exploitation in period 2007-2011 for the entire microregion

Tourism:

Given the already mentioned touristic resources, the localities of the microregion have since 2004, turned their attention to the development of tourism, as one of the strategic directions for the local development. Horezu has become a local interest touristic resort in 2005. In the same year, three of the

region's localities associated to create a Project for the Rehabilitation and Development of the General and Touristic Infrastructure in the Cultural- Historic Area of the Horezu Depression from Vâlcea County.

The evolution of the accomodation structure of the Horezu town is presented below:

Table 3 Evolution of the accomodation structure in Horezu town

Unit type	2006	2007	2008	2009	2010	2011
Hotels	1	1	1	1	1	1
Campings	1	1	1	1	1	1
Touristic pensions	-	-	1	3	6	10
Total	2	2	3	5	8	12

The measures taken for the development of tourism have been effective, since the number of tourists arriving to the local accomodation units has increased by 90%, while the number of those who chose to spend the night increased by 184,4%. Correspondingly, the duration of stays has increased by almost 50%, that is one of two tourists spends more than 1 night in the locality. In 2009, at the request of the touristic pensions owners and administrators, the Foundation Partners for the Local Development (FPDL) has organized the training course for the Touristic pension administrator occupation, supported by SC Tourism, Hotel and Restaurant Consulting Group SRL, an authorized tourism professional training supplier. The course had 8 theoretical modules, and was followed by study visits in areas of the country where tourism is well developed.

Eco-tourism:

The Horezu area, together with its surroundings, has the potential elements to become within 5-10 years an acknowledged eco-touristic destination in Romania and Eastern Europe. Eco-tourism, nature-oriented tourism and rural tourism represent development alternatives of the mass-tourism or of holiday home tourism, bringing together with the conservation of the natural and cultural capital bigger and longer-term financial resources in the Horezu microregion.

The development of touristic programmes: the eco-touristic activities that could be successfully developed in the area are:

- Thematic journeys, speleotourism in the equipped caves (the existence of 3 caves equipped for tourism represents a favourable prerequisite for the creation of an equipped caves network in the area).
- Horsemanship tourism (riding, sledges or waggons pulled by horses)
- Bird-watching, wildlife watching
- Tours for nature photography, including inside the caves
- Scientific tourism (studying plants and animals)
- Cyclotourism
- Skiing –especially in the Căpățâna Massif, winter journeys
- Cultural sports – creation camps, crafts demonstrations.

The development of thematic routes such as: the route of the equipped caves, of the monasteries, of the traditional crafts and architecture, of the protected natural areas, could distinguish the area from other similar regions and it could offer quality touristic experiences to different market sections- in terms of age, social status, income, education. It is desirable that these touristic programmes be developed by a specialized touroperator, or by the local tourism association, that uses local services like accomodation, public food,

local guides, equipment rental centres, touristic information centres.

This touroperator would undertake a part of the local offertants promotion and distribution efforts, so as they can focus exclusively on improving the quality of their services and developing new touristic services.

CONCLUSIONS

The Horezu Valley – An Excellency European Destination the project of the Horezu Depression Association has presented the touristic attractions of the Association's constitutive localities - Horezu, Costești, Vaideeni, Măldărești, Slătioara, emphasizing the value of the natural and cultural heritage and the service offered to the tourists. The project got the first prize within the "Excellency European Destination" contest on the subject "tourism and intangible local heritage" (the local intangible heritage includes cuisine, handcrafts, rural specific), organized by the General Direction for Entrepreneurship and Industry of the European Comission.

Thus, the Horezu Valley will be part of the national network of non-traditional cultural destinations to be promoted at the European level.

The Mining Industry

The still-existing risk of earth-sliding has been evaluated as serious, with reference to the soil component part. The mineral particles emission at the crushing of the limestone and the dump heap have a significant effect on the quality of life. What is more, the effect of reducing the touristic development potential has been evaluated as small. As far as we know, the oil, coal, mineral and geothermal springs resources are not exploited.

Local Industries- pottery: the Horezu pottery centre is the most important Romanian enameled pottery centre.

It hosts a permanent ethnographical exhibition, at the house of culture and at the potters' workshops, and an anual fair. During the summer School "Talking to the Local Actors" were interviewed 17 craftsmen in their own workshops. The production of each of them varies between 250 and 4000 items of

pottery a year. I estimate that the local craftsmen produce at least 60.000 items every year, and their production is entirely sold.

The preferred distribution forms are through their workshop, using meddling wholesale dealers or at the fairs. They use varied channels in order to distribute their products- older creafstmen usually sell their works at the specialized fairs, while younger ones sell them in their own stores, through intermediaries or even on the internet. More and more craftsmen have treir own shop, next to the national road that crosses the town.

The development of tourism enlarges the market of the traditional products.

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FISCAL CULTURE - AS KEY ELEMENTS OF ENSURING TAX COMPLIANCE IN DEVELOPING COUNTRIES (BASED ON THE REPUBLIC OF MOLDOVA EXPERIENCE)

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Abstract

Tax avoidance and tax evasion have considerably consumed the ink and papers of academic research because taxation is an issue that has been relevant in the last 6000 years of human history and will continue to be relevant in the future. Questions about tax compliance are as old as taxes themselves and will remain an area of discovery as long as taxes exist. To understand the impact of a tax system, it is important to know who complies with the tax law as well as who does not. In this paper I discuss several key factors that seem to be important for understanding tax compliance in Republic of Moldova: factors of tax evasion and avoidance, consequences and methods for ensuring tax compliance.

Key words: *corruption, enhanced relationship, fiscal culture, fiscal nihilism, tax compliance, tax morale*

INTRODUCTION

The long period of transition and the aggravation of economic crisis that our country faced at the beginning of the XXI-st century predetermined a certain condition of national economic security in which the old system of public security ceased to function and the new system barely began to be formed. The appearance of such threats as criminalization of public relations, high level of underground economy, massive fiscal evasion, organized criminality and corruption determined scholars to intensify scientific researches on the nature of phenomena that influence directly the sphere of national and economic security, which was reflected in the National Security Concept of the Republic of Moldova, developed and adopted in 1995, the Economic Security Concept of the Republic of Moldova (2008), the Information Security Doctrine of the Republic of Moldova and other important legal and political documents. Taxes, as an objective reality that assures from financial point of view the functioning of any state, generate amongst citizens a certain subjective attitude toward this socioeconomic phenomenon, which may be positive (anyone understands the necessity of paying taxes), or negative (individuals consider the possibility of not paying taxes).

The humans express their attitude differently either through a rational approach or emotions and feelings when it comes to fiscal regulation. Therefore, by tax compliance we will understand overall representations and feelings that express people's attitudes towards taxes and fiscal relations in a society. Tax compliance is tightly connected with other types and forms of perceiving the reality, for example, moral principles. Citizens evaluate taxes and tax levying by means of moral categories of equity, freedom, equality, and honesty, lacking or having common sense. The formation tax compliance is influenced not only by legal relations in this field, but also by its historic origin and practice of other societies in this context.

“Despite passionate debates regarding the core and content of the equity principle, it has been the main benchmark of any civilized system of tax levying for the last two hundred years” [5].

MATERIALS AND METHODS

National and international legal acts, textbooks, monographs, national and international publications on the specific theme are the materials used in the research. The study is performed on selected and processed by the authors' data on the basis of

OECD, IMF, World Bank and other publications that have provided meaning and relevant explanations in relation to phenomena or processes considered.

RESULTS AND DISCUSSIONS

LABUSE AND CORRUPTION: AN INTERNATIONAL COMPARISON

The tendency of that people not to pay taxes or pay them in a small amount has been actual since the state exists, whereas taxes are the state's main source of existence. The polarized diversity of interests reveals the fact that the participants in fiscal relations are taxpayers (legal entities and natural persons) and the state, each of them following one's own goals, conditioned by the interests, necessities and objectives of each part. On the one hand, the taxpayer wants to derive maximum profits avoiding tax related

expenses; on the other hand, the state wants a stable taxes collection.

Tax avoidance and tax evasion has significantly consumed the ink and papers of academic research, being considered all along the history and relevant in future.

Measuring the shadow economy is one method to measure the extent of tax evasion, because it provides information of extent non-compliance.

People join shadow activities for a diverse reasons in respond to state authorities activities, especially, taxation and regulation. Less shadow economies appear in countries where the rule of law is respected, while in developing countries have a large discretionary regulatory framework, consequently resulting in a higher shadow economy.

Obviously, economic crisis force taxpayers to hide profit on an increasing trend as presented in Table 1.

Table 1. Size of the Shadow Economy in 10 Highly Developed and 10 Developing countries over 2003 – 2012 (in % of off. GDP)

No.	Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1.	Ukraine	49,7	48,8	47,8	47,3	46,8	46,2	-	-	-	-
2.	Moldova	45,8	45,6	45,2	45,0	44,5	43,9	-	-	-	-
3.	Belarus	48,3	47,5	46,3	44,9	43,3	41,7	-	-	-	-
4.	Russian Federation	43,6	43,0	42,4	41,7	40,6	40,3	-	-	-	-
5.	Bulgaria	35,9	35,3	34,4	34	32,7	32,1	32,5	32,6	32,3	31,9
6.	Romania	33,6	32,5	32,2	31,4	30,2	29,4	29,4	29,8	29,6	29,1
7.	Lithuania	32	31,7	31,1	30,6	29,7	29,1	29,6	29,7	29,0	28,5
8.	Estonia	30,7	30,8	30,2	29,6	29,5	29	29,6	29,3	28,6	28,2
9.	Latvia	30,4	30	29,5	29	27,5	26,5	27,1	27,3	26,5	26,1
10.	Slovenia	26,4	26,2	25,8	25,3	24,7	24,0	24,6	24,3	24,1	23,6
11.	Denmark	18,0	17,8	17,6	17,0	16,9	13,9	14,3	14,0	13,8	13,4
12.	Germany	16,3	16,1	16,0	15,6	15,3	14,2	14,6	13,9	13,7	13,3
13.	Ireland	16,0	15,8	15,6	15,5	15,4	12,2	13,1	13,0	12,8	12,7
14.	Canada	15,3	15,1	14,3	13,2	12,6	12,6	12	12,6	12,2	11,9
15.	United Kingdom	12,5	12,4	12,4	12,3	12,2	10,1	10,9	10,7	10,5	10,1
16.	Australia	13,7	13,2	12,6	11,4	11,7	10,6	10,9	10,3	10,1	9,8
17.	Netherlands	13,3	13,2	13,2	13,2	13,0	9,6	10,2	10,0	9,8	9,5
18.	New Zealand	12,3	12,2	11,7	10,4	9,8	9,4	9,9	9,6	9,3	8,8
19.	Austria	9,8	9,8	9,8	9,6	9,5	8,1	8,5	8,2	7,9	7,6
20.	United States	8,5	8,4	8,2	7,5	7,2	7,6	7	7,6	7,2	7
21.	Developing 10	37,64	37,14	36,49	35,88	34,95	34,22	-	-	-	-
22.	Highly Developed 10	13,57	13,4	13,14	12,57	12,36	10,83	11,14	10,99	10,73	10,41

Source: Based on Schneider (2011) data and Elgin and Oztunalz (2010) data

In Table 1 is presented the size and the development of 10 Highly Developed and 10 Developing Countries shadow economies over the period 2002-2012. If we first look at the results of the average size of the shadow

economy of the 10 highly developed countries, we realize, that the shadow economy in the year 2003 was 13.57% (of official GDP), decreased to 10.83% in 2008 and increased to 11.14 % in 2009 and then

decreased again to 10.41 % in 2012. Same trend we can see in developing countries too. Thus is evident that one of the big challenges for every government is to undertake efficient incentive-orientated policy measures in order to make it less attractive, aiming the enlargement of the amount of taxpayers willing and able to pay their fair share on time

Comparing tax revenues by nominal value and percent of GDP between Netherlands (as developed country) and Moldova (as developing countries), as presented in table 2, we can mention some interesting findings related to GDP and tax revenues temps of grow, as well as to ratio of direct and indirect tax in total.

Table 2. Moldova vs. Netherlands: Tax Revenue by Nominal Value and Percent of GDP, 2007 and 2010

Indicators		2007, Moldova		2010, Moldova		2007, Netherlands		2010, Netherlands	
		Euro Millions	% of GDP	Euro Millions	% of GDP	Euro Millions	% of GDP	Euro Millions	% of GDP
Tax revenue		1.187	34,4	1.452	31,4	221.276	38,7	227.716	38,7
1.	Personal and corporate income tax	176	5,1	162	3,5	62.324	10,9	63.549	10,8
2.	SSC and payroll taxes	335	9,7	458	9,9	77.189	13,5	82.966	14,1
3.	Property taxes	14	0,4	14	0,3	10.292	1,8	8.826	1,5
4.	Taxes on good and services	580	16,8	731	15,8	68.613	12,0	70.021	11,9
5.	Other taxes	82	2,4	87	1,9	2.858	0,5	2.354	0,4
GDP		3.445		5.348		571.773		588.414	

Source: Statistics of IMF and OECD

Tax revenues still comprise the major share of budget revenue in 2011 of which 44% was from direct taxes and 56% were from indirect taxes. At the same time mentioned ratio in Netherlands is opposite (60%/ 40%) that is characteristic for developed countries.

GDP and tax revenues indicators for Netherlands growths equally by 2,9 %. Meanwhile the GDP of Republic of Moldova

grows in 2010 by 55% comparing to 2007, while tax revenues registered an increase only by 22% in absolute terms and a decrease of 3% comparing to GDP. This raises a lot of questions and requires deeper understanding of all actors involved in tax system.

In this purpose is worth to look through the evolution of tax audits in Republic of Moldova, generalized in table3.

Table 3. Evolution of tax audits in the Republic of Moldova, 2005–2011 period

Year	Nr. of businesses registered at the end of the period	Including (thousands)			Results of controls (million USD)	
		Nr of audited taxpayers	Nr. of violations		additional calculated payments	including penalties
			thousands	Detection%		
2005	645,4	43,3	32,5	75,1%	321,4	135
2006	659,4	62,0	45,1	82,7%	349,1	139,1
2007	674,7	42,1	25,3	60,1%	237,7	60,0
2008	679,6	38,4	21,1	54,9%	201,1	94,7
2009	683,8	53,5	36,3	67,9%	449,5	185,4
2010	686,2	66,8	41,9	62,7%	498,0	253,1
2011	702,3	71,9	45,7	63,7%	517,0	256,4

Source: Elaborated by the author on the basis of STS of Moldova, annual reports data

Even if share of annual audited taxpayers out of total number registered a light increase from 7 to 10% within 2005-2011 period, in absolute terms almost doubled from 43.3 to 71.9 thousands, while total number of taxpayers grows only by 8,1 % or 57000 entities.

At the same time, increased number of tax audits has a positive impact on the share of

tax violators' which allowed a decrease from 83% in 2006 to 64% in 2011.

Meanwhile additional calculated budget taxes, fees and other payments grow by 60% mainly because of penalties that are applied on one to one ratio, which means that for each additional calculated EURO is added another EURO as penalty.

This fact along with introduction of a variety of small taxes, according to Doing Business

2013 World Bank Report, cause the decrease of attractiveness for business activities in Moldova for FDI, leading to their massive

outflow and shift a big part of MSMEs towards shadow economy, reflected latter on in abuses and corruption.

Table 4. Evolution of Corruption Perception Index in 10 Highly Developed and 10 Developing countries over 2002 – 2011

No.	Country	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
1.	New Zealand	9,5	9,5	9,6	9,6	9,6	9,4	9,3	9,4	9,3	9,5
2.	Denmark	9,5	9,5	9,5	9,5	9,5	9,4	9,3	9,3	9,3	9,4
3.	Netherlands	9	8,9	8,7	8,6	8,7	9	8,9	8,9	8,8	8,9
4.	Australia	8,6	8,8	8,8	8,8	8,7	8,6	8,7	8,7	8,7	8,8
5.	Canada	9	8,7	8,5	8,4	8,5	8,7	8,7	8,7	8,9	8,7
6.	Germany	7,3	7,7	8,2	8,2	8	7,8	7,9	8	7,9	8
7.	United Kingdom	8,7	8,7	8,6	8,6	8,6	8,4	7,7	7,7	7,6	7,8
8.	Austria	7,8	8	8,4	8,7	8,6	8,1	8,1	7,9	7,9	7,8
9.	Ireland	6,9	7,5	7,5	7,4	7,4	7,5	7,7	8,0	8,0	7,5
10.	United States	7,7	7,5	7,5	7,6	7,3	7,2	7,3	7,5	7,1	7,1
11.	Poland	4	3,6	3,5	3,4	3,7	4,2	4,6	5	5,3	5,5
12.	Lithuania	4,8	4,7	4,6	4,8	4,8	4,8	4,6	4,9	5	4,8
13.	Latvia	3,7	3,8	4	4,2	4,7	4,8	5	4,5	4,3	4,2
14.	Romania	2,6	2,8	2,9	3,1	3,1	3,7	3,8	3,8	3,7	3,6
15.	Bulgaria	4	3,9	4,1	4	4	4,1	3,6	3,8	3,6	3,3
16.	Moldova	2,1	2,4	2,3	2,9	3,2	2,8	2,9	3,3	2,9	2,9
17.	Kazakhstan	2,3	2,4	2,2	2,6	2,6	2,1	2,2	2,7	2,9	2,7
18.	Russian Federation	2,7	2,7	2,8	2,4	2,5	2,3	2,1	2,2	2,1	2,4
19.	Belarus	4,8	4,2	3,3	2,6	2,1	2,1	2	2,4	2,5	2,4
20.	Ukraine	2,4	2,3	2,2	2,6	2,8	2,7	2,5	2,6	2,4	2,3

Source: Based on Transparency International's (2002-2011) surveys¹.

To manage tax compliance in order to detect and prevent delinquent behaviours, revenue authorities are faced with other significant problem as corruption. As it shown in table 4, corruption is a large and growing problem in developing countries. No region or country in the world is immune to the damages of public-sector corruption, the discrepancies in scores between developing and developed countries being evident. The question "What is corruption?" is often raised in the literature. As Phan Anh T. [3] noted 'the definitions of corruption developed by the World Bank and Transparency International are commonly used' they define it as "the abuse (misuse) of public power (entrusted power) for private gain." To continue the idea of defining *corruption* we will use this concept in meaning of the abuse (misuse) of tax inspectors' potential to protect taxpayers from audit for private gain.

As it shown in Table 2, corruption is a large and growing problem in developing countries.

Unlike the developed countries, the developing countries historically experienced little prosperity and stability. They declared their independence from the communist regime on the end of 80th.

The people from developing countries are still living in a society where the acceptance for corrupt behaviours is very high. This is why we can conclude that that countries are poor because of the corruption and not corrupt because are poor.

As we can see in Table 4 the developing countries assessed score below five (average of analysed countries is 3,4) instead of a higher score above seven of developed countries (average - 8,4) on a scale of 0 (highly corrupt) to 10 (very clean). According World Bank Enterprise Survey percent of firms identifying corruption as a major constraint vary from 3,0 in Ireland or 3,9 in Germany to 52,3 in Romania or 50,2 in Russia in accordance with corruption perception of doing business.

It may be difficult to stop the reproduction of corruption in these conditions, if the authorities will not perform a conjugate intervention at several levels: legislation, education, media communication, etc.

¹ *No region or country in the world is immune to the damages of public-sector corruption, the vast majority of the 183 countries and territories assessed score below five on a scale of 0 (highly corrupt) to 10 (very clean).

II. BASIC ISSUES CONCERNED OF TAX COMPLIANCE

For a long period of time fiscal commitments have been perceived as unfair towards the subject of taxation, because they are supposed to withdraw a part of his income. In antiquity, taxes served as indicator of slavery. This attitude towards taxes persisted in Europe for a long period till the beginning of the XX-th century. The manifestation of chaos is characteristic for totalitarian states. In his study "On the nature and cause of the wealth of nations", Adam Smith argued another conclusion, stating that for those who pay taxes "it is not a sign of slavery, but of freedom". There is a difference between the state and taxpayer in terms of understanding what equity and freedom are, when it comes to the situation in which a subjective fiscal interest of a citizen does not coincide with the public interests of society, leading even to contradiction in capacity and possibility of choosing consciously and willingly his fiscal behaviour.

But, when the taxpayer's "interior" freedom is not restricted by anything, then "exterior" freedom is restricted by a certain legal framework, which sets up boundaries of taxpayers' own freedom in order to avoid illegalities of each particular individual, becoming an object of examination in the practical work of the Constitutional Court.

The constitutional obligation to pay legally-set taxes is the basis of a state's economic security and the turning point in the formation of tax compliance and perceiving of states' financial interests. Thus, in his study P. Kirhhof mentions that the "existence of tax is justified by social obligations resulting from the right to private ownership and not the citizen, who generally finances the state. [6].

Thus, fiscal consciousness is one of the forms of social consciousness that reflects fiscal legal relations and all phenomena related to them, depending, first of all, on taxpayers' perception of developed fiscal policy. The problem of forming tax compliance resides in so-called "fiscal paradox" where taxpayer, is restricted by a forced distribution of capital for the benefit of other people that have the right to a certain level of living, which comes

into contradiction with fundamental human rights, to act freely and gain profits, free medical assistance and education, social protection and pension retribution.

In a civilized modern world, tax compliance reflects the democratic basis of a society, ensuring equilibrium between public and private interests. A real confirmation of these opinions related to forming of tax compliance can be found in Turghenev's works, in which he mentioned that "All citizens enjoy the benefits of society; therefore, everyone should contribute to its maintenance. Any citizen who is under protection of government and laws must make offerings directly proportional to his/her wealth in order to support this government and these laws. In a word, all must contribute to the benefit of everyone"[7].

Even though fiscal policy, in almost all countries, has a little support from citizens. Therefore, elaboration of development strategy regarding tax compliance has to be based on the understanding of social significance of tax compliance according to its levels and profound manifestation in society:

-Social level (level of general culture), obtained in educational establishments or under the influence of life experience or people's general behaviour, characterised by awareness of general principles, which are tightly combined with their moral and ethical views.

-Professional level is practice, principles and beliefs formed as a result of professional activity related to fiscal administration and entrepreneurial activity. This is the level where subjects have specialised knowledge regarding fiscal legislation, and abilities and skills in applying it, where close attention should be paid on forming tax compliance.

-Scientific level that expresses theoretical notions, methodological concepts and approaches of taxation system and is characteristic for scientific researchers that deal with fiscal issues of social relations.

Meanwhile, forming tax compliance makes the state more stable; otherwise, when there is a lack of tax compliance criminality in economic and fiscal relations reaches the highest point, the number of disloyal

taxpayers increases (see table 3), and illegal schemes of tax evasion are developed.

This is the situation in which all the negative and unjustified tendencies in terms of society development and behavioural patterns show up. The society is divided into separate corporate groups that have common economic interests; the relationships between friends and relatives prosper, which, in fact, are contrary to the interests of other remaining citizens and the state, in general. The cause of these unmatched interests is the obvious conflicting character of fiscal relations that are intensified as a result of the lack of common, clear, rational and augmented game rules, which are not respected and are ignored by certain economic subjects, without being held responsible or even punished. Therefore, people do not perceive themselves as citizens of the country, do not want to fulfil their fiscal commitments, do not realize their civil rights and do not want to have civic responsibility, which leads to negative global socio-economic consequences.

It has to be mentioned that at the beginning of the XXI-st century tax compliance in the East European countries was not formed yet, which led to an unstable socio-economic development of the country, having unpredictable socio-economic consequences. In our opinion, the problem regarding formation of fiscal consciousness of our citizens resides not in the fact that during the transition to market economy, it (tax compliance) did not manage to be formed, but in the fact that its maturity is hampered by our citizens' retrograded mentality, which cannot be developed without scientific methods of influencing the taxpayer to make him more loyal.

III. STRATEGIC TASKS RELATED TO TAX COMPLIANCE

At present, the influence of tax compliance on organising social life and forming a civilized society is rather big and perceptible. The specific feature of tax compliance as a component part of legal regulation mechanism is that its role is not limited only to whether honour or not fiscal commitments. A more

conflicting situation arises at the stage of executing the property right and in the context of honouring fiscal commitments, when the behaviour of economic agents reflects tax compliance. People's legitimate, socially useful, or illegitimate, socially harmful and dangerous behaviour in the society, depends on the level and quality of fiscal quality context.

The transition to market economy in our country necessitated a clear determination of state's economic security strategy, in which various directions, including fiscal security, had to be emphasized. This task should be implemented in the current educational system.

Therefore, strategic tasks related to formation of tax compliance under the conditions of market economy are determined by people's attitude to fiscal legislation and fiscal system in general, which allows setting the following fundamental directions towards modernizing it:

1. Provide all citizens with a necessary and sufficient amount of information on fiscal realities existing in the country. The information should be extensive, multilateral and is a compulsory element of tax compliance, influencing the efficiency of ensuring fiscal security.
2. Educate national and legitimate values of tax compliance that determine the taxpayer's behaviour. *Legum servi esse debemus, ut liberi esse possimus* (lat.) – to be free is to abide by laws. This is how the state's taxation system should restrict the property right of a business in order to protect this property from inside or outside claims and preserve it for further development of entire society.
3. Using information and education elements, form in taxpayer's tax compliance a professional and civilized approach to decision making and availability of acting under certain conditions: whether he will show loyalty in respecting of all fiscal legal relations, or he will look for the possibility of not meeting the requirements of legislation, acting in his own interests and fulfilling momentary necessities, and risking thus to be fiscally charged.

The relationship between personality development, formation of tax compliance and fiscal culture is obvious. Educating a

personality that has a developed civic consciousness and recognizes his commitment to pay taxes conscientiously leads inevitably to forming society's fiscal culture and to development of a powerful state from social and economic points of view. It may be assumed that the common interest of all participants in fiscal relations regarding the conscientious honouring of fiscal commitments might arise from overall private interests of a taxpayer's more active part. Meanwhile, not all private interests are capable of forming wholly a common interest related to honouring fiscal commitments. In this context, using imperative measures the state is compelled to set such a level of fiscal security that makes fiscal authoritarianism become a necessary tool in opposing disloyal taxpayers, criminalization of economy, mass tax evasion and reduction of social welfare under the conditions of market economy. In this case, state's fiscal imperative will be considered a lesser evil than the anarchy and chaos in fiscal relations, degradation of nation's economic and fiscal potential, conditioned by the lack of culture and tax compliance in society.

IV. FISCAL NIHILISM – THE CORE PROBLEM OF THE SOCIETY'S TAX CULTURE

A society's fiscal culture is determined to the highest extent by its subject – the human or a group of people, as well as by real behaviour of his, and to what extent the individual knows and honours his fiscal commitments in time, is aware of prohibitions and uses his rights. This depends on the development level of some social and professional groups and on the development level of particular personalities. Poor citizens cannot be interested in paying taxes; when their wealth is withdrawn, they become even poorer, being deprived of any future perspective. The richest part of the society is not interested in calculating taxes for any further social distribution of them since their interests may be radically different from those of the state. The wealthy have the possibility of resisting the state, requiring stipulation in the legislation of more advantageous facilities and

conditions for their business. Such actions lead to the redistribution of fiscal burden towards the remaining part of society and to a higher impoverishment of population, which threatens social stability. People became aware of this problem even from old times: Jean-Jacques Rousseau argued that big fortune and high level of poverty make the human immoral, forcing him to conflict with society. Therefore, liberalization of fiscal relations in 2010 was orientated to decriminalization of economy and reduction of liability for fiscal and economic felonies. This means that it is high time to design a new model of economic development, orientated to forming and sustaining small and medium-sized entrepreneurs, since the big business has the possibility of bribing corrupted clerks and the poorest citizens do not have any business to the rights of proprietors.

The category "fiscal culture" can be applied for characterising existent fiscal legal relations, evaluating efficiency and quality of fiscal system and comparing it with the fiscal system from the most developed economic states, revealing the level of guarantee granted by the state and civil society to constitutional rights and obligations of taxpayers. The implementation of fiscal legal norms, i.e. the authoritarian activity of governing bodies that regulate law-abiding social relations, influences the society's fiscal culture. It is all about the legal framework for taxes and fees, taking into consideration judicial courts decisions, about fiscal administration performed by fiscal authorities, participation of law-enforcement agencies in making fiscal control, increase of competence and authority of judicial courts regarding litigations and consolidation of guarantees that assure fiscal security of all participants in fiscal relations.

The causes of the lack a fiscal culture in our country are subjective and are determined by the fact that the human does not perceive himself as a citizen and does not want to honour his/her fiscal commitments. This problem may be solved only by educating the citizen, a responsible resident of his/her country, who is concerned with the country's development and prosperity and perceives his/her civilized existence. As it was

mentioned above, this person could only be the “middle class” representative, the biggest social layer of society, and the average incomes of whom give him the possibility of feeling as a meritorious man. No any other institutional reforms that create various economic and fiscal mechanisms for regulation will be able to form a citizen who is capable of using these mechanisms, if the majority of population is below poverty level. The fact that in the developing countries legal framework for taxes and fees is not sufficient for forming the fiscal culture in society, in general, and tax compliance of every taxpayer, in particular, which emphasises our persuasion in the necessity of forming these qualities in the process of education. Citizens of our country are not aware of the fundamental socio-economic and political values that democratic states benefit from, at the basis of which resides the principle that taxes are the foundation of state and society’s welfare. The mentality of our taxpayers does not allow them to understand why they are forced to pay taxes and cut down on their significant part of incomes, without taking into consideration the economic interests of different groups of entrepreneurs, because in the East European countries non-payment of taxes does not affect the image and reputation of business people. This leads to showing nihilism in society and namely: *legal nihilism in fiscal relations* that may be noticed in two forms – *ideological* and *practical*. *Ideological fiscal nihilism* represents a theoretical, conceptual argumentation of fiscal nihilism, whereas scholars, philosophers and politologists demonstrate that there are other non-fiscal ways of completing the budget and financing the state rather than forceful withdrawal of a part of property that belongs to an individual apart. *Practical implementation* of this kind of views and theories in the situation, in which a certain group of people does not respect fiscal legislation and in which all the norms established by the state are not met by the same legal authorities and clerks, leads to massive fiscal evasion, criminalization of economy and development of underground economy. What is also characteristic for our

society is legal nihilism, i.e. rights and law infringement. We might make here an ironical remark that if a European social agreement assumes the consent of authorities and subordinates in abiding by the law, then the national social agreement means a tacit understanding between people and authorities regarding mutual non-sanctioning whenever the law is broken, which characterises rather persuasively modern fiscal law relations in the developing countries.

Thus, differentiation of tax compliance according to its stage of maturity allows us to consider the legitimacy of the fact that namely this index is one of the fundamental indices for ensuring the fiscal security of the state, society and the business under current conditions, when knowledge becomes a real material force. The formation of high-level culture is based on the taxpayer’s awareness of economic advantage of taxes and their social importance. It is more efficient to educate from the beginning a positive tax compliance than to change the negative attitude towards taxes. The lack or the loss of tax compliance denotes the danger of detaching the state from society when empowered people solve their own economic and financial problems without taking into consideration taxpayers’ interests. The adequate perceiving of fiscal law relations is hampered by the real legal and economic practice, because it is impossible to use this way in educating a taxpayer to pay respect to a state that uses only the words, which are confirmed usually in the populist statements of political leaders, when declaring respect for constitutional guarantees. Systematic perception of strategic tasks, which are orientated towards forming tax compliance, is displayed in the measures of educating a socially responsible personality, who represents middle class that has to become guarantor of fiscal security of the state, business and society and determine civilized, stable and inoffensive development of the state and society as a whole.

IV. AN ENHANCED RELATIONSHIP BETWEEN TAXPAYER AND TAX ADMINISTRATION: A GOOD IDEA?

A new approach to the relationship between the tax administration and the taxpayer is known as the enhanced relationship (ER). In favour of the ER point is the evolution of this relationship for several reasons:

- it does not cause a further strengthening of the position of one of the parties;
- is related to attitude in defense of their positions;
- is implemented through soft-law instruments;
- is not affected by any legislative change, court decision or academic proposal.

The OECD [8, Chapter 8] defines an enhanced relationship as a “more collaborative, trust based relationship (...) between revenue bodies and large corporate taxpayers who abide by the law and go beyond statutory obligations to work together co-operatively”.

Main focus on large enterprises is caused by the fact that:

a) the majority of gross income and profit taxes paid. According to World Bank [9, p.39] less than 1 percent of large enterprises are responsible for 60-70 percent of domestic tax collections.

b) large businesses have complex tax situation. As a result of their tax corporate strategies the transactions of large taxpayers segment are placed, in a gray area between tax evasion and tax avoidance.

Entering into a relationship of this nature will allow a better control of cross-border tax risks. The introduction of 'enhanced relationship' tax compliance programs marks a major cultural change in the manner which taxes are collected all over the world. Improvement of enhanced relationships will result in right amount of tax payments and relevant state budget revenues with fewer costs.

The STI of Moldova continues to strengthen tax administration in line with the best practices agreed by OECD and promoted by IMF. Since 2011 STI has come far with implementing a Compliance Risk Model (CRM), which is the very basement of ER. At the same time a complex actions is required such as:

- Taxpayer services must be strengthened and used to promote compliance.

- A simple but effective first step is for the STI to work more closely with tax professionals and business groups to promote compliance.

- Improved compliance will also require enhanced audit skills.

- The authorities must learn how to bring a small but well-selected group of tax evaders before the courts each year.

- Organizational structures can be improved.

- The Large Taxpayer Office (LTO) must continue its evolution.

- The reform agenda relies on better IT.

- Handling of VAT needs improvement.

At this stage of development achievement of proposed goals could be done only through enforcement of the law and education of future taxpayers. Thus the success of the idea ER model has a huge potential to change taxpayer behaviour, if implemented well.

In this regards the very first step of acknowledgment, communication and dissemination of actual experiences in research and implementation becomes crucial for developing countries like Moldova and could be reached only based on joint effort with the leaders in each specific area.

CONCLUSIONS

Introduction of special discipline will allow filling in theoretical and practical vacuum that exists in the field of fiscal and economic security. Within the education process is necessary to find adequate responses to modern world challenges and threats in order to educate citizens with patriotic way of thinking that will respect the laws. It is also necessary to form highly-qualified professionals, able to ensure fiscal and economic security as a system of activities, contribute to the formation and consolidation of financial basis of the statehood, and achieve ideals and creation of the state of law. Under the conditions of economic crisis, what is imposed as one of the main priorities of morale, ethics, and culture in general, is the fact that the main emphasis regarding the modernizing of tax compliance should be put on the improvement and re-education of

professionalism of the state and town clerks and entrepreneurs, on informing population about existent fiscal facilities and requirements in order to ensure a qualitative and efficient protection of the rights and fiscal freedoms against state fiscal illegalities, and protection of the weak against the strong (the powerful). Ideally, all curricula in the multi-level education system should contain case studies featuring tax compliance and the basics of taxation.

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THE ANALYSIS OF THE EXPENSES, INCOMES, FINANCIAL RESULTS AND ECONOMIC EFFICIENCY ON CROPS AT S.C TOMA S.R.L IN THE AGRICULTURAL YEARS 2008-2009; 2009-2010; 2010-2011

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Abstract

SC company TOMA LLC is wholly owned private company with limited liability organized and existing under the law 31/1990, the Romanian legislation and the Romanian state. As main activity is the cultivation of cereals, leguminous plant seed oil and spices and medicinal and aromatic plants as secondary activities, the following are provided in the statute of the company: tobacco farming, growing of textile fibers, growing shrubs, growing seed production and service providers in the agricultural field.

Key words: average production, expenses, financial analysis, income, total production

INTRODUCTION

The company is located in Modelu commune, Calarasi county, currently having in exploitation a surface of 360 hectares of arable land. In 2003 when the company started its activity, exploited an area of 250 hectares and since 2011 the company operates 360 ha, fully leased. The company now has an office with an area of 14 000 m² of the building (shed, warehouse, machine shop, office, annex) with the area of 2100 m², 5000 m² concrete platform, 6900 m² orchard. The commune relief is required by some variety of landforms and altitude offset from north to south, a relatively flat relief, sprinkled with a few mounds largely leveled. The relief is disposed in degrees from north to south, as follows.

In the north, the southern extremity of Baragan plain between the northern boundary of the village to the north of the former village Radu Negru, gently sloping to the south. The landscape is flat, with many dales which create difficulty in storm water discharges. Calarasi terrace – passing from plain to the terrace I called Calarasi terrace is via a slope connecting the locals called "the hill". Lower terrace is formed by alluvial and extends north

to the former village Radu Negru on about 112 km south. The lowest flood stage is largely an exciting dammed. This sector comprises two aspects: the meadow, between the Danube and Borcea branch, known as the "swamp" and external narrow valley, forming an interrupted strip left arm Borcea. Moving from the terrace floodplain is made through a bump slope of 4-5 m absolute altitude meadow is 11 m southern limit of the terrace is festooned appearance due to meandering of Borcea. The meadow is low, with a micro-relief formed by alluvial ridges and complex levels with small depressions, cuvettes of the former lake bed now drained and old Borcea arm, known as Old Borcea. From the climate perspective, the commune is included in climate Province II, characterized by a strong continental character with large contrasts between summer and winter. The climate is influenced by the presence of the Danube, and its right bank. The average annual air temperature is above 11 °C. Due to the influence of the Danube floodplain, frost days are lower than the rest of the county. The first ground frost recorded at the beginning of the third decade of October and the last in the first half of April. The lowest temperature in the last hundred years, Calarasi weather

station recorded was -30°C on January 8, 1938, and the highest temperature was recorded on 10 August 1951 and was 41.4°C . The amount of rainfall is insignificant and does not meet all requirements of plants best, sometimes with torrential character having an average annual rainfall of about 500mm. A maximum rainfall was recorded in late spring and early summer, when the amount of rainfall sums % of the total value. The minimum rainfall is installed in August and September.

The snow falls in low thickness and it is usually smaller and shattered. Firstly, there is usually snow in early December, last snow fall usually in late February. Known periods when average snow depth was 69 cm, and 1.5 m (winter of 1953-1954). Because there are no relief obstacles on the territory, the most dominant winds are blown in the northern and north-eastern most part of the year. Prevailing winds are chilly winds, Austria and Bălăreţul. Crivăţul blowing from the northeast and is more frequent in winter. It blows the snow and it bring waves of cold and snow. It also felt in late autumn and early spring, plants uprooted by presenting danger of frost by dissipation and frost producing. In order to protect roads devices against snow are used. Austrul, dry wind that blows from west closer all year, is popularly known as the "empty bag" or "starveling". In spring, warm wind, from the pool, accompanied by rain, melts the snow at once. This wind is known as Bălăreţul, its frequency is lower than the other. Soils are chernozem in Modelu, which were formed under steppe grass vegetation in the conditions of a temperate continental climate. These soils formed on loess, which is the parent rock.

MATERIALS AND METHODS

To analyze expenses and revenues, we used the specific research methods: dynamic economic analysis, deductive and quantitative, SWOT analysis, case studies, by gathering information from documents provided by SC TOMA Ltd and processing information from websites.

RESULTS AND DISCUSSIONS

This analysis was based on estimates of work on each crop and each agricultural year analyzed. Yields per unit area achieved in the years mentioned were caused by agricultural varieties and hybrids used in each crop, crop technology applied, the quality of agricultural work carried out and the climatic conditions.

SC Society TOMA Ltd uses technologies applied only to seed varieties and hybrids. Cultivated varieties are pure lines, very uniform genetically, have superior qualities, demanding growing conditions but with a high potential for production. The tie. The varieties do not have a stability of its characteristics, while there is an impairment of biological values or even degeneration variety. The causes of these processes are natural hybridization mechanical impurities to conditioning and seed treatment, natural selection that takes place in the chain tend to remove the valuable biotypes in the favour of the most resistant to the most unfavourable conditions. In this way within a few years the obsolescence of the varieties occurs, that are outdated in terms of performance requirements from the growers. The assortment of the varieties of crops is changed currently in the countries with performing agriculture, a variety not resisting in competition more than 6-7 years. Hybrids are created by crossing inbred lines obtained by self-pollination conducted to show the first generation (F1) the phenomenon of heterosis or hybrid vigor and that manifests itself by obtaining very vigorous plants resistant to a whole range of phyto-pathogenic agents and have a great production capacity. The creation and introduction of hybrids c in maize and sunflower crops led to the accelerated and accentuated increase of the production. The hybrid vigor in the F1 generation is maintained in the next generation (F2) the production potential decreases significantly. In the 2008-2009 crop year average, crop production was as follows: 4200 kg / ha for wheat, 4400 kg / ha for barley; 1800 kg / ha for turnip; 1700 kg/ ha for sunflower and 5100 kg/ ha for maize.

In the 2009-2010 crop year average crop production was as follows: 4500 kg / ha for wheat, 2100 kg / ha for turnip; 1900 kg / ha for sunflower and 5400 kg / ha for maize. In the agricultural year 2010-2011 the average production on crops was as follows: 4700 kg / ha for wheat, 4900 kg / ha for barley; 2400 kg / ha for turnip; 2100 kg / ha for sunflower and 5800 kg / ha for maize.

The total production of crops was determined by performance achieved per unit area and land area. Thus total crop yields were as follows:

- Year 2008-2009 - Wheat 336 t, 352 t barley, turnip 108 t, 136 t sunflower, maize 306 t.
- Year 2009-2010 - 630 t wheat, turnip 168t, 152 t sunflower, maize 324 t.
- Year 2010-2011 - Wheat 376 t 294 t barley, turnip 168 t 126 t sunflower, maize 464 t.

Table 1. Average and total productions in the agricultural year 2008-2009

Crop	Surface		Average production kg/ha	Total production t
	ha	%		
Wheat	80	22	4200	336
Barley	80	22	4400	352
Turnip	60	17	1800	108
Sun flower	80	22	1700	136
Maize	60	17	5100	306
Total	360	100		

Table 2. Average and total productions in the agricultural year 2009-2010

Crop	Surface		Average production kg/ha	Total production t
	ha	%		
Wheat	80	22	4200	336
Barley	80	22	4400	352
Turnip	60	17	1800	108
Sun flower	80	22	1700	136
Maize	60	17	5100	306
Total	360	100		

Looking at average yields and total yields obtained by SC TOMA SRL during the three years analyzed we found out that: the average production of wheat increased by 11.9% in

barley by 11.4% to 33.3% turnip; sunflower and maize by 23.5% to 13.7%.

Table 3. Average and total productions in the agricultural year 2010-2011

Crop	Surface		Average production kg/ha	Total production t
	ha	%		
Wheat	80	22	4700	376
Barley	60	17	4900	294
Turnip	80	22	2400	168
Sun flower	60	17	2100	126
Maize	80	22	5800	464
Total	360	100		

This increase was due to production environments using a seed material becoming more efficient, the use of new hybrid varieties and high production quality, the application of modern technology updated annually to emerging technologies, improved tillage and seedbed consequence of investments in SC TOMA Ltd in modern high-performance and higher returns.

Yields obtained were fully capitalized on the market except wheat crop whose total production was attributed to lessors amount of 800 kg / ha.

Therefore in 2008-2009 in the amount of 336 tons of wheat was sold on the market only amount to 48 t.

In the year 2009-2010 the total production of 630 t to 320 t valued on the retail market. In 2010-2011 the total quantity of 376 t to 88 t value at market. The amount paid annually to agricultural lessees of 228 tons of wheat, grain remaining results were fully capitalized on the market. Summarized the evolution of total output and price recovery. Analyzing these data we find that the gross income of the company increased in 2009-2010 compared to 2007-2008 at the rate of 44.9%. We also found that the main reason for this increase is not included in the price recovery that has varied within a maximum of 21.1%, but in the year by year of the productions obtained.

CONCLUSIONS

The analysis of the profit and loss account reflecting the company's financial activity we easily remark that the company revenues increased in 2010-2011 compared to 2009-2010 with 17.6% while operating expenses reported in the same period by 116.5 %. Going further with the analysis we observed that profits increased at the rate of 18.5%. This allows us to conclude that the company is working in profit, constantly, without jumps, which is the result of a balanced and very accurately applied management. The economic balance is used as a tool for the analysis of the financial and economic activity at the end of each year, in order to characterize the margin in which the project indicators were achieved in the income and expenditure budget of that year and especially to identify stocks used to improve future work. The accounting departments of the patrimonial units can not submit the balance sheet at the General Directorate of Public Finances only under conditions in which the general meetings of shareholders, the boards of directors, the executive management unit analyzed the patrimonial situation of the company and a minutes was made for this purpose containing the findings and the measures.

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THE KNOWLEDGE OF ROMANIAN AGRICULTURE IN TERMS OF SUSTAINABILITY

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Abstract

Agriculture, a key component of the structure of economic branches, should be addressed directly related to the maintenance of natural resources and their exploitation in a controlled way or the enhancement of their own, without resorting to inconsistent stimulus elements that can in time generate dysfunctions in products and the environment. Looking at things from this perspective, there is a need for a sustainable agriculture approach, given its social, ecological and economic representativeness, with active and continuous character.

Key words: agriculture, environment, knowledge, Romania, sustainability

INTRODUCTION

Conventional agriculture, as a big consuming of synthetic products, has led to alarming situations globally. In this context, measures are needed to reduce or even eliminate these effects by managing activities in producing agricultural products and shifting towards cleaner technologies. In this regard, there is need for alternative technologies (ecological) which, besides compliance seasonal crops, take into account the quantity, quality, timing and technique of using inputs.

If we consider the development of conventional agriculture, without neglecting the environmental ones, but aiming to extend it, it should initiate measures so that the negative impact of successive allocations and additional factors on soil, products and generally natural environment. Regardless of the factor used is to consider the exercise a strict control over its administration, doses allocated to be correlated with plant needs and output.

Romanian agriculture has different use categories, mainly being the arable, providing important economic and vegetable products, especially cereal. Cereal is specific character areas Danube, the predominant soil type chernozem and reddish-brown ground is level

with groundwater at 1.5 m depth [1]. The territorial distribution of crops, achieved by zoning, providing favorable environmental conditions for the making of productions with some stability, is based geomorphology, climate and biological formations in relation to plant. The quality and geographical location of land offers a range of practice structure and other crops: legumes, and forage crops, vegetables (in surrounding towns and river valleys), viticulture, fruit growing. Beyond providing natural conditions, it takes knowledge about the application of technology to the climatic conditions and their changes. Differentiation agro works, choosing vegetable production systems, types of agricultural machinery, choice of varieties and hybrids are additional requirements necessary to obtain the effect of sustainability.

MATERIALS AND METHODS

Entrance in ecological and economic competition, alignment agricultural exploitations to these, require, as premise, the development of activities generating performant results. Involved, in this sense, variables from inside and outside the exploitations (market, financial levers, European requirements, environmental

conditions, management and production structure) which, by their nature and intensity, can induce different effects on the development of exploitations. Considering the size of the consequences, some negative, which can create problems, in time, in agriculture, in general state of environmental, is needed the knowledge of the variables which determine their identification, the restructuring actions where is the case, using the methodologies of economics analysis appropriate agricultural exploitations activities. Diversification, as form of the structure of production, is one of the factors which influencing economic and ecological performance of agricultural exploitations. Practiced at various levels, from very large diversification to limit of specialization or more, narrow specialization, depending, of course, by type and form of agricultural exploitations and intensity of production (activities), the diversification can determine the results more or less performance, creating significant delimitation between exploitations with similar activity [3]. Use on production activities only, to meet market demands, in order to achieve an immediately profit, without regard to environmental conditions, as support to obtain agricultural production, triggers, at agricultural exploitation and agriculture level, a big consumption of factors, which generating expenditure unjustified economically and the risks with long-term effect. Therefore, it is necessary to find that degree of production diversification which to ensure the economic and ecological optimum. This requires the orientation agricultural activities to reduce pollution and meet long-term demand for agricultural products, in this respect manifested Romanian agriculture sustainability.

Sustainable development has origins that go beyond economics. "Virtues" takes its multidimensional form, found in the current generations and those to come heaven existential need certainty provided as a long-term commitment. If we approach things, considered natural and explicit "evolution" of the terms of the need for sustainable development, natural resources have left the (limited) and necessities (unlimited)

individuals. Thus, long, natural resources were viewed as simple "but the universe", some without cost, which in time led to their widespread use. There are references to agriculture, which states that "the earth was made in relation to population density 'is recovering later on resource issues, with references to the fact that" the use, non-use or bad use are a direct result of their social and economic organization ". Therefore need reconsideration resources, given that once attracted various production processes generate not only costs but also the possible exhaustion while.

Response to the needs of sustainable development is found in caring for agriculture through practices that support them, time, ability to produce and is recognized role as a vital and indispensable for human existence. In this respect, was crystallized ecological agriculture whose interventions (actions) are close approach to sustainable development: crop rotation, limits on chemical synthetic pesticides and chemical fertilizers, antibiotics for animals, food additives and other substances used complementary processing of agricultural products, prohibit the use of genetically modified organisms, the use of manure, selection of plant and animal species resistant to pests and diseases, adapted to local conditions, breeding in freedom and open shelters and food systems based organic feed. All of these are directly related to the "space" in which have place the activity, ie organic farm, seen as a functional entity to obtain organic products and place for the exercise of management (responsibility center).

This paper is supported by information recognized in the literature and own assessments based on studies conducted derived from the social environment.

RESULTS AND DISCUSSIONS

Correlation between sustainable development and socio-economic environment.

Orientation of agriculture to sustainable development model follows the interdependence of social, economic and environmental issues which can not be seen

independently, their assessments will be analyzed in terms of the effects it produces. Measuring sustainability Romanian rural area is showcased by indicators used by the World Bank and the European Union. One of the most complete list of indicators belongs U.N.Commission on Sustainable Development. This includes a number of 100 indicators covering all aspects of the environment. Some indicators are listed: Human Development Index, which includes: life expectancy, level of education, purchasing power, Wealth of Nations, ecological Footprint. These indicators need to be adapted Romania's economic geography and retrieve the indicators as: income/capita, the use of local resources, the amount of organic products is per capita, the value of tourism activities, the level of education of the rural population, birth and life expectancy, purchasing power. Achievement of the sustainability should be "triggered" in the agriculture. In this way, what is sought is to achieve sustainable agricultural practices on farms.

Are known the types of agricultural exploitations: family farms, farms associative-family associations and agricultural societies, commercial societies for production, commercial societies for agricultural service, societies in the fields of agricultural inputs and marketing..

Production structure practiced in agricultural exploitations is different, broader in the sense of diversification crops or livestock species and categories in case of small units and specialized or specialized narrow (which implies a few branches), in the big farms However, structural, production is distributed according to its determinants, referring mainly to the ecological and economic.

Relation agriculture – environmental (natural).

Agriculture takes resources from the environment necessary for products and it is assumed that this takes place under conditions of knowledge. According to agricultural management science, attracting in the agricultural activity of the natural resources is based on two criteria: economic and ecological. They are designed to respond to

issues of agriculture-environment equilibrium [2].

In interrelation with environment, agriculture: supporting to the environmental protection when it occurs rationally, without "pressure" on it with a high intensity level generated by excessive concentration of production factors per unit area, linking criterion economic (high efficiency and maximum profit) on the ecological functioning prudence in their management (factors). Or can cause adverse effects such as polluting the environment (soil, water, air, products etc.), the principle of rationality not show [4].

Transition to an harmony between agriculture and environment is given by ecological agriculture, which will follow the principles of protecting natural factors (table 1).

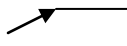
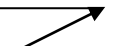

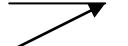


Table 1: Production factors in agriculture

Type of agriculture	Chemicals	Organic fertilizers	Pesticides
Conventional	x	-	x
Ecological	-	x	-

Source : own interpretation

It is easy to see that without allocation of factors with polluting acting (on plants, soil or environment), ecological agriculture is desirable. But there are also elements coming to counteract the effect from economic point of view (table 2).

Table 2: Production costs

Indicators	Conventional agriculture	Ecological agriculture
Material costs		
Production cost		
Total costs		

Source : own interpretation

[^]Line shows cost size

There are differences in the total costs in ecological agriculture, which are much higher than in conventional agriculture. By branch of activity, this level is: cost of seeds, fertilizers, fodder etc. .. Production cost is, thus, much higher in ecological version, even if the

expenses relate to large production compared to that obtained under conventional (table 3).

Table 3: Economic performance in agriculture

Indicators	Conventional technology			Ecological Technology		
	Kg/ha	lei/kg	lei/ha	kg/ha	lei/kg	lei/ha
Average production		↗		↘		
Sale price		↘			↗	
Total incomes	-	-	↘			↗
Profit	-	-	↘			↗
Profit rate (%)	-	-	↘			↗

Source : own interpretation

What emerges as a result of environmental practices, has more economic value than conventional agriculture, it encountered in selling price. The issue is the extent to which it can extend this type of agriculture, given the demand for these products, population, purchasing power.

CONCLUSIONS

- 1)Romanian land resource is remarkable in terms of suitability for different categories of use and degree of favorability for different cultures;
- 2)There are a variety of exploitations, which may lead to the maintenance of biodiversity, under controlled conditions;
- 3)Obtaining conventional products involve large allocations inputs;
- 4)Ecological agriculture seeks to protect the principles of natural factors and products;
- 5)It requires knowledge regarding the allocation of production factors;
- 6)Build environmental and economic performance depend on production, price, competition, consumption patterns.

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NEED TO DEFINE SMALL AND MEDIUM ENTREPRISES AS ECONOMIC CATEGORY IN THE CONTEXT OF EUROPEAN UNION INTEGRATION

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Abstract

Currently with particular attention of small and medium enterprises, whose existence in the economic structure of a country is absolutely indispensable. We know that they always represent a special role in economic and social life of society, being out in the revival of many economies. With the emergence and assertion of small and medium business in economies that are in the process of developing a new phenomenon and a central component of any program of economic reform, accepting a global perspective on the phenomenon, represents an essential condition to achieve a relevant research. A central point of departure in research problems of small and medium enterprises presents how they are defined, comparing definitions, the role of this type of business and health policies in different countries and that type of business impact analysis macroeconomic structure. The fundamental purpose of this research is focused on the development of contributions to the foundation of small and middle business in the context of integration into the European Union.

Key words: *small and medium enterprises, small enterprises, criteria for SMEs, indicators, developing countries.*

INTRODUCTION

Currently, in all countries, especially in highly developed economical countries with a clear and stable legal system, where the market is the sole economy arbiter, where the private enterprise is encouraged, it is considered that the main way of development is represented by the increasing importance and the role of the small and middle business in the national economy. [4]

A developed economy is nothing but healthy enterprises, business oriented to further development, implementation of new technologies and foremost a highly purchasing power consumer. The consumer represents the medium class, which is the private entrepreneur in developed countries, people who owns small and medium business. In the conditions of market relations, the center of business is represented by the company which is the main link of the whole national economy. Namely, at company level, the products are created and the necessary services are provided.

Currently a particular attention is paid to small and medium business, whose existence

in the economic structure of any country is absolutely indispensable. They always played a special role in economic and social life of any society, being the basic revival of many economies.

MATERIALS AND METHODS

For the activity analysis of the define small and medium enterprises on the Republic of Moldova territory I use literature, articles and theses published by different researchers in economics. There was studied the laws of the Republic of Moldova with regard to supporting small and medium enterprises sector that nea made it possible to analyze and generalize the information studied.

RESULTS AND DISCUSSIONS

The first records of small businesses arose 400 years ago, when the bankers lent money by buying interest. Since then the entrepreneurs started to offer their production and services to consumers.

Considering the conditions when, with the emergence and assertion of small and medium

business in developing economies represents a new phenomenon and the central component of any program of economic reform, the adoption of a global perspective on the phenomenon, from triple economy motivation, as well as from the perspective of its existence at micro-and macro level, represents a prerequisite for performing a relevant research.

A central point of departure in the research of small and medium enterprises problems presents the way they are defined, comparison of definitions, the role of such kind of business and the assistance policies in different countries, as well as the impact of such type of business on the macroeconomic structure. At the microeconomic level, the research aimed to analyze the way they are managed, developing and integrated into national and international economic circuit. The fundamental aim of this research is oriented towards contributions to grounding the theory of small and medium business in the context of European integration.

Almost two decades ago major efforts were made to define the SMEs, which raised to about fifty definitions. Some of them are not definitions but discussions around the concept of defining the SMEs.

Richard Cantillon (1680-1734), French economist of the eighteenth century is considered the founder of the small business theory, who introduced the scientific concept of element "entrepreneurship". The classics of the political economy *Adam Smith* (1723-1790) and *Jean Baptiste Say* in the nineteenth century understood the direct link between the small business and entrepreneurship.[18]

Joseph Schumpeter (1883-1950) states that "business is to the economy what blood is to the human body, it moves the entire economic gear in all productive sectors, with major benefits on social and cultural branches." [26] Very actual are the conclusions of scientists of 90s about the role of small business in the economic reforms related to the transition to market economy. [3]

The small business creates a perfect premise for welfare and freedom, especially in poor countries and developing countries. [15] (Levine,1995) Thus, according to the

American economist *Peter Ferdinand Drucker* (1909-2005), "Small business is the main catalyst of economic growth". The small businesses largely contribute to the achievement of the fundamental objectives of any national economy. [5]

In the work "Small business in Moldova: problems and prospects", *Valentina Veveriță* proposes the following definition: "As matter of the small business enterprise can be considered a limited number of employees who have an owner (owners) that hold simultaneously the role of manager (managers) of the company." [24]

According to *Daniela Dascaluic*, the small and medium business is a way to organize the economic activity which is characterized by modest parameters of turnover, personnel, assets volume, etc, that are established in each country through certain definite laws [7].

According to the scientific paper "Development of small enterprises in Ukraine", the researcher *Olga Șamanscaia* states that: "Small businesses are one of the components of commercial-type economic system that provides innovative activity and environmentally sustainable concurrence." [21] *Tatiana Grișcova* argues that, at present, the small business is an integral part of the market system that determines the rate of economic growth, promotes innovation and technology development, insurance and tax revenue accumulation "by creating new additional jobs, thus confirming its effectiveness and durability to the rapid development of market conditions." [13]

The Russian scientist *Vadim Utchin* believes that "the small business as a specific sector of the economy, forms and develops the middle class and represents the key factor for the stability of any society." [22]

The SMEs represent the most numerous and important business sector, having multiple economic, technical and social functions. [10]

According to a broad conception the SMEs are defined as "independent legally and financially entities, active in all sectors, created by a small number of entrepreneurs who are involved in management activities, may be responsible for all functions and have a relatively small number of employees". [11]

Generally a small or medium company is represented by a system usually created by an entrepreneur or a small number of private entrepreneurs where goods are produced, works are developed or services are rendered for sale [4], notes the author.

Svetlana Mironov says in her work that "the company gives legal form and status

and Western European countries they use "small and medium enterprise".

But regardless the used term, the small business can be defined by the following basic criteria:

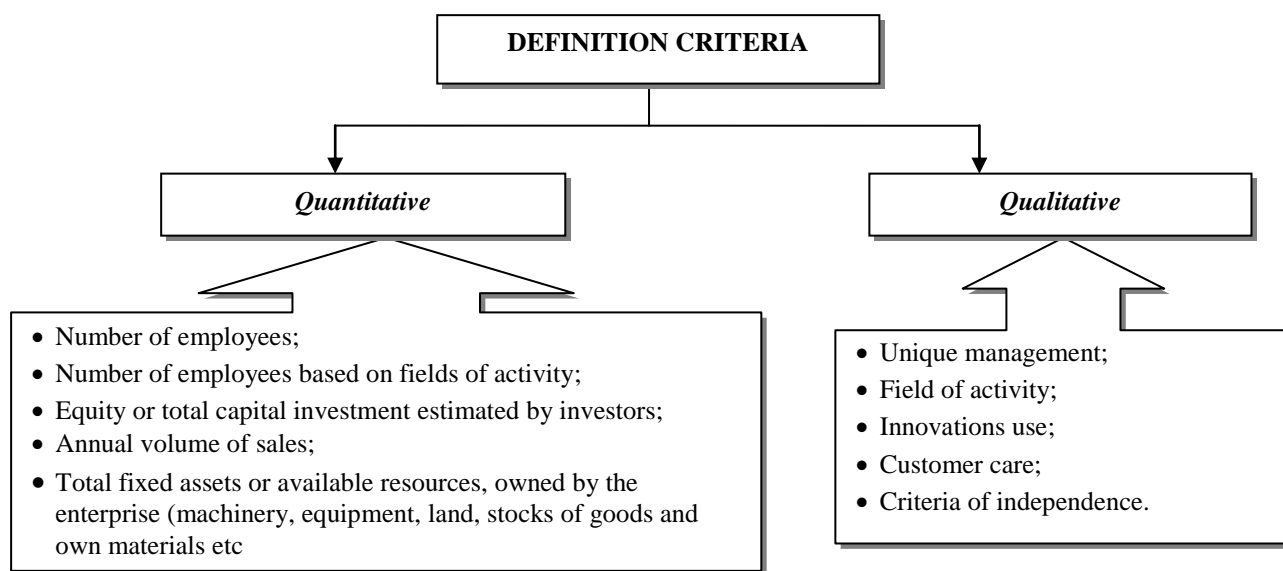


Fig. 1. Small business definition.
 Source: modified by the author [19].

The lack of consensus in determining the unique indicator for defining the SMEs is explained by the fact that none of these criteria allows a complete definition of small and medium business. Also, according to the business, but the business - as an economic activity characterized by various quantitative and qualitative indicators – gives small, medium or large measure to the company.

In its turn, the business shows its dimensional characteristics. Equally the companies engaged in several types of activity (business), their summary characteristics positionates the company as small or medium-sized enterprise "[16].

In economic theory there is no universal definition of small business, as the sole-accepted criterion is lacking, and in practice each country establishes its independent standards, and criteria required by the law, when the business can be considered small. For example in Anglo-Saxon countries they use the term "small business", while in Japan

to these factors that can be easily determined, seen, comparable and accessible, the small business is defined in the Republic of Moldova.[25]

Although there are a lot of discussions on identifying the criteria of the small and medium business, the economic practice requires accurate strictly defined signs, to refer the small business to the category of small enterprise.

In this situation, arising from the local peculiarities and traditions, the national legislation will play the critical role, clearly and unequivocally establishing strict and rigorous criteria to refer the business to SME category.

According to Moldova law, the "Law about SME support" № 206-XVI from 07.07.2006, the SME sector comprises three businesses categories, based on three indicators: number of employees, annual sales volume, value of financial assets.

The classification of SMEs, taking into account the provisions of this law is shown in Table 1.

Table 1. Classification of enterprises in Moldova dependence quantitative criteria

Company	Annual average number of employees (persons)	Annual amount of sales revenue and total value of financial assets, (mln lei)
Micro	1-9	up to 3
Small	10-49	up to 25
Medium	50-249	up to 50

Source: [1]

The small and medium companies are defined by this law according to which it is a business carried out by micro, small and medium enterprises, with less than 249 employees and annual net sales amount and value of financial assets do not exceed Lei 50 million.

In other countries or economic regions of the world, they use different criteria for defining the SMEs as can be seen in Table 2.

Table 2. Criteria used to define the small business in different countries

Country	Number of employees	Turnover	Field of activity	Asset size
Australia	X			
Denmark	X			
France	X	X		x
Germany	X	X		x
Italy	X			x
Spain	X	X		x
Great Britain	X	X		x
Romania	X	X		x
Country	Number of employees	Turnover	Field of activity	Asset size
Moldova	X	X		
Ukraine	X	X		
Russia	X		x	
Japan	X	X	x	
USA	X	X	x	

Source: [19]

In the USA, the definition of small business can be represented in two ways:

- "the small business is an independently owned and managed company, but it can not be dominant in the field in which it operates" [8]

- "the company, where the managers are owners and where the capital is offered also by the owners, belongs to small business area" [9]

Besides other definitions used in the USA, there is one that is based primarily on two criteria:

1 - number of employees;

2 - annual volume of sales, based on fields of activity.

But the small business can not be treated only from the size feature of the company, as in its definition the quantitative and qualitative parameters of the company are reflected.

Among the quantitative characteristics, the most commonly used is the criterion about the number of employees of the company. However, despite the advantages of this criterion, many researchers, including the American *Peter Drucker*, believes that the number of employees "represents only one aspect of the business", but in order to determine the size of the company a set of factors have to be considered, the main ones being as follows: number of employees, sales volume, value added (where applicable), the complexity and diversity of products, the number of markets, technologies complexity, etc.

Table 3. Criteria for defining the SMEs in different countries considering the number of persons

Country	Criteria for SMEs
Ukraine	15- trade 25- non-production areas 50- science 100- production areas 200- industry and constructions
Russia	30-50- trade, services 60- science and agriculture 100-industry, transport, constructions
Belarus	25-other areas 30-other areas of production 50-constructions and trade 60- science and agriculture
Kazakhstan	Up to 50 persons
Kyrgyzstan	15- non-production areas 50- production areas
Country	Criteria for SMEs
Tajikistan	15- industry 50- other areas

Source: modified by the author [2]

The list of quantity criteria and their importance depend on the possibilities of the state to support the small and medium business: the greater possibilities, the higher values of quantitative parameters. In a particular context it might seem the most accurate indicator, but it differs from one country to another[23].

Further we will present the number of people within a company by various fields of activity in some Eurasian countries.

For example, in the USA, the industrial SMEs are considered the enterprises with a staff up to 500 employees, but in most West European countries - from 50 to 500 employees, and in Japan from 30 to 300 people. [14]

Defining the SMEs at European level is facilitated by the fact that the EU law about the SMEs is the same for all Member States.

The main criteria taken into account to classify the companies into one of three categories (micro, small or medium) are: average number of employees, turnover and value of business assets.

Another important factor is that a company which is not a SME can not hold more than 25% of the share capital (or have the voting right) of a small or medium enterprise. If this happens, then the company is no longer considered a SME. [20]

As required by the European legislation, the Table 4 presents the relationship between the type of business and the standard criteria to define the micro, small or medium enterprises.

Table 4. Evolution of enterprises classification in the European Union

Company category Indicators	Micro		Small		Medium	
	1996	2012	1996	2012	1996	2012
Average number of employees, persons	<10	<10	10-49	10-49	50-249	50-249
Annual turnover, (mln. €)	n.d.*	<2	<7	<10	<40	<50
Total assets, (mln. €)	n.d.*	<2	<5	<10	<27	<43
Capital or voting, (%)	25	25	25	25	25	25

*= not defined

Source: modified by the author[4]

In Moldova the definition of SMEs is still different from the European Union one. Comparing the definition of SMEs in Moldova with the European Commission one, we can find that it is identical only in terms of staffing. But we can mention that the company capital which is required for registration is 337 Euro, regardless the classification of the company into one of three categories.

Considering the turnover and total assets, the local definition is restricted, as the maximum

of these indicators is much lower than the limits set by the European Commission.

Table 5. Definition comparison of SMEs between Moldova and the European Union

Company category Indicators	Micro		Small		Medium	
	Moldova	EU	Moldova	EU	Moldova	EU
Average number of employees, persons	<10	<10	10-49	10-49	50-249	50-249
Annual turnover, (mln. €)	<0.187	<2	<1.562	<10	<3.125	<50
Total assets, (mln. €)	<0.187	<2	<1.562	<10	<3.125	<43
Capital or voting, (%)	n.d.*	25	n.d.*	25	n.d.*	25

*= not defined

Source: modified by the author[20]

Studies in the recently acceded countries show that some firms will have to bear costs that can reach up to Euro 500,000 to produce according to the European standards. Neither the just integrated European Union countries were exempted from these problems. The most expensive matters are to purchase technologies to fit the environmental quality standards and the technological conditions themselves. [20]

The bases of the small and medium business in the Republic of Moldova were made in the '80s, when the private business began to emerge and develop after liberalization.

As in the most developing countries, the small business arose as a result of structural reforms carried out during the transition from centralized to market economy, an economy that tends to capitalize the entrepreneurship of private property [19]. The difficulties faced by the developing countries in enhancing and accelerating the entrepreneurship in business, are explained by the fact that the socialism has attenuated the opportunities to have and act in terms of economic freedom [17].

Mentality itself to be free and act in this environment was affected. Therefore during this period of transition, the most important function of small business was to ensure survival of the population in acute crisis

conditions, by allowing more resources of obtaining subsistence.

The Government of the Republic of Moldova perceives the SMEs sector as the creation and development of a modern and dynamic knowledge-oriented economy. This sector of the national economy can make a substantial contribution to the Gross domestic product and exports boost. In a market with strong competition, the SMEs have the ability to react flexibly and quickly adapt themselves to cyclical and structural economic changes. From this point of view, a well-developed SMEs sector can contribute to strengthening the macroeconomic stability and growth in the country, which is a lever for social and regional integration in Europe.

Also, the small business must be viewed in the light of ensuring them with primary products and services.

Literature review allows us to highlight two groups of factors that influence the development of small businesses:

1. external factors, among which the following are the most evident: high tax pressure, high bank interest rates and limited access to financial resources, imperfect legislation and so on;

2. internal factors, including managerial incompetence and lack of experience.

Small business is producing goods and services, generating wealth. This is reason for which they have a central part in any economy. They exist and work in every field, in industry, agriculture, transport, trade, scientific research design.

The small enterprises play a decisive role in the innovative process. They are more receptive to technical novelties compared to giant industrial structures. In this context, the small business offers the following advantages:

-High innovation capacity, manifested not only by the new products but also in the strategy it adopts;

-Lower costs products, due to fixed costs which are inferior to the large enterprises and the more rational distribution of all expenses;

-High productivity level, due to the specialization in products, by-products, technological phases.

Currently the local SMEs get greater influence in the branches, which were among the first to be privatized such as: trade, social services or in the new sectors such as real estate, renting and services offered to enterprises.

CONCLUSIONS

Small business, also called the "backbone of the economy", plays an important role in the development of the national economy based on market principles. Thus, in a strong competition market, the SMEs have the ability to react flexibly and quickly adapt themselves to the economic cyclical and structural changes.

For this reason, the SMEs operators is the mainstay of the economy of Moldova, thereby strengthening the macroeconomic stability and growth in the country by creating the new jobs, stimulating the competition, encouraging the innovation and modern technologies. SMEs have been, are and will be the leading part in revitalization and economic development.

Thus the SMEs' ability to stimulate the competition weakens the monopoly position of large enterprises, reducing their ability to raise the prices. In fact, the latter ones benefit from the services of small enterprises and somehow they are dependent of them. Their ability to respond to local needs through detailed information about the local markets, the SMEs operates more efficiently than the large companies from inner or out the village.

On the labor market, the SMEs produce the largest number of new jobs and having a lower capital cost, use the local resources and labor, they have a substantial contribution to solve the problems of unemployment, which is an important alternative to combat it.

This would also improve and fill in the market niches that are not profitable for large companies, but are real opportunities to the SMEs development, as they use all the local resources (financial, material, information). In Moldova the small business may and can play an important role because the country has a

lot of favorable conditions for its development, such as:

- Within the structure of the economic sectors, formed even before the reform commencement, there were branches with favorable conditions for small businesses (especially - agriculture, food, processing);
- Considering the severe conditions of raw material resources in the country, the small companies easily accommodate to process the local resources and various waste materials;
- The privatization process has revealed a lot of uninstalled machines and devices within the large companies. The small enterprises are usually more mobile, faster and use more efficiently the equipment;
- The small business can absorb a part of the unemployment caused by the reorganization of large companies;
- The existence of a large number of towns and urban places, which have free labor resources, favorable influence the small business development;
- The small and medium enterprises can be easily integrated into a regional industrial network, which contributes, on one hand, to the economic development of the region, and on the other hand, reduces the unemployment and raises the living standards, because they provide jobs; [5]
- The small business can find its niche on the domestic market to fully and differentially satisfy the people demand for consumer goods and various services. [11]

The SMEs vital contribution to the economic growth is now a widely recognized reality. Revealing their economic and social effects has led to considerate the SMEs sector as an area of strategic interest for the economy.

By their specific flexibility, innovativeness, speed of response, the SMEs tend to be the only compatible companies within an increasingly dynamic and complex environment, contributing to the economic progress of the society.

So the small and medium enterprises offer real opportunities to implement the creative skills of the entrepreneur, his/her inventiveness and capacity for leadership,

very necessary and useful qualities. Certainly, the small business is the "engine of innovation and modernization", where individuals achieve their aspirations and successfully use their talent and creativity. [6]

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PASTORALISM AND THE ROMANIANS HISTORY

2. PEOPLE, LANGUAGES, GENES AND THE LOCAL SHEEP BREEDS, IN NORTH-EASTERN BLACK SEA STEPPE

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Abstract

In 17 guberniyas of the former Russian Empire of 1740-1812-1918 years, was identified (1912-1924) some 7 breeds of the Romanian Walachian phyletic group, of sheep breeds and in some guberniyas the Romanian Tsigai breed. It seems that from the present Moldavian Republic to the rivers Bug and Dnieper the sheep production was of sedentary type, connected with some local Romanian inhabitants. It see also that over the Dnieper the breed presence was connected also with the transhumance practiced up to 1918 by the Transylvanian Romanian transhumance shepherds, some of them organizers after 1918 Romanian of sheep breeds association in Crimea and North Caucasus area. The official statistics from 1925 year registered in the former SSSR (without Bessarabia) some 259,324 Romanians. Different historical sources estimated a higher number (1.2 million, 600,000 just in Siberia) A possible explanation of founded sheep and man presence in this area can be the fact that it was the antique borderland between Thraco-Dacia and Scythia border, and the Walachian (=Romanian) sheep were the sheep of Thraco-Geto-Dacs, Romanian ancestors. Transylvanian transhumance and Romanian from SE Romania introduced later Tsigai in North Pontic, this breed being introduced later by Roman in Carpathian bend.

Key words: ethnogenesis, immigrant, indigenous, pastoralism, shepherding, transhumance

INTRODUCTION

The Wallachian sheep are raised on a wide area which includes 17 districts in South and South-East Russia, starting from Bessarabia up so South Ural” present day South Ukraine and Southern Russia)

M.F.Ivanov 1924

In 641 the official language of the former East Roman empire changed from Latin to Greek. The former vanquish able became vanquisher, **the East Roman Empire become Byzantine** and the area was invaded by aggressive migratory people. The Roman, Latin inhabitants of the former East Roman Empire have **disappeared from the history as Romans and appeared, after some 400 years as Walachians**. The main place of long-term **ethnic salvation** for them were the refuges, the marginal, isolated places, such as the mountains, forests, meadow and even the steppe, where **shepherding was a major occupation for subsistence**. The north-Pontic steppe, place of invasions, was seemingly such a refuge. Iorga was probably right that

Romania was a Carpathian sheepfold in the way of wolves. The former Romans contributed and still do, not supported by the Romanian state, as Cavalli Sfoza (2000), Matley (1968) and others demonstrates, to the ethno genesis of the SE Europe people. That is the explanation of attention given by “Romanian and foreign scholars, historians, philologists, linguists, ethnographers, sociologists to pastoralism (I. Rusu). Hence the synonymy of the notions of shepherd and Walachian, which existed in the Greek and Serbian languages, the malicious speculations of the Tzar Nicolay II that “Romania (“Walachia”) is neither a nation, nor a state, just a profession”; hence the attempts to mistake transhumance for nomadism or for migration, with the clear purpose to contest the rights of the Romanians to a country, or at least of ethnic minority, hence the trend to change the name of the sheep breeds from SE Europe – a proof of the presence of Romanians as indigenous people.

The Romanian pastoralism was the object of many studies, but perhaps sometimes

subjectively or insufficiently presented by some historians. We mention as important studies the research of S. Opreanu (1931) and N. Dragomir (1938) on the transhumance of the Romanian shepherds to southern Tsarist Russia, which should have been compulsory in the animal husbandry list of references. They supplied documentation to Muller (1938) for his classical transhumance map in Europe, map continued by Braudel (1985) and Grigg (1974) Drăgănescu (1995 2006). Botzan (1990, 1998) also showed the real routes of transhumance and an imaginary transhumance travel. Golopenția et al. (2006) identified east of Bug River numerous cases in which the Romanians have preserved their language, or at least their traditions. Dolha, Wikipedia synthesized many interesting historic aspects connected with the presence of Romanians in the Transnistrian area, which is in North Black Sea area. The complication of all these studies was that their authors were not familiar with the problems of sheep production (breeds, management, products etc.).

MATERIALS AND METHODS

After we analysed some aspects of shepherding, sheep breeds and people in the Balkans, the longest Romano-Thraco-Iliro-Greek admixture, the purpose of this study is to continue the studies based on documents and discuss some aspects of pastoralism, sheep breeds, people, language, genes, in the north-Pontic steppes, as the presence of Romanian shepherds, Romanian sheep breeds, was noticed in this area and in antique borderland between Thraco-Geto-Dacia and Scythia.

RESULTS AND DISCUSSIONS

Some geographical, historical and genetic information on the NE Black Sea steppe
The NE Black Sea steppe includes the coastal area from the Dniester River perhaps to the Dnepr even Don river. The area was for some millennial in antiquity a borderland between Thrakia (Dacia) and -Scythia, and a gate for Middle Ages entrance in Central Europe. It is

noted (Wikipedia) that the Tyragetae (a Getae Thracian tribe) inhabited the area around the River Dniester (called "Tyras" in ancient documents) and from 56 AD, the Romans occupied the coastal area around the city of Tyras for nearly four centuries.

Considered by Braudel (1985) as seemingly uninhabited, the settlement in the NE Black Sea is older than any recorded historical document. Really a lot of turmoil quoted by Dolha and mentioned in Wikipedia (occupied by Moldavians, by the Tartars, by Turks, the uprisings of the Slavs, whose groups of soldiers also included Moldavians). The residents whoever they were, needed food and the old local sheep breeds can give some indications on the real old local inhabitants. The incoming of the Russians who occupied with military forces in 1740 the area between the Dnepr and the Bug, occupied Crimea in 1772, arrived on the Dniester in 1792, occupied in 1812 half of the Moldavian country (Bessarabia (1812), imposed systematically their language to settlers and local people and assured some political stability and more information, perhaps with some subjectivity.

The paleogenetic research of the human's populations from the area can reveal interesting aspects. It seems however that the Romanian scientists do not pay enough attention to this subject, fact who support some incorrect historical speculations. "In comparison with other European ethnic groups, it is comparatively hard (Andrada Dacian 2012) to find detailed data on Romanian DNA". Nevertheless, she find the following estimates for the frequencies of Y-DNA haplogroups among Romanian people: 7.4% E, 5.6% G, 22.2% I or I2, 5.6% J, 20.4% R1a, 13% R1b.

"Haplogroup I is also common in Bosnia and Herzegovina, in Serbia, in Croatia, in Sardinia, and in Scandinavian countries. Some of these peoples, especially Sardinians and Serbs, are believed to primarily descend from among the earliest European settlers, prior to successive waves of new immigrations from the Near East.

Haplogroup **I2a1b** is found in especially high frequencies in northeastern Romania,

Moldova, and central Ukraine.

She tried to parse out **ethnic Romanians** in Family Tree DNA's "Romania" group. As far as I can tell, for non-Jewish non-Hungarian non-German non-Roma ethnic Romanians their **Y-DNA haplogroups include E1b1b1, G, I1, I2a, Q, and R1b1a2**. This is in line with the expectations from the frequencies above. Their **mtDNA haplogroups include H, H7, I, J, K1c1, M, U4, and U5**.

For some studies of Romanians we note the followings.

Alexandru Varzari (2007) et al performed an analysis of 12 binary autosomal markers in samples from six Dniester-Carpathian populations: two Moldavian, one Romanian, one Ukrainian and two Gagauz populations. The analyses allowed a distinction between Balkan-Carpathian (Macedonians, Romanians, Moldavians, Ukrainians and Gagauzes) and eastern Mediterranean (Turks, Greeks and Albanians) population groups.

G. Cardos et al (2004) performed an analysis of *skeletal remains of some old Thracian populations from SE of Romania, dating from the Bronze and Iron Age in order to show their contribution to the foundation of the modern Romanian genetic populations.* [...] Computing the frequency of common point mutations of the present-day European population with the Thracian population has resulted that the **Italian (7.9%), the Albanian (6.3%) and the Greek (5.8%) have shown a bias of closer genetic kinship with the Thracian individuals than the Romanian and Bulgarian individuals (only 4.2%).** [...] So far they just supposed, that the old Thracian populations would have been able to contribute to the foundation of the Romanian modern genetic pool and supposed that more mtDNA sequences from Thracian individuals are needed in order to perform a complex objective statistical analysis.

Rodewald et al. studied the genetic relationships at mitochondrial level, old human populations from Romania who have shown closer genetic relationship to Turks of Thracian origin, while modern Romanians were closer to modern Bulgarian, Italian, Greek and Spanish

A study of six Dniester- Carpathian

populations ("Moldavian", Romanian, Ukrainian Gagauz), compared with the Southeast Europe found small genetic differences between them. The observed homogeneity suggests either a very recent common ancestry or a strong gene flow between them.

Concerning the local sheep breeds, about which we will speak, we note that the Walachian is a Thracian sheep, introduced there some two millennia BC from Mesopotamia, where it was supposedly created some two millennia earlier. Walachian breeds, that is Romanian, group of sheep breeds was named in literature Zackel, the German name of. Corkscrew Horns Walachian breed.

Local sheep breeds in north-Pontic are-Romanian breeds

Studying the animal production of 19th and 20th centuries in the south-western steppes of Ukraine, **Borinevici (1925)** shows that in that area he identified the following sheep breeds:

Voloh (Pârnaie)*, Țsigai, Țsușcă (or Moldavian, as Dobrohotov said), Karakul, Merinos etc. Table 1 shows their proportion in the former Odessa district of that time, which actually included parts from several others former districts (Cherson, Tavrici, Podolsk). The great scientist P.N.Kulešov (1922), cited by M.F.Ivanov (1924) had drawn attention to the fact that actually, the correct name of the Voloh sheep is Walachian, and the Moldavian Țsușca is clearly included in Romanian Tsurcana (Walachian) breed and, Borinevici attested that it arrived, same as the Voloh sheep, from Bessarabia. **It is obvious that the Walachian, Țsușcă and Tsigai are Romanian breeds and, they were not raised only in Odessa district only.**

The **Voloh, (Walachian)** breeds shows clearly that they were Romanian. The Oxford dictionary shows that Wallach is a "member of a population speaking Romanian, population widely spread in south-eastern Europe, mainly in Romania, normally known today as Romanians". By an elementary mistake, which the scientists don't understand, or don't want to understand, these sheep breeds are called Zackel.

Table 1. Proportion of the Romanian sheep breeds and the stock of sheep in Odessa district in 1923 (data by A.A. Borinevici 1925)

District	Total number of sheep*	Breed, %				
		Tsigai	Ciușca	Wallachian	Total Tsigai + Ciușcă + Wallachian	Other breeds (Merinos, Karakul)
Total Odessa Gubernia	155 504	2.78	45.27	19.54	67.89	32.11
Bălți**	23 355	0.58	71.93	2.62	75.11	24.89
Zinoviev**	33 256	0.20	78.61	6.44	85.25	14.75
Pervomaisk	11 407	-	14.89	17.56	32.45	67.55
Odesa	13 631	17.17	47.86	24.17	89.20	10.80
Nicolaev	26.052	3.02	54.36	20.04	77.42	12.58
Cherson	42 803	2.29	3.43	40.79	46.51	53.49

*of the total 812 027 sheep recorded at the 1923 sheep census

**included probably between 1925-1940 in the former Transnistrian Moldavian Republic which existed at that time within the USSR.

Zackel is the German for the name which Linnaeus gave to a breed from another phylogenetic group of breeds, *O. a. strepsiceros*, (*strepsiceros* = zackel = straight, pointed horns), the sheep which Buffon, then Darwin called Walachian, correctly named Corkscrew Walachian (Valașca Vitoroga) by the Serbians, wrongly named Rațca (Racka) by the Hungarians and Romanians, which means Serbian and which belonged to the group of sheep descending from the former Egyptian sheep.

Stimulated by the quality of the „Voloh” sheep, which he had seen at the Imperial agricultural exhibition from 1912, M. F. *Ivanov conducted extensive research on this breed*, publishing an article (1924) and a monograph. He found that the breed was raised in 17 districts from the south and south-east of the former empire and it had **5 sub-breeds** described in 1950 (also in the Romanian edition of his book). The districts with the largest number of Walachian sheep were: *Herson, Tavrig, Ekaterinoslav, Don, Voronej, Stavropol, Astrahan, Cuban. Lower stocks were found in Orlov, Harkov, Kursk, Riazan, Penza, Tambov, Saratov, Samara, Oremburg*. The Walachian breed has been replaced by absorption with the Merino in almost all its former area. It is presently reared only in Northern Caucasus (Dimitriev and Ernst 1989). Șoimaru (Reniță 2006) shows that even in our days in the Krasnodar area from this region there are 8 villages inhabited preponderantly by Romanians.

Other two breeds for leather from Ukraine - **Sokolki** (brown + black) and **Reșetilov** (black), from the regions of Poltava, Harkov and Dnepopetrovsk are presented as resembling to Țușca, therefore to Țurcana, originating probably from brown and black Țurcana sheep existing in Romania too. The Sokolki sheep display chronic tympanum disorder in the homozygous lambs (Dimitriev and Ernst 1989). **Cooperation with Ukraine would probably be useful to preserve the Romanian brown and black Țurcana sheep, as well as the Grey Steppe breed.** The new breeds, Mountain Ukrainian and Carpathian Ukrainian are obviously, with changed names, the Maramureș Țurcana and Bucovina Țurcana.

The five “types” of Walachian sheep presented by Ivanov were clearly different in terms of development and body conformation, economic features. There are two factors which explain this variation: 1. Țurcana breed of sheep is not a uniform breed, an actual breed, rather a complex of emergent breeds (Drăgănescu 2004); 2. In Russia it evolved influenced by selection and by the cross with some local breeds, as mentioned by Ivanov too. The “purest” type, according to Ivanov, is the steppe Walachian sheep, which was reared mainly in North Caucasus, Don, Astrakhan, being presently conserved in North Caucasus. The Russians also use the Romanian terms for some dairy products („brânză”, ”cașcaval”), and sheep milking in the north-east Pontic area has been introduced and practiced just by

the Romanians; the author, who was wearing in 1949 in Russia a homespun suit was surprised by a North Caucasian Russian who recognised the fabric as being homespun, saying that in his village they produce exactly the same fabric (mixture of white and black Tsigai wool)

How and when did the Romanian breeds arrive to the North-Pontic steppes becoming autochthonous breeds?

“The flow of colonists arrived here, in the southern steppes, from north and west. Different sheep breeds came along with the people”

.A.Borinevici, 1925, p 71

Ivanov (1950) said that “The Walachian sheep descend from the thick tail sheep brought to southern Russia from Asia, more than sure through Wallachia. This explains the name of the Walachian sheep (p. 163). The great scientist has two flaws in his statement. First, the sheep descended from the long, thick-tailed sheep (*o. plathyura*), but they actually belong to *dolichur* sheep, with long, thin tail. The second flaw is that he avoids saying **how, by whom and when have the sheep been brought** (they didn’t come by themselves!). Logically speaking, the Walachian sheep (“*Voloh*”) is called so, because it came, as Kulešov says, cited by Ivanov (1924), from Asia through Wallachia (the 5th edition seemingly avoids to say „through Wallachia”), because **it was the sheep of Wallachian people**, who lived there before other people who came later. Borinevici (1925), wrote that the Wallachian sheep came from Bessarabia, and Dobrohotov wrote that it “had unknown origin”. If the Walachian breed would have arrived to southern Russia after the empire was installed, it is very probably that he Russian scientists would have known its origin.

How did the Romanian breeds arrive to the North-Pontic steppes?

The explanation of the presence of the Romanian breeds in the north-east Pontic steppes might be a triple one: (1) importation; (2) transhumance from the Romanian countries and (3) presence of Romanian inhabitants in this area from ancient times. The first hypothesis is dismissed from the beginning. There were no imports of Țurcană

and Țigaie sheep in the **former Russian empire, which came to the area only in the 18th and 19th centuries (it occupied Crimea in 1772 and arrived on the Dnister in 1792)**. We are left with the other two hypotheses.

Transhumance. Transhumance, the spectacular and efficient system of animal production, sheep mainly, presented for the first time by Varro (116-27 B.C.), was clearly practiced by the shepherds from the 4 centres from the Southern Carpathians (Mărginimea Sibiului, Bran) and from the Bending Carpathians (Săcele, Covasna-Brețcu) towards Crimea, North Caucasus (Opreanu 1931, Dragomir 1938, Botzan 1996, Drăgănescu 1997 ș.a.).

The sheep herds crossed the Carpathians, crossed the Prut at Galați-Reni, crossed the Dnester at Tighina, the Bug at Nicolaev, the Dniepr at Cherson, entering Crimea; from there they were travelling on the shore of the Azov Sea through Taganrog, Rostov towards the Caucasus (Krasnodar, Terek) and Volga (Astrakhan). The travel from Bessarabia to Crimea took about 25 days, and from Crimea to Astrakhan about 6 weeks.

Opreanu (1931) estimated that each year, about one million sheep were wintering in Crimea, and at the mouth of the Dniepr, some 300 herds. The village of Poiana Sărată only, had 30 sheep herds in Crimea. A shepherd from Sibiu, who moved to Mosdok in the North Caucasus, had about 40,000 sheep. The Țigaie sheep arrived early from the Bending Carpathians to the Romanians from the north-east Pontic steppes, where it was noticed by Borinevici (1924). It was further introduced in Crimea and in the Northern Caucasus by transhumance, by the shepherds from the Bending Carpathians. **The arrival of the Tsigai sheep to Crimea and North Caucasus is clearly depicted by Opreanu, but not by Ivanov (1928 p 226). Here is what Ivanov says:** “The Tsigai sheep from Crimea were brought by the Transylvanian shepherds from Romania, shepherds who, before the First World War, were coming here each year with their sheep herds from Transylvania and were grazing on the pastures from the Iaila Mountains, leased from the Tatars.



Fig. 1 Transhumance routes in the Mediterranean Basin (Muller 1938, cited by Braudel, 1966, (1985, p182), Grigg-1974, with some corrections by Drăgănescu-1996 for the transhumance centres from Romania and for transhumance towards the N-V

Late in autumn they were returning to their country with their sheep. Some of these shepherds were wintering here, leasing hill pastures from the Tartars. The 1914 war, which started in summer, caught them in Crimea. They had to remain in Crimea and keep rearing sheep there. When the pasture area from Crimea narrowed because the region was colonized, part of the shepherds moved to northern Caucasus. The experimental station from Ascania Nova bought 100 Tsigai sheep from a Transylvanian shepherd”.

The Romanian shepherds had to **organise associations in the newly established USSR**. In 1929-1930 there were 6 Romanian associations in Rostov on Don, for the Northern Caucasus, Salsk, Poltava, Taganrog, Mariopol, Simferopol, some Romanian-Russian associations in Krasnodar, Stavopol, Borozdnica etc and a Union of the Transylvanian Shepherds in Crimea. In 1929, this Union was liquidated and together with the sheep confiscated from other shepherds (Socolov 1960, p. 154), the authorities have established the first elite sovhoz for Tsigai sheep in the former USSR, Sovhoz No.8 Orlov, Rostov Region.

Existence of Romanian inhabitants in the north-Pontic steppes

The second hypothesis regarding the penetration of the Romanian sheep breeds in

the north-Pontic steppes is the existence of an old Romanian population in this area, as suggested by Borinevici (1925), Opreanu (1935) and documented by Golopenția (2006). According to the 1925 census studied by Olsiewicz (1930), **there were 259,324 Romanians, the third minority as population, after the Jews (1,576,769 and Germans (393,924)**. As shown in Table 2, they were living mainly in the rural area of the southern steppes (244,831) in the North Caucasus (10,108) and in the Donet Basin (9,328). Some researchers (Smochină, 1939; Diaconescu, 1942) consider that the 1926 census actually underestimated the number of Romanians, which they estimated to about 1.2 millions in the former USSR. They had given the figures of the 1773, 1834, 1897 and 1900 censuses, which were showing larger Romanian populations in some areas. Șorban (2001) estimated that there were 600,000 Romanians in Siberia! The Romanians living in this area didn't enjoy the minimal rights of a national minority. The author had met a Russian in Harcov, whose name was Niculescu.

Moment of the Romanian shepherds spreading in the north-Pontic steppes Oprean (1931) considers that the Romanian shepherds had spread in southern Russia a few centuries back, being the first inhabitants of the north-Pontic steppes.

Table 2. Romanians registered in 17 December 1926 census in URRS (Olsiewicz, 1930)

Republic, Area Region, Raion	Romanian in area:			Republic (Raion)	Romanian in area:		
	Urban	Rural	Total		Urban	Rural	Total
Rep. Ucraina	12230	248536	259324	Reg. Voronej	26	236	256
Polesie	119	44	163	Rep Aut. Crimea	233	545	778
Wright Dnepr	1107	1576	2683	Reg. Caucazul de Nord	647	9461	10108
Left Dnepr	241	2 292	2533	Rn Marea Neagră	140	6098	6238
South Step	9929	234902	244831	Rn. Kuban	224	2472	2696
Mold Aut. Rep.	6260	166296	172556	Rn. Armavir	52	148	200
Rn. Zinoviev	1706	21345	23051	Rn. Maiacop	10	172	182
Rn. Pervomaisk	60	14754	14814	Rn. Terek	41	113	154
Rn. Odesa	1225	15350	16575	Rep. Aut. Cerkeză			184
Rn. Nicolaev	523	13585	14113	Rep. Aut. Daghestan	123	426	549
Rn. Melitopol	26	1730	1756	Reg. Stalingrad	20	144	164
Rn. Mariopol	56	1374	1430	Reg. Saratov	11	50	61
Reg. Zaporoje	221	1007	1228	Reg. Central Volga	66	83	149
Reg. Bazin Donet	613	8715	9328	Reg. Samara	20	32	52
Reg. Briansk, Kursk	36	30	66	Reg. Orenburg	15	45	60
				Reg. Volga inferior	53	218	271

*Romanian, Moldavian, Wallah

This assertion cannot rely, however, on the tradition from the *Mărginime*, according to Dragomir, (1938). There are no written documents showing the moment when the Romanian sheep and shepherds had penetrated the north-eastern steppes. The fact is normal for an area which experienced a lot of turmoil (occupied by the Tartars, Turks, the uprisings of the Ukrainians, whose groups of soldiers also included Moldavians, the incoming of the Russians who occupied in 1740 the area between the Dnepr and the Bug and the Bug-Nistru area in 1792). The area was seemingly uninhabited, as Fernand Braudel (1985), noted. He wrote: (in the 16th century) “southern Russia was a deserted area crossed only by the nomadic cohorts of the Tartars from Crimea who were also riding towards northern Caucasus, towards the banks of the Caspian Sea and towards Moscow, which they had burned in 1572...”. However, it was not possible to be a deserted area. Both the tartars and the Turks, and the Russians later, needed something to use the local vegetation and to supply food, sheep meat, particularly. Obvious, this someone, were the Romanian shepherds living in this area, but there was no interest to mark this even in history. **The Russian-Polish treaty of 1577 allowed the Romanian shepherds to cross the Dnistru River and graze their sheep herds on the north-Pontic steppes. As Cantemir wrote**

(1716), the Turks had forbidden the Tartars to take the Moldavians in slavery. The Russian scientists do not name the transhumant Romanian shepherds “Wallachians”, rather “Transylvanians” which means that the term of Wallachian for sheep was used before the 1800s. This term was used in the Genovese strongholds from Crimea (Caffa, Gota, Mangup 1270-1475) to indicate not only their defenders, but also some of their inhabitants (Brun 1 Among the few historic documents which provide data on the beginning of the Romanian presence in the north-eastern Pontic area are information regarding: (1) the Romanian names existing in the registers of the Genovese notaries from Crimea in late 18th century (Brătianu 1925-1999 p.15); (2) the data regarding the Romanian soldiers recruited from the Transylvanian shepherds, who defended the Caffa garrison in 1463-1470 (Meteş, cited by Botzan 1990, p 102); (3) the soldiers of Ştefan the Mare who defended Caffa, Mangupul (1475); (4) existence in the documents from Caffa stronghold from Crimea, in 1290, 1496, 1470, of several Romanian names, probable (879) of Transylvanian Romanians, because they were recorded as Hungarians. (Brătianu 1925..1999); a chronicle of Nestor in the 10th century cited a state of the Bolohoveni (Volohoveni) in the area of Kiev, Volhinia-Podoli, destroyed in 1241 by Danil

Romanovici, lord of Kiev (Smochină 1939). The Kazakh army from Ukraine used a large number of Romanians; among the 15 deputies of Bogdan Khmndnitski were Toader Lobodă, from Pereislav, Nestor Puşcaru from Poltava, Burlă from Gdeansk, Pavel Apostol from Mirhorod, Dumitraşco Race. One of the lad rulers from 1577 was named Potcoavă. During the rule of Duca Vodă (1681) the area of Ukraine on the right of the Dnepr was incorporated in Moldavia (Iorga 1913, cited by Smochină 1939). The co-habitation of Cumans and the Romanians between the Don and the Dnepr, in the 12th century (H. Stahl) is another fact that can contribute to the clarification of the ancient presence of the Wallachian sheep in this region. We add the opinion of Scepkín, cited by Kuleşov (1860, p.140), according to whom, the “Tsiagi sheep existed in Russia before the Merino sheep have been brought in”, therefore, before 1802. Among the **animal husbandry facts** which argue in favour of the ancient presence of the Romanians in the north-Pontic area are: 1. The large number of “Voloh” breeds formed in the north-Pontic area and their wide dispersal (17 districts) **presumes several centuries of existence in those areas of their owners, whose name they bear**; the transhumant shepherds from Sibiu didn’t recognize at the end of the 19th century, as Dragomor notes, in the “voloski” sheep the Turcan, Walachian sheep from Romania, and they called them “Russian sheep”. That means that this Walachian breeds were created in Russian area much before 19th century, there was enough time to genetically modify them, if initially were similar to the 19th century Sibiu sheep, or they were from their introduction different from the Sibiu Woloshian (Tsurcana).

2. The number of Tsigai sheep was much too large if the breed was introduced just after 1812 year, when the transhumance shepherds were granted officially the permission to pass the new borders of Russia, when they occupied Bessarabia. In 1894, Kuleşov (p.129) estimated that in Russia there were about 700,000-800,000 Tsigai sheep. The first Russian work on the Tsigai sheep was

published before 1900 (Dereaghin H.H. Ţigaiskie ovşevodstvo ed II-a1896). All these facts invalidate clearly the more recent statements according to which the “Tsigai sheep have been imported from Romania in 1914 through the Transylvanian shepherds” (Dimitriev and Ernst 1989), showing, at least, a poor documentation of the authors. The Tsigai sheep had entered Russia no later than the moment Bessarabia has been occupied (1812). In the counties from southern Bessarabia, as Scepkín (1860) wrote, cited by Kuleşov, “there is no village or even household without Tsigai sheep”. The Tsigai sheep were not reared in Bessarabia only. Also Scepkín indicated their presence in the districts of Herson and Tavrici, being reared by Bulgarians (?) and Moldavians, while in the “households of the Russians this breed is hardly accepted”. It is therefore possible that the Tsigai sheep had entered the southern steppe of Ukraine even before 1812, brought in by the western “colonists” mentioned by Borinevici.

Toponymy The old name of the places and breeds may show, as Brătianu (1988) mentioned, situations in which a people comes in place of another people, or situations in which the language of part of the population ends by assimilating the language of the other part of the population. Such situations might exist in the north-Pontic Toponymy. This matter is not an easy one because the old toponymy is usually wiped out.

CONCLUSIONS

It is perhaps correct to think, as Cavalli-Sforza (2000) did, that actually the **language sometimes extended by the force of domination**, as it was done in SE Europe, doesn’t actually document the people, its genes, its ethnogenesis. It is possible that the differences between neighbouring nations are much smaller genetically than linguistically. It is also possible that the Romanian language had been spoken also in many others area of the North Sea steppe, not just in the former Moldavian Transnistrian republic of years 1925-1940. Despite the deliberate action to

wipe out the Romanian language, it still exists, as Șoimaru noticed and as Golopenția (2006) clearly demonstrated. Iorga was right to say that we have conquered land with our sheep, but we not able to keep it politically.

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ENERGY EFFICIENCY POLICY IN MOLDOVA

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Abstract

Energy is the dominant factor that determines the country's welfare and influences all activity segments of society. To achieve continuous and sustainable economic development, energy sources must be adequate and safe, reasonably priced and ensure economic competitiveness of the country. This article will examine the essence of energy policy, stages of development and perspective directions for Moldova, oriented towards joining the European Union and cooperation with the CIS countries.

Key words: competitiveness, energy policy, energy sources, sustainable economic development

INTRODUCTION

Fuel and energy sector (resource base). At present, Moldova has no deposits of fossil fuels. It is the fact that energy economy of the country is based on imported fuel and hydropower resources. The country has significant renewable energy sources that are

used in extremely small scale. One of the main sources of national fuel supply biomass resources are provided with wood and agricultural waste [5]. In the table below we will present the historical evolution of the energy sector in Moldova.

Table 1. Historical evolution of the energy sector in Moldova

Electricity sector			Gas sector	
1997 year State Owned company "Moldenergo" was unbundled into:			2000 year Privatization:	
Generation: JSC "CET-1 Chisinau", JSC "CET-2 Chisinau", JSC "CET-Nord Balti"	Distribution: JSC "Red Chisinau", JSC "Red Nord", JSC "Red Nord-Vest", JSC "Red Centru", JSC "Red Sud"	Transmission and central dispatch: state-owned enterprise "Moldtranselectro" which acquired all other assets and activities of the state owned company "Moldenergo"	Spanish company "Union Fenosa" aquired 100% of the share capital in three distribution companies, namely JSC "Red Chisinau", JSC "Red Centru" and JSC "Red Sud"	
			The Russian-Moldovan joint venture JSC Moldovagaz: <ul style="list-style-type: none"> • 50% - of its shares owned "Gazprom" of Russia • 36,6% - by the Republic of Moldova • 13,4% - by the Transnistria region (now belong to Russia) 	

* The electricity system in the Transnistria region is operated by Dnestrenergo company, with headquarters in Tiraspol. Dnestrenergo includes Eastern electricity networks in Dubasari city, South Eastern electricity networks in Tiraspol city and the Dubasari Hydro Power Station Source: [2]

Table 2. Forecast expenditure for the energy sector (2013-2015)

Program/sector	Total public expenditure (thousand, lei)		MTBF (thousand, lei)		
	2011 executed	2012 approved	2013	2014	2015
Policy development and management in the energy sector	852,1	1352,3	40408,7	32580,6	60441,8
Development of national system of gas supply	2938,7	6940,8	19000,0	65014,0	-
Electricity sector development	74,9	10919,3	106702,8	337656,5	551114,8
Thermal system development	-	9000	4743,2	-	-

Source: [6]

Expected results of the energy sector development will contribute first of all to the achievement of sustainable development of the national economy, implementation of the new economic paradigm based on "investment-export" under the country's industrial development policy, poverty reduction by increasing energy access for the population, reducing dependence on energy imports and strengthening energy security.

MATERIALS AND METHODS

The paper presents study results based on the methods of statistical analysis of time series; induction and deduction and historical modeling.

RESULTS AND DISCUSSIONS

This section presents an analysis based on the methodology presented above.

Given the strategic vision of energy sector development "*Creating a competitive and efficient energy complex that will ensure all consumers with qualitative energy resources, accessible and reliable*" by 2020, it will be possible to achieve two strategic objectives: to ensure energy security of the state and increase energy efficiency.

By implementing these strategic objectives in the energy sector, the state assumes responsibility to carry out following: the integration into the regional energy market; the development of the transportation energy interconnections and integration into European energy system, as well as reduction of the energy intensity in residential, industrial, transport and agriculture, modernization of energetic system (production, transport and distribution) raising awareness on the need to save energy [3].

First step towards addressing sectorial issues was forwarding state policy as a new vector toward efficient use of energy resources, including renewable energy, also the establishment of the Energy Efficiency Agency (EEA) by reorganizing National Agency for Energy Conservation.

We can also mention the programs and strategies of Moldova related to energy such

as *Moldovan National Development Strategy 2008-2011; Energy Strategy of the Republic of Moldova until 2010; Energy Strategy of the Republic of Moldova until 2020; National Program of Energy Conservation for 2003-2010; National Energy Efficiency Program 2011-2020;*

At the moment, Moldova has signed five international agreements such as: Energy charter treaty; Energy community from 2010; The United Nations Framework Convention on Climate Change from 1995; the Kyoto Protocol from 2003; the Copenhagen Accord and the 2010 Cancun Agreement.

In this context, we will evaluate and compare values of national and European energy intensity, which is presented as an energy resources efficiency indicator.

Table 3. Analysis of energy intensity in RM and UE

Year	2009	2010	2011	2012
Energy consumption, ktep	2191	2071	2209	2200
GDP, thousands €	4114 784	3892 479	4381 185	4837 773
Energy intensity RM, tep/1000 Euro	0,533	0,532	0,504	0,455
Energy intensity UE, tep/1000 Euro	0,167	0,165	0,160	0,155
Ratio of energy intensity, RM/EU	3,19	3,22	3,15	2,93

Source: [4, 8]

According to the Table 3, we find a decrease in benchmark referred to an annual average rate of 12%, which is higher than European average estimated at 2.5% annually; the indicator of energy intensity in terms of energy resources consumption, distribution in different economic activities is presented in the figure 1.

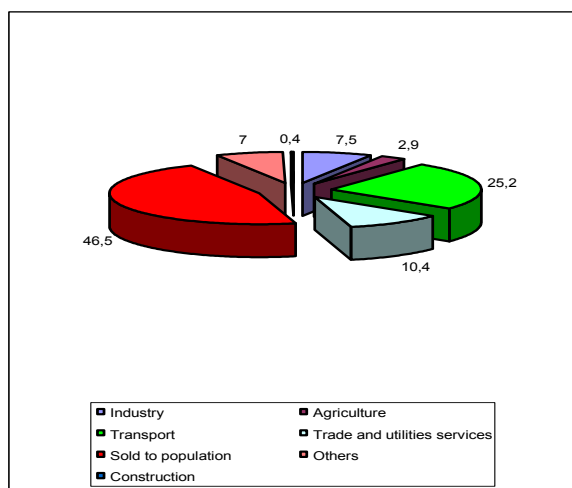


Figure 1. Distribution of fuel and energy resources consumption on the types of economic activities, %, 2011

Source: compiled by the author in base [4, 8]

In the world's primary sector of economy, a leading role is played by energy resources such as oil and oil products, natural gas, coal and energy. This group of goods maintains a leadership role among other groups of goods in international trade, followed by group of machines and equipment.

Fuel and energy complex (FEC) plays a critical role in the global economy, because without it's products can not function any industry. The main components of FEC are gas, oil and coal industries and energy.

Global demand for primary energy resources (PER) in the 1995-2015 will grow more slowly than in the '80s (excluding USSR) and this trend will continue for the next decade of the XXI century. Experts believe that in the period of 1995-2015, total consumption of all types of PER in the world could rise about 1.6-1.7 times and will be about 17 billion tons of oil equivalent. The fuel and energy resources of organic origin (94%) will remain dominant in the structure of consumption. The share of nuclear power energy, hydropower and others will not exceed 6%. In the total production and consumption of PER will lead oil, followed by coal and the third will be gas. Nevertheless, the structure of the share of oil consumption will drop from 39.4% to 35%, while the share of gas from 23.7% to 28%. The share of coal will slightly decrease from 31.7% to 31.2%. A small increase in the proportion of inorganic energy will be

determined by decline in the share of nuclear power from 2.3% in 1995 to 2% in 2015 [10]. The trends of energy balance in Moldova will be presented in Table 4.

Table 4. Energy balance in Moldova (terajouli), 2007-2011

	2007	2008	2009	2010	2011
Resources – total	98989	101065	96946	100779	102563
Internal sources	3709	4633	5160	4342	4886
Import	88767	88163	82712	86884	90184
Stocks of fuel beginning of the year	6513	8269	9074	9553	7493
Distribution – total	98989	101065	96946	100779	102563
Internal consumption*	90645	91780	86761	92544	93879
Export	290	211	654	799	599
Stocks of fuel end-year	8054	9074	9531	7436	8085

*Calculated by the formula: internal sources + import – export + changes in stocks

Source: [7]

Production and consumption of energy resources.

Consumption of energy resources in Moldova in 1997 was half less compared to '90s. The main boiler and furnace fuel in the country is coal. All the needs in fossil fuels in Moldova are covered by import [5].

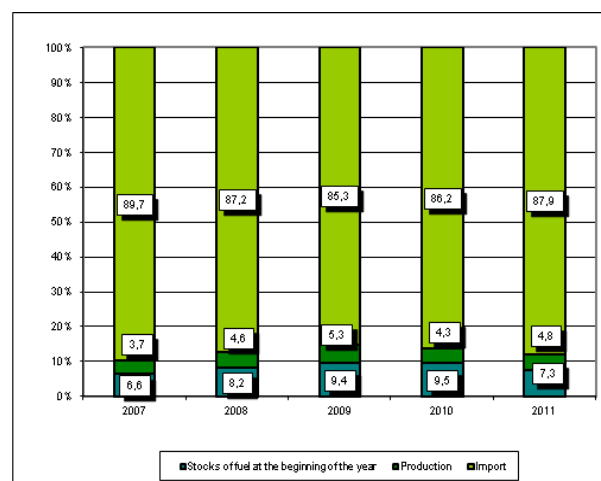


Figure 2. The structure of the energy and resources, %, 2007-2011

Source: compiled by author in base [7]

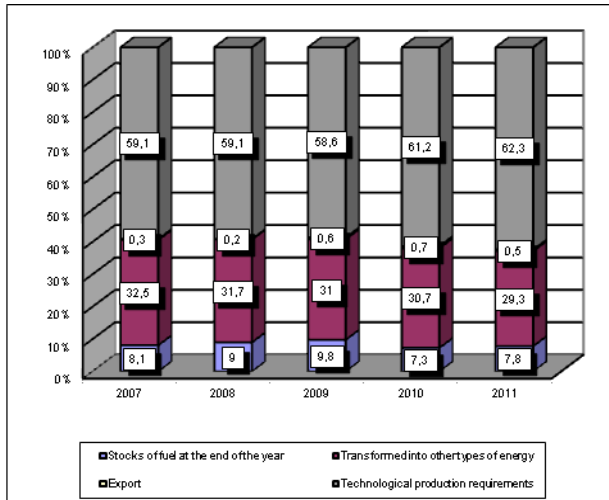


Figure 3. The structure of the fuel and fuel energy resources distribution, %, 2007-2011
 Source: compiled by author in base [7]

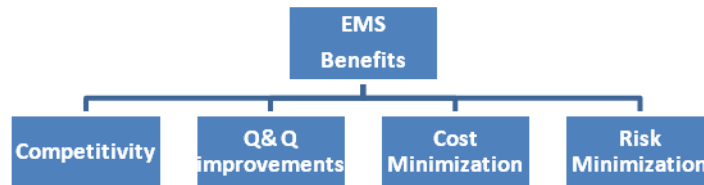


Figure 4. "Standard" benefits of an energy management system
 Source: elaborated by author

However, it is considered that there are some deficiencies related to technological upgrading of industry, energy security, harnessing renewable energy sources and energy consumption; it is considered that an effective energy policy and legislative framework will ensure sustainable development of energy sector in Moldova.

Starting from the fact that Republic of Moldova has signed an EU- RM Action Plan in 1998 that *inter alia* provided for approximation of the Moldovan legislation, norms and standards to those of the EU. In 2007, the Government of Moldova approved the Energy Strategy until 2020, which shows the directions of development for the energy sector, identifies the main actions, parties in charge and financial sources, as well as sets the 20% EE improvement till 2020 [9].

Currently, the author believes that it is beneficial to strengthen energy interconnections with neighboring country in consolidation of important role of transit country for electricity and gas on East-West

In general, the energy saving potential is estimated at 30% of total primary energy consumption, or 2.4 million in 1997. Currently on energy imports annually are spends about 210 million \$, representing 43% of the budget expenditure. The implementation of existing energy saving potential would reduce the cost of energy imports by 63 million \$.

Benefits of energy management system (EMS) can be exemplified in Figure 4.

In recent years, there have been made some achievements in the energy sector, such as restructuring and liberalization of national energy market.

and North-South direction; to promote consequent policy, use and conservation of energy efficiency for consumers; to join national electricity and gas to the Energy Community Treaty; to harmonize national legislation with the EU legislation and to cooperate effectively with CIS countries. Also, we have some key challenges such as lack of own energy resources; total reliance on imports of fossil fuels and electricity; low levels of Energy Efficiency and Renewable Energy Source use; dominance of imported natural gas; non-uniform location of electricity generation capacity; advanced level of wear and tear of the equipment of power stations, high voltage power lines and distribution networks; and not the last one, insufficient amount of investment in the energy sector.

CONCLUSIONS

The problem of increasing the energy efficiency of the economy in terms of energy

supply is almost completely dependent on imports of energy resources and is a priority for Moldova, in order to achieve the required level of energy security.

The implementation of energy conservation policy is appropriate to the national and international level, to include measures such as: establishment of the legal framework in the area; attraction of funds from local and international foundations; local and foreign investors to participate in the implementation of energy efficiency projects; development of methods to promote energy efficiency projects; creation of an effective system of management efficiency programs based on the experience of other countries.

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RATE OF RETURN ON INVESTMENT IN A DAIRY CATTLE BREEDING FARM IN BULGARIA

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Abstract

The paper analyses the rate of return on investment in a dairy cattle breeding farm in Bulgaria. To achieve the aim, it was investigated a dairy cattle breeding farm in Bulgaria first category with average number of 83 cows in the main herd. Based on information collected from the farm in 2012 and on own calculations it was defined the different types of investments necessary to create a farm. It was calculated also the rate of return of cash inflows, rate of return of cash outflows and investments per cow. It was found that the analyzed farm has implemented 12.5% rate of return on investment in 2012. Investments per cow are 4422 euros. The largest share of investments has the investments in productive animals (43.6%). 64.6% of the revenues are from the sale of milk. The largest share of the cash outflows have the purchase of feed and forage production - 58.3%. Subsidies play an important role for profitable operation of the analyzed farm.

Key words: cash flows, cattle breeding, investments per cow, rate of return on investment

INTRODUCTION

Value of the different cash flows, generated from the main activity, rate of return on investments [4], [7], rate of return of expenses and revenues [4], [8] and investments per cow [5] in dairy cattle breeding sector are extremely important for the motivation of farmers and employees, for the cost of the production and product quality. Each enterprise is interested in optimizing expenses and revenues to achieve positive financial result. Various researches in the sphere of economic effectiveness in dairy cattle breeding were published: some authors [2] examined the competitiveness of dairy cattle farms in terms of their size in Bulgaria; the structure and return on investment in dairy cattle breeding in Bulgaria was investigated [3]; economic models in dairy farms were examined [1].

MATERIALS AND METHODS

The aim of the study is to determine the rate of return on investment in a dairy cattle breeding farm in Bulgaria.

To achieve the aim, it was investigated a dairy cattle breeding farm in Bulgaria first category with average number of 83 cows in the main herd.

Based on information collected from the farm in 2012 and on own calculations it was defined the different types of investments necessary to create a farm. Cash flows exclude VAT. Cash inflows and outflows were estimated. The net cash flow was calculated as a difference between cash inflow and cash outflow occurred in 2012.

For the purposes of the analyses ROI (%) was calculated as a ratio between net cash flows and investments. It was calculated also the rate of return of cash inflows (ROCi%) as a ratio between net cash flows and cash inflows; rate of return of cash outflows (ROCo %) as a ratio between net cash flows and cash outflows and investments per cow (Ic%) as a ratio between investments and number of cows in the main herd. The reason why in the calculations of ROCi (%), ROI (%) and ROCo (%) are not used the net profit and expenses is because in agriculture we often have unfinished production and production which is not sold at the end of the year, so expenses, incurred during the year are not equal to the cash outflows and the net cash

flow is not equal to the net profit. Some of the cash outflows incurred this year will be pointed as expenses during the next year or years when the farmer sell the production or put it in the next production cycle (feed the animals with forage – own production, which was produced previous year). Revenues are equal to the cash inflows.

RESULTS AND DISCUSSIONS

Table 1 represents investments, cash inflows, cash outflows, ROI (%), ROCo (%), ROCi (%) and Ic (%).

Cash inflows include:

- revenues from the sale of male calves – 35 calves a few weeks after birth;
- revenues from the sale of cull cows and heifers (12 cows and heifers per year);
- revenues from the sale of milk – 280 tons per year;
- revenues from subsidies;

In the analyzed farm 15% of cow are culled annually, average service period is 60 days, dry period - 70 days. The cows are from the Black and White breed and are culled mainly due to aging; artificial insemination is practiced; selection is on a proper level. Approximately 1-2% of cows in the herd have clinical mastitis and endometritis. The average milk yield is 6,100 liters and the farm sells on the market about 280 tons cow milk per year. Animals are kept free - boxing. In the summer they graze on the pastures and a small amount of compound feed was given to them. The cows are milked twice a day with automated milking line. Hygiene in the farm is excellent. Ventilation is a natural with chimneys.

ROI (%) has value of 12.5%, it means that every 100 euros of investments account for 12.5 euros net cash flow.

ROCo (%) shows that on every 100 euros of cash outflows account for 54.8 euros net cash flow.

ROCi (%) represents that on every 100 euros of cash inflows account for 35.4 euros net cash flow.

Investments per cow are 4422 euros.

Table 1: Cash flows

Cash flows:	Value (a thousand euros):
Investments including:	367
Cows	160
Tractors	70
Land	30
Buildings	30
Bobcat	25
milk line	13
manure spreader trailer	12
forage harvester	9
Microbus	3
Trailers	2
hay rake	1
forage grinder	1
cow brush	1
others	10
Cash inflows including:	130
from milk sale	84
from the sale of male calves	2
from cull cows and heifers sale	4
from subsidies	40
Cash outflows including:	84
for combined fodder	45
for grain and lucerne production	4
Labour	15
Medicaments	1
Disinfectants	2
Electricity	3
vet services	1
accounting services	1
rent /pastures/	4
fuel	3
other materials and services	5
Net cash flow	46
ROI (%)	12.5
ROCo (%)	54.8
ROCi (%)	35.4
Ic (a thousand euros)	4.422

Source: data, collected from a dairy farm and own calculations

Figure 1 shows that the largest share of investments has the investments in productive animals (43.6%) followed by the investments in tractors (19.1%).

Investments in land and buildings have values of 8.2%. The share of investments in milk line is 3.5%; investments in bobcat are 6.8%. Total percents of investments in equipment (tractor, bobcat, forage harvester, manure spreader trailer, forage grinder, trailers, hay rake) occupy 32.7%.

Figure 2 represents that 64.6% of the revenues are from the sale of milk, followed by the revenues from subsidies- 30.8%. The smallest share of revenues has the revenues from the sale of cull cows and heifers (3.1%) and male calves (1.5%).

Consequently, subsidies are crucial to good and profitable operation of the farm. If the farm doesn't receive subsidies, ceteris

paribus, then net cash flow would have the value of 6k euros; ROI (%) - 1.6%; ROCo (%) - 7.1%; ROCi (%) - 6.7%; ROI (%) would be under the interest rate on deposits in Bulgaria (around 5% [6]) and therefore the farmer would not have been interested in investing the money in creating a dairy farm. The analysis of the data in Figure 3 shows that the largest share of the cash outflows has the purchase of feed and forage production - 58.3%, followed by labor costs (17.8%), other materials and services (6%) and rent of pastures (4.7%). The lowest share of cash outflows has veterinary services (1.2%), accounting services (1.2%) and medication (1.2%). Cost of fuel, electricity and disinfectants are respectively 3.6%, 3.6% and 2.4%.

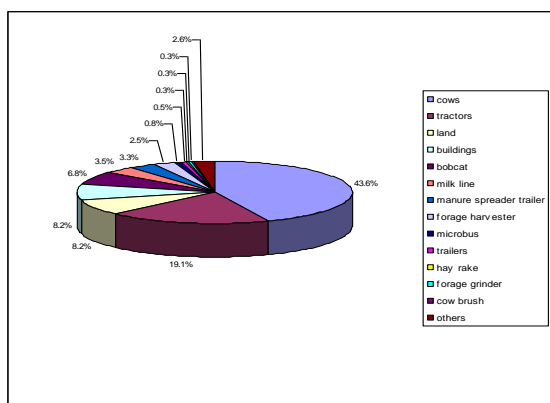


Fig. 1 Investments %

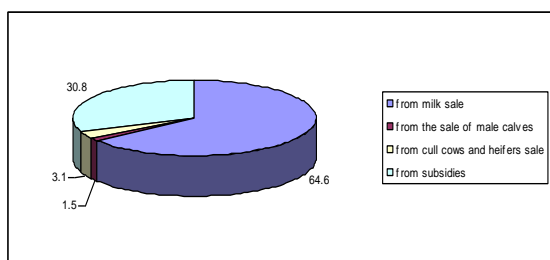


Fig. 2 Cash inflows %

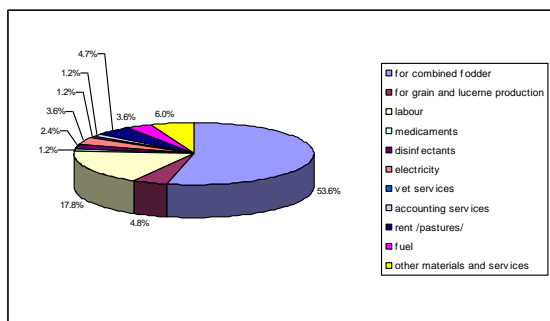


Fig. 3 Cash outflows %

CONCLUSIONS:

- In 2012 the analyzed farm has implemented 12.5% rate of return on investments;
- On every 100 euros of cash outflows account for 54.8 euros net cash flow.
- On every 100 euros of cash inflows account for 35.4 euros net cash flow.
- Investments per cow are 4,422 euros.
- The largest share of investments has the investments in productive animals (43.6%) followed by the investments in tractors (19.1%);
- 64.6% of the revenues are from the sale of milk, followed by the revenues from subsidies - 30.8%;
- The largest share of the cash outflows have the purchase of feed and forage production - 58.3%, followed by labor costs (17.8%);
- Subsidies play an important role for profitable operation of the analyzed farm;

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STUDY ON TOURISM DEVELOPMENT AND SPATIAL RESORT ANALYSIS BY BRAN BRASOV COUNTY TOURIST TRAFFIC

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Abstract

This paper is based on an analysis of tourism and mountain tourism trends nationally and internationally, the degree of capitalization of the mountain tourism in Romania, focusing on assessment of tourism in mountain tourist resort Bran, Brasov. The research study is to study the spatial tourist mountain resort of Bran. The objective of this study consists of analysis of tourist traffic at the county level and at the resort. To perform this study we used a series of documents provided by the Municipality representatives Bran on tourism and tourist traffic statistics on the county level and at the boarding house.

Key words: average tourist stay, coefficient monthly tourist traffic, tourist attraction, tourism indicators, tourism service, tourism in relation to population density

INTRODUCTION

Aspects of tourism in rural areas fit best cultural tourism with emphasis on understanding the contrasting lifestyles and interchange of knowledge and ideas. Therefore, rural tourism attracts those seeking personal contact and interaction with different cultures, backgrounds and groups of people [2].

These events include: recreational tourism with a focus on physical stress and environmental activities (biking and hiking), ecological tourism with emphasis on nature and landscapes contrasting visits (visits to national parks and reserves), historical heritage tourism is focusing on places or events, often for educational purposes. Rural tourism can also include day trips from one place to another in a sequential manner, in contrast to urban tourism urban destination where the emphasis is on activities that focus on urban tourism [1].

Current socio-economic conditions led to a decline of accommodation bases tradition of seaside resorts or mountain. But while once modern hotels are allowed to deteriorate, there were other accommodation base in rural areas, smaller but more easily maintained and adapted to the current needs of tourism. Peasant houses replaced the hotel complex

most popular with tourists. Among the most important reasons considered in choosing the destination of tourist hostels, mention [3]:

- increasing comfort they offer higher pensions farms and agro continuous and ongoing concern amid the hosts to meet customer requirements;
- traditional resorts, city type, tourists felt only part of a mass of tourists while in villages it is viewed and treated individually unique, his wishes into account in compiling the menu, for example;
- increased privacy afforded by the fact that pensions are incomparably smaller scale than hotels;
- creation of friendly relations with the host family and liaising years, the return on the same board for several years in a row;
- offer fresh produce from the farm peasant dishes host tourists and tourism demand;
- a less polluted environment.

MATERIALS AND METHODS

For the study we used documents provided by the Municipality representatives Bran on tourism and tourist traffic statistics on the county level and at the boarding house provided by the National Institute of Statistics. Tourist traffic analysis we performed the following indicators calculating

and interpreting presents search results of tourism demand and supply two hostels in Bran tourist resort, namely: *Index of global tourist demand change, Index of (domestic and foreign) demand variation in time, Indicator of total accommodation capacity evolution, Index of global tourist demand distribution, Index of customer evolution, Index of overnight stay evolution, The evolution in time of the average length of stay (Romanian), The evolution in time of the average length of stay (foreign), Hotel occupancy indicator, The monthly concentration coefficient, Tourist density indicator in relation to population density, „Tourist function” indicator.* Analysis and interpretation of these indicators of tourist traffic helps us to see which is the development of tourism in the resort Bran and what measures of growth, development and tourism development can take in this area .

RESULTS AND DISCUSSION

Accommodation facilities

The main tourist activities are included in the allowance for accommodation and food services, transportation services, services relating to the production and sale of goods for tourists, entertainment and tourism services organization [4].

Accommodation

Table 1. The evolution of tourist accommodation establishments in 2006-2010

Accommodation	Years				
	2006	2007	2008	2009	2010
Hotels	37	37	42	52	50
Youth Hotels	-	4	3	4	4
Inns and motels	5	6	11	11	9
Rustic villas	35	43	46	51	42
Cottages	20	20	13	17	13
Urban guesthouses	46	82	107	135	137
Rural guesthouses	78	104	155	193	200
Farmhouses	122	107	-	-	-
Camping	2	2	2	2	2
Camps for students and preschool	3	3	1	1	1
Total	370	431	403	489	471

Source: Statistical Yearbook 2011 Braşov County

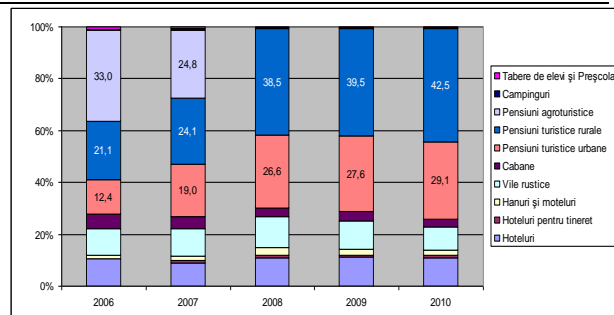


Fig. 1. The evolution of tourism in 2006-2010

As you can see in the chart, in the analyzed period, the number of urban and rural tourist hostels have increased every year.

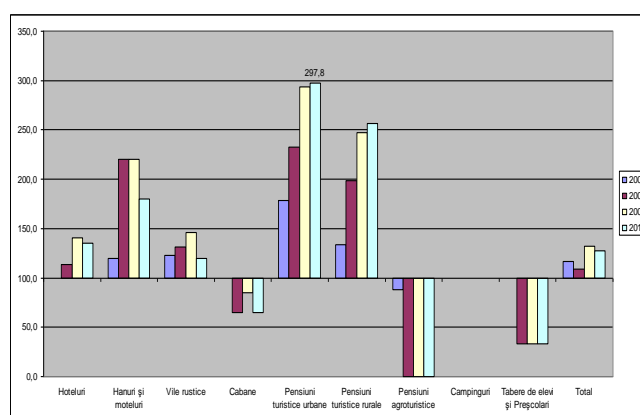


Fig. 2. Dynamic tourist structures in 2006-2010

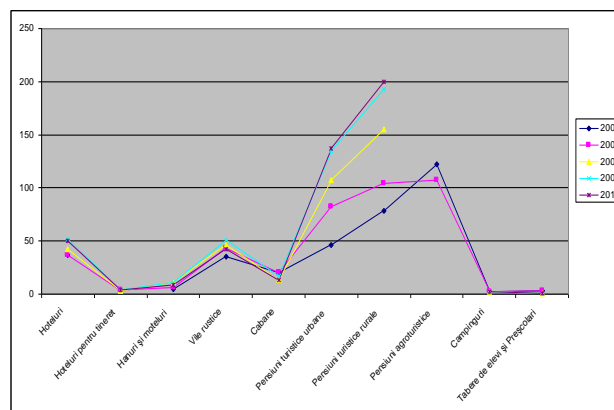


Fig. 3. The evolution of tourist accommodation establishments in 2006-2010

The data in the table it is observed that the number of housing units is increasing. In the 5 years of the study, the number of hotels increased by 13 units, rustic villas increased by 7 units, the number of camping sites is constantly being only 2 units throughout the period of study, and students and preschool camps are reduced from 3 to one.

Estimating occupancy accommodation capacity

In assessing occupancy accommodation capacity was based on the following aspects: values recorded in previous years this indicator resorts of the country with similar profile: tourist flows recorded in Brasov and Brasov resort, competition and trends in the industry, quality unique represented the future of tourism resorts throughout the area, increased traffic projected domestic and international tourism with economic development trends [3].

Table 2. Arrivals of tourists in Brasov in 2006-2010

Year	2006	2007	2008	2009	2010
Total	328282	421765	448147	484044	556815
Romanian	251070	329511	359259	401307	452586
Foreigners	77212	92254	88888	82737	104229

Source: Statistical Yearbook of Brasov County 2011.

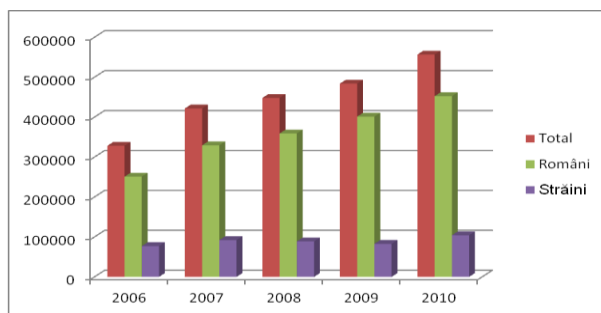


Fig. 4. Arrivals of tourists in Brasov in 2006-2010

It is noted that the number of arrivals increases from year to year, which makes us believe that Brasov county is a favourite tourist trips.

Table 3. Nights spent by tourists in the establishments of tourists in 2010

Type structure of receipt	Total overnight stays	Romanian	Foreigners
Hotels	709472	533458	176014
Youth Hotels	34242	26783	7459
Inns and motels	39301	35428	3873
Tourist villas	81201	73804	7397
Cottages	26216	25178	1038
Urban guesthouses	182671	144525	38146
Rural guesthouses	99728	92585	7143
Camps for students and preschool	5760	5641	119

Source: Statistical Yearbook of Brasov County 2011.

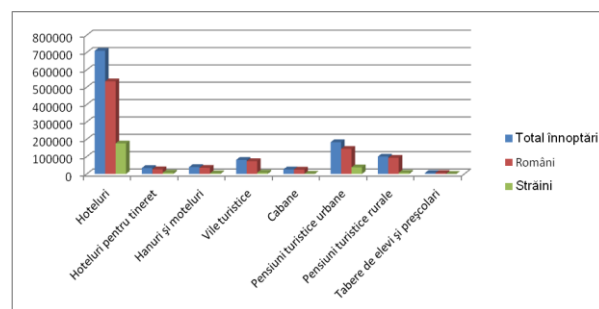


Fig. 5. Nights spent by tourists in the establishments of tourists in 2010

Hotel Presentation „Flo' Mary ”from Bran, for tourist traffic analysis

Bran valley located in a wonderful landscape, between Bucegi and Piatra Mountains, “Flo `Mary” Hotel is the ideal place for a holiday in the mountains, for corporate training or rest in transit.



It is a tourist facility built in august 2007, European standards, with 18 rooms, 36 beds, good taste, with a dreamlike, with all necessary facilities. Its location is ideal, just 150 meters from the European way, but in a position which ensures quiet and clean air. The hotel is the best place for leisure is located 1.5 km from Bran Castle, 4 km from the ski slope, 6 km from the village a few miles from Cave and all mountain trails in the area.

Here are some complex services:

- accommodation with breakfast included;
- rooms with balcony, colour TV with cable, telephone, internet, minibar and safe;
- sauna, Jacuzzi and mini fitness;
- parking, terrace, playground generous arranged on a surface;
- bowling, table tennis, billiards, darts.

Tourist traffic analysis by calculating and interpreting tourism supply and demand indicators at Hotel "Flo' Mary"

This group of indicators reflects the distribution and evolution in time of global tourism demand, foreign and domestic. [5] They also reflect the behaviour of the application on the use of vehicles and equipment receipt and can be used for studying the origin and destination of tourism demand, the average stay and fidelity to a particular destination.

To calculate these indices tour is necessary to know the indicators and they are presented in the following table:

Hotel „Flo`Mary”

Table 4. Number of nights, number of visitors and average hotel stay "Flo' Mary"

Indicators	2006	2007	2008	2009	2010
Number of nights	0	4362	5581	5612	11362
Number of Romanian tourists	0	1550	2300	2350	3205
The number of foreign tourists	0	132	140	134	142
Accommodation (No Rooms)	0	18	18	18	18
Total number of beds in hotel	0	36	36	36	36
Total number of seats on resort hotels	204	204	204	224	224
The average stay	0	2,81	2,42	2,38	3,54

Source: Statistical Yearbook 2011 Braşov County.

Of the most important tourism indicators we analyze:

a. Index of global tourist demand change

$C_t = (No. \text{ overnight stay per current year} / No. \text{ Overnight stay per previous year}) * 100$

$$\Delta CG_{0-i} = \frac{CG_i}{CG_0} \cdot 100$$

where: CG_i - global tourist demand in year „i”;

CG_0 - global tourist demand in year „0”.

$$\Delta C_{t2008} = (5581 / 4362) * 100 = 127,9 \%$$

$$\Delta C_{t2009} = (5612 / 5581) * 100 = 100,5 \%$$

$$\Delta C_{t2010} = (11362 / 5612) * 100 = 202,5 \%$$

From the above calculations it can be said that tourism demand during 2007-2010 exceeded 100% and the maximum rate of increase is 102.5%.

b. Index of global tourist demand distribution, between domestic and foreign demand

$I_{ci} = [No. \text{ Romanian tourists per current year} / (No. \text{ Romanian tourists} + No. \text{ Foreign tourists}) \text{ current year}] * 100$

$I_{ce} = [No. \text{ Foreign tourists per current year} / (No. \text{ Romanian tourists} + No. \text{ Foreign tourists}) \text{ current year}] * 100$

$$I_{CTI} = \frac{CI}{CG} \cdot 100 ; I_{CTE} = \frac{CE}{CG} \cdot 100$$

where: CI - domestic tourist demand (no. Romanian tourists);

CE - foreign tourist demand (number of foreign tourists).

CG - global tourism demand (no. Romanian tourists + no. Foreign tourists)

$$I_{i2007} = (1550 / 1682) * 100 = 92,1 \%$$

$$I_{e2007} = (132 / 1682) * 100 = 7,9 \%$$

$$I_{i2008} = (2300 / 2440) * 100 = 94,3 \%$$

$$I_{e2008} = (140 / 2440) * 100 = 5,7 \%$$

$$I_{i2009} = (2350 / 2484) * 100 = 94,6 \%$$

$$I_{e2009} = (134 / 2484) * 100 = 5,4 \%$$

$$I_{i2010} = (3205 / 3347) * 100 = 95,7 \%$$

$$I_{e2010} = (142 / 3347) * 100 = 4,3 \%$$

From the above analysis we can see that the highest number of tourists who come to the resort Hotel "Flo `Mary" are Romanian, while the number of foreigners is very low, mainly thanks to the fact that they do not prefer hotels and pensions.

c. Index of (domestic and foreign) demand variation in time:

$I_{ci} = (No. \text{ Romanian tourists per current year} / No. \text{ Romanian tourists per previous year}) * 100$

$I_{ce} = (No. \text{ Foreign tourists per current year} / No. \text{ Foreign tourists per previous year}) * 100$

$$ICE_{0-i} = \frac{CE_i}{CE_0} \cdot 100 :$$

$$ICI_{0-i} = \frac{CI_i}{CI_0} \cdot 100$$

where: ICE_{o-i} - index of foreign demand variation (number of foreign tourists this year and the previous year);

ICI_{o-i} - index of domestic demand variation (number of Romanian tourists this year and last year).

$$ICI_{2008} = (2300 / 1550) * 100 = 148,4 \%$$

$$ICE_{2008} = (140 / 132) * 100 = 106,1 \%$$

$$ICI_{2009} = (2350 / 2300) * 100 = 102,2 \%$$

$$ICE_{2009} = (134 / 140) * 100 = 95,7 \%$$

$$ICI_{2010} = (3205 / 2350) * 100 = 136,4 \%$$

$$ICE_{2010} = (142 / 134) * 100 = 105,9 \%$$

From the above calculations it can be said that during 2007-2010 domestic tourism demand both increased from year to year, and the maximum percentage increase is 48.4%. External demand has also increased, but in 2009 was a decrease of 4.3%.

d. The monthly concentration coefficient is calculated by dividing the number of tourists recorded during the highest-traffic month by the total number of tourists during a year A_t

$$C_c = \frac{LM}{A_t}$$

$C_c = [No. Tourists per each month / (No. Romanian tourists + No. Foreign tourists) per year of calculation]*100$

Value C_c ranges between 0.083 and 1.

For this we consider the year 2010, the number of tourists every month is as follows: January 268, February 256, March 240, April 268, May 198, June 396, July 383, August 408 September 248 October 178 November 162 December 342.

$A_t = 3347$ tourists

$$C_{c \text{ ian}} = (268 / 3347) * 100 = 8,01 \%$$

$$C_{c \text{ feb}} = (256 / 3347) * 100 = 7,64 \%$$

$$C_{c \text{ mart}} = (240 / 3347) * 100 = 7,17 \%$$

$$C_{c \text{ apr}} = (268 / 3347) * 100 = 8,00 \%$$

$$C_{c \text{ mai}} = (198 / 3347) * 100 = 5,91 \%$$

$$C_{c \text{ iun}} = (396 / 3347) * 100 = 11,83 \%$$

$$C_{c \text{ iul}} = (383 / 3347) * 100 = 11,44 \%$$

$$C_{c \text{ aug}} = (408 / 3347) * 100 = 12,19 \%$$

$$C_{c \text{ sept}} = (248 / 3347) * 100 = 7,41 \%$$

$$C_{c \text{ oct}} = (178 / 3347) * 100 = 8,72 \%$$

$$C_{c \text{ nov}} = (162 / 3347) * 100 = 5,31 \%$$

$$C_{c \text{ dec}} = (342 / 3347) * 100 = 10,21 \%$$

e. share of hotel (the pension) capacity out of total accommodation capacity:

$$I_{cc} = \frac{LC}{LH} * 100$$

where: LH - number of beds in hotels;

LC - total accommodation capacity (hotel, motel, pension, inn, etc.);

$$S_{cp \ 2007} = (36 / 204) * 100 = 17,64\%$$

$$S_{cp \ 2008} = (36 / 204) * 100 = 17,64\%$$

$$S_{cp \ 2009} = (36 / 224) * 100 = 16,07\%$$

$$S_{cp \ 2010} = (36 / 400) * 100 = 16,07\%$$

f. Index of customer evolution between „0” and „i”:

$I_{ec} = (No. Romanian tourists + No. foreign tourists per current year) / (No. of Romanian tourists + No. foreign tourists per previous year) * 100$

$$\Delta T_{H_{i-0}} = \frac{TH_i}{TH_0} * 100$$

where: TH_i - tourists in hotels in year „i” - current year;

TH_0 - tourists in hotels in year „0” - last year.

$$\Delta T_{H \ 2008} = (2440 / 1682) * 100 = 145,06 \%$$

$$\Delta T_{H \ 2009} = (2482 / 2440) * 100 = 101,72 \%$$

$$\Delta T_{H \ 2010} = (3347 / 2484) * 100 = 137,74\%$$

In the period 2006-2009 tourists come to Complex Hotel Flo `Mary has seen growth year on year. The largest increase recorded in the number of tourists is complex in 2008, the increase being 45.06%.

g. Index of overnight stay evolution:

$I_N = (No. overnight stay per current year / No. overnight stay per previous year) * 100$

$$\Delta N_{p_{i-0}} = \frac{NP_i}{NP_0} * 100$$

where: NP_i - no. overnights stay in hotel in "i" - current year;

NP_0 - no. overnights stay in hotel in "0" - last year.

$$\Delta N_{p \ 2008} = (5581 / 4362) * 100 = 127,9 \%$$

$$\Delta N_{p \ 2009} = (5612 / 5581) * 100 = 100,6 \%$$

$$\Delta N_{p \ 2010} = (11362 / 5612) * 100 = 202,5 \%$$

Number of overnight stays was a downward trend in 2009 compared to 2008 by 27.3% and in 2010 increased by 102.1%.

h. The evolution in time of the average length of stay is calculated according to the following formula

$$\Delta S_{o-i} = \frac{\overline{S}_i}{S_o} \cdot 100$$

where: S_i - average length of stay within a certain interval (month, trimester, year) at time „i” - current year;

S_o - average length of stay at time „0” (month, trimester, year) - last year.

$$\Delta S_{m 2008} = (2,42 / 2,81) * 100 = 86,12 \%$$

$$\Delta S_{m 2009} = (2,38 / 2,42) * 100 = 98,35 \%$$

$$\Delta S_{m 2010} = (3,54 / 2,38) * 100 = 148,74 \%$$

The average stay in the analyzed period was variable evolution, presenting growth and decrease, reaching in 2010 to 148.74%.

i. Hotel occupancy indicator

Reflects the use of supply for a given period of time, i.e. hotel activity depending on its capacity:

$$G_{o-i} = \frac{NP}{(LP \times Z)} \times 100$$

where:

G_o - occupancy, percentage;

NP - number of overnight stays;

LP - number of beds in hotels;

Z - number of supply days = 365 days;

$$G_{2007} = (4362 / (36 \times 365)) * 100 = 33,2 \%$$

$$G_{2008} = (5581 / (36 \times 365)) * 100 = 42,5 \%$$

$$G_{2009} = (5612 / (36 \times 365)) * 100 = 42,7 \%$$

$$G_{2010} = (11362 / (142 \times 365)) * 100 = 21,9 \%$$

Employment of pension is in 2007-2009 with an increase of 42.7% in 2009, and in 2010 fell to 21.9%.

j. Tourist density indicator in relation to population density

$$D_{t-i-0} = \frac{T_{t-i-0}}{Populatie} \times 100$$

where:

T_{i-0} - total Romanian+foreign tourists;

Pop - local population.

$$D_{t 2006} = (0 / 5512) * 100 = 0 \%$$

$$D_{t 2007} = (1682 / 5512) * 100 = 30,5 \%$$

$$D_{t 2008} = (2440 / 5512) * 100 = 44,3 \%$$

$$D_{t 2009} = (2484 / 5573) * 100 = 44,6 \%$$

$$D_{t 2010} = (3347 / 5573) * 100 = 60 \%$$

Population density in relation Tourist Complex Hotel “Flo' Mary” is increasing in the period under review, the highest being 60% in 2010.

k. „Tourist function” indicator

$$F_{t-i-0} = \frac{N_{t-i-0}}{Populatie} \times 100$$

where:

N_{t-i-0} - no. places the hotel;

Pop - Bran village population.

$$F_{t 2006} = (0 / 5512) * 100 = 0 \%$$

$$F_{t 2007} = (36 / 5512) * 100 = 0,65 \%$$

$$F_{t 2008} = (36 / 5512) * 100 = 0,65 \%$$

$$F_{t 2009} = (36 / 5573) * 100 = 0,64 \%$$

$$F_{t 2010} = (36 / 5573) * 100 = 0,64 \%$$

Because the number of places unchanged, with only a variation in the population, the indicator value is almost uniform.

CONCLUSIONS

Study, aimed foundation redesign and development program Bran mountain resort, the area is characterized by high landscape value natural resources, science and practice. This important tourism potential for Romanian tourism can be highlighted by a number of facilities that provide a significant increase in tourism activity in terms of environmental protection and sustainable development.

In the structure of the work was done an analysis of tourist traffic at a hotel in Bran being presented its services because the area is very good accommodation conditions and tourists gladly choose this mountainous area. The only problem is the large number of hostels in the area by trying different offers to

attract customers to their places of accommodation. Bran is an exciting and sights, but mountain air and scenery draw tourists to spend even a mini vacation in the area.

To present the tourist services offered in Bran, I chose Hotel 'Flo' Mary', which I considered indicators of tourism demand and supply.

The analysis we observed the following indicators:

- *Tourism demand in 2006-2010 increased by different percentages, which indicates that a growing number of tourists are attracted to this region Bran.*
- *Of the tourists who come here, the highest number is the Romanians, but there is a 9% foreign tourists. This indicates that foreigners are attracted to the natural wonders of our country and the sights of Bran, respectively Prahova Valley.*
- *highest concentration of tourists is in the summer, but tourists are present in this region throughout the year, it is a mountainous area where there are activities for tourists throughout the year.*
- *tourist services are top quality, otherwise it an increasing number of newly opened hostel is a three star hotel, offering quality customer service and offer increasingly attractive.*
- *Staying environment and the number of nights is increasing, which indicates that tourists choose to spend more days in the Bran area.*
- *Employment of hostels for the year is 40%, which is very good considering the number of hostels is great.*

Structures proposed tourism activities led to the creation of a significant number of jobs. Given the implications it will have on the local community tourism activities, develop and related activities (trade, traditional crafts, transport, services, etc..) That will lead to other additional jobs, attracted the most Much of the area.

Taking into account all aspects detailed in the study and summarized above, it is evident appropriateness of Brasov mountain resort, and use the natural resources of the area through tourism, both economically and socially, and in terms of biodiversity

conservation and creation framework of sustainable development of the area.

Bran will continue to attract tourists as long as you know how to offer new attractions. Tourism skill and talent managers will demonstrate by determining the tourists were already in Bran to return, not tourists that come first, because the latter are particularly attracted by the reputation castle or natural qualities of the area.

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COMPARATIVE STUDY OF TOURIST TRAFFIC AT THE CITY, COUNTY AND HOUSE IN CÂMPULUNG MUSCEL ARGES

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Abstract

This paper is based on a comparative analysis of tourism demand and supply and the development of mountain tourism tendințelor de planșional and internationally, the degree of capitalization of the mountain tourism in Romania, focusing on assessment of tourism in the tourist resort Campulung Muscel County Arges. The objective of this study consists of a comparative analysis of tourist traffic at the county level tourist resort and tourist board level. To perform this study we used a series of statistical data provided by the representatives of the City of Delhi Muscel on tourism and tourist traffic statistics on the county level and at the boarding house.

Key words: average tourist stay, tourist attraction, tourism indicators, tourism service, tourist density indicator in relation to population density, tourist density indicator in relation to area the monthly concentration coefficient.

INTRODUCTION

In the current period when tourism has become a major social activity, economic and even political, both nationally and internationally, need knowledge of tourism potential, the rational exploitation of required increasingly more. Determination of quantitative methods tourism potential concern many specialists, the results are a real help to systematize tourism activities of planning, adequate facilities and equipment that potential value [2].

In this sense, tourism potential should be investigated in terms of its two components:

- *natural component*, represented by spectacular scenery, varied configuration of terrain, weather conditions favorable (reduced frequency of negative phenomena, no excessive temperatures), therapeutic value and abundance of natural factors (and thermo mineral water, curative mud, topoclimate and microclimate and fauna and flora, etc.) [1];
- *anthropogenic component*, represented by the remains of civilizations that succeeded in Romania since time immemorial, Monuments and secular and religious art, museums and museum collections, ethnography and folklore items of great beauty and originality, current achievements prestige etc [1].

As reflected in its manual tourism economy since 1959, the famous Swiss specialist W. Hunzicker shows that "*tourist offer is a combination of material elements and service*" combination the services plays the main role.

In a general sense, the tourism potential of an area is defined as the natural elements of economic and cultural-historical, representing some possibilities for tourism, giving a specific functionality is a prerequisite for tourism and tourism development [2]. An area of interest in terms of tourism potential, to the extent that it provides natural and anthropogenic tourist resources, whose exploitation amid complex design can cause a tourism activity and include that territory in domestic and international circuit [3].

Depression Câmpulung is situated in the eastern part of Getic Sub-Carpathians, on the foothills Iezer on Fair River, between the valleys arm (V) and Dambovita (E). South of the ridge anticline bordered Matau-Ciocanu and east of the summit pit Sheep typical depression looks submontane and relatively elongated form (like a "long field"), and the city is situated in the north - east of Arges County [3].

This depression is one of the best individual in the country, South Carpathian high hills covered with pastures, meadows and fruit trees, called muscele people.

Existence in this area Rucar - Bran, open from Piatra Craiului and Leaota greatly influenced the city's economic development and tourism Câmpulung Muscel and its surroundings. The town developed along the river valley Fair, and the highest terraces of depression [3].

Spas Câmpulung, is situated in the foothills of the Fagaras mountains only 20-25 km height in the high hills in the middle of a forest area that's complete beauty of the landscape. Quiet forest as whole spices and plants surrounding natural beauty have an overwhelming influence on the body beneficial.

As in other areas in Arges county are recorded reserves and natural monuments that belong to the geobotany, geology, flora, fauna, forest, with great scientific value, landscape and tourism, which have been placed under the protection of the law.

Mention of Arges County reserves: *Natural Reserve of Piatra Craiului*, where the only 300 square kilometers were identified about 1200 species of phanerogams and cryptogams and vascular plants have been reported numerous endemic, plants and animals declared natural monuments such as the edelweiss, ghintura yellow, blood pea, marigolds mountain smardarul, marsh marigolds, yew and larch, chamois (*Rupicapra rupicapra*), lynx (*Lynx lynx*), capercaillie (*Tetrao-urogalus*) [3];

- *Geological and paleontological - caves in the Rucar-Dambovicioara*, Dambovita keys, keys geological and paleontological Dambovicioarei - caves in the Rucar-Dambovicioara, Dambovita keys, keys Dambovicioarei.

- *Microrelief characteristic citizenship.*

- *Reserve with limestone numulitic of Albestii* (nummulite and fossils of laminated branchiate, echinoderme, sharks, etc.).

- *Granite Reserve in Albestii of Muscel.*

- On the hill called Marlauz Suslanesti East Village (municipality Mioarele) *point fossil found in Suslanesti* - Oligocene deposits containing a rich fauna fossilifere Canned fish (29 species) [3].

MATERIALS AND METHODS

This paper is based on an analysis of tourism and mountain tourism trends worldwide, the

degree of capitalization of the mountain tourism in Romania, focusing on assessment of tourism in the tourist resort balneary Câmpulung Muscel, Arges county.

The research study was to study the tourist mountain town planning Câmpulung Muscel on tourist traffic in the area. The objective of this study consists of a comparative analysis of tourist traffic to the local, district and village level in Câmpulung Muscel board. To perform this study we used a series of statistical data provided by the representatives of Câmpulung Muscel Hall on tourism, statistical data taken from Statistics Bucharest Institution and data from pension "Elyon".

RESULTS AND DISCUSSIONS

Calculation of tourists movement, tourism indicators, Arges County, in town and Campulung Muscal "Elyon" House

Tourism demand indicators

This group of indicators reflects the distribution and evolution in time of global tourism demand, internal and external. They also reflect the behavior of the application on the use of vehicles and equipment receipt and can be used for studying the origin and destination of tourism demand, the average stay and fidelity to a particular destination [2]. Here are the main indicators in this category:

a. Index of global tourist demand change

$C_t = (\text{No. overnight stay per current year} / \text{No. Overnight stay per previous year}) * 100$

$$\Delta C_{O-i} = \frac{CG_i}{CG_0} \cdot 100$$

where: CG_i - global tourist demand in year „i”;

CG_0 - global tourist demand in year „0”.

Tabel 1. Tourism demand in Arges

Year	2007	2008	2009	2010	2011
Tourism demand	315000	310000	306000	308000	318000

$$\Delta C_{2008-2007} = (310000/315000) * 100 = 98,41\%$$

$$\Delta C_{2009-2008} = (306000/310000) * 100 = 98,70\%$$

$$\Delta C_{2010-2009} = (308000/306000) * 100 = 100,65\%$$

$$\Delta C_{2011-2010} = (318000/308000) * 100 = 103,24\%$$

Tabel 2. Tourism demand in Câmpulung Muscel

Year	2007	2008	2009	2010	2011
Tourism demand	20000	19000	21000	21500	20000

$$\Delta C_{2008-2007} = (19000/20000) * 100 = 105,26 \%$$

$$\Delta C_{2009-2008} = (21000/19000) * 100 = 90,47\%$$

$$\Delta C_{2010-2009} = (21500/21000) * 100 = 110,52\%$$

$$\Delta C_{2011-2010} = (20000/21500) * 100 = 93,02\%$$

b. Index of global tourist demand distribution, between domestic and foreign demand

$Ici = [No. Romanian tourists per current year / (No. Romanian tourists + No. Foreign tourists) current year] * 100$

$Ice = [No. Foreign tourists per current year / (No. Romanian tourists + No. Foreign tourists) current year] * 100$

$$\Delta C_i = \frac{CI}{CG} \cdot 100 ; \Delta C_e = \frac{CE}{CG} \cdot 100$$

where: CI - domestic tourist demand;

CE - foreign tourist demand.

CG - global tourism demand (internal + external)

Table 3. The distribution of tourism demand in Arges

Year	2007	2008	2009	2010	2011
CI	314950	309935	305920	307900	317890
CE	50	65	80	100	110
CG	315000	310000	306000	308000	318000

Domestic tourism demand in Arges:

$$\Delta C_{i(2007)} = (314950/315000) * 100 = 99,98\%$$

$$\Delta C_{i(2008)} = (309935/310000) * 100 = 99,97\%$$

$$\Delta C_{i(2009)} = (305920/306000) * 100 = 99,97\%$$

$$\Delta C_{i(2010)} = (307900/308000) * 100 = 99,96\%$$

$$\Delta C_{i(2011)} = (317890/318000) * 100 = 99,96\%$$

Foreign tourism demand in Arges:

$$\Delta C_{e(2007)} = (50/315000) * 100 = 0,015\%$$

$$\Delta C_{e(2008)} = (65/310000) * 100 = 0,020\%$$

$$\Delta C_{e(2009)} = (80/306000) * 100 = 0,026\%$$

$$\Delta C_{e(2010)} = (100/308000) * 100 = 0,032\%$$

$$\Delta C_{e(2011)} = (110/318000) * 100 = 0,034\%$$

Table 4. The distribution of tourism demand in Câmpulung Muscel

Year	2007	2008	2009	2010	2011
CI	19970	18975	20971	21467	19983
CE	30	25	29	33	17
CG	20000	19000	21000	21500	20000

Domestic tourism demand in Câmpulung Muscel:

$$\Delta C_{i(2007)} = (19970/20000) * 100 = 99,85\%$$

$$\Delta C_{i(2008)} = (18975/19000) * 100 = 99,86\%$$

$$\Delta C_{i(2009)} = (20971/21000) * 100 = 99,86\%$$

$$\Delta C_{i(2010)} = (21467/21500) * 100 = 99,84\%$$

$$\Delta C_{i(2011)} = (19983/20000) * 100 = 99,91\%$$

Foreign tourism demand in Câmpulung Muscel:

$$\Delta C_{e(2007)} = (30/20000) * 100 = 0,151\%$$

$$\Delta C_{e(2008)} = (25/19000) * 100 = 0,131\%$$

$$\Delta C_{e(2009)} = (29/21000) * 100 = 0,137\%$$

$$\Delta C_{e(2010)} = (33/21500) * 100 = 0,133\%$$

$$\Delta C_{e(2011)} = (17/20000) * 100 = 0,085\%$$

c) Index of (domestic and foreign) demand variation in time:

$Ici = (No. Romanian tourists per current year / No. Romanian tourists per previous year) * 100$

$Ice = (No. Foreign tourists per current year / No. Foreign tourists per previous year) * 100$

$$ICE_{O-i} = \frac{CE_i}{CE_O} \cdot 100 ,$$

$$ICI_{O-i} = \frac{CI_i}{CI_O} \cdot 100$$

where: ICE_{O-i} - index of foreign demand variation;

ICI_{O-i} - index of domestic demand variation.

Index of (domestic and foreign) demand variation in time for Arges:

$$ICI_{2007-2008} = (309935/314950) * 100 = 101,618\%$$

$$ICI_{2008-2009} = (305920/309935) * 100 = 101,312\%$$

$$ICI_{2009-2010} = (307900/305920) * 100 = 100,647\%$$

$$ICI_{2010-2011} = (317890/307900) * 100 = 103,244\%$$

$$ICE_{2007-2008} = (65/50) * 100 = 130\%$$

$$ICE_{2008-2009} = (80/65) * 100 = 123,07\%$$

$$ICE_{2009-2010} = (100/80) * 100 = 125\%$$

$$ICE_{2010-2011} = (110/100) * 100 = 110\%$$

Index of (domestic and foreign) demand variation in time for Câmpulung Muscel:

$$ICI_{2007-2008} = (18975/19970) * 100 = 105,24\%$$

$$ICI_{2008-2009} = (20971/18975) * 100 = 90,48\%$$

$$ICI_{2009-2010} = (21467/20971) * 100 = 110,51\%$$

$$ICI_{2010-2011} = (19983/21467) * 100 = 102,36\%$$

$$ICE_{2007-2008} = (25/30) \cdot 100 = 83,33\%$$

$$ICE_{2008-2009} = (29/25) \cdot 100 = 116\%$$

$$ICE_{2009-2010} = (33/29) \cdot 100 = 113,79\%$$

$$ICE_{2010-2011} = (17/33) \cdot 100 = 51,51\%$$

**The Tourist Traffic Analysis
"Elyon" House**



Pension "Elyon" is in Câmpulung Muscel in a unique natural setting at the foot of Iezer. Elyon Pension offers accommodation in Câmpulung Muscel with possibility to spend unforgettable moments in a quiet of a small mountain town.



Table 5. Number of nights, number of visitors and average stay

Year	2007	2008	2009	2010	2011
Number of nights	1870	1850	1948	1916	1896
Number of Romanian tourists	970	793	1012	989	955
Number of foreign tourists	16	10	12	9	12
Accommodation	13	13	13	13	13
Total beds in hostels	91	97	103	103	111
The average stay	1,89	2,30	1,90	1,91	1,96

a) Index of (domestic and foreign) demand variation in time from Pension "Elyon":

$$\Delta CP_{0-i} = \frac{CP_i}{CP_0} \cdot 100 :$$

Where: CP_0 - rate of change of total tourism demand in the previous year;

CP_i - rate of change of total tourism demand this year.

$$\Delta CP_{2007-2008} = (803/986) \cdot 100 = 81,44\%$$

$$\Delta CP_{2008-2009} = (1024/803) \cdot 100 = 127,52\%$$

$$\Delta CP_{2009-2010} = (998/1024) \cdot 100 = 97,46\%$$

$$\Delta CP_{2010-2011} = (967/998) \cdot 100 = 96,89\%$$

b) Indicator „length of stay”.

Globally, the average length of stay is the result of the ratio between the number of days of presence in a particular tourist destination and the total number of tourists present on the territory.

$$\bar{S} = \frac{\text{no. of travel days}}{\text{no. of tourists}} = \frac{ZT}{T}$$

Table 6. Number of tourists in Arges

Year	2007	2008	2009	2010	2011
No. of tourists	315000	310000	306000	308000	318000

The average stay in Arges:

$$S_{2007} = 365/315000 = 0,0011$$

$$S_{2008} = 365/310000 = 0,0011$$

$$S_{2009} = 365/306000 = 0,0011$$

$$S_{2010} = 365/308000 = 0,0011$$

$$S_{2011} = 365/318000 = 0,0011$$

Table 7. Number of tourists in town Câmpulung Muscel

Year	2007	2008	2009	2010	2011
No. of tourists	20000	19000	21000	21500	20000

The average stay in town Câmpulung Muscel:

$$S_{2007} = 365/20000 = 0,0182$$

$$S_{2008} = 365/19000 = 0,0192$$

$$S_{2009} = 365/21000 = 0,0173$$

$$S_{2010} = 365/21500 = 0,0169$$

$$S_{2011} = 365/20000 = 0,0182$$

The evolution in time of the average length of stay is calculated according to the following formula:

$$\Delta \bar{S} = \frac{\bar{S}_i}{\bar{S}_0} \cdot 100$$

where: S_i - average length of stay within a certain interval (month, trimester, year) at time „i”;

S_0 - average length of stay at time „0” (month, trimester, year).

The evolution in time of the average length of stay in Arges:

$$\begin{aligned} \Delta S_{2007-2008} &= (0,0011/0,0011)*100 = 100\% \\ \Delta S_{2008-2009} &= (0,0011/0,0011)*100 = 100\% \\ \Delta S_{2009-2010} &= (0,0011/0,0011)*100 = 100\% \\ \Delta S_{2010-2011} &= (0,0011/0,0011)*100 = 100\% \end{aligned}$$

The evolution in time of the average length of stay in Câmpulung Muscel:

$$\begin{aligned} \Delta S_{2007-2008} &= (0,0192/0,0182)*100 = 105,49\% \\ \Delta S_{2008-2009} &= (0,0173/0,0192)*100 = 92,10\% \\ \Delta S_{2009-2010} &= (0,0169/0,0173)*100 = 97,68\% \\ \Delta S_{2010-2011} &= (0,0182/0,0169)*100 = 107,69\% \end{aligned}$$

In order to calculate the average length of stay for each accommodation facility, the number of days is replaced by the number of overnight stay registered in the accommodation records, as follows:

$$S_P = \frac{NP}{T}$$

where: NP - number of recorded overnight stay;

T - number of tourists arriving;
 S_H - average stay in the hotel.

The average stay in Pension “Elyon”:

$$\begin{aligned} Sp_{2007} &= 1870/986 = 1,89 \\ Sp_{2008} &= 1850/803 = 2,30 \\ Sp_{2009} &= 1949/1024 = 1,90 \\ Sp_{2010} &= 1916/998 = 1,91 \\ Sp_{2011} &= 1896/967 = 1,96 \end{aligned}$$

Variation in time of the average length of stay

$$\Delta S_P = \frac{S_{P_i}}{S_{P_0}} \cdot 100$$

Time variation of the average length of stay in the guesthouse “Elyon”:

$$\begin{aligned} \Delta Sp_{2007-2008} &= (2,30/1,89)*100 = 121,69\% \\ \Delta Sp_{2008-2009} &= (1,90/2,30)*100 = 82,60\% \\ \Delta Sp_{2009-2010} &= (1,91/1,90)*100 = 100,52\% \\ \Delta Sp_{2010-2011} &= (1,96/1,91)*100 = 102,61\% \end{aligned}$$

c) Tourism demand seasonality indices

Tourism demand, essentially seasonal tourist flows evolving prints while uneven, with particularly important effects on the economy, environment and society. Seasonality can offer specific determinants belonging when it is dependent on natural factors, but can be generated only by request, namely environmental determinants of

tourism demand are formed [4]. Seasonal tourist traffic can have different amplitudes from one year to another, making it difficult to predict and requires more than its quantification [4].

- **The monthly traffic coefficient** is calculated as a ratio between the number of tourists during the highest-traffic month (LM) and the number of tourists during the lowest-traffic month (lm)

$$C_{monthly} = \frac{LM}{lm}, \text{ unde } C_{monthly} \geq 1$$

Monthly coefficient of tourist traffic in the pension “Elyon”:

$$C_{monthly} = 112/62 = 1,80$$

Coefficient monthly tourist traffic in the county Arges:

$$C_{monthly} = 33400/19200 = 1,73$$

- **The monthly concentration coefficient** is calculated by dividing the number of tourists recorded during the highest-traffic month by the total number of tourists during a year A_t .

$$C_c = \frac{LM}{A_t}$$

Value C_c ranges between 0.083 and 1.

Table 8. Concentration coefficient monthly pension at “Elyon”:

The board:

2011	ian	feb	mar	apr	may	jun	jul	aug	sept	oct	nov	dec
Nr.de turisti	76	72	66	62	84	87	100	98	104	98	75	112

$$C_c = 112/1034 = 0,108$$

Table 9. Monthly concentration coefficient at Arges County:

In the county:

month	Year- 2011
Ian.	27000
Feb.	19200
Mar.	24800
Apr.	25300
May	26500
Jun.	28300
Jul.	32100
Aug.	33400
Sept.	26800
Oct.	23500
Nov.	21600
Dec.	29500

$$C_c = 33400/318000 = 0,105$$

II) Tourism indicators

Calculate the offer businesses and reflects the distribution and temporal variation in the structure of their offer and individually for each undertaking offer.

a) The total supply of housing indicators

Global supply unit includes hotel accommodation, hotel our units, chalets, campsites, etc.. The unit is the number of seats or number of rooms rarely number of units.

- *Share of hotel (the pension) (B&B) capacity out of total accommodation capacity*

$$I_{cc} = \frac{LC}{LP} \times 100$$

where: LP - number of beds in hotels;

LC - total accommodation capacity

(hotel, motel, B&B, inn, etc.);

Table 10. Accommodation units, Arges County

NUMBER ACCOMMODATION IN ARGES					
Accommodations	2007	2008	2009	2010	2011
Hotels and motels	63	65	66	70	67
Urban guesthouses	70	72	78	78	80
Rural guesthouses	21	25	25	27	31
Total housing units	154	162	169	175	178
No. places	2580	2650	2780	2950	2780

Arges county level:

$$I_{cc(2007)} = (154/2580) * 100 = 5,96\%$$

$$I_{cc(2008)} = (162/2650) * 100 = 6,11\%$$

$$I_{cc(2009)} = (169/2780) * 100 = 6,07\%$$

$$I_{cc(2010)} = (175/2950) * 100 = 5,93\%$$

$$I_{cc(2011)} = (178/2780) * 100 = 6,40\%$$

Table 11. Boarding the "Elyon" House

Year	2007	2008	2009	2010	2011
Accommodation	13	13	13	13	13
Total beds in hostels	91	97	103	103	111

$$I_{cc(2007)} = (13/91) * 100 = 14,28\%$$

$$I_{cc(2008)} = (13/97) * 100 = 13,40\%$$

$$I_{cc(2009)} = (13/103) * 100 = 12,62\%$$

$$I_{cc(2010)} = (13/103) * 100 = 12,62\%$$

$$I_{cc(2011)} = (13/111) * 100 = 11,71\%$$

- *Indicator of total accommodation capacity evolution between „0” and „i”*

$$\Delta LC_{0-i} = \frac{LC_i}{LC_0} \times 100$$

In the county Arges:

$$\Delta LC_{2007-2008} = (2650/2580) * 100 = 102,71\%$$

$$\Delta LC_{2008-2009} = (2780/2650) * 100 = 104,90\%$$

$$\Delta LC_{2009-2010} = (2950/2780) * 100 = 106,11\%$$

$$\Delta LC_{2010-2011} = (2780/2950) * 100 = 94,23\%$$

The pension Elyon:

$$\Delta LC_{2007-2008} = (17/17) * 100 = 100\%$$

$$\Delta LC_{2008-2009} = (17/17) * 100 = 100\%$$

$$\Delta LC_{2009-2010} = (17/17) * 100 = 100\%$$

$$\Delta LC_{2010-2011} = (17/17) * 100 = 100\%$$

III) Indicators of supply and demand relationship

a) Index of customer evolution between „0” and „i”:

$$\Delta T = \frac{TP_i}{TP_0} \times 100$$

where: TP_i - tourists in hotels in year „i”;

TP₀ - tourists in hotels in year „0”.

Table 12. Number of tourists in accommodation units, Arges County

NUMBER ACCOMMODATION IN ARGES					
Year	2007	2008	2009	2010	2011
No. tourists	250000	245000	263000	269000	272000

Index of customer evolution in period 2007-2011 in Arges:

$$\Delta T_{2007-2008} = (245000/250000) * 100 = 98\%$$

$$\Delta T_{2008-2009} = (263000/245000) * 100 = 107,34\%$$

$$\Delta T_{2009-2010} = (269000/263000) * 100 = 102,28\%$$

$$\Delta T_{2010-2011} = (272000/269000) * 100 = 101,11\%$$

Table 13. Pension "Elyon", number of tourists

Year	2007	2008	2009	2010	2011
No. tourists	986	803	1024	998	967

Index of customer evolution in period 2007-2011 in pension "Elyon":

$$\Delta T_{2007-2008} = (803/986) * 100 = 81,44\%$$

$$\Delta T_{2008-2009} = (1024/803) * 100 = 127,52\%$$

$$\Delta T_{2009-2010} = (998/1024) * 100 = 97,46\%$$

$$\Delta T_{2010-2011} = (967/998) * 100 = 96,89\%$$

b) Index of overnight stay evolution:

$$\Delta N = \frac{NP_i}{NP_0} \times 100$$

where: N_{0-i} - overnight stay.

Table 14. Number of overnights in Arges County

Year	2007	2008	2009	2010	2011
Number of overnights	689300	660100	702200	710000	693800

Evolution index overnight stays in Arges:

$$\Delta N_{2007-2008} = (660100/689300) * 100 = 95,76\%$$

$$\Delta N_{2008-2009} = (702200/660100) * 100 = 106,37\%$$

$$\Delta N_{2009-2010} = (710000/702200) * 100 = 101,11\%$$

$$\Delta N_{2010-2011} = (693800/710000) * 100 = 97,71\%$$

Table 15. Number of overnight stays, "Elyon" House

Year	2007	2008	2009	2010	2011
Number of overnights	1870	1850	1948	1916	1896

$$\Delta N_{2007-2008} = (1850/1870) * 100 = 98,93\%$$

$$\Delta N_{2008-2009} = (1948/1850) * 100 = 105,29\%$$

$$\Delta N_{2009-2010} = (1916/1948) * 100 = 98,35\%$$

$$\Delta N_{2010-2011} = (1896/1916) * 100 = 103,65\%$$

c) Employment rate of pension/guesthouse hotel occupancy indicator (employment) - coefficient of capacity utilization accommodation (Cuc)

$Cuc = [no. overnights / (no. of places \times no. days)] \times 100$

$$G_o = \frac{NP \times 100}{LP \times Z} = \frac{NT \times S}{LP \times Z} \times 100$$

where:

G_o - occupancy, percentage;

NH - number of overnight stays;

LH - number of beds in hotels;

Z - number of supply days = 365 days;

NT - number of tourists;

S - average length of stay.

Employment of pension "Elyon":

$$G_{2011} = \frac{NP \times 100}{LP \times Z}$$

$$G_{2011} = (1896 \times 100) / (183 \times 365)$$

$$G_{2011} = 2,83$$

IV) Tourist traffic density:

a) Tourist density indicator in relation to population density:

$$D = \sum (T / P)$$

where:

T_{i-0} - total Romanian+foreign tourists;

Pop - local population.

Table 16. Tourists arrivals in Arges County

	2007	2008	2009	2010	2011
Tourists arrivals	315000	310000	306000	308000	318000
Population	483741	529833	613918	681206	652625
Romanian	314950	309935	305920	307900	317890
Foreign	50	65	80	100	110
Total	798741	839833	919918	98927	970625

$$D = (T1/P1) + (T2/P2) + (T3/P3) + (T4/P4) + (T5/P5)$$

$$D = (315000/483741) + (310000/529833) + (306000/613918) + (308000/681206) + (318000/652625)$$

$$D = 2.65$$

Table 17. Tourists arrivals in Câmpulung Muscel

	2007	2008	2009	2010	2011
Tourists arrive	20000	19000	21000	21500	20000
Population	38209	38358	38489	38506	39009
Romanian	19970	18975	20971	21467	19983
Foreign	30	25	29	33	17
Total	58209	57358	59489	60006	59009

$$D = (T1/P1) + (T2/P2) + (T3/P3) + (T4/P4) + (T5/P5)$$

$$D = (20000/38209) + (19000/38358) + (21000/38489) + (21500/38506) + (20000/39009)$$

$$D = 2,61$$

b) Tourist density indicator in relation to area:

$$D = \sum (T / S)$$

where:

T_{i-0} - total Romanian+foreign tourists;

S - town/village (county) area.

Table 18. Tourists arrivals in Arges County

	2007	2008	2009	2010	2011
County area	6800 Km ²	6800 Km ²	6800 Km ²	6800 Km ²	6800 Km ²
Total	315000	310000	306000	308000	318000
Romanian	314950	309935	305920	307900	317890
Foreign	50	65	80	100	110

$$D = (T1/S1) + (T2/S2) + (T3/S3) + (T4/S4) + (T5/S5)$$

$$D = (315000/6800) + (310000/6800) + (306000/6800) + (308000/6800) + (318000/6800)$$

$$D = 228.95$$

Table 19. Tourists arrivals in Câmpulung Muscel

	2007	2008	2009	2010	2011
Local area	11,7km ²	11,7km ²	11,7km ²	11,7km ²	11,7km ²
Total	20000	19000	21000	21500	20000
Romanian	19970	18975	20971	21467	19983
Foreign	30	25	29	33	17

$$D = (T1/S1) + (T2/S2) + (T3/S3) + (T4/S4) + (T5/S5)$$

$$D = (20000/11,7) + (19000/11,7) + (21000/11,7) + (21500/11,7) + (20000/11,7)$$

$$D = 8542.1$$

CONCLUSIONS

Statistics have shown that most of the tourist attractions in the county are not fully known and promoted, one of the key objectives of local authorities are turning Câmpulung Muscel

and surrounding areas in one of the most important tourist destinations in Romania for alternative tourism, environmental and cultural.

Significant findings from this study, data analysis and interpretation, by calculating the tourist traffic indicators will lead to a favourable change in the city so that the city wants to be a favourable tourist destination residents and tourists in particular, to satisfy the requirements to practice various forms of tourism. Municipality anticipated beneficial effect that this change brings the city into a tourist destination, being able to generate time and money to the local budget, but that investment should be continued to increase the attractiveness of the regional and national level. Câmpulung Muscel spas, is located in the foothills of the Fagaras mountains only 20-25 km height in the high hills in the middle of a forest area that I complete the beauty landscape. Quiet forest as whole spices and plants surrounding natural beauty have an overwhelming influence on the body beneficial. In this sense, tourism potential should be investigated in terms of its two components:

- *natural component*, represented by spectacular scenery, varied configuration of terrain, weather conditions favourable (reduced frequency of negative phenomena, no excessive temperatures), therapeutic value and abundance of natural factors (and thermo mineral water, curative mud, topoclimate and microclimate and fauna and flora, etc.);
- *anthropogenic component*, represented by the remains of civilizations that succeeded in Romania since time immemorial, Monuments and secular and religious art, museums and museum collections, ethnography and folklore items of great beauty and originality, current achievements prestige etc .

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AGRICULTURAL LAND-USE CHANGES AND RURAL TRANSFORMATION IN THE REPUBLIC OF MOLDOVA

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Abstract

This paper focuses on the links between changes in the land use and sustainable rural development in the Republic of Moldova. A particular attention is addressed to the analysis of land ownership fragmentation, existing impediments for creation of sustainable agricultural systems based on principles of economic growth, social equity and protection of the environment. The following research methods such as analysis of the impact of public policies in rural areas, including in agriculture, comparative analysis, analysis of annual time series, were used. There were also used qualitative research methods such as: interviews of key stakeholders and focus groups' interviews. Data for the quantitative analysis were collected from statistical yearbooks of the Republic of Moldova, National Land Cadastre and other available sources. The agricultural sector of the Republic of Moldova after the land reform is characterized by a polarization between large corporate farms and many small and fragmented family farms. The consolidation of land ownerships could become an effective instrument that can address both the problems of land fragmentation, but also the sustainable rural development in a wider context.

Key words: agriculture, land fragmentation, land ownership, land use, transformation.

INTRODUCTION

Modernization of the agricultural sector in the Republic of Moldova, as in many other countries with economies in transition supports complex processes of transformation. Structural changes in agriculture are very dynamic as for example, the size of land holdings, forms of ownership, labor utilization, increased dependence on external financing and markets.

There are several works in literature which examine the structural changes in the economic environment, starting from the least developed countries, where the predominant economic activity is based on agriculture and ending with highly developed countries [0, 0]. The rural economy is highly dependent on efficient use of agricultural land. The structure of agricultural land in the Republic of Moldova was changed through its distribution to workers of former collective and state farms after implementation of the land privatization program "Land" during the period 1998-2001.

In conditions of the lack of institutional support, rural areas of the Republic of Moldova encountered substantial problems caused by the inconvenient structure of farms and highly fragmented ownership of agricultural land and especially of the perennial plantations.

The main scope of this paper is to identify existing problems of the efficient land use and rural development in the Republic of Moldova.

MATERIALS AND METHODS

Given the specific set of problems related to efficient use of agricultural land, have been studied several scientific papers related to land privatization, rural development, and structural changes in rural areas [0, 0, 0, 0].

In this paper have been analyzed data from statistical yearbooks of the Republic of Moldova, data from the National Land Cadastre and other available sources.

The following research methods such as: analysis of the impact of public policies in rural areas, including in agriculture,

comparative analysis, analysis of annual time series, etc.

There were also used qualitative research methods such as: interviews of key stakeholders and focus groups' interviews in order to evaluate the impact of land use changes over the agricultural systems and rural livelihoods in the Republic of Moldova.

RESULTS AND DISCUSSIONS

As the most of the East- European countries the Republic of Moldova has passed through a process of land reform after the political changes around 1990.

The first attempts of land privatization have been made after adoption of the Land Code in 1991. However the massive land privatization has started after the implementation the program „Pământ” (Land) in 1998-2001, when over ¾ of agricultural land were privatized.

During the land privatization process the land was distributed to workers of the former collective and state farms in order to assure the social equity among the rural population.

Based on privatized land new forms of agricultural holdings and farms, limited liability companies, joint stock companies and production cooperatives had been created.

Currently about 74 percent of agricultural land (1,834,600 ha) is privately owned and about 26% of agricultural land (654,700 ha) are public property.

According to the national land cadastre on January 1, 2011 most of private agricultural land (40.4%) is owned by limited liability companies. In the possession of peasant farms are about 33 percent of the land. About 13% of agricultural land are cultivated independently by private owners, while cooperatives and joint stock companies own 7.5% and 2.4% of private land, respectively (see figure 1).

According to preliminary data of the General Agricultural Census in 2011 were working 903 000 farms, including 391,646 peasant farms, 232 agricultural cooperatives, 161 joint stock companies and 3624 limited liability companies.

Average size of an agricultural holding is 2.2 ha, including agricultural holdings with legal entity - 247.9 ha, and those with physical entity - 0.8 ha.

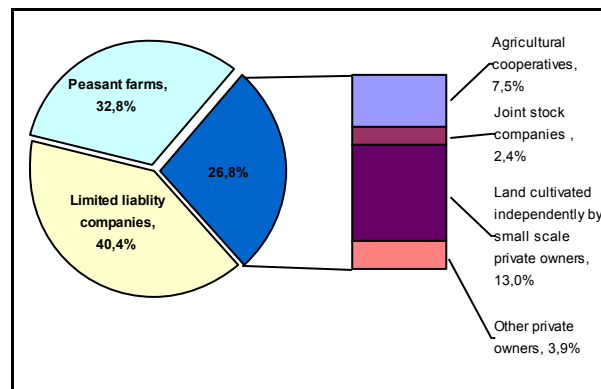


Figure 1. Structure of the private agricultural land according to the form of farms' organization, 2011, %

According to the General Agricultural Census of 2011 lands of agricultural holdings are divided into 2.65 million plots. Each farm holds on average 2.9 plots of land.

At national level the average size of parcels is 0.8 ha, including farms with legal entity - 25.8 ha, and those with physical entity - 0.4 ha. In many cases these parcels are located at a distance of 9-20 km from each other.

This fragmentation of agricultural land is largely a consequence of the imperfection of the legal framework and insufficient law enforcement.

Thus, under the latest version of the Land Code, art. 13 – the equivalent land share to be granted in kind in accordance with the land management project can be divided, depending to the situation at most within 3 plots of land (arable land, vineyards and orchards) [0].

However, within the framework of privatization process "Land" the equivalent shares of land in many cases were divided into 5-7 plots with the minimal size of the plot of about 4-5 ars.

Of the total number of 903 000 agricultural holdings registered within the General Agricultural Census of 2011, only 4800 (0.5% of the total) are farms with legal entity (limited liability companies, agricultural production cooperatives, joint stock companies, state enterprises, research institutes and agricultural schools, local

councils / municipalities owning agricultural land, religious establishments, NGOs and other agricultural enterprises) and about 898 000 (99.5%) are agricultural holdings with physical entity (peasant farms, individual and family households, etc.).

The corporate type of farms in particular such as Limited Liability Companies and Joint stock Companies in recent years have shown increasing trends of the number of households and respectively the reduction of the areas held by them as a result of adjustment to market conditions. Simultaneously, family peasant farms shows increasing trends of the number of households with areas larger than 5 hectares in recent years, keeping at the same level the number of households with 1-5 ha and reducing the number of households that have less than 1 ha of land (see table 1).

Table 1. The number of agricultural holdings, 2007-2011

Agricultural holdings	2007	2008	2009	2010	2011
Agricultural cooperatives	239	259	283	233	232
Joint stock companies	116	109	108	170	161
Limited liability companies	1342	1344	1513	2038	3624
Peasant farms (thousand)	390	386	381	400	392
<i>Including with area</i>					
Larger than 100 ha	186	209	203	276	559
From 50 up to 100 ha	105	113	143	524	780
From 10 up to 50 ha	746	904	1126	1794	2729
From 5 up to 10 ha	3307	4156	4320	3958	4175
From 1 up to la 5 ha (thousands)	2405	216	224	241	240
Less than 1 ha (thousands)	147	165	152	146	144

Source: Elaborated by authors based on data from the National Land Cadastre

Currently about 98% of the total number of peasant farms have areas less than 5 ha, including about 37% of them that have less than 1 ha, and 61% that holds areas from 1 to 5 ha. Together these agricultural holdings have worked about 42% of total agricultural land in Moldova in 2011.

Peasant farms have a significant share in total agricultural production. Together with

population households they deliver essential quantities of agricultural products. Thus the major part of the production of corn, potatoes, vegetables, fruits and grapes are concentrated in the community of small-scale farmers (see table 2).

Table 2. Share of population households and peasant farms in the total volume of vegetal agricultural production, 2007-2011, %

Crops	2007	2008	2009	2010	2011
Winter wheat	23,6	29,7	33,0	28,7	28,3
Barley	26,3	26,8	30,5	36,0	37,7
Corn	91,3	83,8	89,9	84,5	80,9
Leguminous vegetables	53,9	56,9	51,4	58,9	69,5
Sun flower	33,4	31,7	33,2	30,2	31,9
Soya	32,9	26,0	31,3	22,3	21,6
Sugar beet	14,8	9,6	12,1	13,5	8,5
Tobacco	19,4	17,9	13,6	19,7	22,2
Potatoes	88,6	90,7	88,9	83,4	84,6
Field vegetables	80,2	78,9	84,5	83,9	84,0
Pumpkins	96,6	96,7	97,5	97,8	98,0
Fruits and berries	52,1	50,5	57,9	59,8	62,2
Grape	80,0	77,8	79,7	85,7	78,6

Source: elaborated by authors based on data [0]

The share of small farmers in the livestock sector is even more impressive. Thus, most of the herd of cattle, swine, sheep, goats, horses and poultry are concentrated in small farms (see figure 2).

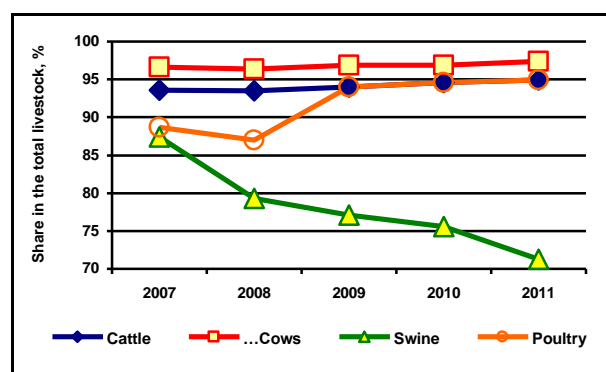


Figure 2. Share of population households and peasant farms in the total livestock production, 2007-2011, %

The small size of farming units and the difficulties they faced in adopting standards of hygiene, environment, plant protection and animal health, accompanied by lack of vocational education in agriculture can be

identified as major obstacles in developing the individual farming sector of the Republic of Moldova.

An alternative to individual farming in order to increase their bargaining power in relation to the processing industry is creating local associative structures such as marketing and production cooperatives.

Currently, there are three agricultural systems in the Republic of Moldova such as: conventional, subsistence system and organic. Specific features of the conventional system in the Republic of Moldova are:

- The concentration of land in large farms;
- Deepening the specialization of agricultural enterprises;
- High level of dependence on imported resources;
- Mechanization and intensive use of chemicals in the production process;
- Increasing labor productivity and reducing rural population.

Subsistence agricultural system is characterized by:

- Agricultural production is used mainly for family consumption;
- Practicing simplified technologies based on manual labor;
- Small size of agricultural plots.

Organic agricultural system is characterized by:

- Production organized at certified farms;
- Ecological certificate performed in accordance with European regulation of organic production;
- Maintenance and restoration of soil fertility.

The share of organic agricultural system is insignificant and does not exceed 1% of the cultivated land in the country.

An important factor for sustainable rural development is the availability of qualified labor force. In the last five years, rapid changes are highlighted in employment in the agricultural sector as whole and agricultural enterprises in particular. Reducing the number of people involved in agriculture in all

farming systems demonstrates inability of agriculture to absorb surplus of labor. This creates an uncertain situation in rural economic development planning (see figure 3).

Taking into account the increasing complexity and uncertainty of agricultural systems of different sizes that compete with each other, it is necessary to form a modern vision of agricultural development.

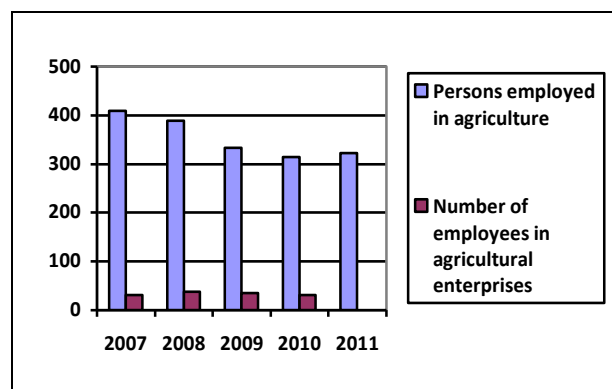


Figure 3. Use of labor force in agriculture of the Republic of Moldova, 2007-2011, thousand persons

The efficiency and competitiveness of the rural sector is dependent on a coherent approach regarding land tenure. Land fragmentation is an important factor affecting the Republic of Moldova as many other countries and its resolution through land consolidation would give to agricultural producers an incentive to invest in their farms and to remain in rural areas.

Taking into account the risk of land abandonment and depopulation, due to the high level of migration from rural areas, there are several opportunities for intervention in order to assure a sustainable development of the rural sector. Thus the demographic development can be influenced to a limited extent, while socio-economic factors and institutional frameworks can be addressed by appropriate policies.

Sustainable development has three principal dimensions: economic growth, social equity and protection of the environment. The economic dimension is the underlying principle for the society's well being that should be maximized and poverty eradicated through the optimal and efficient use of natural resources. The social aspect refers to

the relationship between nature and human beings, uplifting the welfare of people, improving access to basic health and education services, and fulfilling food security needs and respect for human rights. The environmental dimension, on the other hand, is concerned with the conservation and enhancement of the physical and biological resource base and ecosystems.

Today, in majority of the European countries, land consolidation is an essential tool amongst other instruments in the land management tool-box and it is an integrated part of a broader rural development “package” [0].

The most relevant approach of land consolidation is based on the following principles such as:

- Land consolidation has to be participatory, democratic and community driven
- The focus is on rural livelihood rather than on primary production of food staples
- The end result is community renewal, that is, sustainable economic and political development of the whole community
- It is founded on the principle of assisting the community define new uses of its resources and then reorganize its spatial components (parcels) accordingly [0].

Consolidation processes in the Republic of Moldova shows a slow but steady growth trend. Thus, in 2005 the share of agricultural land cultivated by farms larger than 100 ha was of 48.7%, of those with size from 5 to 100 ha was about 1.6%, and of those with areas less than 5 ha - 49.7%. Respectively in 2011 the share of agricultural land cultivated by farms larger than 100 ha was 52.4 (+3.7%), of those with size from 5-100 ha was 5.3% (+3.7 %) and of those with areas less than 5 ha - 42.3 (-7.4%).

Also one can observe a positive development in the agricultural land market. Thus, during the period 2008-2011 the volume of transactions with agricultural land has increased by 7.3% from 169.1 thousand transactions in 2008 to 181.4 transactions in 2011. The major part of these transactions consists of sale/purchase of agricultural land which amounted to about 39% of total number

of agricultural land transactions in 2011. The second important type of land transactions is inheritance, followed by change/donation with 33% and 21% of total number of agricultural land transactions in 2011, respectively. The share of other type of land transactions was of about 7% in 2011 (see figure 4).

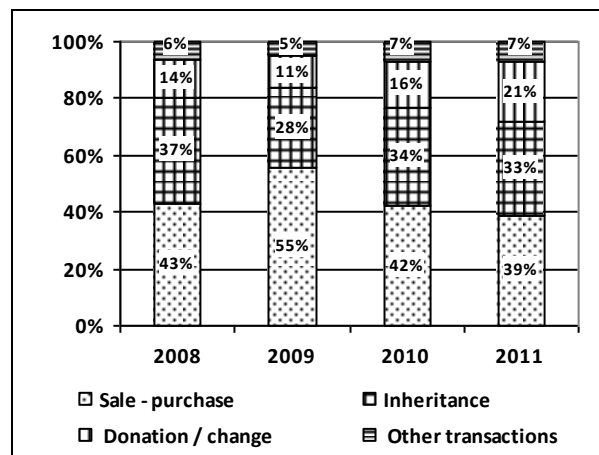


Figure 4. Structure of agricultural land transaction, 2008-2011, %

The main constraints in the development of the land market are manifold for both purchase-sale market and lease on the land. Most of these problems are common to countries in transition. Among the biggest obstacles are the following:

- Difficult identification of the transaction partners for the sale or purchase of agricultural land;
- Too high price of agricultural land and insufficient funds to purchase this land;
- Excessive fragmentation of land parcels;
- Reduced offer for agricultural land;
- The complexity of legal procedures related to sale-purchase and inheritance of agricultural land;
- The uncertainty, complexity, and long transaction process for purchase of agricultural land [0].

These obstacles contribute to increased transaction costs that inhibit the development of the land market. Transaction costs refer to the costs for information search, identification and selection of potential trading partners, negotiation of contractual terms, monitoring,

coordination and implementation of contractual stipulations [0].

At the same time transaction costs are only a part of these barriers that together with other factors such as reduced demand for agricultural land, low profitability of agriculture and insufficient motivation for selling farmland contributes to slowly consolidation of the farmland.

Causes underlying the cumbersome process of land consolidation can be grouped into several categories:

- Continuous enlargement of the process of land parceling due to the lack of the legal framework governing the inheritance of agricultural land to a single heir. Without this legal framework parcels of agricultural land are distributed to several heirs, which only deepen the process of land parceling.
- The negative attitude towards processes of association among the local farmers. This is largely due to their insufficient information about the benefits that can be obtained from the farm association, and the insufficient legal framework regulating the processes of association.
- Absence in the village of landowners, which creates serious problems because people with rights to own land are either deceased or are working abroad. In case of the deceased persons their heirs either are in the process of law to take possession rights or do not know that they can obtain these rights, especially in the situation when these people are not in the country.
- Conceiving agricultural land as a "safety net" under extreme conditions. About 42% of agricultural land is owned by farmers that cultivate areas less than 5 ha. In most cases the income from small scale farms is not enough to serve as the main source of income for rural families. Thus these owners have, as a rule, other income sources, mostly non-agricultural and non-rural, while the agricultural lands are preserved either as an additional source of income and as a "safety net" in the event of socio-economic changes in a fairly instable environment.

CONCLUSIONS

- The agricultural sector of the Republic of Moldova after the process of land privatization is characterized by a clear dichotomy between large scale corporate farms and many very small and fragmented family farms.
- Land consolidation is still at a vulnerable stage in Moldova due to the inadequate structure of the agricultural systems that does not correspond to main principles of the sustainable rural development
- Among major impediments to the process of land consolidation one can mention legal gaps, poor law enforcement and underdeveloped institutional framework.
- The small size of agricultural land plots, internal fragmentation of land in farms, predominantly subsistence nature of agricultural production in family farms significantly influence farmers' income, and their ability to maintain a sustainable rural community.

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THE GLOBALIZATION, AN OPPORTUNITY FOR THE ROMANIAN ECOTOURISM

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Abstract

Globalization has become a driving force to many industries in today's world. Tourism was one of these forces of the globalization system. People were brought together by tourism from distinct parts of the world and it is due to tourism that the exchange of information, economics and cultures has been possible. Ecotourism is an alternative way of travelling and discovering other countries that makes more sense at the time being for smaller players.

Key words: ecotourism, globalization strategies, trends

INTRODUCTION

In this time of globalization, the entire world is facing with the challenge of protecting important resources, while at the same time ensuring economic growth. The current era of globalization has seen an increase in the exploitation and degradation of natural resources due, in part, to the opening of markets, an increase in trade and industrialization, and developing countries struggling to improve their standard of living. Much has been written about sustainable development and its use as a possible solution to the challenge of economic growth and environmental protection. One tool that can be used as part of a sustainable development approach to link economic growth with conservation of natural resources is ecotourism.

The nature is getting more and more important as criteria for today's tourist. There was a time when comfort and luxury were extremely important in a tourist's decision-making process, but those criteria have very much changed since then. Today's travelers are willing to give money for the preservation of the social and natural environments they want to visit.

Tourism, one of the fastest growing industries, is being accelerated by globalization. The fast growing transportation industry, the free flow of information over the

internet and different media, and the decreasing costs of communication are all factors supporting the new emerging ecotourism.

However, there is a major paradox: a tourist harms the environment he is searching for, while he discovers it. Main tourism corporations have adopted the way of generic mass tourism for economical reasons.

The practice of ecotourism and sustainable tourism has the potential to assist in conserving natural areas, reducing poverty, empowering women, enhancing education, and improving the health and well being of local communities.

This is considered to be the great challenge of ecotourism to support economic growth and settle the frame for effective environment protection, both natural and social perspectives.

Due to the current tourist market problems, such as the length of the chains and the non-flexible components tourism companies have created, smaller actors will be able to join the ecotourism market. Taking into consideration the necessary measures, those small actors will have the opportunity to create and offer products and services that incorporate the new criteria that are in demand, creating more value for the tourist.

For a successful ecotourism industry is very important to adapt innovative management tools, and help the small actors to get key

tools in order to materialize the opportunities brought to them by this form of tourism. Ecotourism products and solutions could be seen as innovative for the tourism industry. Latest innovation models developed for high technology industries could be adapted by the ecotourism as key success factors for this industry that contains unique characteristics and dynamics.

MATERIALS AND METHODS

The importance of the quality criteria for the typical traveler has changed over the last years. One of the main criteria for every tourist is the positive environmental impact. Yearly, more and more tourists are willing to give money for taking advantage of an ISO 14000 drain system or for having their garbage collected, recycled and reused as part of a recycling program.

While people in poor and developing countries are looking for the benefits of modern world, western travelers are now avoiding traveling to over-populated-with-tourist locations, and are beginning to search for simplicity, natural environments and primitive cultures. Local ecotourism actors in countries having good weather conditions, rich biodiversity, beautiful landscapes and authentic culture should consider these elements and develop good quality infrastructures and trips.

Companies acting in tourism have to take into consideration these expectations and demands in order to aspire to a top position in tourism industry. In 2013, tourists expect tour operators, transport companies and local actors to be fully aware of the long-term affects their trips have on the surrounding environment, whether natural or social.

The Germans are one of the first documented cultures to identify this phenomenon. The environment has become a major criterion in the tourist's decision-making process. For the German ecotourism market, relative to the rest of the world, this is very much in its maturity phase. They have achieved this status in the same way that they are one of the leaders of the recycling movement.

An interesting study by the World Tourism Organization in 2002 demonstrated that tourists do not necessarily require their trips to consist uniquely of ecotourism activities. Rather, they see their ideal trips as a compliment to ecotourism activities. Thus, it is an added-value for tourists to know that they are traveling through the Danube Delta in a fuel-efficient boat for example, instead of being forced to take canoes.

This confirms the fact that the general population is more and more orientated towards environmentally friendly trips, and not just a small group of Greenpeace activists. Such a trend will allow for the environment to be gradually included in all facets of tourism, without necessarily replacing what currently exists. This, in turn, will enable the phenomenon reach the tourism industry as a whole, and make a significant impact on the environment [1].

Globalization has become a driving force to many industries in today's world. Tourism industry is one of the fastest growing sectors which has benefited from it. Many developing countries have the opportunity to embrace the integration of culture, technology, politics, and economics as a part of their strategy in attracting tourists to these countries. It is very important to realize that both globalization and tourism feed off each other. In other words, as much as tourism needs globalization to grow as an industry, it is due to tourism that globalization has become such an important aspect of interaction across geographic spaces. Tourism it is considered to be the forerunner of the globalization system. People were brought together by tourism from distinct parts of the world and it is due to tourism that the exchange of information, economics and cultures has been possible.

The globalization system connects political, social, economic and geographic divided parts. It is the force that encourages growth in tourist activities across such divided parts. Through globalization, communication has become much more easily accessible between people.

Globalization is characterized by facilities and easier access to information, which in turn drives tourism as an industry.

Because information is conveniently accessible to tourists via the Internet, they approach traveling with a much more concrete idea of what it is they will get out of this experience. Anyway, the tourism industry must continually keep on going with the changes in a consumer's knowledge about different cultures in the world, and also try hard to offer innovative approaches to touring the world.

There is a paradox within a destination that relies on tourism as a main industry for the country's economy: a tourist destroys what he is searching for, while he discovers it. As Dr. Sheryl Elliot, professor at the George Washington University's School of Tourism Administration has noted, "Finding the right balance is the key for tourism as it is for the overall globalization system. Being able to see tourism through multiple lenses (financial, political, social, environmental, and technical) helps in accomplishing this goal". (Elliot S., 2011)

The biggest problem that the tourism faces is to support economic growth while ensuring the long-term protection of the social and natural environment. Many of the developing countries rely on tourism as main source of income, and job employment making it very important for the economy of the country. So, many developing countries rely on mass tourism to support their economy. However, these countries might make the mistake of overuse their resources in order to maximize the short-term opportunities that tourists can bring, sacrificing the long-term natural environment of their area. Thus, if not well managed, touristic attractions can degenerate into generic commercialized mass tourism sites that lose their attraction and eventually become unpopular.

Ecotourism is a solution to this problem. It allows for tourist activities to take place, while keeping in mind ways to react against the negative impacts of mass tourism. Breaking down the elements of globalization and their effects on tourism, will allow tourist industry to ponder the pro's and con's of the market's evolution and ensure that the popular destinations are subjects of a sustainable development.

Good news is that globalization, by information channels, allows every potential traveler to be aware about today's environmental threats such as global warming and water pollution, making more and more people look for alternative and sustainable travel solutions.

RESULTS AND DISCUSSIONS

Romania offers to travelers the opportunity to discover some of the most superb, unexplored scenery in Europe. Tourists have the possibility to explore dense pine and beech forests still teeming with wildlife or watch pelicans in the Danube Delta, or they can try their hand at traditional rural crafts, trace secret passages in rambling Transylvanian castles, or just enjoy a tranquil picnic amid a patchwork of wild flowers.

Hiking is a great way to experience Romania's spectacular flora and fauna. Hiking routes vary from easy day walks in rolling hills to strenuous hikes through high, remote mountains.

Birds watching in one of the top three biodiversity hotspots in the world: the Danube Delta (over 320 bird species) or in remote locations of the Carpathian Mountains where Wallcreepers and Green Woodpeckers can be seen.

Another attraction for tourists experiencing Romanian Ecotourism is to discover tracks left by wildlife in the forest, watch bears from a hide or experience the co-existence between humans and wildlife by visiting a shepherd's camp.

Cycling through rolling hills and traditional villages or trying more strenuous routes, over rough terrain and steep hills, both in lowland and mountain areas, could be also an important attraction for travelers in Romania.

Travelers can appreciate the variety of the landscape when riding from a picturesque village, across attractive farm land still worked by horses, through natural forest, and up into high pastures with an extensive view over unspoiled mountains.

For a taste of rural culture in Romania, travelers can explore medieval villages, try their hand at traditional crafts, observe wild

flowers, wander in the stunning countryside, picnic in the fields - or just relax at the home of a village family and sample wholesome, country fare (with zero food miles!) washed down with home made wine and plum brandy. Tourists passionate about food, they will be intrigued to discover how - along the centuries - Hungarian, Saxon, Turkish and Lipoveni flavors have become interwoven, with local ingenuity, to create the special Romanian dishes of today, specific to each historical region.

Canyons, waterfalls and fast rivers are perfectly suited to water sport activities such as canoeing and white water rafting, while lazy rivers, lakes and reservoirs encourage rafting by traditional wooden raft. The Danube Delta offers opportunities for quiet paddling and canoeing for both skilled and amateur canoeists.

Winter sports fans will enjoy trails in the hills and mountains ranging from short trips for beginners to strenuous routes for fit, experienced ski-mountaineers. Snow-shoe trips are a great way to spot tracks left by animals, while a gentler option is a trip by horse-drawn sleigh. After the cold outdoors, tourists can enjoy the night in a warm guesthouse heated by traditional wood-burning stoves, with good home-cooking and local plum brandy.

CONCLUSIONS

Ecotourism is the new way of traveling and discovering other countries that makes more sense at the time being for smaller actors. Larger and established players are stuck with their rigid organizational structures and will never allocate resources to serious ecotourism projects until the market is large and profitable enough. In other words, large organization such as Tomas Cook and TUI will wait until a profitable infrastructure is in place. While most countries still struggle to find a solution for such an infrastructure that balances economy and ecology, Romania is showing positive change.

The inevitable path large tourism companies will follow is the opportunity for innovative start-ups to successfully launch their new

products, grow the ecotourism market, and leapfrog their established rivals.

Information and communication technologies, the Internet, travel guides and other information-diffusing media are bringing about great knowledge that is significantly stimulating our thirst for world discovery.

Tourism is about balancing the unknown with the known. While people travel to search for what they lack in their own environments, they also travel to find what they already know and could relate to. When images and texts on beautiful natural and social environments pass through our computer screens every day, we become aware and our fear of traveling to the unknown disappears. We no longer need elements from our physical home to feel comfortable when elements from our virtual home are naturally available. This fundamentally explains the accelerated ecotourism market and the new opportunities for new entry local firms.

Romania has a lot of attractions, making it one of the most attractive ecotouristic destinations in Europe. The authenticity and the uniqueness of those attractions create a story which looks forward to be revealed to all tourist visiting Romania.

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THERMAL CALCULATION FOR THE PRODUCTION OF VEGETABLES GREENHOUSE

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Abstract.

This paper presents the calculation regarding thermic transmission through the closing elements made for a greenhouse designed for salat production, pea, spinach and cabbage, D.M. greenhouse type, with medium and large openings (12...30m) having a light roof with spatial structure from bars and thin walls made from galvanized steel or aluminium and designed at the Technique University from Cluj-Napoca. The greenhouse opening is 15.90 m, the total length is 40.50m and 669.53 sqm surface with 643.95 sqm usable area. After analyzing the thermal calculations for the production of vegetables greenhouse show that the heat losses are insignificant, advantage is given by the light roof with spatial structure from bars and thin walls made from galvanized steel or aluminium.

Key words: greenhouse, roof with spatial structure, thermal calculation

INTRODUCTION

Greenhouses are constructions for extra-season production of vegetables, flowers or seedlings, having external surfaces made from glass or other transparent materials, in which is realized an artificial microclimate favorable to crops, independently of season and the weather condition. The evolution of greenhouses construction led to different achieving conceptions of schemes for strength structure and closing elements, depending on the types of obtained crops and the local conditions, particularly for individual and block greenhouses [7].

MATERIALS AND METHODS

The calculation regarding thermic transmission through the closing elements was made for a greenhouse designed for salat production, pea, spinach and cabbage. At the Technique University from Cluj-Napoca was designed the D.M. greenhouse type, with medium and large openings (12...30m) having a light roof with spatial structure from bars and thin walls made from galvanized steel or aluminium (fig. 1). The new type of greenhouse is

equipped with all possible thermal energy saving technics and shading systems using a single or double screen etc.

RESULTS AND DISCUSSIONS

Calculations were prepared according to STAS 1907/3-97. The characteristic elements of the building location are:

- third climate area related to Romanian climate zoning map;
- orientation to the cardinal points: EV longitudinal direction, with the main facade to the west;
- the fourth aeolian area related to settlements framing map in windy areas;
- the importance class related to P 100-2006;
- seismic zone related to P100-2006:F, $ag=0.08$;
- corner period related to P100-2006: $TC=0.7$ sec;

Bearing structure and finishes:

The greenhouse opening is 15.90 m, the total length is 40.50m. The greenhouse built surface is 669.53 sqm. The usable area is 643.95 sqm.

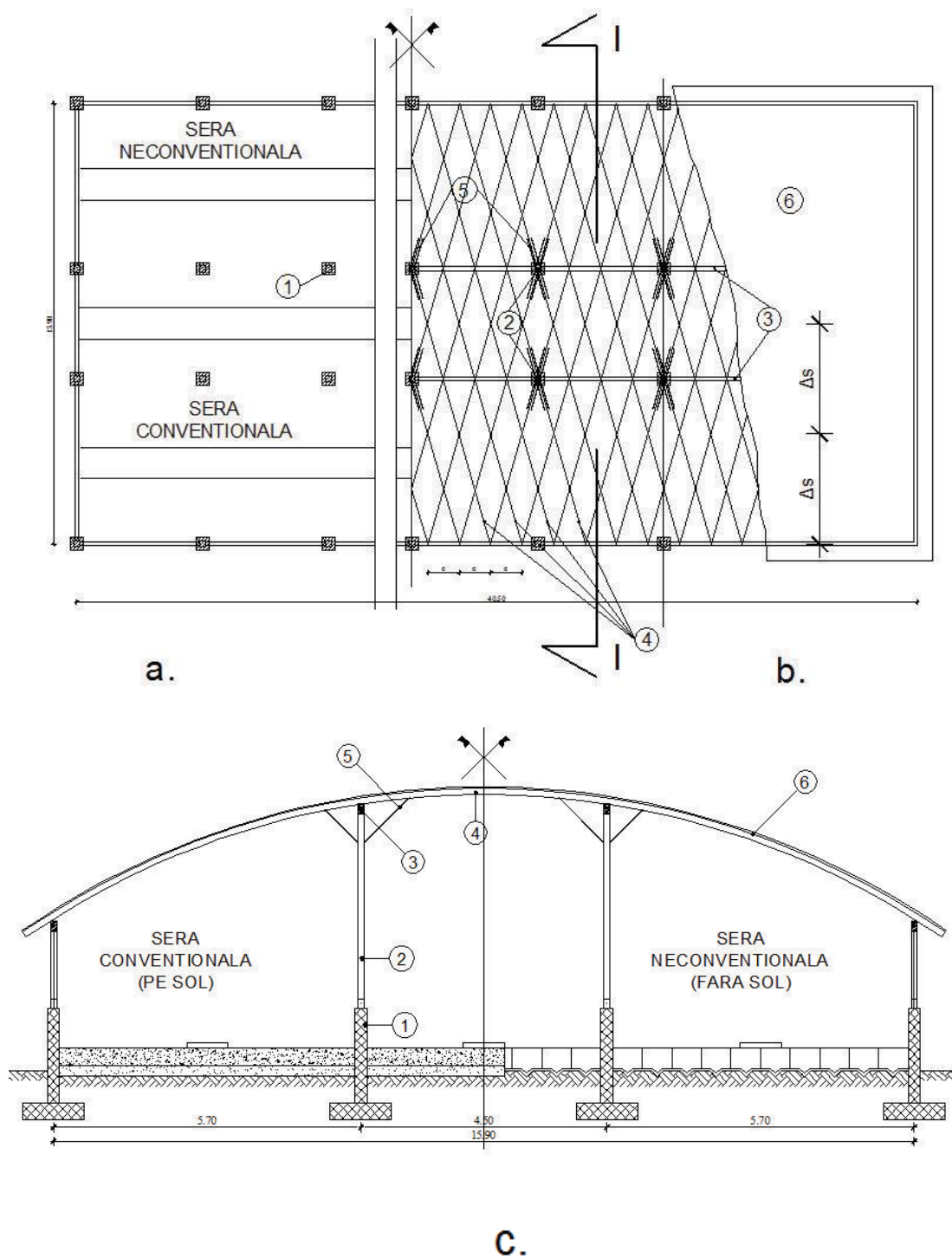


Fig. 1. Greenhouse for the production of lettuce, peas, spinach and cabbage
 a-ground level plan; b-light roof plan with spatial structure; c-section cross; 1 - precast concrete pillar supporting the greenhouse roof; 2 - metal pole supporting the greenhouse roof; 3 - metal beams; 4 - light roof with spatial structure; 5 - metal struts supporting the roof; 6 - parcel of structured polycarbonate boards, glass or foil from plastic metal

The bearing structure made of rolled galvanized steel, will have 3 openings of 5.70 m, 4.50 m and 5.70 m and spans of 4.50 m, and as closing material will be used the glass, plastic foil and structured polycarbonate boards (Twinwall sau Triplewall). Prefabricated foundations have deep (from the natural field level) of -2.40 m and the socle level over the field at +0.30 m.

The envelope elements have the following composition:

- The exterior walls are made of glass, plastic wrap or structured polycarbonate boards (Twinwall or Triplewall) and metal frame. Glass, plastic wrap or structured polycarbonate boards must have the following qualities: great penetrability for sunlights, low reflection, high resistance at applications. Optimal thickness for lateral walls is 3 mm.

- The roof is made from glass, plastic wrap or structured polycarbonate boards that have the following qualities: elasticity, flexibility, high resistance at applications, low specific weight, high optical transparency.

Land area on which is located the greenhouse:

$$S_{\text{greenhouse}} = 15.90\text{m} \cdot 40.50\text{m} = 643.95\text{m}^2$$

Glass surface:

$$S_{\text{FL}} = 1.50\text{m} \cdot 40.50\text{m} \cdot 2 + 1.50\text{m} \cdot 15.90\text{m} \cdot 2 = 169.2\text{m}^2$$

$$S_{\text{FA}} = 17.81\text{m} \cdot 40.50\text{m} = 721.305\text{m}^2$$

$$S_{\text{F}} = S_{\text{FL}} + S_{\text{FA}} = 890.505\text{m}^2$$

Calculation of heat needed for greenhouse

Calculations shall be prepared according to STAS 1907/3-92.

So, is calculated:

$$\psi(s) := 0.50 \quad \text{for } S_{\text{greenhouse}} = 643.95\text{m}^2$$

In the forth windy area (related to STAS 1907/3-92) "v" is the calculation speed for wind:

$$v := 4 \left(\frac{\text{m}}{\text{s}} \right) \quad v^{\frac{4}{3}} = 6.35 \left(\frac{\text{m}}{\text{s}} \right)$$

α_i, α_e – superficial coefficients of heat transfer are calculated with the following relations:

$$\alpha_i := 4.65 + 1.63v \cdot \psi(s) = 7.91 \left(\frac{\text{W}}{\text{m}^2\text{K}} \right)$$

$$\alpha_i > 6.4 \quad \text{then } n := 1.70$$

$$\alpha_e := 5.82 + 4.07 \cdot v = 22.1 \left(\frac{\text{W}}{\text{m}^2\text{K}} \right)$$

$$K_{\text{ET}} := \frac{\alpha_i \cdot \alpha_e}{\alpha_i + \alpha_e} = 5.825$$

π_n - penetration coefficient;

$\pi_n := 0.10$ for sealed greenhouses;

n- leakage coefficient of the greenhouse;

n:=1.70 for sealed greenhouses;

$$\xi := \frac{i_i - i_e}{t_i - t_e} \left(\frac{\text{KJ}}{\text{kg} \cdot \text{K}} \right)$$

where:

i_i - indoor air enthalpy (KJ/kg);

i_e - outdoor air enthalpy (KJ/kg) or (Wh/m³);

- greenhouse is intended to produce salad $t_i := 14^{\circ}\text{C}$ $u_i := 70\%$

- greenhouse is placed in climate zone III $t_e := -18^{\circ}\text{C}$ $u_e := 80\%$

- t_i - interior temperature of calculation;

- t_e - conventional temperature of outdoor air according to climate zoning map of Romania;

$$i_i := 9.118 \frac{\text{kcal}}{\text{m}^3}$$

$$i_e := -5.07 \frac{\text{kcal}}{\text{m}^3}$$

$$\xi := \frac{i_i - i_e}{t_i - t_e} = 0.443 \cdot \frac{\text{kcal}}{\text{m}^3 \cdot \text{K}}$$

K_{conv} - global coefficient of heat transfer due convection through glazed surface is

$$K_{\text{conv}} := K_{\text{ET}} \cdot \left[1 + \pi_n (K_{\text{ET}})^{n-1} \zeta \right] \quad \text{determined}$$

with the relation:

$$K_{\text{conv}} = 6.711 \frac{\text{W}}{\text{m}^2\text{K}}$$

c- coefficient that takes into account the occurrence frequency of hours with clear sky associated to conventional temperature of outdoor air, with the value $c=0.10$ regardless the climate area;

$$K_{\text{conv}} = 6.711 \frac{\text{W}}{\text{m}^2\text{K}} \quad c := 0.10 \frac{\text{W}}{\text{m}^2\text{K}}$$

$$t_i := 14^{\circ}\text{C} \quad t_e := -18^{\circ}\text{C}$$

$$S_{\text{greenhouse}} = 643.95\text{m}^2$$

$$S_{\text{F}} = 890.505\text{m}^2$$

Global heat demand "Q" of a greenhouse is calculated with the relation:

$$Q := 1.26 \cdot S_{greenhouse} \left[0.35 \frac{W}{m^2 K} + \frac{S_f}{S_{greenhouse}} \cdot (K_{conv} + 3.26 \cdot c) \right] \cdot (t_i - t_e)$$

$$= 2.618 \times 10^5 \cdot W$$

CONCLUSIONS

After analyzing the thermal calculations for the production of vegetables greenhouse show that the heat losses are insignificant, advantage is given by the light roof with spatial structure from bars and thin walls made from galvanized steel or aluminium, model developed at the Technical University of Cluj-Napoca according to invention D.M. new type of greenhouse. The modern greenhouse has many new design with medium and large openings and with free spaces for the shielding installation under the roof and along the side walls. The energy crisis and the growth of fuel prices, from the last period, has generated interest in using new systems for the protection and use of heat sources, such as double-walled constructions to reduce heat losses, constructions with plastic closures without technique heating, using new sources of heating from solar, wind, geothermal energy etc.

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CALCULATION REGARDING THERMAL TRANSFER THROUGH CLOSING ELEMENTS FOR A CATTLE SHELTER KEPT IN LOOSE HOUSING

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Abstract.

This paper presents the calculation regarding thermal transmission due to closing elements for cattle shelter kept loose housing. The shelter is compound from 2 compartments, splitted in the middle by a cross alley. The compartments are divided in feeding area and resting area. The shelter has the opening of 16.35 m, total hall length is 40.95 m, with surface about 669.53 sqm and the maximum height about 6.40 m. After analyzing the calculation of heat transfer through closing elements for a cattle shelter kept in loose housing show that the amount of heat lost through external walls with heterogeneous structure is minimal compared to the classical exterior wall with homogeneous structure.

Key words: constructive system, shelter, thermal balance, thermal transmission

INTRODUCTION

Shelters designed for breeding and exploiting animals are designed in such a way as to respond to specific technological requirements imposed by species considering: capacity, biological value, purpose, endowments, all leading to various constructive solutions, that respond to the functional interdependence factors. Conception, projection and execution of these constructions must be done in such ways to match the advanced technologies of exploitation and to offer large possibilities of typing and industrialization. Choosing the constructive system of buildings must be done also through economical efficiency determination, in order to adopt the most beneficial constructive solutions that to base on advanced methods and procedures of execution and to lead to minimizing consumption of scarce materials and high consumer materials of embodied energy by using local materials and high evaluation of industrial waste [5].

MATERIALS AND METHODS

This paper presents the calculation regarding thermal transmission due to closing elements for cattle shelter kept loose housing. The characteristic elements regarding the building location are:

- third climate area related to Romanian climate zoning map, $T_e = -18^\circ\text{C}$;
- orientation to the cardinal points: EV longitudinal direction, with the main facade to the west;
- the forth aeolian area related to settlements framing map in windy areas;
- seismic zone related to P100-2006:F, $a_g = 0.08$;
- corner period related to P100-2006: $T_C = 0.7$ sec.

The shelter has the opening of 16.35 m, total hall length is 40.95 m. The built surface of the hall is 669.53 sqm. The maximum height is 6.40 m. The shelter is compound from 2 compartments, splitted in the middle by a cross alley. The compartments are divided in feeding area and resting area. The bearing structure is made from independent frames with 3 openings of 5.70 m, 4.50 m and 5.70 m

and spans of 4.50m. The frames pillars are prefabricated and embedded in isolated foundations of glass type, that rests on concrete blocks C8/10. Exterior walls with heterogeneous structure have the following characteristics:

- interior plaster mortar-cement with density $\rho = 1700 \text{ kg/m}^3$, thickness $d = 0.015 \text{ m}$ and thermal conductivity $\lambda = 0.87 \text{ W / mK}$;
- full-brickwork with density $\rho = 1800 \text{ kg/m}^3$, thickness $d = 0.24 \text{ m}$ and thermal conductivity $\lambda = 0.80 \text{ W/mK}$;
- rigid insulation boards of mineral wool with density $\rho = 100 \text{ kg/m}^3$, thickness $d = 0.10 \text{ m}$ and thermal conductivity $\lambda = 0.048 \text{ W/mK}$;
- ventilated air layer;
- full-brickwork sitting on the edge with density $\rho = 1800 \text{ kg/m}^3$, thickness $d = 0.063 \text{ m}$ and thermal conductivity $\lambda = 0.80 \text{ W/mK}$;
- external plaster with mortar-cement with density $\rho = 1800 \text{ kg/m}^3$, thickness $d = 0.02 \text{ m}$ and thermal conductivity $\lambda = 0.93 \text{ W/mK}$.

The roof is made of precast prestressed concrete purlins that support a layered structure consisting of: wood substrates insulation, vapor barrier of polyethylene, 10 cm thick mineral wool (density $\rho = 100 \text{ kg/m}^3$, thickness $d = 0.10 \text{ m}$ and thermal conductivity $\lambda = 0.048 \text{ W/mK}$, according to C107/3-2005) and covering of corrugated iron with $\rho = 7200 \text{ kg/m}^3$ density, thickness $d =$

0.0035 m and thermal conductivity $\lambda = 50 \text{ W/mK}$ according to C107/3-2005.

RESULTS AND DISCUSSIONS

Geometrical and thermotechnical characteristics of building envelope elements

Calculation of shelter's windows

- State lighting: $i = 1/20$ for

$i = Sf/Sp$;

$Sf_{nec} = Sp/20$;

$S_p = A_{util} = 627.12 \text{ m}^2$; $Sf_{nec} = 31.356 \text{ m}^2$;

$Sf = 31.356 / 36 = 0.871 \text{ m}^2$ window;

Choose $Sf = 1.80 \times 0.90 = 1.62 \text{ m}^2$ window, where $h = 90 \text{ cm}$, $l = 180 \text{ cm}$ and $h_{parapet} = 1.50 \text{ m}$.

Number of windows considered for housing of cattle is 36

Establishing geometrical characteristics

-Were calculated related to building's plan and are summarized presented below:

Establishing geometrical characteristics

Levels number: $N_r N_{iv} = 1$ ground;

Useful high volume of shelter is $V_{util} = 1755.936 \text{ m}^3$;

Useful area of shelter is: $A_{utila} = 627.12 \text{ m}^2$;

Useful height of shelter is: $h_{utilmediu} = 2.80 \text{ m}$;

The surfaces of envelop elements for bulls shelter are showed in table 1, the exterior walls and glazed areas are showed on cardinal orientations.

Table 1. The surfaces of envelop elements for cattle shelter

Nr. crt.	Element of envelope	Element area in m^2 cardinal orientation			
		Facade E	Facade V	Facade N	Facade S
1	Exterior walls (glazed areas)	55.65	55.65	110.565	110.565
2	Exterior walls (opaque zones)	49.40	49.40	80.865	80.865
3	Glazed areas	6.25	6.25	29.70	29.70
4	Ground plate	627.12			
6	Total area envelope stable	1563.66			

- Ground plate area: $A_{ground\ plate} = 627.12 \text{ m}^2$;

- Roof area: $A_{roof} = 706.797 \text{ m}^2$;

- Envelope area: $A_{env} = A_{PE} + A_{ground\ plate} + A_{roof} = 332.43 + 627.12 + 706.797 = 1666.347 \text{ m}^2$;

In figure 1 is presented a building for a simple cattle shelter kept in loose housing.

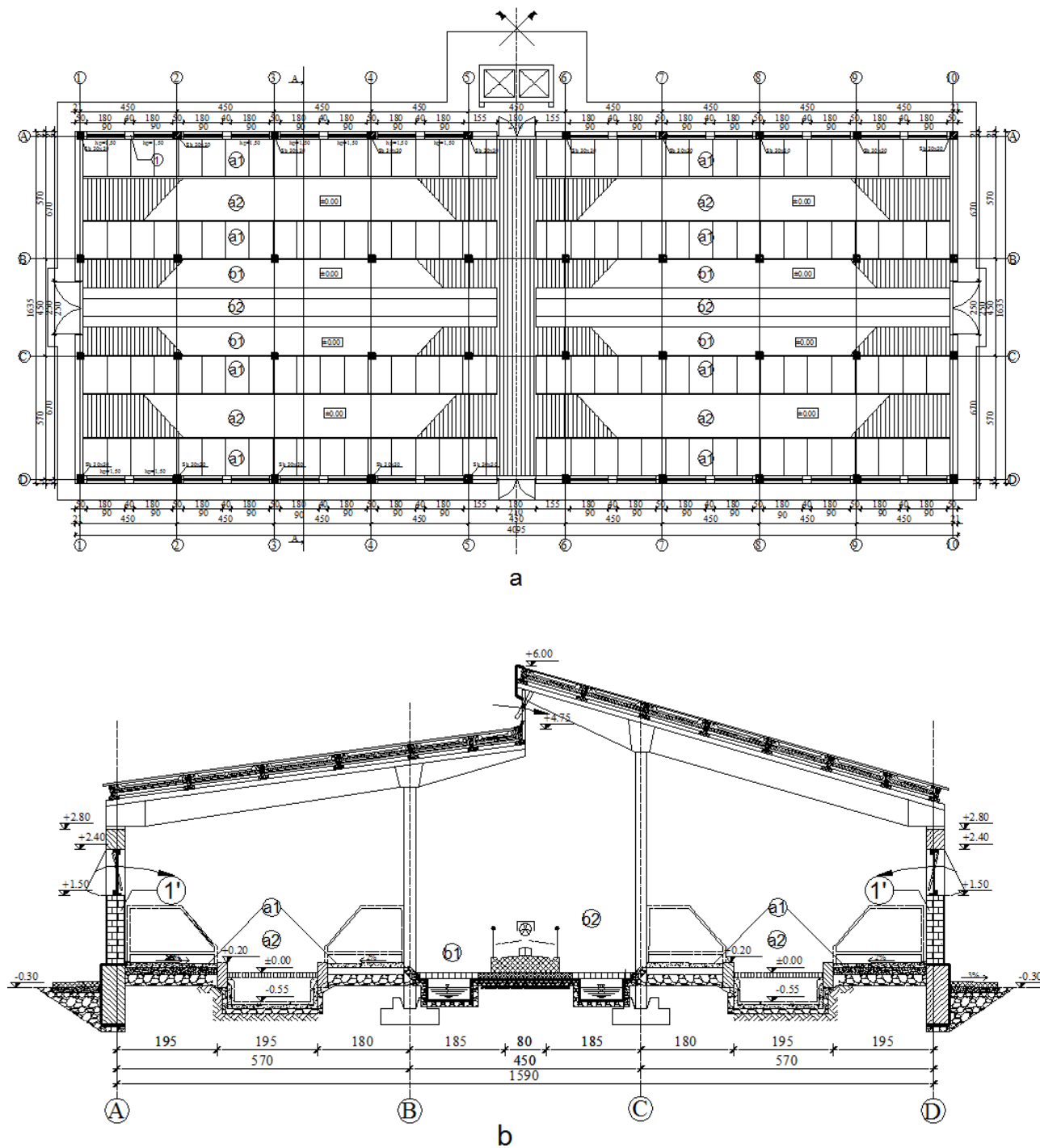


Fig. 1 Shelter for cattle kept in loose housing

a-ground plan, shelter for cattle kept in loose housing; a1-resting area with individual bunks; a2-circulation alley with discontinuous floor across manure drain channels; a3-circulation alley with feeding grills; a4-feeding alley; b-cross section; 1, 1'-exterior wall.

The volume of air required

If it is considered necessary air volume per cow = 25 m³, total volume of air required is equal to 136 x 25 = 3400 m³. If the useful area of the stable is 627.12 m² and usable height is

2.80 m then the volume useful height is equal to 1755.936 m³, and the roof volume = 515.97 m³. Therefore resulting total effective air volume = 2271.906 m³ and air volume per cow actually = 16.70 m³.

-Report:

$$\frac{A_{env}}{V} = \frac{1666.347}{2271.906} = 0.733 \frac{m^2}{m^3}.$$

Calculation of thermal transfer Unidirectional thermal resistances of envelope elements Unidirectional thermal resistances of envelope elements for cattle shelter are calculated with the relation:

$$R = R_{si} + \sum R_{sj} + R_{se} (m^2K/W)$$

where:

$$R_{si} = \frac{1}{\alpha_i}; R_{se} = \frac{1}{\alpha_e}; R_{sj} = \frac{d_j}{\lambda_j};$$

d_j -layer thickness;

λ_j - thermal conductivity of calculation;

$R_{si} = 1/\alpha_i = 1/8 = 0.125 [m^2K/W]$;

$R_{se} = 1/\alpha_e = 1/24 = 0.042 [m^2K/W]$;

On the ground plate $R_{si}=0.167[m^2K/W]$;

Thermal inertia index for exterior wall:

$$D_j = \frac{\sum A_j \times D_j}{\sum A_j} = \frac{55.864}{9.19} = 6.078$$

A_j . areas of distinct zones on the surface of building elements [m^2];

D_j thermal of inertia indices corresponding zones with A_j areas.

Specific thermal resistance unidirectional of the roof :

$$R_{oef} = R_{si} + \sum R_{sj} + R_{se} = 2.467 (m^2K/W).$$

Corrected thermal resistance for characteristic areas of envelope components

$$R' = r \times R [m^2 K / W]$$

The roof's window zone

$\psi=0.25$;

$$r = \frac{1}{1 + \frac{R_{roof} \times \sum l_i \times \psi_i}{A}} = \frac{1}{1 + \frac{2.469 \times 40.95 \times 0.25}{706.797}} = 0.965$$

$$R'_{window\ roof} = 2.469 \times 0.965 = 2.382 m^2K/W.$$

$$R'_{ground\ plat} = \frac{A}{L_s} = \frac{669.532}{278.525} = 2.404 m^2 K / W;$$

Thermal coupling coefficient:

$$L_s = A \times U = 669.532 \times 0.416 = 278.525 W/K.$$

Plate area on the ground

$$A = 40.95 \times 16.35 = 669.532 m^2$$

Glazed areas

$$R'_v = R_v$$

$$R'_f = 0.351 m^2K/W; A_{FE} = 58.32 m^2;$$

$$R'_{ue} = 0.32 m^2K/W; A_{uE} = 13.58 m^2;$$

Thermal balance

The thermal balance for cattle shelter depends on the following formula:

$$Q_A = Q_C + Q_V [W], \text{ where:}$$

Q_A - Average total quantity released by animals;

Q_C - Heat loss through exterior building elements;

Q_V - Ventilation heat loss;

$$Q_A = n \times q;$$

$n = 136$ dairy cows;

$q = 733 W$ (according to Tab. 3.1. - "Agricultural Buildings"-Dumitru Marusciac);

$$Q_A = 136 \times 733 = 99688 W;$$

$$Q_C = Q_1 + Q_2 + Q_3 [W]$$

$$Q_1 = \sum m_i \times K_{0i} \times S_i \times (T_i - T_e);$$

in wich: Q_1 =lost heat quantity through walls and roof, in W; m_i =coefficient of thermal massiveness calculated for each considered construction elements; K_{0i} =total coefficient of thermal transfer through construction element, in W/m^2K ; S_i =construction element surface, m^2 ; T_i =lower temperature of calc, T_e =exterior temperature of calc;

For the walls $D_j=6.078$ (with medium thermal inertia); $m_{walls}=1.225-0.05 \times D = 1.00$;

For the roof $D_j=2.0675$; $m_{roof}=1.225-0.05 \times D = 1.121 > 1$;

$M_{windows}=1.225 > 1$; $m_{doors}=1.225 > 1$;

$$Q_1 = 1.00 \times \frac{1}{1.729} \times 260.53 \times (12 - 3.094) + 1.121 \times \frac{1}{2.469} \times 706.797 \times (12 - 3.094) + 1.225 \times \frac{1}{0.35} \times 58.32 \times (12 - 3.094) + 1.225 \times \frac{1}{0.32} \times 13.58 \times (12 - 3.094) = 6481 W$$

Q_2 = loses through floor;

$$Q_2 = \sum S_p \times K_p \times S_i \times (T_i - T_e);$$

$$Q_2 = \frac{1}{R'_{ground\ plat}} \times (S_{warmsurfae} + S_{circsurfae}) \times (T_i - T_e);$$

$$Q_2 = \frac{1}{2.404} \times (261.76 + 276.27) \times (12 - 3.094) = 1993 W;$$

Q_3 = loses through outline band;

$$Q_3 = S_b \times K_b \times (T_i - T_e);$$

$$S_b = 1m \times P = 1 \times 114.6m = 114.60 m^2;$$

$$K_b = 1.37;$$

$$Q_3 = 114.60 \times 1.37 \times (12 - 3.094) = 1398.26W;$$

$$Q_c = Q_1 + Q_2 + Q_3 = 6481 + 1993 + 1398.26 = 9872.26W$$

$$Q_v = V_{\max} \times (i_i - i_e);$$

Q_v = heat consumption resulted due to ventilation through allowable flow method;

$$V_{\max} \Rightarrow \text{din } - V_{CO_2} = C / (C_i - C_e) \quad [m^3/h]$$

$$- V_u = X_A / (X_i - X_e) \quad [m^3/h]$$

$$- V_Q = (Q_A - Q_C) / (i_i - i_e) \quad [m^3/h]$$

$$V_{CO_2} = C / (C_i - C_e)$$

C – CO₂ quantity removed by animals

$$C = 136 \times 320 = 43520 [g/h];$$

C_i – maximum allowed quantity of CO₂ in animals shelter;

$$C_i = 3 [l/m^3] = 0.3\%;$$

C_e – CO₂ quantity in outdoor air;

$$C_e = 0.3 [l/m^3];$$

$$V_{CO_2} = C / (C_i - C_e) = 43.52 / (3 - 0.3) = 16.118 [l/h]$$

=>

$$V_{CO_2} = 0.016118 [m^3/h]$$

Water vapors:

$$V_u = X_A / (X_i - X_e)$$

$$X_A = 136 \times 400 + 10\% \times 136 \times 400 = 59840 [g/h]$$

$$X_i = 7.54 g/cm^3 \quad \text{for the indoor humidity}$$

$$\varphi_i = 80\%$$

$$X_e = 0.85 g/cm^3;$$

$$V_u = 59840 / (7.54 - 0.85) = 8944.69 [cm^3/h] = 0.008944 [m^3/h];$$

Excess heat:

$$V_Q = (Q_A - Q_C) / (i_i - i_e)$$

$$i_i = 8.68 [kcal/m^3]$$

$$i_e = -5.47 [kcal/m^3]$$

$$1 \text{ kcal} = 4186 \text{ J} = 4186 W \cdot s;$$

$$V_Q = (Q_A - Q_C) / (i_i - i_e) = (99688 - 987226) / (8.68 + 5.47) = 6347 W \cdot m^3/kcal;$$

$$Q_v = 6347 \times (8.68 + 5.47) = 89810 W;$$

CONCLUSIONS

Thermal balance for cattle shelter depends on the one hand of the heat loss through exterior building elements and on the other hand of the heat loss through ventilation. After analyzing the calculation of heat transfer through closing elements for a cattle shelter kept in loose housing show that the amount of heat lost through external walls with heterogeneous structure (interior plaster, brickwork filled with 24 cm thick, rigid mineral wool insulation boards of , ventilated

air layer, full-brickwork sitting on the edge and external plaster) is minimal compared to the classical exterior wall with homogeneous structure. An efficient livestock construction has to ensure simultaneously with optimum conditions from inside microclimate (needed to maximize the productive potential) and high economic efficiency investments. In this sense, recently began to show increasingly the tendency in finding some efficient constructive solutions, that satisfy a high range of technological requirements and with high possibilities of industrialization of execution, based on prefabricated elements, standardized of large series.

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ENVIRONMENTAL AND SOCIO-ECONOMIC ASPECT OF GROWING MISCANTHUS GENOTYPES

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Abstract

Deliberate cultivation of plants for energy biomass is becoming increasingly important. Biomass should significantly contribute to increase the share of renewable energy in the European Union. On the research locality of Slovak University of Agriculture in Nitra localized in the village Koliňany (Slovak Republic) is implemented basic research focused on the growth and production of the two genotypes energy grass Miscanthus. Research is carried out since 2010. In the third year after planting (the year 2012) were confirmed biomass production depending on the genotype of 35.45 and 36.67 t ha⁻¹. Based on the analysis of growth and production performance of Miscanthus genotypes can be evaluated the high environmental and socio-economic aspects of growing energy crops, depending on the specific agro-ecological conditions.

Key words: energy crops, environmental, genotype, Miscanthus, renewable resources

INTRODUCTION

Economic growth has the task of ensuring job growth and sustainable development. Rising and unstable oil prices focus attention of EU leaders on Europe's increasing dependency on energy imports. This suggests the need to orientate energy policy towards energy independence to countries outside the EU. The use of renewable energy sources is one possible solution.

In many developed countries of the world are experimenting with the cultivation of biomass for energy purposes. The current state of agriculture in Slovakia offers question of the possibility of growing energy plants. The production of environmentally clean energy is a further possibility. Biomass energy in Slovakia significantly lags behind the potential options, both in terms of quantity, energy and economic efficiency, as well as potential environmental benefits [5].

Deliberate cultivation of plants for biomass energy is becoming increasingly important. Plantations of fast-growing trees, which are founded in Slovakia, but are extensively

abroad are quite known. The energy plants of herbal character are less known. As energy plant is most often recommended energy grass *Miscanthus* spp.

The use of biomass as a renewable energy source is a significant source in developed countries [3]. Sweden uses biomass as a fuel source for 27% of total energy consumption, 23% of Denmark and Austria, it is about 19%. The share of Slovakia on the use of biomass is less than 1%

Biomass should significantly contribute to increase the share of renewable energy in the European Union (EU).

Energy crops are plants that are grown primarily for energy use. They are not used for the production of food or for technical use. In principle, each plant can be used for energy, but only crops with are suitable for energy use [6]. Specific conditions are mainly:

- good conversion efficiency of carbon dioxide to biomass using sunlight and therefore high primary production, specifically C4 plants,

- high solids content (low water content) at the time of harvest,
- high calorific value and low ash content,
- undemanding water and nutrients,
- resistance to pests and diseases.

MATERIALS AND METHODS

In addressing the research projects at the Department of Ecology and Department of Sustainable Development Faculty of European studies and regional development (FESRD) in Nitra (Slovakia) is carried out research of production and energy indicators of energy plants since year 2006.

Basic research of growing two *Miscanthus* genotypes is based on research locality to the Slovak University of Agriculture in Nitra, in Koliňany village. The research location is situated in the cadastral municipality of Koliňany.

Climatic indicators (temperature and precipitation) were expressed as an average value for the years 2007 - 2012.

In year 2010, the two crops *Miscanthus* genotypes were established. Each genotype was planted to an area of 100 m² in a planting distance 1x1 m. Planting density is 12100 plants to 1 ha.

The exact definition of the research area was carried out using global positioning system – GPS60CS GARMIN. Selected characteristics of research stand are documented in Table 1.

As plant material was used: *Miscanthus* × *giganteus* [2], often used in the field experiments [7]. Rhizome planting material was made by Hannes Stelzhammer Austria. *Miscanthus sinensis* (Tatai) was cultivated foreign pollination genotypes of *Miscanthus sinensis*. Planting material were seedlings, they were grown in vitro in Power-H Kft, Hungary.

The selected indicators of growth and production organs plant *Miscanthus* were followed in the dynamic abstraction (two-week intervals during the growing period) in the years 2010 to 2012. Specifically, there were observed [4]: the numbers of stems in a clump, stem length, stem thickness, number of green leaves and dry leaves on the stem and total dry weight of the clump.

The gross production of biomass suitable for energy use was fixed on the basis of the fundamental research.

Monitoring and analysis of dynamics growth of experimental plants allowed to define the environmental and socio-economic aspect of growing *Miscanthus* on agricultural land (in rural areas).

Table 1: Selected characteristics of the research stand

Stand characteristic	Stand/locality
	Koliňany
location	13 km north from Nitra town
altitude	199 m above sea level
GPS localization	48° 21' 21.6752115" N 18° 12' 23.8327789" E
average year air temperature / temperature in growing season	11.0 °C / 15.4 °C
average annual sum of precipitation / in growing season	594.22 mm / 429.88 mm
soils	fluvial gluey, medium weight soil
relief	plane without expression of surface erosion

RESULTS AND DISCUSSIONS

Relatively new sources of biomass are crops called energy crops - plants. Term energy crops are referred taxons of trees, perennials and herbs, that botanical species, cultivars, clones, natural and intentional hybrids. These plants are used or tested for the deliberate production of biomass suitable for energy sector - production of bio fuels, or incineration or co-incineration. Growth and especially production in t.ha⁻¹ energy crops by vigorous growing significantly above average in other crop in particular growing conditions. Production potential of *Miscanthus* genotypes depends on the life cycle of individuals. The environmental conditions, particularly climate (temperature and precipitation), are the basic prerequisite for the high production potential. Scheme on figure 1 shows growth cycle of *Miscanthus*. Sprouting shoots is affected by air temperature at the beginning of the vegetation period. The beginning of the growth of new shoots represents temperatures above 10 ° C (in the years 2010 to 2012 it was the end of March to early April). Phase of growth and nutrient recycling is characterized by the rise of phytomass plants.





NUTRIENT RECYCLING		HARVEST
	February	
		
October		April
PHASE OF GROWTH		SPROUTING SHOOTS
	July	

Fig.1. Growth cycle of *Miscanthus sinensis x giganteus* on the research locality Koliňany
 Source and photo: own adaptation (2013)

Table 2: The average values of aboveground organs growth in vegetation period from 2010 to 2012

genotype	<i>Miscanthus × giganteus</i> (Greef et Deuter, 1993)			<i>Miscanthus sinensis</i> (Tatai)		
	2010	2011	2012	2010	2011	2012
Number of stalks in the clump	26.07	40.60	76.94	37.60	43.73	80.19
Clump height in meters	1.63	2.60	2.70	1.24	2.52	2.79
Dry weight of the clump in kg.m ⁻²	1.11	1.81	3.03	1.08	1.69	2.93
Total underground biomass in t.ha ⁻¹	13.43	21.90	36.67	13.07	20.45	35.45

The *Miscanthus* genotypes are compared according to the height and number of stalks in the years 2010 to 2012 in table 2. Energy crops were established in year 2010. The year 2012 is the third year after planting and the growth potential is characterized by insufficient production of biomass suitable for the harvest and subsequent energy use. Aboveground biomass harvesting period is February to March. This is the period when

the dry weight of biomass is the highest (Table 2 - dry weight of the clump).

Aspects of growing *Miscanthus* species in Slovakia

/A/ Environmental aspects

Growing energy crops of *Miscanthus* is a renewable resource (unlike fossil fuels). At the end of the growing season, nutrients in the aboveground part of the individual are moved to rhizomes - underground section. It's environmentally friendly type of renewable energy, in terms of production of greenhouse gases. Non-agricultural land can be use for establishment of *Miscanthus* crops. According to land registry, the area of agricultural land in Slovakia is 2,417,933 hectares, which is almost half the size of Slovakia. It is now 19% of non-agricultural land. 11.7% soils in Slovakia are very suitable for growing of *Miscanthus*, especially the western part of Slovakia. In Europe is currently about 15 million hectares of land that could be put out of cereal production and use for energy plants, which would eliminate the overproduction of food and government subsidies to agriculture. It contributes to the maintenance of a favourable microclimate in the country. Aboveground biomass protects soils from drying out and it prevents soil erosion by massive root system. The growth of *Miscanthus* crop is characterized by increasing power of tillering circle, increase the number of stalks and height of crop (table 2). The increase in the number of stalks on both *Miscanthus* genotypes is nearly 300% (in the third year after planting) compared to crop establishment. These plants can be grown on contaminated soils and in areas with reduced possibility of application of agrochemicals. Phytoremediation effect of *Miscanthus* will by the subject of the further research. As stated in [1] the basic ecological benefits of growing energy crops is an increase in species diversity of agricultural land and its cultivation is of great importance in terms of landscape. As fewer obstacles is growing reliance on climatic and soil conditions of non-agricultural soils, especially uniform distribution of precipitation during the growing period.

/B/ Socio-economic aspects

Growing biomass improves social conditions in rural areas, particularly in the transformation of agriculture (conversion from industrial to food production). With the increase of biomass will increase employment in the growing, harvesting and processing. It can significantly contribute to an alternative program for agricultural business, rural development and the protection of the country. It represents an attractive area for international investment too. The increase in the importance of renewable energy in the energy economy is an opportunity to develop the new industries, focused on growing, harvesting and processing of biomass. The risks by in establishment and growing of *Miscanthus* crops are a lack of their own financial resources, higher demands for investment and equipment, lack of long-term and reliable domestic supply of biomass and lack of experience with the storage and processing of biomass, the absence of a functioning biomass market, the lack of information about the cultivation, marketing problems of the production and a lack of business infrastructure.

CONCLUSIONS

EU energy policy orientation heads towards energy independence on countries outside the EU. The energy grass *Miscanthus* spp. is one possibility for the production of biomass energy use. The potential use of this energy plant is particularly as energy raw material for the production of heat. Yield potential of this plant exceeds the possibilities of domestic species grown in Slovakia, including fast-growing trees. Biomass of *Miscanthus* has a higher calorific value than fossil fuels - brown coal. The production of biomass on our research locality in the third year after planting is 35.45 (*Miscanthus sinensis* (Tata)) to 36.67 (*Miscanthus* × *giganteus* (Greef et Deuter, 1993)) t.ha⁻¹. Natural and ecological conditions, particularly climate and soil, are very important determinant of the cultivation energy plants, in addition to spatial localization. Their knowledge is important in determining the choice of genotype for

cultivation in specific agro-ecological conditions. Cultivation of energy plants of *Miscanthus* has in addition to production of the above-ground biomass significant ecological, environmental and socio-economic aspects too.

The non-agricultural land can be use on the cultivation of energy plants. It can be grown on contaminated soils and in areas with reduced possibility of application of agrochemicals. Growing biomass improves social conditions in rural areas, particularly in the transformation of agriculture (conversion from industrial to food production). With the increase of biomass will increase employment in the growing, harvesting and processing. Planting of energy plants create an attractive place for international investment.

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THE STRUCTURE OF THE FARMS IN SOUTH MUNTENIA REGION

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Abstract

Agriculture is presented in all counties of the region. The region has favourable natural conditions and an important potential for the agriculture development. Agriculture in Romania has its natural, economic-traditional particularities that can be used in order to obtain some competitive advantages, the European Union encouraging these evolutions. At present, in agriculture in Romania there is a poor link between the farms with the market and a production structure that corresponds to the market demand. That is why, in order to highlight some strategic elements of the rural development, related to the agricultural activities in South-Muntenia Region, aspects regarding the structures of the farms, the structures of the crops and animal breeding must be taken into consideration. The present paper presents aspects regarding the farms in South Muntenia Region. The agrarian structures are the expression of evolution/involution of the agriculture and of the rural area, that balance the economic and social development as a whole. The reduction of the level of agricultural surfaces fragmentation and the stimulation of small size farms concentration constitutes an elements of the evolution of the agriculture and of rural area, the European agrarian policies having as objective the decrease of structural discrepancies of the farms. The limits of the farms were also defined under the average surface of 2-9 hectares, that define the small size farms, under these dimensions being considered family farms..

Key words: agriculture, development, farm, region, rural area, structure.

INTRODUCTION

The farm, defined as a self-sufficient technical-economic unit, which develops agricultural activities by using the agricultural surfaces and/or animal breeding, either as main activity, or as secondary activity, is represented in the rural economy in Romania, by the individual farm (peasant household) and the farm with juridical status, represented by the positions in the Agricultural Register, the registration is made at the level of the administrative-territorial units where the used agricultural surfaces and/or animal stock are found.

Both at national level and at South Muntenia Region level, the farm structures are non homogenous, giving many times a dual, complex character, both in the sense of a specialised or mixed profit, and for the existence of a excessively high number of small individual farms and very small ones, non performing ones, from economic point of view, and a reduced number of large and very large farms, with activity that did not restructured in order to comply with the

exigencies of the unique market and to benefit by the financial support given the application of the mechanism of subsidies reductions for the large farms. Further on, it is presented the number of farms at national level and at South Muntenia level in the Table 1.

Table 1. Farms that use agricultural surface and/or have animal stock in South Muntenia and its component counties in 2010

Development Region/County	TOTAL farms number /%
Romania	3.931.350/100.00
South Muntenia	762.885/19.41 762.885/100.00
Argeş	150.560
Călăraşi	65.744
Dâmboviţa	130.080
Giurgiu	83.821
Ialomiţa	61.079
Prahova	156.787
Teleorman	114.814

MATERIALS AND METHODS

The present study was achieved by on site research and by processing the statistical date made available by the National Institute of

Statistics regarding the farms in the Region and making a comparison between the farms in the region and those at national level.

I used also the method of specific research: participative research, that supposes collecting information in the territory.

The study regarding the structure of farms in South Muntenia Region had as a starting point the analysis and data processing obtained from the following sources: Statistic Yearbook for 2010, publications from the National Institute of Statistics and information on rural development in Romania.

RESULTS AND DISCUSSIONS

For the year 2010 a number of 762.885 farms is indicated, of which 84,67% are farms with mixed profile (vegetal and animal breeding), 12,06% of farms are agricultural farms only with the used agricultural surface, and the rest of 3,26% are farms only with animal stock. The highest values regarding the number of farms are registered in the counties in the North part of the region, respectively Prahova with 156.787 farms, Argeş with 150.560 farms and Dâmboviţa with a number of 130.080 farms, related to the total surface of the farms, indicating a reduced dimension of the farms. It is remarked the percent of 19,41% of the total number of farms in the region (762.885 farms), compared to the national level that sums a total of 3.931.350 farms.

From the total of agricultural farms, 99,57%, are individual farms, that is 759.618 farms from a total of 762.882 farms, and the difference of 0,43%, that is 3.267 farms, have a juridical status. The most individual farms are registered in Prahova, Argeş and Dâmboviţa counties, that register a number of 156.334 individual farms, 149.947 and respectively 129.610 individual farms. The figures corresponding to the highest total number of for the units with juridical status is registered in Călăraşi county with 671 units, Argeş county with 613 units and Dâmboviţa county with 470 units. It is remarked the high number of companies with private capital in Călăraşi county of 328 units and in Ialomiţa county of 219 units.. Călăraşi county

registers also the highest number of companies/agricultural associations, of 70 units.

At regional level, the total surface of the individual farms has a percent of 53,75% while the total surface of farms with legal status represents 46,25% at regional level.

The counties with the highest total surface of the farms are Teleorman, Călăraşi, Argeş with 466.663,14 ha, 389.720,73 ha and respectively 386.037,11 ha. Depending on their legal status, the total surface of the individual farms with the highest value is registered in Telorman county with 275.779,38 ha, followed by Argeş county with 265.030,02 ha and respectively Dâmboviţa county with 223.178,73 ha. For the companies with mostly private capital, the county with the highest surface is Călăraşi county with 182.444,40 ha, followed by Ialomiţa county with 137.001,41 ha and respectively Telorman county with 96.273,47 ha. The public administration units in the region have also an important surface of 237.287,72 ha.

The data regarding the total agricultural surface of the farms, company types with mostly state capital, is registered for Dâmboviţa county 61.708,83 ha from a total at the regional level of 61.714,19 ha, that is a percent of 99,99%.

The counties with the highest agricultural surfaces owned by the associative forms are registered in Călăraşi with 52.840,73 ha, Ialomiţa with 32.764,76 ha and respectively Telorman with 49.421,98 ha.

The agricultural farms according to their economic dimension are classified in subsistence farms, their economic dimension is smaller than 2 UDE and semi-subsistence farms, with an economic dimension contained between 2-8 UDE

In South Muntenia Region, the farms as a whole, possess a used agricultural surface of 2.255.529,50 ha, that represents 16,40% of the agricultural surface used at the country level of 13.753.046,49 ha, the percent being higher than the percent for the total agricultural surface of 15,84%.

The agricultural surface used by the individual farms represents 54,02% at region level, higher comparatively with the percent

of 45,98% possessed by the agricultural farms with legal status. From these the highest percent of the used agricultural surface have the companies with mostly private capital with 56,20%, and the state capital ones with a percent of 0,06%. The public administration units in the region have also an important surface of 233.705 ha. The companies and associations in the region own a used agricultural surface in a percent of 16,97% of the total units with legal status in the region, being higher than the national level of 12,87%. The cooperation units own an extremely small used agricultural surface, under 1 ha. The highest values regarding the used agricultural surface is registered in Teleorman county with 452.971, 79 ha, Călărași county with 383.562,94 ha and Argeș county with 348.588,03 ha. The agricultural surfaces used within the individual farms, sums the highest values in Teleorman county with 262.901,50 ha, Dâmbovița county with 207.404,87 and Argeș county with 241.763,34 ha.

From the units with legal status, the counties with the used surface are: Călărași county with 301.533,43 ha, Telorman county with 190.070,29 ha and Ialomița county with 188.986,28 ha.

The counties with the agricultural surface used with the highest values of the agricultural surfaces used in the units with mostly private capital are registered in Călărași county with 181.687,51 ha, Ialomița county with 136.566,14 ha and Telorman county with 96.050,51 ha.

At the counties level, the companies/agricultural associations that own the agricultural surfaces used with the highest values are the counties: Călărași county with 52.740,14 ha, Telorman county with 49.320,45 ha and Ialomița county with 32.647,80 ha.

The data in the specialised literature mention and highlight the reduction of the number of subsistence farms and the formation of the sector of medium size farms although there were adequate measures of structural policy simultaneously with the reform of the land property. From 2002 until 2007 at the country level, the total number of the farms reduced

with only 447,57 thousand, the average surface on a farms increasing from 3,37 ha in 2005 to only 3,57 ha in 2007. In order to reach 10 ha/farm to the total agricultural surface under exploitation, at the level of 2007, the number of agricultural farms as a whole, it should be reduced to about 1,37 million farms compared to 3.931.350 existing farms, in 2007.

The average value of the agricultural surface on a farm, presents the value of 3,50 ha at national level and of 2,96 (84,57%) at South Muntena Region level, and the average value of the used agricultural surface/agricultural farms that use the agricultural surface, expressed in ha, has the value at national level of 3,57 ha, and at regional level of 3,06ha (85,71%). Within South Muntenia Region, the counties with the average used surface/farm that uses this surface, that presents the highest values are Călărași with 6,01ha / fam, Ialomița with 5,0 ha / farm and Teleorman with 3,95 ha / farm, corresponding to the hierarchy presented, except for Argeș county that registers comparatively with Ialomița county, with a number of 146.917 farms SAU, higher than the number of farms SAU in Ialomița county of 59.094.

CONCLUSIONS

The restructuring of the agricultural sector, absolutely needed for the implementation of the sustainable development of the rural sector, it implies the permanent concern for the increase of economic performances of the agricultural farms simultaneously with the introduction of measures for environment protection and social development of the rural area. In order to achieve these objectives measures are needed for the reduction of costs, increase of farms dimensions, promotion of innovation, orientation towards market, investments in physical and human capital, diversification of economic activities, obtaining quality products, ecological products, use of less polluting technologies.

The way of organising the use of resources from farms level must reflect the application of the general principle of economic rationalisation and efficiency, imposing for

completion also an economic evaluation of the advantages and damages caused to the environment. In this sense, the relation agriculture – environment will express to a greater extent the characteristic features of the sustainable development.

In our country, the implementation of the sustainable development concept has as basic premises the sustainable development of the agriculture but also the territorial restructuring and the socio-economic development of the rural areas. [3]

Correction measures can be established for the negative aspects found out and extension measures for the positive aspects, in order to raise on a superior level the whole profitability of the economic financial activities of the farms, to that level of competitiveness imposed by the requirements and exigencies of the market economy. Such a competence can be obtained with the support of the economic financial analysis of the activity within the farm. Theoretically, the analysis studies the methodology of the economic financial analysis of the agricultural enterprise regarding the factors and causes that determined it, as well as the internal reserves in order to improve the results by using the available resources more efficiently possible [4]

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SOIL DEGRADATION AND ASSESSMENT OF LAND PRETABILITY FOR ORGANIZATION OF ORGANIC FARMING SYSTEM IN THE REPUBLIC OF MOLDOVA

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Abstract

The paper studied the impact of unfavorable factors on agriculture land, pretability and measures to reduce negative consequences. Nowadays, there are about 40 anthropogenic factors of soil degradation, but the erosion is the main factor of soil cover degradation in the Republic of Moldova. This type of degradation is manifested from old times as a natural process depended on the accidental relief and torrential rains. The present quality state of the soil cover denotes that the fields with a high reliability note of 80-100 points occupy about 27% of the total area of agricultural lands. The soils with medium reliability note of 70 points or less occupy 52% from the total area of agricultural fields and are moderate degraded. The soil with low rating are completely destroyed by ravens and active earth flows with a surface of 178 thousand ha and have a very low productivity. The complex of measures and technologies regarding the conservation and the increase of eroded soils fertility includes: the antierosion organization of the territory; the formation of forest framing, including the protection curtains against the erosion provoked by waters and winds; recovering of the hardly eroded soils by grassing and foresting; settling ravens and earth flows by regulating water drainages, their and limitary field grassing and foresting, cultivation of field cultures in bands on the slopes; the formation of protection bands from perennial herbs; the implementation of antierosion crop rotations; the unconditioned apply of antierosion soil works on slopes, agrotechnical actions etc.

Key words: agriculture land, degradation, pretability, soil protection, sustainable measures

INTRODUCTION

Soil is a living environment support for humans, plants and animals, energy storage, battery of nutrients and water reserves. The production process is indispensable linked by soil. In the agriculture, soil acts as an active factor being the object of production and the result of human labor. A rational and sustainable agriculture can not be conceived without any protective measures of soil quality status and long-term preservation of its fertility. Organic farming is a particular economic activity in that the long-term maintenance of soil fertility is the main problem. Passing from traditional agriculture to organic farming there is a risk to reduce soil fertility. In this connection it is necessary to develop, test and adopt a scientific augmented system to highlight and assessing the soil resources suitable for organic production and measures to maintain the soil quality and fertility in the specific farming.

According to the Statistical Yearbook of Moldova on January 1, 2012 [1], the total area amounts the 3.38 million ha; including

agricultural land - 2.50 million ha (73.8%), forest resources – 463.1 thousand ha (13.7%). From the total agricultural land of 2.50 million ha the arable land is 1.81 million ha (72.6%), orchards – 133.3 thousand ha (5.3%), vineyards – 149.6 thousand ha (6.0%), pastures – 350.4 thousand ha (14.0%). The data presented shows that the share of agricultural land is unacceptably high (73.8%), the forest resources - less than 5 times as the optimal one. Unbalance between natural and anthropogenic ecological systems makes amplification of different types and forms of soil degradation.

The territory of the Moldova is characterized by rugged relief. Absolute average altitude of Moldova surface is 147 m, maximum - 429 m and minimum - 5 m. Predominance of the slopes on the 80% of the territory creates favorable conditions for the development of erosion processes. The area of eroded soils that have lost from 20 to 70% of their original fertility is about 36% [2].

Moldova's climate is temperate continental with short mild winter (January average temperature is 3-5⁰C), and long hot summer

(July average temperature is +20-22°C). The amount of rainfall varies between 500-630 mm in the North and 450-500 mm in the South. Amount of temperatures higher than 10°C in the North area is 2750-2850°C and 3100-3350°C in the South [3]. Hydrothermal coefficient *K* (ratio of annual precipitation and transpiration (evaporability) potential calculated according to formula Ivanov-Vâsofki) in the North is 0.7-0.8 and in the South - from 0.5 to 0.6. Frequency of droughts in 10 yrs is once the North, 2-3 times in the Center and 3-4 times in the South zone. Compared with values of the climatic indexes the territory of Moldova was divided into three agropedological areas, which are also the climatic zones: North, Central and South.

MATERIALS AND METHODS

The paper is based on the statistical data provided by Republic of Moldova's Statistical Yearbook and the specific methods for such a study.

The following aspects have been approached: status of soil quality, soil degradation and its determinants regarding natural and anthropogenic conditions, assessment of land suitability for organization of organic farming system, land management and soil protection.

RESULTS AND DISCUSSIONS

The issue of soil quality state

The main practical and unique natural wealth of the Republic of Moldova is soils. Soil cover structure is quite complex. The main types and subtypes of soils are: chernozems occupying 70%, brown and gray soils - 10.2%, alluvial and deluvial soils - 14.2% [4, 6], (Fig.1).

High fertility soils and favorable thermal regime allows cultivating a wide range of valuable crops: grape-vines, ether-oleaginous crops, fruit, nut, vegetable, sunflower and so on with high quality productions. The current state of quality soil cover is shown in Table 1. Creditworthiness note of soils between 80 - 100 points occupies about 27% of the total agricultural land [6].

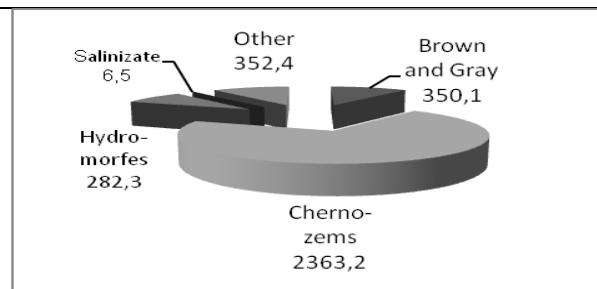


Figure 1: The structure of soil cover of Moldova

Table 1: Soil quality state (creditworthiness)

Class of creditworthiness	Note of creditworthiness, points	% of agricultural land area	Surface, thousand ha	Winter wheat yield, t ha ⁻¹
I	81-100	27	689	3.2-4.0
II	71-80	21	539	2.8-3.2
III	61-70	15	382	2.4-2.8
IV	51-60	15	382	2.0-2.4
V	41-50	9	303	1.6-2.0
VI	21-40	6	153	0.8-1.6
VII	<20	7	178	-
Average	65	100	2556	2.6

The soils with high productivity, usually presented by typical and leached chernozems (standard soils) containing 3.6 to 4.5% of organic matter can be obtained at the expense of actual fertility from 3.2 to 4.0 t ha⁻¹ of winter wheat. The soils from II and III classes of creditworthiness within the limits of 60-80 points occupy 36% or 918 thousand ha. Productivity of these soils is also quite high and obtaining 2.4 to 3.2 t ha⁻¹ of winter wheat. The soils of these two classes of creditworthiness are commonly affected by processes of humus loss, lack of nutrients, dismantling and secondary compaction, biological degradation, and partial surface erosion. Soils from classes IV-VI occupies 30% of total, have a note of creditworthiness of 20-60 points, respectively, have a low productivity, from 0.8 to 2.4 t ha⁻¹ of winter wheat. These soils are poorly, moderately and heavily degraded, especially by erosion [5].

Natural and anthropogenic conditions favoring manifestation of soil degradation

Geological construction. Moldova is characterized by a very complicated geological construction of the territory, soil formation rocks of continental or marine origin of diverse age and texture. The soil rocks contribute to the manifestation of the following soil degradation processes:

- *Argillaceous rock surface texture* - the appearance of excess moisture with stagnated character and formation the swamps with saturated soils on the slopes, the manifestation of gleysolic processes and appearance of the stagnogleyic soils, the occurrence in evolving linear erosion processes;

- *The texture of underlying argillaceous rock* – the groundwater accumulation, the formation and manifestation of sliding faces and landslide processes, the spread on the slopes the swamps and soil with excess of moisture and salts;

- *Medium and easy texture of soils and soil formation rocks* - the evolution of the surface erosion by water and deflation, the desertification and land desertification.

- *Rocks saline soil formation* - the formation of solonchaks on the slopes, increasing the mineralization of groundwater as result of soil salinization in the meadows.

Relief. The relief exercises its influence especially on the forms and intensity of erosion and sliding manifestation – the main factors of land degradation. The relief indicators, which make the intensity of soil erosion processes, are: the total degree of fragmentation of the territory, local base erosion depth, average slope length, steepness, and slope shape. In developing specific land using schemes and erosion control measures it is necessary to consider every relief quantitative parameters (slopes) and characteristic of specific territories.

Climate. To assess soil erosion hazard assessment are important the data concerning rainfall character. During the summer predominate the heavy rains with high intensity (erosion), accompanied by hailstorm, lasting 1-2 days. The torrential character of rains makes the unnecessary large water spills on the slopes. Terrain and torrential character of rainfall causes the intensive manifestation of soil erosion in surface and depth on the agricultural slopes.

General character of arid climate, frequent repetition of dry periods (drought), predisposition of the territory to manifestation of desertification processes require full adoption of agriculture to the dry arid conditions, especially in the South zone.

Vegetal cover. Cultivation of annual and perennial grasses on the slopes is an effective measure for soil protection against erosion. Vegetal cover reduces erosion manifestation or totally prevent. The intensity of soil erosion in hoeing crop can be 3-4 times higher than in cultures with compact vegetation.

In terms to increasing the share of hoeing cultures in crop rotation decreases sharply the coverage and soil protection. Therefore, on the slopes is necessary to apply special anti-erosion crop rotation which prevails in the composition of compact vegetation cover crops and perennial grasses.

Human factor. Anthropogenic factors leading to degradation of soil cover are: maximum involvement the territory under plowing, cutting strips of forest, tillage along the slope, improper placement of roads network, insufficient protection of soil with vegetation cover, excessive share of hoeing crops in crop rotation, soils compaction with mechanisms.

Overgrazing leads to complete degradation of the vegetal cover and soil compaction, the water permeability decreases as result of torrential rains on the slopes forming runoff that erodes soil cover.

Land privatization led to increasing the soil degradation. Excessive fragmentation of the productive sectors and their location along the slopes, activity in economic crisis does not allow new landowners to take basic measures for the protection, improvement and rational use of the land.

Using mineralized alkaline water for irrigation from tanks and small rivers exert a negative impact on soil characteristics. After the first irrigation season sodium adsorbed content exceeds to 5% of the cation exchange capacity and after 10 years of land irrigation this indicator exceeds to 14% [6].

Factors of soil degradation processes

Main factors of soil degradation are water erosion, affected surface– 878 thousand ha; dehumification of land surface - 2.5 million ha; soil nutrient depletion - on the 2.1 million ha; alkalization and salinization of soils, affected surface – 220 thousand ha of land; land slides area – 85 thousand ha; secondary soil compaction on the 2.1 million ha.

Soil erosion. Degree of agricultural land affected by erosion in Moldova increased from 28.1% in 1965 to 49.8% until now. Annual average surface of eroded land is 8000 ha. Eroded soil productivity decreases below: low eroded - 20 percent; moderately eroded - 40 percent; strongly eroded - 50 percent; very strongly eroded - 70 percent; excessively eroded (complete) - 90 percent. The presence of large areas of eroded soils conditioned a potential risk of erosion intensification on the whole agricultural lands.

During 1911-1965 yrs the ravines surface increased from 14 thousand ha to 24 thousand ha (approximately 2 times), the number of ravines increased 3 times. After 1965 some of the lands affected by ravines were excluded from agricultural fund and listed in forest resources, and in some areas were performed flatwork of gullies. This led to a drop in the number of gullies on agricultural land area to 8 thousand ha in total of the country. The cessation liquidation of ravines works and irrational management in agriculture generates growth in recent years in the number and surface of ravines. Average growth rate of ravines surface is 180 hectares per year.

Land deterioration as a result of landslides. Dynamic of growth landslide areas is follows: from 21 thousand ha in 1970 to 84 thousand ha in 2010. The main factor of intensification of sliding during this period was unreasonable slope terracing. Currently, one slide returns every 200 ha of land; annual growth of landslide areas in Moldova is about 1000 ha.

Destruction of soil covers by excavation. Until 1990 the exploitation works of quarries were made without the projects concerning restorations of destroyed land. As result, today on the entire territory are recorded 5000 ha of land with ground cover destroyed by excavation, which can be called "industrial desert territories" (3600 ha of large quarries, with state importance and 1400 ha of communal small quarries and abandoned silage pits having surface with 1-3 ha).

Clogging soils with low humus content deposits materials. Sudden intensification of erosion on the slopes caused clogging of cumulative soil with a layer of diverse thick deposits or low humus materials, which caused damage and

reducing their productive capacity. Surface of agricultural land with deluvial and alluvial soils are periodically subject of clogging process, their surface is 51 thousand ha, and average yields on these soils decreased by 10 percent.

Primary compaction of soils. Gleysolic soils (7700 ha) and compact marshes from meadows (10 thousand ha) covers about 17.8 thousand ha and are characterized by unfavorable physical characteristics: fine texture with high content of fine clay (> 35%), high compaction and bulk density, small structural hydrostability, very low water permeability, high variation of infiltration and contraction by soaking in water and drying. In terms of soil resistance to plowing are very heavy. Due to unfavorable physical properties its have a low fertility that compared with similar no compacted soils, 20-40 percent lower. Approximately half of the surface of these soils is engaged in plowing and the other half is used as pasture.

Secondary deterioration and compaction of soil structure. The secondary deterioration of soil structure and compaction extends over the entire surface of soils, ranging from intensive agro-technical works on the arable land, in the vineyards and orchards perennial plantation. Deterioration of the soil structure is conditioned by intensive losses of humus from arable layer. Mechanical degradation of soil structure due to soil compaction occurs by pointless circulating of tractors, heavy machinery, livestock, etc. Physical-chemical degradation occurs due to rain water, resulting in replacement of calcium by hydrogen cation in adsorption complex. Biological degradation is due to the decomposition of humus by the action of microorganisms. Arable soil fertility as result of secondary compaction was reduced on average by 10 percent.

Unclogging soils. In the foundation of vineyards and orchards plantations were unstopped (or deep plugging) to a depth of 50-60 cm approximately 546 thousand ha. As result of unstopped were disordered the ordination the natural genetic horizons and were brought to the earth's surface underlying horizons with low humus content and high carbon content. This process led to degradation fertility overlying layer (0-30 cm) of unclogging soils, process of clogging is very pronounced on the moderately

and strongly eroded soils. Unclogging land use for field crops after deforestation fruit trees plantations showed a decrease in their productive capacity essential to 5-10 percent. Currently under field crops are 176 thousand ha of unclogging arable soils.

Dehumification of arable soils. Soils dehumification as result of their use in arable is a global process, to stop that under the present system of agriculture is problematic. There is a risk that the next few decades, the humus content of arable soils to decrease on average by 10-25 percent, with very harmful effects on soil physical properties and even microorganisms in soil biodiversity. The most significant annually loss of soil humus from erosion land records 700 thousand tonnes.

Soil degradation as a result of alkalization and salinization. The total area of alkaline soils - 107.5 thousand ha, of which about 35 percent is arable land and 65 percent - pastures. The total area of saline soils is 112.2 thousand ha, 30 percent is arable land and 70 percent – pastures. Environmental damage caused by alkalization is calculated based on the weighted average soil productivity on non alkalization soils. Average of saline soils productivity decreased by 25 percent.

Soil degradation as a result of irrigation. The total area of irrigated land is 306.5 thousand ha. Currently can be irrigated only 85 thousand ha of land because the irrigation installation was destroyed in the privatization period. The reduction of irrigated soil surface caused by the economic crisis that now continues. The factors limiting production capacity of irrigated soils are deteriorating structure and compaction of arable layer and the underlying horizon, salinization and alkalization, raising groundwater and mineralization content.

Biological degradation of soils. Intensive use of arable land, widespread manifestation in association with physical and chemical degradation processes leading to biological degradation of soils. They intensified microbiological processes that contribute to the humus mineralization, decreased activity level of saprophagous 4-10 times, the rate of humus accumulation decreased from 1.7 to 3.3 times, the number of toxic biotic species increased significantly.

Land desertification and degradation as result of overgrazing. In recent years on the land occupied by pastures were intensified destruction processes of grass cover and disappearance of natural vegetation.

Overgrazing is conditioned by the increase in the number of cattle in the private sector and the lack of basic rules of exploitation process of grasslands. Unregulated grazing, early spring until late autumn, both natural and artificial grassland ones, leading to a reduction of about 40 percent of production and quality of grasses and accelerated degradation of grassland by thinning and loss of plants, by strong soil compaction and increase erosion on the slopes.

Assessment of land suitability for organization of organic farming system

Highlighting of land suitability, soil research and land cadastre suitable for organic farming organization is mandatory preventive action, which is done in stages:

I - performance assessment and feasibility study on the premises of Moldova to organize organic farming include: determining and reasoning of subjects as required geo information systems; developing placement schemes items in the agropedoclimacteric areas depending on crop zoning priority; collection of soil, water, plants, manure samples according to the scheme; their packing, shipping and analyzes; assessing the feasibility of the territory for organization of ecological agriculture.

II - assessment of ecological and pedological indicators necessary to delimits land suitable for organic farming organization. The researches allow to formulate preventive following obligations: the average credit-worthiness note of agriculture land - more than 60 points to confirm high fertility and self-purification capacity of soils; slope arable land - less than 5° to effectively combat soil erosion; soils - are not polluted with heavy metals, pesticides, fertilizers, petroleum products, pathogenic micro flora; agricultural land must be located at a certain distance from pollution sources (0.5 km from urban, 8-10 km from cement, metallurgical, chemical plants, 12-15 km from thermal power stations, 0.5 km from large livestock complexes).

III - highlighting possible prior of land suitable for organic farming on the based of earlier

research, mapping, environmental materials; conducting field research and development of soil, agrochemical, pollution and land evaluation maps; generalization of research materials, developing certificates of quality, pollution and ecological suitability of land for organic farming organization and training to producers of organic production; development of ecological certificate of suitability land in organic farming.

IV - development of methodology and monitoring soil quality status in the operation of their farming system to correct production technologies; development and implementation of measures for protection, improvement and sustainable use of soils under organic farming: methods of obtaining and/or preparation of ecological organic fertilizer from variety local sources, systems of crop rotation and fertilization of agricultural soils in ecological corresponding, monitoring of the effectiveness of recommended measures.

Land management and soil protection

Rational land management means combining technologies and activities in such a way as to achieve simultaneously: bioproductivity, food security, protection of soil quality, economic viability and social acceptability. This can be done if it acts primarily on the main goal - protection of soil quality. Maintaining long-term productive capacity of the soils, increasing its fertility, combat desertification are the primary strategic goals of the humanity. To protect soil resources was recommended the following actions:

- territorial organization of the villages and farms on soil research findings, review structure for agriculture and forestry uses in dependence of the nature of degradation processes and the necessary to maintain the ecological balance of natural and anthropo-genic ecosystems;
- management of soil resources corresponding to the requirements organic farming;
- implementation of soil erosion protection measures through antierosion projects of organization and development of agricultural land and water basins.
- improving degraded land by salinity and alkaline based on the projects concerning development of natural areas and watersheds,

land reclamation works and implementation of agropedoameliorative measures.

- land fertilization in purpose to conservation and enhancement of soil fertility; ecological reconstruction of grassland vegetation.

Soil conservation and ecological restoration should take into account the particularities of local soil cover, degradation factors, forms of land ownership based on the set of economic and political mechanisms to stimulate and regulate soil protection activities.

CONCLUSIONS

The necessary for research in this field – organization of organic farming is determined largely by the lack in the Republic of Moldova the *Methodology of management, use, protection and improvement of soil fertility in organic farming system*. The main requirements when selecting the land for organic farming are:

- Land farming system must meet specific environmental potentials and ecological limits of the soil;
- System of selecting land for organic farming should allow maintaining the balance of natural and agricultural ecosystems and stimulate the natural processes of self-purification and revitalize the soils and the varieties of crops are established under land suitability for these crops.

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RESEARCH ON THE ABSORPTION OF EUROPEAN FUNDS FOR AGRICULTURE AND RURAL DEVELOPMENT IN ROMANIA

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Abstract

Accessing and absorbing European funds for agriculture represents the greatest challenge for Romanian public administration, business environment and non-governmental institutions. Making use of European funds is an opportunity to boost the economic growth of Romania, since it would mean an annual capital input equal with up to 5% of the gross domestic product. The paper presents details regarding disbursement of grants for Romanian agriculture and related sectors, for the main measures of the National Plan for Rural Development, since the beginning of plan implementation until now.

Key words: *accessing EU funds, absorption of European funds, economic development of Romania*

INTRODUCTION

In Romania, submission of requests for funding through the National Program for Rural Development [10] (PNDR), for investment projects, is made periodically at APDRP (Payment Agency for Rural Development and Fisheries), during public sessions of submission. These sessions are announced in advance via mass-media and also on the internet, on the APDRP webpage and on the webpage of the Ministry of Agriculture and Rural Development (MADR).

The first stage that has to be completed in order to have access to investment funds involves establishing exactly the field of activity where the investment is to be made. After that, one has to check whether that particular investment or field of activity will receive grants through PNDR, i.e. whether they fall in PNDR area of funding. This checking is performed only at the institutions that can supply relevant information on that issue, namely:

- County and regional offices of APDRP [8];
- County offices for Payments for Rural Development and Fisheries (OJPDRP);
- Regional centres of Payments for Rural Development and Fisheries (CRPDRP);

- County offices of the Directorate for Agriculture and Rural Development [9].

The second stage for accessing the funds is represented by drafting the investment project in conformity with the requirements presented in the Applicant's Guide. More specifically, these requirements include submission of a Request for funding, a Feasibility study, or in other cases a Justification statement, as well as other documents. Chapter Annexes of the same Guide presents models of the important documents that have to be filled in. Besides this, the one who submits the request for funding has to supply a certain amount of money in order to start and continue the project until the costs of services and/or goods are discounted by APDRP.

MATERIALS AND METHODS

The paper is based on the situation of PNDR projects and funds allotted of various measures.

RESULTS AND DISCUSSIONS

APDRP experts from the County Office, together with experts from the Regional Centre of Payments for Rural Development and Fisheries check and evaluate the project.

Table 1 Situation of PNDR projects - 14.02.2013 (Euro)

Measure	Applications		Selected projects		Contracts / approvals for payment		Payments	
	No.	Public value	No.	Public value	No.	Public value	Public value	
111					23	16.512.262	12.378.787	
112	22.493	629.998.066	9.760	218.128.514	9.485	210.495.035	147.580.327	
121	7.664	2.937.054.358	2.333	966.733.436	2.006	762.606.079	422.428.340	
123	1.708	1.726.805.134	751	758.612.236	575	545.603.192	213.597.924	
Scheme XS 13/123A/2008	247	113.706.025	215	101.626.174	151	60.178.942	48.083.017	
Scheme XS 28/123F/2008	177	78.896.763	157	67.450.879	87	33.638.389	26.970.140	
Scheme N578/2009	453	311.099.775	232	176.523.754	206	146.138.452	30.105.101	
125	1.701	1.789.032.854	465	524.330.737	462	510.972.153	84.371.965	
141	88.846	666.345.000	48.512	363.840.000	46.936	353.212.427	137.620.696	
142*	PNDR	57	10.413.555	49	8.355.635	40	6.336.003	1.017.961
	Transferred SAPARD					3	69.794	47.420
143					7	12.415.223	3.349.051	
312	9.499	1.317.172.809	3.265	400.766.659	2.734	340.080.514	203.545.538	
313	3.703	569.890.742	1.292	217.566.660	963	157.671.032	39.691.588	
322	3.225	7.630.432.311	794	1.874.656.159	789	1.712.250.415	1.004.273.919	
431.1	stage 3	112	4.920.162	111	4.827.533	101	4.201.985	3.205.795
	stages 1+2					8	1.704.000	1.657.317
431.2						106	50.107.075	
511						78	34.882.998	
Guarantee schemes					2	220.000.000	220.000.000	
211							513.729.195	
212							275.887.456	
214	PNDR						956.354.501	
	Transferred SAPARD					1	9.498	7.837
221	PNDR	51	4.283.215	36	3.597.134	26	3.085.357	-
	Transferred SAPARD					3	13.796	11.452
611							395.009.912	
TOTAL	140.171	17.799.991.527	68.157	5.693.338.762	64.976	5.188.489.046	4.780.664.499	

Note: Measure 111 "Professional training, information and dissemination of knowledge"; 112 "Setting up young farmers"; 121 "Modernization of agricultural holdings"; 123 "Adding value to agricultural and forestry products"; 125 "Improving and developing infrastructure related to development of agriculture and forestry"; 141 "Supporting semi-subsistence agricultural farms"; 142 "Setting up producer groups"; 143 "Supplying counselling and consultancy for agriculturists" 211 "Support for disadvantaged mountain areas"; 212 "Support for disadvantaged areas, other than mountain areas"; 214 "Agri-environment"; 221 "First afforestation of agricultural lands"; 312 "Support for the creation and development of micro enterprises"; 313 "Encouragement of tourism activities"; 322 "Village renewal and development" 431 "The functioning of Local Action Groups, developing skills and animating the territory"; Sub-measure 431.1 "Building public-private partnerships" and 431.2 "The functioning of Local Action Groups (GAL), developing skills and animating the territory"; 511 "Technical assistance"; 611 "Direct complementary payments";

Source: The Ministry of Agriculture and Rural Development;

In other words, they check whether the project was drafted correctly, whether it follows the specific requirements for funding, they decide which the eligible value of the project is and finally whether or not it will receive funding through the European Fund for Agriculture and Rural Development (FEADR).

Then another stage comes, when the projects are selected at national level. In this stage, part of the projects submitted in the session

are selected to receive grants and to be implemented.

Until 2013, €10,097,083,737 will be allocated through PNDR for agriculture and rural development. They are given to:

- investment projects: €6,953,014,326 through 12 measures (M112, M121, M123, M125, M312, M313, M322, M141, M142, M431, M511, M221) and three State aid scheme (XS13/2008, XS28/2008, N578/2009);

- *direct payments* €2,722,382,704 through four measures: (M211, M212, M214, M611)

From the analysis of the data on contracting grants in the period between March 2008 and February 2013, one can conclude that 140,171 valid applications were submitted at APDRP, with a total value of payments of over € 17,799 billion.

Of these, 68,175 financing requests, with total value € 5,693 billion were selected for funding.

In the same period, 64,976 funding contracts were signed with the beneficiaries, with a total non-refundable value of over €4.162 billion. The total sum of the payments made until February 14 2013 was € 4,780 billion.

After the procurement stage and the realization of a first part of the investment, the beneficiaries who signed financing contracts with APDRP submit a payment request in which they present the expenses incurred and request the settlement of a certain percentage (set in the financing contract) of the value of the payment request. The basic principle of non-refundable financing is that of settlement, of re-imbusement of the expenditures previously incurred for the beneficiary.

In Romania, non-refundable allocation through PNRD until 2013 on the main measures is the following:

Measure 112 "Setting up Young Farmers"

- Total allocation for setting up young farmers was €337,221,484 – 100%.

- Projects submitted for non-refundable financing: 22,493 projects, public value €629,998,066 – 186%.

- Selected and contracted projects 9,485 projects with public value €210,495,035 - 62.4%.

- Instalment payment made by APDRP for young farmers €147,500,327 – 43.7%.

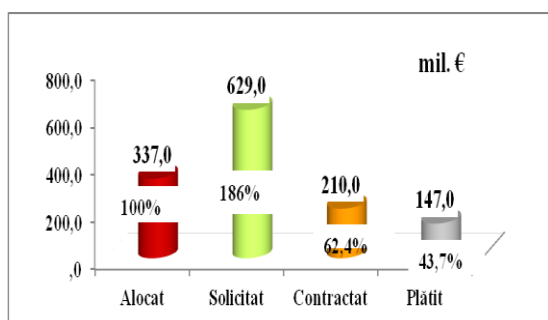


Figure 1. The situation of the funds disbursed through Measure 112 "Setting up Young Farmers" (14.02.2013)

Measure 121 "Modernization of Agricultural Holdings"

- Total allocation for the modernization of agricultural holdings: €913,394,603 – 100%.

- Projects submitted for non-refundable financing 7,664 projects, public value €2,937,054,358 – 321.5%.

- Selected and contracted projects 2,006 projects with total public value of €762,606,079 – 83.5%.

- Instalment payment made by APDRP for the modernization of agricultural holdings: €422,428,340 – 46.2%.

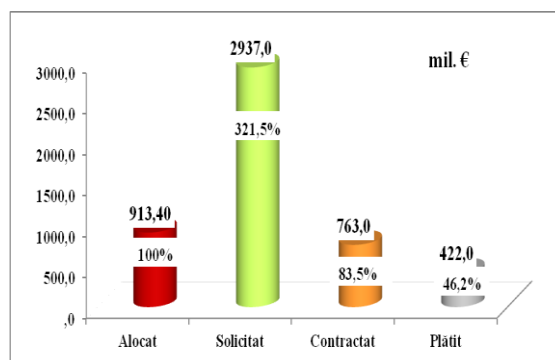


Figure 2. The situation of the funds disbursed through Measure 121 "Modernization of Agricultural Holdings" (14.02.2013)

Measure 123 "Adding value to agricultural and forestry products"

- Total allocation for adding value to agricultural and forestry products was €999,243,407 – 100%.

- Projects submitted for non-refundable financing: 1,708 projects, public value €1,726,805,134 – 172.8%.

- Selected and contracted projects 575 projects with public value €545,603,192 - 54.6%.

- Payments made by APDRP for processing the products €213,597.924 - 21.4%.

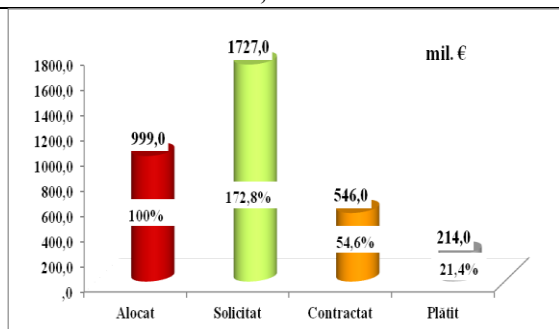


Figure 3. The situation of the funds disbursed through Measure 123 "Adding value to agricultural and forestry products" (14.02.2013)

Measure 125 "Improvement and development of the infrastructure for agriculture and forestry"

- Total allocation for the infrastructure related to agriculture and forestry was € 483,246,817 – 100%.
- Projects submitted for non-refundable financing: 1,701 projects, public value € 1,789,032,854 – 370.3%.
- Selected and contracted projects: 462 projects with public value €510,972,153 – 105.7%.
- Payments made by APDRP €84,371,965 – 17.5%.

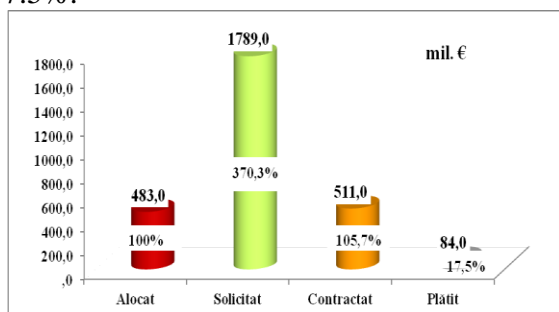


Figure 4. The situation of the funds disbursed through Measure 125 "Improvement and development of the infrastructure for agriculture and forestry" (14.02.2013)

Measure 141 "Supporting semi-subsistence agricultural farms"

- Total allocation for supporting semi-subsistence farms was €476,077,390 – 100%.
- Projects submitted for non-refundable financing: 88,846 projects, public value €666,345,000 – 140%.
- Selected and contracted projects: 46,936 projects with public value €353,212,427 – 74.1%.

- Payments made by APDRP for supporting semi-subsistence agricultural farms € 137,620,696 – 28.9%.

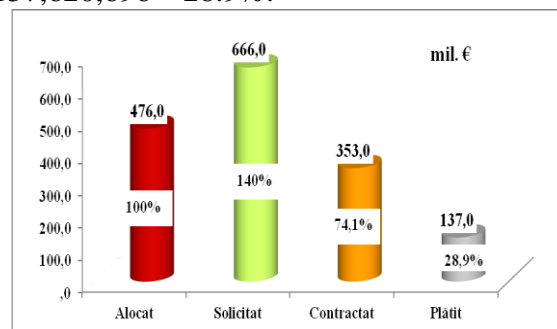


Figure 5. The situation of the funds disbursed through Measure 141 "Supporting semi-subsistence agricultural farms" (14.02.2013)

Measure 221 "First afforestation of agricultural lands"

- Total allocation for first afforestation of agricultural lands was €229,341,338 – 100%.
- Projects submitted for non-refundable financing: 51 projects, public value € 4,283,215 – 1.86%.
- Selected and contracted projects: 26 projects with public value € 3,085,357 – 1.34%.
- Payment made by APDRP for first afforestation of agricultural land €0 – 0%.

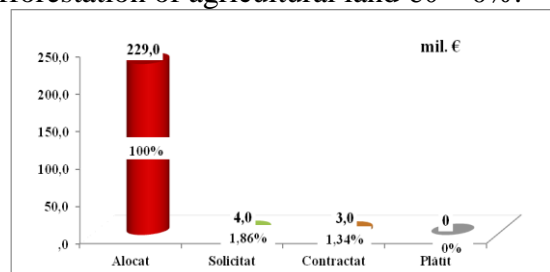


Figure 6. The situation of the funds disbursed through Measure 221 "First afforestation of agricultural lands" (14.02.2013)

Measure 312 "Support for the creation and development of micro enterprises"

- Total allocation for micro enterprises was € 385,237,628 – 100%.
- Projects submitted for non-refundable financing: 9,499 projects, public value € 1,317,172 – 341.9%.
- Selected and contracted projects: 2,734 projects with public value €340,080,514 – 88.3%.
- Payments made by APDRP for developing micro enterprises €203,545,538 – 52.8%.

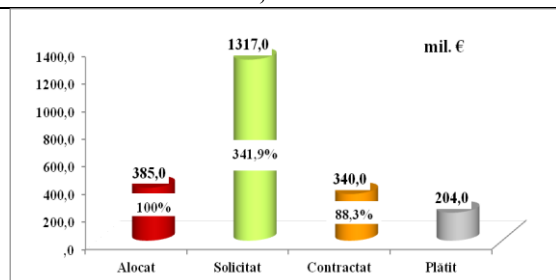


Figure 7. The situation of the funds disbursed through Measure 312 "Support for the creation and development of micro enterprises" (14.02.2013)

Measure 313 "Encouraging tourism activities"

- Total allocation for supporting tourism activities was €534,682,774 – 100%.
- Projects submitted for non-refundable financing: 3,703 projects, public value €569,890,742 – 106.6%.
- Selected and contracted projects: 963 projects with public value €157,671,032 – 29.5%.
- Instalment payments made by APDRP for investments in tourism activities €39,691,588 – 7.4%.

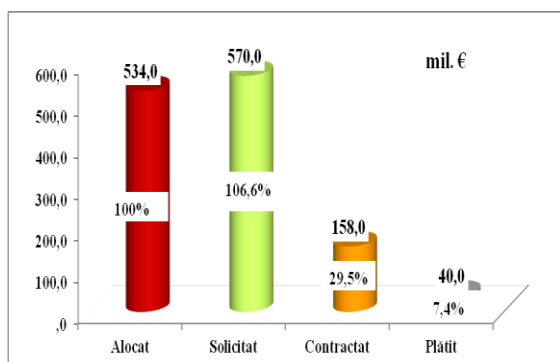


Figure 8. The situation of the funds disbursed through Measure 313 "Encouraging tourism activities" (14.02.2013)

Measure 322 "Village renewal and development"

- Total allocation for renovating and developing villages was €1,570,127,631 – 100%.
- Projects submitted for non-refundable financing: 3,225 projects, public value €7,630,432,311 – 485.98%.
- Selected and contracted projects: 789 projects with public value €1,712,250,415 – 109%.

- Payments made by APDRP for investments in the development of the rural area €1,004,273,919 – 64%.

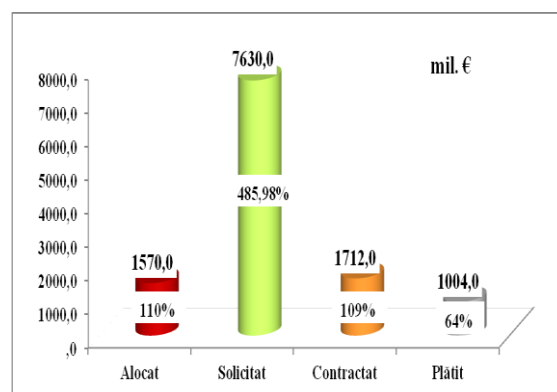


Figure 9. The situation of the funds disbursed through Measure 322 "Renewal and development of villages" (14.02.2013)

After analysing the data, we found that, in Romania, the total situation of non-refundable funds on February 2013 was the following:

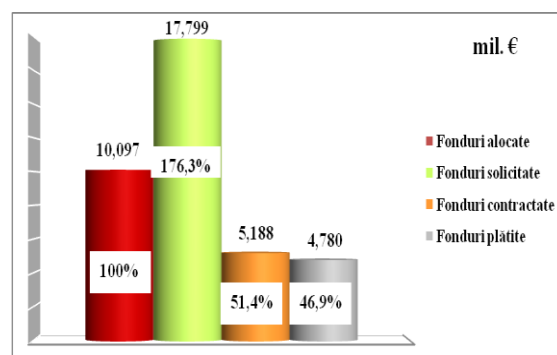


Figure 10. The situation of non-refundable funds (14.02.2013)

- Non-refundable sums allocated through PNDR until 2013: €10.097 billion – 100%.
- Non-refundable sums requested until February 2013: €17,796 billion – 176.3%.
- Non-refundable funds contracted until February 2013: €5,188 billion – 51.4%.
- Non-refundable funds paid february 2013: €4,780 billion – 46.9%.

After the first five years of active implementation of the National Program for Rural Development 2007-2013, unfortunately Romania has not succeeded in absorbing properly the funds for rural development, as, at the end of 2012, only 51.4% of the funds were contracted and only 46.9% of the sums were absorbed. Nevertheless, this absorption

degree puts the National Plan for Rural Development of Romania on the first place in the hierarchy of European Funds at the end of 2012, as the average absorption of structural and cohesion funds is of only 20% in Romania.

After processing and interpreting the data, the authors of this paper have identified the main difficulties Romania faces when it comes to accessing non-refundable funds. These difficulties are presented below.

The fact that 2007 to 2013 only 46.9% of the sums allocated for investments through PNDR were actually paid, proves **low absorption of funds** for investment measures. It also indicates low degree of implementation of such investment projects. One of the main problems is **bureaucracy**, which is strongly manifested in all EU structures.

Another issue is the **lack of transparency of the clerks** who manage the process of granting structural funds, and periodic delay of the deadlines for submitting projects.

Although the Romanian business environment and the local authorities could have benefitted from non-refundable sums starting from January 1st 2007, these funds could not be accessed before January 2008, in the best cases. During all this time, it was the European Community, and not Romania, that benefitted from the money allocated for these projects and the related interests.

Still, the major problems started when the programs were launched, because of: Applicant's Guides issued in haste; unclear selection criteria that left room for various interpretations by representatives of intermediary organizations; rules changed during the submission sessions (thus some projects became non-eligible overnight or they got lower scores); delays in announcing the selected projects; delays in signing contracts with the beneficiaries who had been selected for financing.

The **impossibility of beneficiaries to finance or co-finance the projects** is another problem. It is a known fact that a major problem of Romanian small and medium enterprises is that they lack the money they need for having their own input in financing their investments. This is a serious setback,

since an important principle of financing programs is that first, the beneficiaries invest their own money, and after that, their eligible expenses are settled by non-refundable sums.

In Romania, the **low expertise of beneficiaries in drafting projects** is considered a major hindrance for managing structural funds, while poor information regarding the financing possibilities from structural funds represents another serious problem. In order to eliminate these deficiencies, most beneficiaries tend to use a specialized firm for drafting the project. This firm works in the domain permanently, and sometimes changes appear that only somebody who works in the system will know of in time to draft a project with higher chances of being accepted. The investment necessary in order to work with such a firm is not extremely big either. The commission for a project ranges within the limits of 3% to 5% of the project value, depending on the complexity of the project. Moreover, this commission is partly covered by the eligible expenses.

Creating a virtual space where people can check at any time the stage of the evaluation for their submitted projects would give submitters access to see their scores, and they would be able to see the weak points of their documentations. In this way, a greater transparency of the project evaluation process would be promoted, and at the same time people could assimilate the "good practices" resulted from correcting the imperfections that led to some projects being rejected.

CONCLUSIONS

Started more than one year later than scheduled, the implementation of the National Program of Rural Development for 2007-2013, with non-refundable funds of over €10 billion is in full progress. Until February 2013, approximately 46.9% of the funds were spent.

The main hindrances and factors that slow down the level of absorption of European funds in Romania, as identified by the authors of the present paper are the following:

- excessive bureaucracy;

- lack of transparency of the clerks who are responsible for managing the funds;
- periodical delay of the deadlines for submitting the projects;
- eligible beneficiaries' lack of ability to co-finance their projects;
- low expertise of beneficiaries in drafting projects;
- poor information of the potential beneficiaries regarding financing possibilities.

In order to increase the absorption degree of European funds in Romania, the authors of the present paper propose the following solutions:

- Ensuring the quality of human resources by accrediting consultancy firms. In the accrediting process, consultancy firms should have to comply with certain criteria in regards to the training of their staff, the level of experience and the number of selected projects.

- Human resources in the organizations involved in implementing PNDR proved to be insufficient in relation to the extremely large amount of work required for launching and implementing the measures established in PNDR from the first year of implementation. That is why we think the number of clerks in the institutions that are responsible for the implementation of financing programs should be supplemented. People should be hired who are experienced in assessing European-financed projects, and who are specialized in these domains.

- Taking into consideration the major impact of Program FARMER, running in Romania, on the number of projects submitted for SAPARD program, we consider that this Program should be kept running. For this, certain sums of money should be allocated with subsidized interest and guarantees from the Romanian authorities through Guarantee Funds for ensuring private co-financing.

- Commercial banks should consider lending investments in agriculture more seriously. In the analysis of requests for credits for agricultural purposes, they should take certain particularities of agriculture into consideration. Thus, when setting the rates, they should ensure a grace period, i.e. a period in which some profit can be made from the investment (for instance, a beneficiary who

sets up an orchard will need at least three years before he makes profit from this investment).

- Another facility that can help the potential beneficiaries of FEADR measures is the possibility to request an advance, which at present is of 20% of the non-refundable contract value. The advance is given in conformity with the Council Regulation (CE) 1698/2005 regarding support for rural development allocated from the European Agricultural Fund for Rural Development, amended by Council Regulation (CE) 1974/2006 which states the norms of application of Council Regulation (CE) 1698/2005, and respectively in conformity with the national legislation. We propose that the advance given be increased from 20% to 50% of the non-refundable project value, and that the guarantee for it be done with the help of the credit guarantee funds. In this way, the beneficiaries could have faster access to the money necessary for the investment.

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INFLUENCE OF ECONOMIC GROWTH ON THE SUSTAINABLE DEVELOPMENT OF ROMANIA 2007-2012

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Abstract

This paper intends to analyse the correlation between the level of economic growth of a country and its rural development. The phrase sustainable development combines the economic growth and the preservation and improvement of environmental and human health, preservation of social justice and assurance of democratic environment in social life. Therefore, the sustainable economic growth provides for the meeting of current consumption requirements without compromising or prejudicing those of the future generations. By adding the requirements regarding environmental protection and preservation of natural resources to economic growth we may speak of a proper sustainable development.

Key words: economic growth, sustainable development

INTRODUCTION

The concept of sustainable economic growth has appeared as a result of establishing the irreversible diminishing of the capacity of economic resources, of any kind, as a result of human activity. Academic studies and more applied analyses showed that the old economic optimization criteria are inconsistent with the natural dynamics of basic resources. This fundamental observation in conjunction with the occurrence of global problems led to the necessity of a long or very long term approach of the manner, degree, pace and structure in which the economic resources of any kind are created, consumed and recycled.

MATERIALS AND METHODS

In order to meet the need of information to be used for presenting the subject to be discussed, a bibliographical research and a statistical research have been performed, through which data for the conclusions regarding the performed study were collected, processed and analysed. Statistical tables have been used by which data were presented in a tabular way. This is a method which allows the description of indicators on which the

performed analysis is based, and the establishing of the existing connections between its component elements. Graphical representations have been used to emphasize the extent and/or variation of data subject to the statistical research in view of showing their evolution in time.

RESULTS AND DISCUSSIONS

The best known definition of the sustainable development is the one from the Declaration on Environment and Development, given within the World Summit held in Rio de Janeiro in 1992 which defines this concept as *"the development which answers to the current needs without prejudicing the capability of next generations to meet their own needs. [...] In order to meet the desideratum of sustainable development, the environmental protection will be an integral part of the development process and may not be approached independently of it."* (Declaration on Environment and Development, Rio de Janeiro, 1992). During this summit, it was tried to establish an economic, industrial and social development strategy, at international level, known as sustainable development. The countries which were present to the Rio de Janeiro World Summit agreed with the

preparing of several legal instruments: *Rio Declaration on Environment and Development, Agenda 21 (a plan for supporting the sustainable development), United Nations Framework Convention on Climate Change, Convention on Biological Diversity, Statement of Principle on Forest Management, and United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, by which, a sustainable development is to be provided for.*

In **2002**, during the **Johannesburg World Summit on Sustainable Development**, the progress made by countries towards a sustainable development was analysed and the participants' commitment to promote the principles of sustainable development were renewed.

In 1997, the sustainable development was included in the **Maastricht Treaty**, thus becoming an objective of the European Union. In **2001**, within the **Goteborg Summit**, the **European Union Sustainable Development Strategy** was adopted, which was renewed in 2006 by the **Sustainable Development Strategy for an Enlarged European Union** which was aimed to change the behaviour within the European society by involving the policymakers, both public and private, and the citizens in preparing, implementing and monitoring the sustainable development objectives.

The following **7 priority axes** of the European Union Sustainable Development Strategy have been reviewed: Climate change and energy, Sustainable transport, Conservation and management of natural resources, Sustainable consumption and production, Public health, Social inclusion, demography and migration, Global poverty and sustainable development challenges.

Through the **Sustainable Development Strategy for an Enlarged European Union**, the implementing, monitoring and follow-up procedures have been established. The undertakings have been monitored through reports prepared one in two years. Romania, as a member state of the European Union, is subject to the same sustainable development principles.

In order to measure the sustainable development at national level, there is a set of indicators, established by the Statistical Office of the European Community (Eurostat) together with the National Statistical Institute, categorized on three levels: 1. Main indicators; 2. Indicators usable to monitor and review the sustainable development programs; 3. Analytical indicators, which also includes economic, social and environmental indicators.

In order to measure the sustainable development in Romania, there are 85 indicators, classified according to the European system. In turn, indicators are grouped on 10 subjects: economic development, poverty and social exclusion, ageing society, public health, climate change and energy, production and consumption models, ecological efficiency, management of natural resources, good quality governance and global partnership. Within the category of indicators used to assess the sustainable development, the indicators for material flows are also included, indicators which put pressure on the environment because their action is related to the diminishing of renewable resources and the ecological damage. The material flows may be analysed through the domestic material extraction, direct and total material inputs, domestic and total material consumption, direct and total material outputs, material productivity, material efficiency, dependency on domestic natural resources, material imports etc.

Two of the main sustainable development assessment indicators are: GDP/capita and population pushed close to the poverty line.

Table 1 – Evolution of GDP/capita - 2007-2012
 % change compared with the previous year

Indicator	2007	2008	2009	2010	2011	Q1 2012	Q2 2012
GDP	6.3	7.3	-6.6	-1.6	2.5	0.3	1.1
Domestic demand, out of which:	14.2	7.3	-12.0	-1.5	3.1	1.2	1.3
Private consumption	11.9	9.0	-10.1	-0.4	1.3	0.5	2.2
Governmental consumption	-0.1	7.2	3.1	-4.4	-3.5	-1.2	-2.4
Gross fixed capital formation	30.3	15.6	-28.1	-2.1	6.3	12.2	15.5
Export of goods and services	7.8	8.3	-6.4	14.0	9.9	-2.2	-0.5
Import of goods and services	27.3	7.9	-20.5	11.9	10.5	-0.3	0.2

Source: National Institute of Statistics

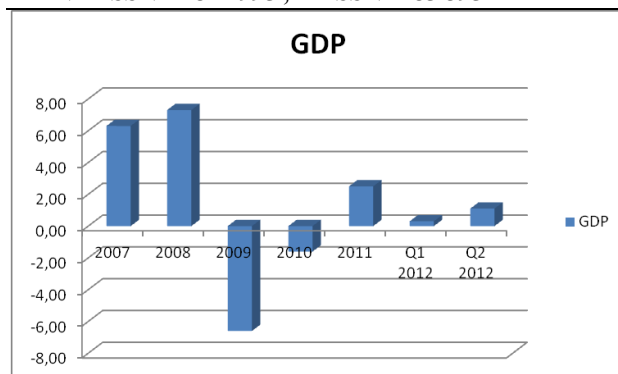


Fig.1 – Evolution of GDP in the period 2007-2012

Analysing the % change of GDP/capita compared with the previous period, an increase is established with an annual average pace of 6.8 % for 2007-2008. In 2009, a decrease of the analysed indicator took place, with -6.6 %. The decrease continued in 2010, when a decrease with 1.6 % of GDP/capita took place, compared with the previous year, followed by an increase with 2.5 % in 2011. For the first two quarters of 2012, the increases were of 0.3 % and 1.1 % respectively. If, during the period 2007-2008, a real economic convergence process of the domestic economy towards the average level of European Union economy took place, during the period 2009-2010, this process was interrupted, due to the economic and financial crisis and the diminishing of international financing which influenced the domestic economy evolution. The false exit from the recession process in 2011 was caused by the agricultural production registered in that year. If we analyse the added value brought by several sectors of the domestic economy in the obtaining of GDP, it is established that in 2011 agriculture has contributed to the recovery of the analysed indicator. This was not the case in 2009 and 2010 when the climate change had negative influences. During the period 2009-2011, the annual average growth was of 0.3 %.

Industry had a positive trend in 2007-2008, followed by a decrease in 2009 and a recovery in the next period.

The other two sectors, constructions and services, have registered decreases in the analysed period due to the fact that the economic recession led to a decrease of real

estate investments, and to the diminishing of public investments in infrastructure.

Table 2 – Contribution of several economy sectors to GDP formation

Indicator	% change compared with the previous year						
	2007	2008	2009	2010	2011	Q1 2012	Q2 2012
Industry	5.4	1.9	-1.4	4.8	5.0	-0.2	0.3
Agriculture	-15.3	20.7	-3.3	-6.3	11.3	4.0	-1.6
Constructions	33.9	26.2	-9.9	-7.3	2.7	0.0	3.6
Services	7.0	5.4	-7.4	-2.3	-0.1	-1.3	0.1

Source: National Institute of Statistics

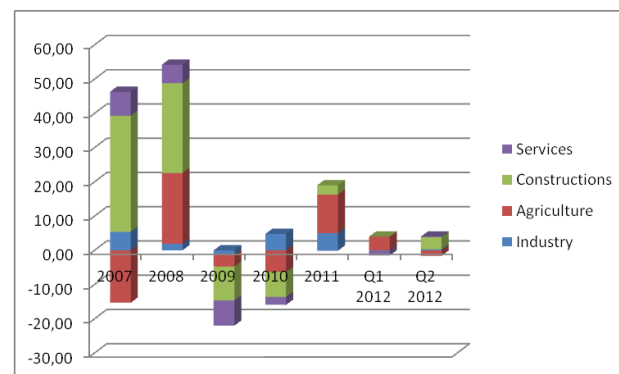


Fig.2 – Contribution of several economy sectors to GDP formation in the period 2007-2012

Data registered by the National Institute of Statistics and Eurostat show that, starting with 2011, Romania is the poorest country of the European Union. In 2010, the weight of population pushed close to the poverty line was of 41.4 %, compared to 41.6 % registered in Bulgaria, when in EU, this indicator is at a level of 23.4 %. This issue is in contradiction with the natural resources endowment of our country.

Table 3 – Population at risk of poverty

Indicator	% of total population				
	2007	2008	2009	2010	2011
Romania	45.9	44.2	43.1	41.4	40.3
North-West	38.3	33.7	35.2	30.8	34.3
Centre	37.6	37.2	33.2	30.3	28.5
North-East	55.1	54.5	52.9	51.0	51.2
South-East	51.0	48.6	42.4	51.8	50.0
South-Muntenia	50.3	45.6	48.1	42.7	43.1
Bucharest-Ilfov	35.1	36.2	41.9	34.4	28.4
South-West Oltenia	55.4	56.5	52.9	48.0	44.8
West	34.2	33.4	30.1	35.5	33.1

Source: Eurostat

By analysing the weight of total population at risk of poverty by regions, it is established that in North-West Region, the population at poverty risk is decreasing, being under the national average.

Centre Region has the lowest degree of population at poverty risk, and the highest

weight is registered in the North-East Region, followed by the South-West Oltenia Region and South-East Region.

The poor economic development of Romania is also shown by the indicators related to the average life expectancy at birth. In 2010, in Romania, the average life expectancy from birth is of approximately 70 years for men and 77.6 years for women, while the average values of European Union is of 76.7 years for men and 82.6 for women.

CONCLUSIONS

Achieving a sustainable economy lies in achieving an economic growth in the context of diminished material consumption.

The increased demand of goods and services drives the sustainable economic development in the context of meeting the eco-efficiency system requirements.

For the eco-efficiency to be obtained, it is necessary to promote market instruments which reflect the real cost of using natural resources and the impact on society.

At the level of our country, it is established that the recovery of the economic growth left its mark on the sustainable development. Human development may not be obtained without material and financial resources, the economic growth being the *conditio sine qua non* for welfare and social cohesion.

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ROLE OF SUPPLY CHAIN MANAGEMENT IN INCREASING THE COMPETITIVENESS OF COMPANIES IN A GLOBAL CONTEXT

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Abstract

The supply chain management is an important source of improving the company's efficacy and effectiveness because it facilitates the logistic integration between companies, the integrated management of the supply chains of the partners, respectively, in view of creating added value for the final client, which allows the creation of long term relationships or partnerships, which involves the cooperation in order to improve the design, diminish the costs, improve the quality and develop products to be launched as quickly as possible on the market. In the broadest sense, the supply chain management includes the entire network and develops strategies and influences to invest in and relate upstream with suppliers, supplier's suppliers etc., and also to invest in and relate downstream with clients, client's clients etc. up to the end user.

Key words: develop products, efficacy, logistic, quality products, supply chain management

INTRODUCTION

The term Supply Chain Management (SCM) was developed in the 80's in order to express the need to integrate the key business processes, from the end user to the original suppliers. The core idea of a SCM is that the companies are involved in a supply chain at least through the exchange of information regarding the market fluctuations and production capabilities. (C. Vasiliu).

Although the authors of the concept are R. Oliver and M. Webbe, the Supply Chain was a topic of discussions long before. Some fields, such as production, had an upward trend, while stock management was subject to marketing. This fragmentation led to the occurrence of conflicts between production, marketing, accounting and financial departments. In this context, logistics emerged as a method of improving company's efficiency.

MATERIALS AND METHODS

By the use of specialized literature, this paper intends to present the importance of SCM within a company.

Based on the bibliographical references, the following were indicated: terms of supply chain and supply chain management, their component elements, as well as the advantages of using the Supply Chain

Management in increasing the company's competitiveness on a global market.

Because there are several issues to be pursued, the supply chain management is difficult to treat as a whole. New trends regarding SCM are focused on the most recent approaches to the coordination of material and information flows.

RESULTS AND DISCUSSIONS

The term Supply Chain Management (SCM) was developed in the 80's in order to express the need to integrate the key business processes, from the end user to the original suppliers. The core idea of a SCM is that the companies are involved in a supply chain at least through the exchange of information regarding the market fluctuations and production capabilities. (C. Vasiliu).

Although the authors of the concept are R. Oliver and M. Webbe, the Supply Chain was a topic of discussions long before. Some fields, such as production, had an upward trend, while stock management was subject to marketing. This fragmentation led to the occurrence of conflicts between production, marketing, accounting and financial departments. In this context, logistics emerged as a method of improving company's efficiency.

Supply Chain represents a network of organisations which are involved, by upstream and downstream connections, in different processes and activities which generate value as products and services which reach the end users. In a broader sense, a Supply Chain consists of two or several organizations which are legally separated, but connected through material, financial and information flows, including the end user also.

In a narrow interpretation, the term of Supply Chain is applied to a single company which has several seats, often located in different countries within which the coordination of material, information and financial flows takes place and it is easier to take decisions because these premises are included in a single organization, with a single management level.

Supply Chain Management was defined as a process for “the management of downstream and upstream relations with suppliers and clients which allows the supply of a higher value to the client, at a lower cost, in a supply chain which is viewed as a whole” (Moller, 2003; Christopher, 1998).

Supply Chain Management includes more issues than the traditional logistics functions, being one of the most powerful instruments in increasing company’s efficiency, especially in increasing the operational efficiency.

Since the emergence of this term, the marketing departments started to offer a greater importance to distribution.

Supply Chain Management unifies all the processes in a single homogenous chain from the supplier, manufacturer, and merchant to the client. Resources and capabilities are combined and the design, manufacturing, and delivery of goods, services and information are performed in an organization which is objective-oriented.

In the article “The ABC of Supply Chain Management”, published in the online magazine NetworkWorld, 2007 it is shown that a Supply Chain Management may include five main components (C. Vasiliu):

1) “the plan, which refers to the over-all strategy of the SCM program including the development of SCM metrics to monitor;

2) the source, which refers to the suppliers who'll provide you with goods and services necessary for you to run your business;

3) the make or manufacturing component, which refers to the execution of processes needed to produce, test, and package your products or services;

4) the delivery, which refers to the system for receiving orders from customers, developing a network of warehouses; getting the products to the customers; invoicing customers and receiving payment from them;

5) the return, which is the system for processing customer returns and/or supporting customers with problems with the products they received”

In this context, the cooperation between the supply chain and the extended supply chain becomes important, and relevant information becomes relevant for any enterprise within the supply chain, which could to be optimized. This will lead to a better general planning of production and distribution. In turn, this situation will lead to cost diminishing and will offer a greater attractively to the end product, supporting the sales increase.

The successful implementation of the Supply Chain Management leads to the emergence of a new type of competition on the global market which takes place between supply chains and not between companies, being an effective method of creating value for the client.

Florea N. and Clipa C. described SCM as follows:

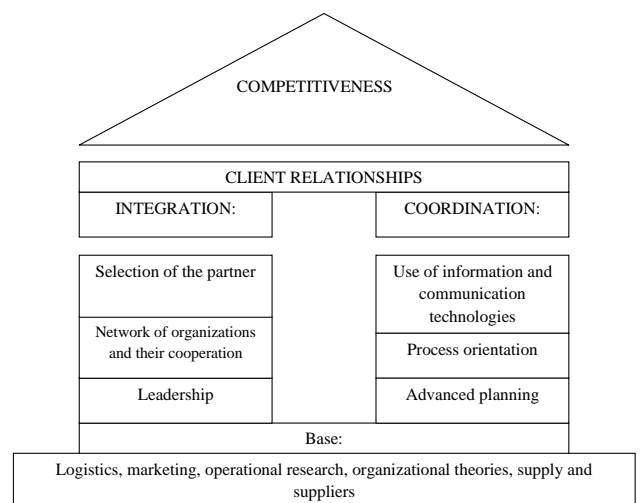


Figure 1 – SCM Structure
 (Source: Florea N., Clipa C., 2005)

The elements underpinning this structure are: competitiveness, client relationships, integration and coordination.

Competitiveness may be improved as follows: by diminishing costs, increasing the quality of products offered or by increasing the flexibility, in the context of observing the changes which occur in the client's demands.

Integration means grouping an aggregate of organizations, selecting proper partners to form an average and long term partnership.

Coordination on the one hand, means the use of information, of materials and financial flows, and on the other hand, it means the alignment to the strategies of the involved partners.

It involves the use of information and communication technologies, process orientation and advanced planning and it must be performed by using the newest developments in information and communication technology.

The use of all these elements is aimed to the most efficient operation of SCM, without interrupting the physical, financial and information flows. This is why SCM needs to use some advanced planning systems, which are developed with the help of effective software applications.

CONCLUSIONS

In conclusion, the advantages of using the Supply Chain Management are represented by the streaming of flows which led to cost optimization: costs related to stock maintenance, costs related to the circulation of physical flows; costs which involves the disconnection of physical flows. This cost reduction will lead to the improvement of profits to the expense of its own partners within the Supply Chain.

The aim of the supply chain management implies the clients' satisfaction, obtaining of a high performance of the organization, and identification of methods by which the companies continue to learn, innovate and to evolve.

The objectives of the supply chain management are squander reduction, time

compression, responsiveness flexibility and reduction of unit cost of the product.

In order to achieve the full capacity of the supply chain management, integration is necessary not only within the organization, between departments, but also with the external partners.

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ANALYSIS OF DEVELOPMENT OPPORTUNITIES FOR RURAL ENTREPRENEURSHIP IN THE DEVELOPMENT REGION WEST, ROMANIA

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Abstract

Romanian rural communities are characterised mainly by an ageing population, by a decrease of birth rate and by a dependence on agriculture, particularly subsistence agriculture and demi-subsistence agriculture. The policy of rural development of the European Union aims at solving the issues of rural areas through the exploitation of their potential and by ensuring the proper services and infrastructure. Income sources are scarce because of the few jobs and this has major implications on life quality in the rural communities. Therefore, local authorities should be concerned with the development of their own localities and with the improvement of their inhabitants' life quality and implement successfully some development programmes or projects. The goal of the present paper is to present the most favourable ways of development for the rural communities in the development Region West, Romania, an area confronted with such issues as shortage of jobs and low incomes and where there are discrepancies between the economic developments of the counties making it up. Based on the analyses carried out and on study cases, the authors present the main aspects of the rural areas in the region, pointing out the fact that local authorities should be concerned with the development of their own localities and implement successfully development projects. The authors have reached the conclusion that the development of non-agricultural activities determines the diversification and increase of jobs and, implicitly, the increase of life quality in rural communities.

Key words: entrepreneurship, non-agricultural activities, rural development, SMEs, tourism

INTRODUCTION

Romania has known disparities between the levels of economic and social development of the different areas of the country.

Between the two World Wars, there was industrial activity in only a few regions of the country, where mineral and energetic resources were available. Thus, the economy of the other regions was dominated by agricultural activities.

After World War II, the Communist leadership, through its policy, tried to develop all the regions equally through industrialisation. As a result, they made investments in industry in all the areas of the country, no matter their economic justification.

The effects of industrialisation materialised in an increase of the number of localities relying on a single type of activity (e.g., Reșița, Hunedoara, Petroșani, etc.) and in the development of economic activities that were

not supported by the resources of the area and that has to rely on imported raw materials.

On the other side, the concentration of industrial investments, particularly in the urban areas, has resulted, in time, in the migration of the population, mainly the young one, from the villages to the towns, increasing considerably the urban population.

The negative effects of the industrialisation were obvious, on the one hand, in the rural areas, which not only lost the most productive population, but also declined economically and, on the other hand, in the urban areas that underwent a quick urbanisation and had to bear demographic and social pressure impossible to absorb from the point of view of the housing facilities.

In this context, working class blocks of flats or single-people's dormitories appeared in great numbers in all the towns and cities of Romania. [1]

Nowadays, we have to deal with the effects of the policy of development that marked in the

past all the counties of Romania; briefly, all the areas of Romania confront with on type or another of problems.

The issues related to job occupancy are obvious in both under-developed areas – that do not manage to make enough productive investments and cannot create a satisfactory number of jobs – and in developed areas – that, because of the economic crisis, have lost a considerable number of jobs as a result of the shortage of activities in some enterprises or of the bankruptcy of enterprises that were not enough consolidated economically. [3]

In this context, the general issues of economic development in all Romanian development regions are similar to those of the less developed European regions where the GDP is below 75% of the European Union GDP. This is also the situation of the four counties in the development Region West of Romania [2]

MATERIALS AND METHODS

As material, we have used the partial results of the research project “Promoting entrepreneurship to increase job occupancy in the rural environment” (POSDRU 110/5.2./G/89043 from 30.01.2012), carried out through the Romanian Academy, Timișoara Branch, by the Scientific Research Team Sustainable Rural Development of Romania.

Research was conducted in the four counties of the development Region West, i.e. Timiș, Arad, Bihor and Caraș-Severin.

Within the project, we made diagnosis analyses of the present state of unemployment and of people occupied in subsistence agriculture in the rural areas of the entire region and in each of the four counties of the region; the study is a quantitative and qualitative scanning of the three main issues: unemployment, subsistence agriculture, and dynamics of the business environment.

RESULTS AND DISCUSSIONS

Labour force occupancy in the development Region West reflects in the following factors: activity rate 66.4%, employment rate 49.5%,

long-term unemployment rate in youth (over 6 months): 12.2%. Labour force occupancy per sectors of activity is as follows: industry – 27.7%, agriculture – 25.1%, commerce, transports, hotels and restaurants – 21.1%, public administration, insurance, education, health and social work – 11.9%, constructions – 5.9% and information and communications – 15.0%.

The few chances to get a job in the rural area are because of the low number of economic agents in the rural area.

The present state of the rural area in the development Region West is the effect of the few major investments in infrastructure, particularly in the rural infrastructure that could make the areas more attractive. In most cases, the inhabitants of the rural area do not know how to speculate the opportunities of a profitable business. The main reasons why they do not start a business are the lack of information and of entrepreneurial education.

Through the project, we have carried out in the development Region West, the people in the target-group benefit from entrepreneurial education courses to acquire the necessary skills and from the consultancy necessary to start non-agricultural business such as SMEs specific and necessary to the rural area and business in rural tourism, crafts, or services.

At regional level, private investments represent 20.2% of the GDP, structured as follows: 43.7% in industry (31.6% in the producing industry); 9.9% in commerce; 9.7% in real estate; 8.6% in constructions; 8.3% in agriculture and 7.7% in transports and storage.

In the year 2011, there were, in the development Region West, 43,241 enterprises, as follows:

- 85.95% micro-enterprises (0-9 employees);
- 11.37% enterprises (10-49 employees);
- 2.25% medium enterprises (50-249 employees);
- 0.43% large enterprises (over 250 employees).

The development Region West has a population of 1,913,831 inhabitants, of which 71.5% are aged 15-64 years.

We should also mention that, in the development Region West, there are also 25

SMEs/1,000 inhabitants, and that the number of people employed in enterprises is 427,511. According to statistics, the share of the unemployed population is considerable (50.5%) at regional level and, though there are no data on the shares per urban and rural, our research shows that most of the unemployed people come from the rural area.

Thus, the shortage of jobs has resulted in the practice of subsistence agriculture and, even most dramatically, in migration of the active population to more industrialised areas.

Though in some localities in the development Region West the population is ageing, this is not a barrier to entrepreneurship: these localities can become poles of integration for the surrounding localities. It is expected that, once a new business is started, the demand of labour force is oriented not only to the active population in the locality of the investment, but also to the neighbouring localities.

The setting of many rural localities in the development Region West in a special natural landscape with exceptional cultural and historical heritage favours the development of tourism under different forms (particularly the counties of Caraş-Severin, Hunedoara, Arad, and Timiș). In the development Region West, there are five national protected parks covering 1,730 km², 4 natural protected parks covering 2,731 km², and 2,104 monuments and sites listed on the List of Historical Monuments. In the Timiș County, there are 2,142 accommodation places and 338 monuments and sites on the List of Historical Monuments, i.e. 16.1% of the total number of monuments and sites in the region. However, as ADR-Timiș statistics show, this potential is not valorised properly.

At the level of the development, Region West there are 497 tourism structures (as a rule, small capacity bed-and-breakfasts) with 23,276 beds, of which only 5,950 are functional. [4]

The strategic vision for the period 2014-2020 approaches all regional disparities specific to Romania and presents the socio-economic development of all regions.

The global goal for the next period is to reduce economic and social disparities between Romania and European Union

Member States through supplementary increases of the GDP with 15% until 2022 and through increases of the GDP per capita to 65% of the European Union mean.

To reach this global goal, we identified theme priorities related to the objectives:

- improving human capital through the increase of the labour force and through better policies of social inclusion and education;
- developing a modern infrastructure in order to increase economic development and the number of jobs;
- promoting economic competitiveness and local development;
- optimising the use and protection of natural resources and activities;
- etc.

These theme priorities are a true advantage in the development of rural regions based on European Union funds for the period 2014-2020 also.

CONCLUSIONS

Regional development should aim at developing the infrastructure of urban (small towns) and rural areas that could become poles for investments in the region. In parallel, we should support complementary actions in other fields such as professional education and training, development of health infrastructure, protection of the environment, etc.

Diversifying the economy of the rural areas in the development Region West, particularly tourism potential, and the development of SMEs, particularly activities that self-support from the points of view of human and material resources if the area, are pertinent measures and solutions for the re-launching of the rural areas.

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INTERNATIONAL TRADE WITH AGRIFOOD PRODUCTS OF ROMANIA, AS A CONSEQUENCE OF THE EUROPEAN QUALITY CONFORMITY LEVEL

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Abstract

The paper aimed to find the tendency of the volume of international agrifood product exchanges that should enable the substantiation of decisions regarding the structure and level of the international trade of Romania. By the adequate indicator is rendered the tendency of the import and export that should finally substantiate the degree of ensuring competitiveness on the market of Romania. We start from quantitative issues (progressive quantities of agrifood product exchanges) to qualitative ones (with reference to the balance level), deducting the knowledge of policies on product quality in the market competitiveness. On such basis may be configured exchanges and two-dimensional involvements of the production volume ↔ commercial agrifood product exchanges.

Key words: commercial deficit, Community standard, international trade (import/export), market competitiveness.

INTRODUCTION

The main feature of the world economic situation is the tendency towards globalization. This implies that goods, services, capital and labour will move freely and companies, products will be treated equally, regardless of their nationality or origin. This process has a positive impact on the need for obtaining competitive agricultural products whereas the market will be the regulating factor of the economy, both nationally and internationally. Romania as an EU country has adapted its legislation to European and global regulatory requirements, to ensure export of some agricultural products, which meet the requirements of public health safety.

MATERIALS AND METHODS

In methodological view was targeted by comparative analyses the description by a set of characteristics (variables) of the differences/homogeneity of annual exchanges of the main agrifood products countrywide within the dynamics of the period 2006-2011. The features of the main agrifood products have been concurrently analysed in view of the commercial exchanges (import/export), in view of the value and the percentage, framed on three levels, i.e.: for the aggregate of the

agricultural and hunting products, the import and export level worldwide, of the international trade of Romania with the European Union.

The statistical analysis of the indicators has been performed by comparison to the total international exchanges of Romania also at the level of the basic year. In the same comparative form has been also determined the rest of the commercial balance with agrifood products.

The working methodology targeted the knowing of the rhythm and tendency of the international trade that should enable also the taking of decisions on the highlighting the structure of agrifood products by adequate indicators and substantiate the quality insurance degree in the market competitiveness from Romania.

RESULTS AND DISCUSSIONS

The adoption of Community standards regarding commercial policies in Romania in the field of agrifood products targets a series of objectives regarding the food market and the and competitiveness policy, the warranting of quality/ sanitary security of food products (starting from the phitosanitary control and sanitary-veterinarian controls) and the increase

of the self-sufficiency level. However, the quality research and assurance in general are insistently claimed by the contemporaneous society, as the quality research and assurance of goods is an express requirement of varied economic sectors.

1. The international trade with agricultural and hunting products in Romania.

It can be assessed for Romania that the significant difference between the export and import of agricultural and hunting products poses variations within the period 2009-2011 (table 1). It results that the exports of agricultural products have increased in weighting versus the national total from 4.46% in 2009 to 6.06% in 2011 and imports have decreased from 2.7% in 2009 to 2.62% in 2011.

Table 1. The evolution of value in the international trade with agricultural and hunting products in Romania for the period 2009-2011

Specification	UM	EXPORT (FOB)			IMPORT (CIF)		
		2009	2010	2011	2009	2010	2011
TOTAL (countrywide) d.c.:	mil. euro	29084	37360	45274	38953	46869	54948
Agricultural and hunting products	mil. euro	1300	1802	2294	1054	1198	1442
	% versus total	4.46	4.82	6.06	2.70	2.55	2.62

Source: Statistic Yearbook of Romania, INS, 2012[1]

In accordance with the categories delimited in the "agricultural products" [2] are identified the requirements of quality categories and size that Romania has to observe.

This is one of the main reasons due to which it was necessary to adopt in Romania the European policies of promoting the quality of agrifood products that represents a component of the Community agricultural policy (PAC). Such policies are simultaneously destined to enterprises, public authorities and consumers.

2. The current standing of commerce with food products.

The effects of the worldwide economic crisis started to manifest themselves quite intensely also in Romania in regard to the economic slowdown that became a reality. Differentiated rhythms upon the level of economic activities can be noticed that by direct repercussions upon the international commercial relations of Romania have been strongly limited. The levels of imports and exports have been analysed that at the countrywide level within

the period 2006-2011 frame significant fluctuations in the structure of the main groups of agricultural/agrifood products.

The import in the international trade with agricultural/agrifood products illustrated in Table 2 signifies a differentiation out of which it results:

Table 1.2. The structure of the import in the international trade with agricultural/agrifood products in Romania for the period 2006-2011

Specification	2006		2007		2010		2011	
	mil RON	%	mil RON	%	mil RON	%	mil RON	%
Total import (countrywide level) d.c.:	144087	100.0	171319	100.0	197458	100.0	232853	100.0
1. Livestock and animal products	2500	1.73	2900	1.69	4147	2.09	4089	1.75
2. Vegetable products	1902	1.32	3470	2.02	4802	2.43	5599	2.40
3. Animal/vegetal fats and oils	261	0.18	483	0.28	916	0.46	1041	0.44
4. Food products, beverages and tobacco	3913	2.72	4305	2.51	6645	3.36	8099	3.47

Source: Statistic Yearbook of Romania, INS, 2005-2012[3]

1) All products record annual increases and the most accentuated rhythms are signalled for fats and (from RON 261 mil in 2006 to RON 1041 mil in 2011, being an increase of 3.98 times);
 2) Livestock, animal and vegetable products are recorded in similar annual rhythms, signalling however for milk products also dairy products besides cereals that signify growth rhythms exceeding all other products.

In regard to the export can be assessed similar phenomena regarding the levels of annual variations (Table 3).

Table 3. Structure of the export in international trade with agricultural/agrifood products in Romania million RON

Specification	2006		2007		2009		2010		2011	
	mil RON	%	mil RON	%	mil RON	%	mil RON	%	mil RON	%
Total export (countrywide)	91472	100	98579	100	123344	100	157471	100	191914	100
1.- Livestock and animal products	746	0.81	839	0.85	1380	1.11	1829	1.16	2475	1.28
2.-Vegetal products	1442	1.57	1468	1.48	4768	3.86	6892	4.37	8947	4.66
3.- Animal/vegetal fats and oils	201	0.21	225	0.22	374	0.30	694	0.44	1027	0.53
4.- Foodstuff, beverages and tobacco	633	0.69	1209	1.22	2983	2.41	3752	2.38	4655	2.42

Source: Statistic Yearbook of Romania, INS, 2005-2012[4]

1) The highest weighting from exports is held by vegetal products (4.37 % in 2010), cereals having priority among them;

2) Livestock and animal products besides other foodstuff, beverages and tobacco also hold significant weightings on export (1.28% in 2011).

We can also highlight the fact that a niche of the commerce was created that clearly considers the innocuousness and quality of foodstuff that is represented by the bio or premium products for which due to the difficult economic situation consumers are less willing to spend, given the fact that they have higher prices. In the EU, meat without chemicals has a double price versus conventional meat. Due to such differences, either humans cannot consume the meat, or they choose the conventional variant. Concurrently, dairy products and ecologic vegetables tend to have prices higher by 20%-30% than their conventional counterpart [5].

3. The international commerce of Romania with the European Union.

It can be said that especially for agrifood products in the international commerce of Romania, the commercial exchanges with EU-27 have priority. Thus, within the period of the years 2009-2011, exports of agricultural/agrifood products to such destination have had a value weighting of approximately $\frac{3}{4}$ and imports from EU member states weighting about 80 %.

In table 4 is deepened the analysis of such levels for the main group of products for the period 2009-2011.

Table 4. The structure of international trade of Romania with the European Union (EU-27)

Section	2009		2010		2011	
	thousands euro	%	thousands euro	%	thousands euro	%
Total (countrywide)	21600.4	100.0	26952.9	100.0	32160.1	100.0
d.c.: Livestock and animal products	275.2	1.27	339.3	1.3	472.2	1.5
Vegetal products	765.0	3.54	1019.3	3.8	1254.0	3.9
Animal/vegetal fats and oils	76.4	0.35	159.2	0.6	226.7	0.7
Foodstuff, beverages and tobacco	625.9	2.90	785.3	2.9	958.5	3.0

Source: Statistic Yearbook of Romania, INS, 2008-2012[6]

1) Vegetal products and foodstuff including beverages and tobacco occupy the highest weighting countrywide (2.90% in 2009 and 3.0% in 2011), such levels currently rising;

2) In the group livestock and animal products, to which fats and oils are added, at which are recorded the lowest levels (1.62% in 2009 and 2.20% in 2011).

4. The commercial balance with agrifood products of Romania.

For the period 2002 – 2011 resulted from the analysis of the export/import relation of agrifood products from Romania a balance that for Romania that may be interpreted, as follows:

Table 5. The evolution of the commercial balance in the trade with agrifood products of Romania

Specification	U M	2002	2005	2006	2007	2008	2009	2010	2011
Export	mi								
	l \$	433.13	830.85	1070.4	1514.4	3087.8	2892.2	4049.6	4974.4
Import	mi								
	l \$	1173.1	2512.7	3034.3	4473.2	6125.0	5165.4	5030.0	5547.3
Total rest	mi								
	l \$	-739.9	-1681	-1963	-2958	-3037	-3273	-980.4	-572.9
	%	100.0	227.2	265.7	399.8	410.5	307.2	132.5	77.4

Data source, Dinu, T., ș. a., - Dynamics of commercial exchanges with agrifood products of Romania during the last decade, MADR, 10.07.2012, Commerce with agricultural products, agribusines2012 [7]

1).further to the evolution of the two components (import/export), the rest of the commercial balance with agrifood products for each year from the analysed period is negative and with varied levels (-739.9 mil\$ in 2002, -3037 mil\$ in 2008, -572.9 mil\$ in 2011);

2). from the total commercial deficit with agrifood products of Romania, a significant weighting is granted to the trade with soy, derivative products and fodder for animals.

3). the deficit is annually rising and it risks to amplify itself during the following years, unless the meat production rises in its turn and unless measures are adopted to ensure the domestic production of the necessary vegetal protein;

4). The crisis, the decrease of the purchase power, the measures to fight against tax evasion in the commerce with agrifood products and other causes made Romania a country that is getting close to the desiderate of food self-sufficiency.

Within the period of the last decade can be noticed the existence, but also the limitation of the commercial deficit that was due to the permanent increase of exports of agrifood products, especially on the intra-Community markets, where Romania exported

agricultural/agrifood products. Concurrently, due to the pro rata increase of exports, the rest of the commercial balance in the relation with third countries has been in surplus.

CONCLUSIONS

Commercial exchanges with agrifood products of Romania are the result of a complex of factors, among which the quality of competitiveness is a driving element.

From the aggregate situations rendered in the structure of this paper, conclusions can be synthesized, such as:

1. The international trade of Romania is a consequence of the European quality level of the conformity of agrifood products, the knowing of which was necessary to adopt European policies of promoting the quality of agrifood products. This because the demand of food products Romania slowly tends to the same phenomena specific to the food demand from Western Community countries.

2. Agrifood policies and the increase of the qualitative level of the products in Romania target the revival and development of research-development activities in view of the technological extension and transfer in the industrial field. For such purpose, by international, European and national programs have been assigned significant funds for the research in the field of food and nutrition.

3. The current standing of the commerce with food products renders differentiated rhythms upon the levels of activities from the economy that have had direct repercussions upon the international commercial relations of Romania. From the analysis of the main groups of agricultural/agrifood products, it can be assessed: *a)* for the import significant fluctuations for all products that register annual growths out of which milk and dairy products besides cereals means growth rhythms that surpass the level of the other products; *b)* for the export can be noticed similar phenomena regarding the levels of annual variations referring to the highest weighting held by vegetal products, whereas livestock and animal products besides other foodstuff, beverages and tobacco, also holding significant weightings on export.

4. The European Union was the main partner in the agricultural trade of Romania. In the destinations of international trading of Romania, the commercial exchanges with the EU-27 have priority, which analysed in the structure of the product can be mentioned for: vegetal products and foodstuff, beverages and tobacco that occupy the highest weighting versus the national level (such levels being on the rise); the group of livestock and animal products, to which are added fats and oils that record the lowest levels.

5. At national level is manifested a limitation of the commercial deficit that was due to the permanent increase of exports of agrifood products, especially on the intra-Community markets, where Romania exported agricultural/agrifood products. The rest of the commercial balance with agrifood products, analysed for the period 2002 – 2011 further to the evolution of the two components (import/export) for each year from the analysed period is negative, but also the existence of a decreasing tendency.

6. The main fields related to the commercial policy of the EU with which the companies with Romanian capital are less familiarized are issues of adapting to regulations that concern on one side the procedures of certifying the products for the export and on the other side the use of measures to protect the commercial interests (anti-dumping, anti-subsidy and safeguarding measures).

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DYNAMICS OF MAIN PROFITABILITY INDICATORS IN DISTRIBUTION OF FOOD AND AGRICULTURAL PRODUCTS OF THE COMPANY EL CASIO COM SRL-SLOBOZIA

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Abstract

The return of distribution companies is related to the performance of activity based management, which can be expressed through a system of indicators reflecting their activity. This paper aims to analyse the company EL CASIO COM SRL Slobozia, active in the distribution field of food and agricultural products in Ialomita and Calarasi counties. We analysed the economic indicators between 1999-2009 from which resulted the main elements influencing the company's revenue and profitability. The analysed period revealed that the break-even was achieved in 2003 with 5 employees, a revenue of 1899, 16 thousand lei whereas the expenses amounted 1732 thousand lei and labour productivity was set at 379, 8 thousand lei/ worker. The resulted trend after presenting and interpreting the exponential function $Y=3,862 \cdot X_1^{0,5480866} \cdot X_2^{1,239971}$ is given based on the changes of income level (Y), from the factors of influence, represented by the amount of equity (x_1) and labour used (x_2). The multiple correlation ratios ($rx_1x_2 = 0,9505$), confirm the influence intensity of the two factors upon the trends in revenue growth. As result we can see trends in revenue growth with amplification factors of influence

Key words: equity, expenses, labour productivity, polynomial equation, productivity, revenues

INTRODUCTION

The company is profitable (advantageous) when its income (revenues) is higher than the expenses incurred to carry out its activity. These two elements, revenues and expenses are major factors which define profit, respectively the return of the company. The profit of the company increases when its income increases using the same resources but with a smaller increase than in its economic activity. The covering of expenses and assurance of profit depends from each individual player active in the field of goods distribution. The actual distribution expenses and trade markup determine the selling price of the product. Of course while in the market, we should not forget that the price is subject to competition and many prices tend to approach the lowest cost of production and circulation, which indirectly determines the size margins of trade markups which may be charged.

This paper aims to analyze the activity of the company El Casio Com SRL from 1999 to 2009, to emphasize the evolution of the main indicators of profitability (revenue, expenses, profit, and break-even) in the field of distribution of food and agricultural products in Slobozia and Calarasi counties.

MATERIALS AND METHODS

The approach of the problem required the use of normative and constructive estimation models as well as economic-mathematic models through indicators in physical, value and percentage units. The indicators were displayed from 1999 to 2009, where we comparatively followed following aspects: the income and expenses on which the profit was revealed the dynamics of the number of workers on which was highlighted annual productivity, the ratio of income and total number of workers. The determination and annual presentation of these indicators aimed

to highlight the trend of the upper mentioned period.

The analysis of income variation based on equity and labor is an ancient practice because revenues include all acts of (legal) enrichment values of the company related or not to its ordinary activity. Through annual deviations level of economical and financial indicators we aimed to follow the achievement of designed parameters in bi-dimensional aspect: on one hand the structure level of these indicators in the studied annual growth rate and on the other hand the trend of variation/correlation level.

Simultaneously the carried research has sought to reveal results by using the exponential function. We used the adjustment achieved through the second degree polynomial equation as follows: $Y(\text{adjusted}) = a + bt + ct^2$, where $t = \text{adjusted time (Begu, L-V., 2009[1])}$. We applied the calculation of the exponential production function of the type y (income / thousand) = $a \cdot x_1^a \cdot x_2^b$ whereas

$a = \text{constant}$ $x_1 = \text{total equity}$; $a = \text{marginal exponential coefficient}$; $x_2 = \text{number of workers}$, $b = \text{marginal exponential coefficient}$. The assessment of significance was made by comparing the values obtained at structural level. The analysis of indicators as a whole and of their main structural elements aimed to highlight the variations by formulating differentiated meanings. Effectively, the working methodology followed to acknowledge the trend of production and economic indicators that would allow a final financial decisions making process by highlighting the distribution activities of the upper analyzed company.

The multiple correlation ratio (which can take values between -1 and +1), highlights the value of elements that are close to +1 (the higher the correlation ratio has values closer to +1 the stronger is the linear correlation between the variables x and y and vice versa). In case of the performed correlation, the level of correlation ratio can be regarded as a test of the link $Y/x_1 x_2$.

RESULTS AND DISCUSSIONS

Short description of the company EL CASIO COM SRL- Slobozia:

The upper mentioned company with headquarters in Slobozia carries out operations in Ialomita and Calarasi counties. This company started its activity in 1997 having as main activity wholesale. Although it started only with a single manufacturer and two sales agents, gradually as the business developed the company reached a number of 73 workers. The company's distribution activity which began in 2003 was focused mainly on distribution of food and non-food products in the following counties: Slobozia and Calarasi. The company is endowed with a modern car fleet and employs a team of well-trained professionals. The company distributes products of some well-known manufacturers (Primola, La Festa, Boromir, Pan Group) with a wide coverage area in Ialomita and Calarasi counties.

The logistics of the company can be described by the following structure: warehouse + office area with a surface of 2000 m², freezer warehouse with a surface of 500m², 16 Matiz cars, 3 Logan cars, 7 Sandero cars, 23 utility vehicles of different brands such as: Fiat, Peugeot, Mercedes, Volkswagen, Iveco, Ford. The company owns 1 grocery store (represented by commercial ensemble Slobozia). The activity is carried out within 3 food divisions (food and non-food products inclusive products which require cold storage).

Evolution of distribution characteristic indicators:

In the distribution activities carried out during 1999-2009, can be found some differences regarding the framing structure depicted through the activity result.

During this period the business development of the company was focused on its horizontal policy development, reaching a total number of 3 divisions. In this regard at the beginning of 2007, there was an opportunity for distribution of frozen and refrigerated products and consequently there was established a third division in order to represent the manufacturer (called "La Festa").

The level and interpretations presented in *Table 1* seeks to highlight the dynamics of the indicators resulted from operative outcome of distribution, and the derived indicators synthesis. Considering the upper stated we notice following:

Table. 1 - Dynamics of main indicators in establishing the company's breakeven

Year	Income		Expenses (ths. Ron)		Gross profit		No. of employees		Productivity	
	ths. lei	%	ths. lei	%	ths. lei	%	no.	%	ths.lei/employee	%
1999	91	100.0	91	100.0	-0.2	100.0	3	100.0	30.2	100.0
2000	273	301.9	272	299.9	1.5	50.0	4	133.3	68.3	226.2
2001	89	98.8	110	121.0	-20.3	-676.7	7	233.3	12.8	42.4
2002	22	24.1	37	41.2	-15.5	-516.7	3	100.0	7.3	24.2
2003	963*	1063.9	880	970.8	83.3	2776.7	5	166.7	192.6	637.7
2004	3908	4318.7	3793	4186.9	115.1	3836.7	20	666.7	195.4	647.0
2005	10311	11393.1	10003	11041.1	307.6	10253.3	27	900.0	381.9	1264.6
2006	13987	15454.7	13556	14961.9	431	14366.7	30	1000.0	466.2	1543.7
2007	25575	28259.2	25066	27666.1	509.2	16973.3	80	2666.7	319.7	1058.6
2008	38871	42951.6	38009	41952.1	862.6	28753.3	74	2466.7	525.3	1739.4
2009	39041	43139.6	38956	42997.5	85.6	2853.3	73	2433.3	534.8	1770.9

Processed according to: Total Firme România,
http://www.totalfirme.com/466964/EL_CASIO_COM_SRL

*) Break-even [2]

The revenues correlated with expenses register annual successive growths. In comparison to first year (2009/1999) is emphasized an increase of 491.39, respectively of 429.97 times. Simultaneously the number of employees is rendered by a succession which occurs until 2007, followed by a slight decrease (in 2007 compared to 1999 is registered, an increase of 26.66 times, then again in comparison in 2009 this growth level would be only of 24.33 times);

Synthetic indicator of gross profit is showed through varying levels where we can distinguish two periods: the first period 1999-2002 where the values are negative for most years (loss between -0.2 and -20.3 thousand lei per year) and in the period 2003-2009 is recorded an significant annual growth (a profit of 862,000 lei was reached in 2008). Specific causes from 2009 led to a great decrease of the profit;

Labor productivity per employee defines the description of the same periods, respectively: between 1999-2002 where the productivity varies (between 7.3 and 68.300 lei/employee)

is kept at low level and in period 2003-2009 the labor productivity records a significant increases in the mentioned period (2009/1999 shows a growth rate of 17.70 times, and 2009/2003 shows a growth rate of 2.77 times)

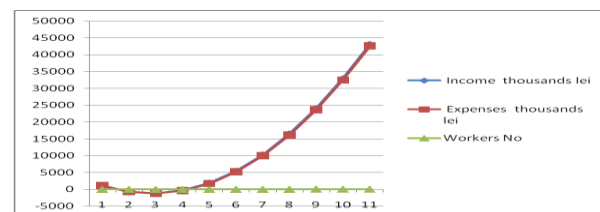


Fig.1. Evolution of distribution characteristic indicators in the company El Casio Com SRL.

Suggestive, Fig. 1 shows the annual evolution of revenues, expenses and number of employees, correspondent to the annual growth rate.

Break-even rendered through adjustment calculations. By means of adjustment calculations of income and expenses, we determined the company's breakeven. The used calculation formulas were following: Y adjusted income (thousand) = $4175.53 - 3786.18t + 666.18t^2$ and for expenses: Y adjusted expenses (thousand) = $4355.69 - 3862.55t + 667.56t^2$

The results are presented in Table 2, where we can observe, that the break-even point was achieved in 2003 and the company achieved revenues worth 1899, 16 thousands lei and the expenses amounted 1.732 thousand lei. The number of employees is 5 and the labor productivity was set at 379,8 thousand lei /worker.

Revenue growth and influencing factors trends (equity and labor). In order to highlight the possible achieved income trends we referred to the influence variation in of changes of equity and the number of employees during the 1999-2009. Thus appeared the necessity of studying by the exponential function of the link between changes in equity (x_1) and change employee number (x_2) upon the recorded revenue(Y).

Table 2. - Results of production function for the income (adjusted y), through the influence of equity

factor (x_1) and number of employees (x_2) within the company El Casio Com SRL.

Total equity (x_1)	No. of employees (x_2)	Income (Y)	Income (Y adjusted)
Ths. lei	Ths. lei	Ths. lei	Ths. lei
38	3	90	110
39	4	273	160
27	7	89	264
25	3	22	88
32	5	963	190
118	20	3908	2169
371	27	10311	5885
716	30	13986	9616
1140	80	25575	41876
1855	74	38871	49657
2046	73	39041	51518

Processed according to: Total Firme România,
[http://www.totalfirme.com/466964/EL_CASIO_COM_SRL\[3\]](http://www.totalfirme.com/466964/EL_CASIO_COM_SRL[3])

Based on the data from Table 2 we calculated by using the product-program SIMUL [4], the following exponential function:

$Y = 3,86 \cdot x_1^{0,5480866} \cdot x_2^{1,239971}$ where 3,86 is a constant, 0,5480 is a marginal contribution of the equity factor and 1.23 is the marginal contribution of the labor factor. The correlation ration ($rx_1 \cdot x_2 = 0,95$), signifies a strong intensity of equity and number of employees factors upon the achieved income. The level of variations $Y/x_1 \cdot x_2$, are drawn in fig.2 from which may result annual comparison elements within the dynamic of analyzed period.

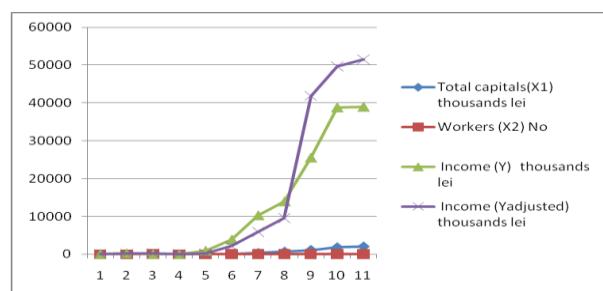


Fig. 2.- Variation curves in equity and number of employees figures in comparison with revenues of the company El Casio COM SRL.

The analysis of the production function revealed following:

a) A growth of the equity factor (x_1) by 1%, ie. 2.066 thousand (+ 20 thousand lei), which means an increase in revenues to 51799 thousand lei (plus 282 thousand lei);

b) An increase in the number of employees (x_2) by 1%, ie at 73.73 employees (plus 0.73 employees), whereas the income may reach a level of 52155 thousand lei (plus 637 thousand lei);

c) A concomitant increase of 1% of the equity (x_1) (+20 thousand lei)

and of the number of employees (x_2) (+0.73 employees) one can achieve an income of 52437, 17 thousand lei. The final increase amounts to 919 thousand. It is noteworthy that this value is the sum of the two increases, respectively 282 thousand lei due to equity and 637 thousand lei due labor force because the coefficients represent the marginal exponential contributions of the upper mentioned factors.

CONCLUSIONS

1. From the analysis based on the financial statements of the company El Casio Com SRL results, that the revenues of this company are influenced by variations of the factors, which by their nature have been structured in: equity and its component elements (equity: ordinary shares, share premiums, reserves and other items) and the growth rate of the number of employees (with reference to quantitative and qualitative evolution of the existing categories of employees).
2. The breakeven of the company El Casio Com SRL was achieved in 2003, when the company earned revenues worth 1899, 16 thousand lei the expenses amounted 1732 thousand. Number of employees in the company was 5 and the labor productivity was of 379,8 thousand lei /worker
3. From the analysis of the production function, the company El Casio Com SRL, expressed exponentially was revealed that the marginal contribution of equity is 282 thousand, and the labor contribution is of 637 thousand.

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STUDY OF ROMANIAN BLACK AND WHITE BREED PRODUCTIVE PERFORMANCES FROM BISTRITA-NĂȘĂUD COUNTY

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Abstract

This research aims to highlight the main cattle productive features of Romanian Black Spotted breed, raised for milk production in Bistrita-Năsăud county. A number of 386 milk cows were taken into research which produced a total of 1194 lactations. Production and reproduction data were obtained through the official control of milk production, the existing databases at UARZ units (origin, reproduction and production) from the named county and there were taken, processed and statistically interpreted. In Bistrita-Năsăud Romanian Black Spotted cows achieved performances between 1047 kg of milk and 17196 kg of milk, with an average production on normal lactation of 4212 kg of milk, and 4846 kg of milk on total lactation.

Key words: milk production, productive potential, Romanian black and white, , quality of milk

INTRODUCTION

Raising genetic potential and actual cattle breeds productivity of populations, optimizing management and proper economic management are important ways to increase milk production along with increasing number of staff and their qualitative improvement [1]. Regarding the improvement of obtained milk quality, the efforts and achievements were quite poor [2], in line of increasing the cows herds, their genetic improvement, the total production growth and per head of cow were and are undertaken several actions.

MATERIALS AND METHODS

The research took place between 2008 and 2012 and focused over the biological material of Romanian Black Spotted breed. Related to the purpose, the conducting plan of research work, especially depending on the current investigation possibilities and the existing records, we highlighted the productive performances gave by the Romanian Black Spotted milk cows bred and exploited in Bistrita-Năsăud. For productive performances analysis was tracked a number of 1194

successive lactations. Production and reproduction data were obtained through the official control of milk production, the existing databases at UARZ units (origin, reproduction and production) from the named county and there were taken, processed and statistically interpreted.

RESULTS AND DISCUSSIONS

In Bistrita-Năsăud county the Romanian Black Spotted cows realized performances between 1047 kg and 17196 kg of milk, with an average production on normal lactation of 4212 kg of milk and 4846 kg of milk on total lactation. The dynamic of milk quantitative production has a descending trend, from the first lactation when records an average production of 4665 kg to the fifth lactation when is recording a production of 3849 kg. The average production of fat and protein, on normal lactation on the studied livestock is 166.29 kg fat (3.93%), 162.46 kg protein (3.39%) and raises to 198.92 kg fat and 188.17 kg protein on total lactation. The average age of first calving at the studied herd for 1061 days (34 months) is set to the maximum limit and needs to be improved.

Dry period length in lactations dynamic had averages between 76 and 90 days. Although the variability of this indicator is very strong, we can say that almost all the breeders are tracking the weaning of the cows within an optimum term respecting the dry period necessary to resume production activity.

Analysing the average parameters of production and reproduction at Romanian Spotted breed from this county the following essential aspects are distinguish:

- the age of first calving, 1061 ± 11.60 days, of almost 35 months, marks actually a higher

age than the desired one for this breed with 10 months, something which in turn is reflected with implications on subsequent costs and on production achieved;

- milk yield on normal lactation is 4212 ± 50.89 kg milk;

- milk yield on total lactation is 4846 ± 67.77 kg milk;

- birth rate stands at values of 84.33%;

- milk yield on economic life is 14538 kg milk;

- period of development is 3 lactations;

- productive life is 6 years.

Table 1. Dynamics of main milk production indices at Romanian Black and White breed from Bistrita-Nasaud County

Indices	UM	Lactation					
		1	2	3	4	5	Average
Number	head	386	242	216	162	132	1194
Length of total lactation	Days	388.42	360.90	342.21	339.45	334.78	354.27
Quantity of milk	Kg	5648.17	5266.75	4498.55	4428.59	4293.72	4846.94
Quantity of fat	Kg	225.68	208.99	177.97	176.24	170.59	192.98
Fat content	%	3.97	3.94	3.95	3.94	3.95	3.96
Quantity of protein	Kg	228.44	217.79	166.82	170.77	157.30	188.17
Protein content	%	3.44	3.44	3.45	3.41	3.42	3.43
Length of normal lactation	Days	296.77	293.50	289.94	291.34	288.76	291.78
Quantity of milk	Kg	4665.58	4522.88	4012.73	4006.18	3849.90	4212.11
Quantity of fat	Kg	183.65	178.67	157.87	158.25	152.46	166.29
Fat content	%	3.91	3.92	3.92	3.92	3.94	3.93
Quantity of protein	Kg	185.02	185.66	151.35	152.83	141.37	162.46
Protein content	%	3.36	3.41	3.43	3.38	3.40	3.39
Mammary repose	days	87.01	86.34	81.28	90.64	76.62	83.20
Calving interval	days	464	433.87	421.17	432.87	409.73	432.80

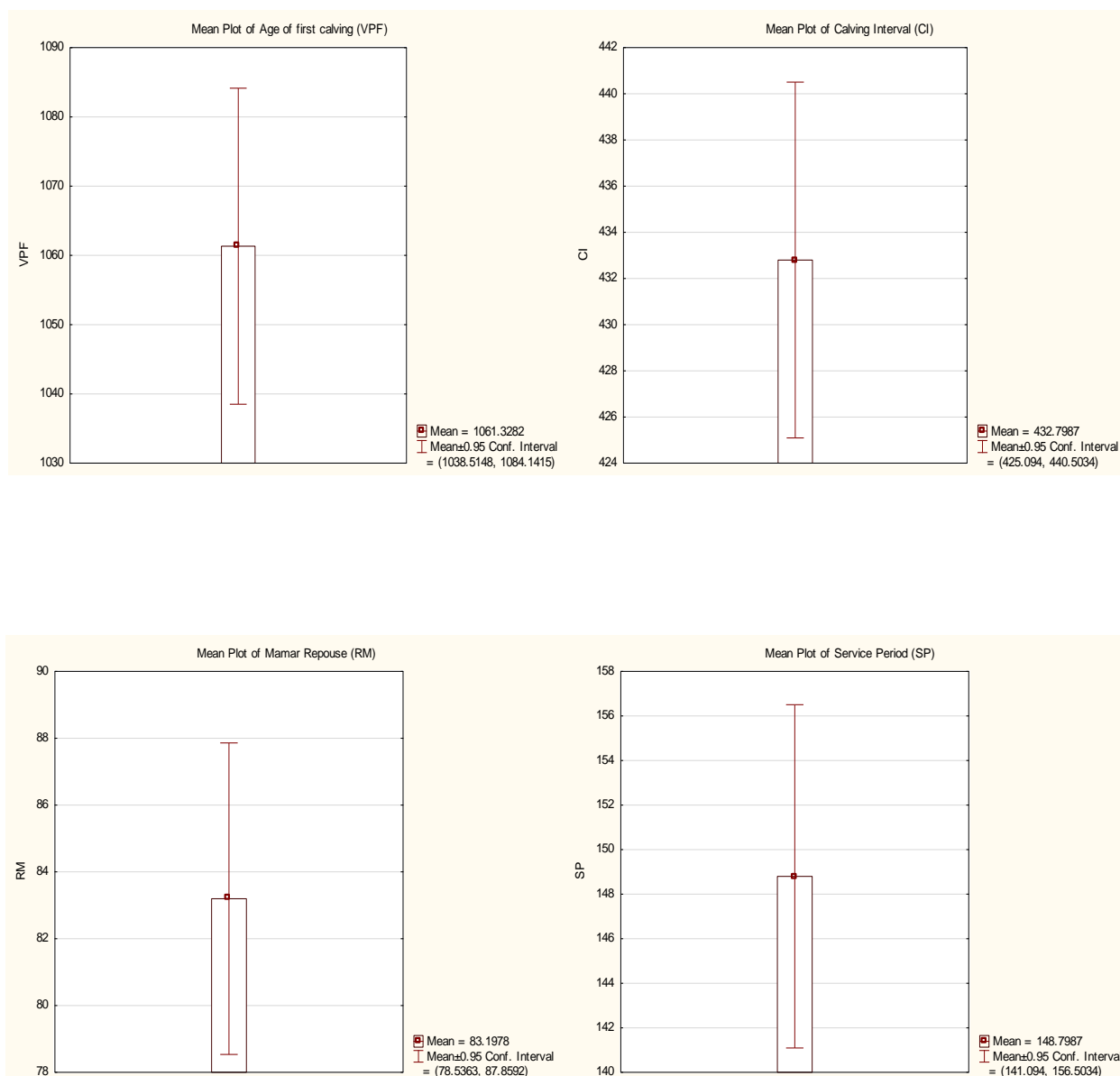


Fig. 1. Average values of reproduction indexes for Romanian Black and White breed

The quantitative dairy production of these breed is above the national average but still characterized by lower values according to European Union members. A real challenge for the romanian farmer is to obtain qualitative agricultural products according to the European Union legislations. From vegetable and zootechnical point of views, this challenge is very hard to complete due to the fact that agricultural and alimentary products in European Union reached the saturation point, and represents a barrier for the cattle breeding.

CONCLUSIONS

The research allowed to establish the main qualitative and quantitative properties of milk production, precocity and reproduction. For all the Romanian Black Spotted cows holdings from this county, the variability estimates reflect very heterogeneous groups and the lack of rigorous selection, with retention and reproduction of the most valuable genotypes as well as the strong influence of the operating technological factors primarily feeding. From the researches

carried it appears that annually is lost a large number of calves with failure of fertilization and even at pregnant cows, due to organizational weaknesses and exploiting in less favorable technological conditions the pregnant females. To achieve the most high milk production, growth and improvement of indigenous breeds specialized for milk production and also with high productive potential, it is necessary to ensure technical and material bases suitable in order to apply optimal growth technologies.

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STUDY OF PRODUCTIVE PERFORMANCES SPECIFIC TO DAIRY COWS BREEDED IN FARMS OF DIFFERENT SIZES IN BISTRITA NASAUD COUNTY

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Abstract

The research were made in farms of various capacities located in Bistrita-Năsăud on an effective by 1029 heads of cows, out of which 100 heads with 370 lactations in holdings with 15-30 heads, 168 heads with 638 lactations in holdings with 31-50 heads, 303 heads with 1068 lactations in holdings with 51-100 heads and 458 heads which produced 1692 lactations in holdings with over 100 heads. From data analysis results that all 15 analyzed holdings, achieved average productions over 4000 kg of milk on normal lactation and 7 holdings accomplished average productions over 5000 kg, with an average productions which varies between 3814 kg and 8668 kg of milk.

Key words: farm size, milk production, economic efficiency

INTRODUCTION

The optimum sizing for milk cows holdings constituted and constitutes a research topic, that during decades were dedicated extensive researches by many specialists: Zahiu and Otiman (1971), Samochis (1974) [4], Drăgănescu I.C. et al. (1976) [2], Iosif Gh. (1984) [3], Livia Vidu (2002), to optimize the economic and technical indicators.

Given the need for continuous improvement of the entire activity in animal husbandry, especially that the dimensional structure of animal farms from the private sector has a situation where over 95% from breeders have less than 2 cows, under 2 fattening steers, under 3 sows and under 17 birds [1], we considered it is appropriate to conduct a study on the evolution of milk production on farms of various sizes in Bistrita-Năsăud.

MATERIALS AND METHODS

The research were made in farms of various capacities located in Bistrita-Năsăud and took place during the years 2008-2012. The biological material studied is represented by

1029 heads of cows, exploited in intensive and semiintensive system, which produced a total number of 3768 lactations, out of which 100 heads with 370 lactations in holdings with 15-30 heads, 168 heads with 638 lactations in holdings with 31-50 heads, 303 heads with 1068 lactations in holdings with 51-100 heads and 458 heads which produced 1692 lactations in holdings with over 100 heads. On this population, individual and overall, were analyzed more aspects: productive performances during the exploitation period, the main reproduction indices, the milk index, the fat index and the protein one. Production and reproduction data were obtained from the official control databases, existing at UARZ units from Bistrita-Năsăud and there were statistically processed.

RESULTS AND DISCUSSIONS

From presented data analysis, results that all the analyzed holdings, reached average productions of over 4000 kg of milk on normal lactation, and 7 holdings reached average productions of over 5000 kg.

Table 1. Average values for production traits according to lactations, registered on farms

Traits Farms	n	Total lactation				Normal lactation			
		Lactation length	Milk	Fat	Protein	Lactation length	Milk	Fat	Protein
		(days)	(kg)	(%)	(%)	(days)	(kg)	(%)	(%)
Farms with 15-30 heads									
Babalau	15	322,83	4262,3	4,1	3,48	293,13	4102,6	4,0	3,40
Gatini Simion	25	325,24	4513,0	4,0	3,34	285,64	4165,0	4,0	3,33
Echim	30	389,25	5875,5	4,0	3,50	293,78	4980,5	4,0	3,43
Pop Ioan	30	330,44	4506,5	4,0	3,44	291,47	4156,6	4,0	3,37
Farms with 31-50 heads									
Moldovan	40	310,28	4510,4	3,9	3,45	289,69	4387,5	3,9	3,41
Platon	40	368,72	7371,7	4,1	3,49	297,40	6243,2	4,1	3,44
S.C. Carla	43	353,03	6353,7	4,0	3,38	287,06	5328,1	4,0	3,37
Dobrican	45	278,08	4061,2	4,0	3,41	257,90	3814,0	4,0	3,40
Farms with 51-100 heads									
Ciorba Calin	62	317,33	5903,4	4,0	3,50	273,50	5466,0	4,0	3,48
Peica	70	337,31	7125,8	4,1	3,51	290,64	6397,1	4,1	3,47
Onoai	76	362,9	10136,	4,1	3,54	294,22	8668,4	4,1	3,48
Pasca Traian	95	315,46	4681,3	4,0	3,37	285,87	4392,6	4,0	3,36
Farms over 100 heads									
S.C. Centana	140	342,35	8642,7	4,0	3,43	287,25	8076,6	3,9	3,43
S.C. Carmolact	158	397,07	8519,9	4,1	3,45	300,26	7220,5	4,0	3,42
Galea	160	352,09	4648,3	4,0	3,46	292,78	4099,4	4,0	3,43

Table 2. Average values of reproductive traits on the entire population of cows

Farms	n	Age of first calving	Calving interval	Mamar repouse	Service period
		Days	Days	Days	Days
Farms with 15-30 heads					
Babalau	15	1122,92	386,96	62,14	96,43
Gatini Simion	25	1124,70	389,23	59,36	109,79
Echim	30	1041,87	447,69	75,04	158,32
Pop Ioan	30	1043,44	382,72	56,04	105,78
Farms with 31-50 heads					
Moldovan	40	964,61	363,09	62,52	86,41
Platon	40	960,09	441,72	65,02	157,72
S.C. Carla	43	959,37	405,45	48,32	118,62
Dobrican	45	989,86	347,07	77,74	77,81
Farms with 51-100 heads					
Ciorba Calin	62	1021,88	383,48	49,70	109,71
Peica	70	1124,37	406,28	66,49	128,25
Onoai	76	980,98	416,31	54,67	145,20
Pasca Traian	95	988,78	381,15	65,83	96,23
Farms over 100 heads					
S.C. Centana	140	899,86	403,75	50,65	133,07
S.C. Carmolact	158	824,88	459,88	65,33	175,88
Galea	160	1025,08	400,61	54,53	117,77

The weakest productions were realised in the group of holdings with 15-30 heads with an average productions which varies between 4102 kg and 4980 kg of milk.

Regarding the productive performances of Romanian Spotted breed, which is raised in 13 holdings from the total of 15 farms, varies between 3803 kg of milk with 4.06% fat at a normal lactation length of 292 days (Galea

Cristian's farm) and 5588 kg with 4.11% fat at a period of 290 days (Peica Liviu), compared with those from the Romanian Black Spotted breed, raised in 8 holdings, from the total of 15 farms, which realised productions varying between 4118.22 kg of milk with 4.10% fat at a normal lactation length of 300 days (Galea) and 8516.92 with 3.99% fat related to a period of 292 days (S.C. Centana).

Table 3. Average values of reproductive traits on Romanian Yellow Spotted breed population

Farms	n	Age of first calving	Calving interval	Mamar repose	Service period
		Days	Days	Days	Days
Babalau Grigore	9	1362,00	382,41	59,24	98,41
Gatini Simion	20	1194,50	387,15	59,95	107,88
Echim Ioan	15	1028,64	430,07	76,15	156,88
Pop Ioan	20	1193,25	385,21	55,69	106,65
Moldovan Flaviu	30	1182,88	377,30	62,88	93,30
Platon Prodilact	26	992,80	404,30	40,83	120,30
S.C. Carla	17	1079,82	408,23	48,95	122,29
Dobrican Teodor	19	1093,75	382,31	85,13	99,29
Ciorba Calin	34	1211,33	383,65	45,27	111,90
Peica	30	1203,92	426,57	68,63	149,55
Pasca Traian	50	1127,25	393,88	66,14	103,62
S.C. Centana	28	1034,50	416,93	48,46	175,91
Galea Cristian	45	1197,97	387,42	57,13	107,74

Table 4. Average values of productive traits on Romanian Yellow Spotted breed population

Farm	n	Lenght of normal lactation	Quantity of milk	Quantity of fat	Fat content	Lenght of total lactation	Quantity of milk	Quantity of fat	Fat content
		Days	Kg	kg	%	Days	Kg	Kg	%
Babalau Grigore	9	294,29	4123,66	167,91	4,08	322,23	4335,01	179,62	4,16
Gatini Simion	20	284,87	4211,03	170,84	4,06	322,52	4516,81	185,01	4,09
Echim Ioan	15	295,33	5210,28	206,61	3,96	368,69	5929,26	239,22	4,02
Pop Ioan	20	291,25	4198,36	167,84	4,00	329,28	4542,90	185,41	4,09
Moldovan Flaviu	30	289,86	4216,70	167,19	3,98	314,93	4398,53	176,82	4,04
Platon Prodilact	26	294,62	5407,58	220,28	4,02	360,12	6141,15	254,14	4,09
S.C. Carla	17	293,45	5526,08	221,70	4,01	359,49	6634,94	266,65	4,01
Dobrican Teodor	19	263,28	3966,14	162,88	4,12	298,39	4448,35	181,79	4,11
Ciorba Calin	34	274,09	4978,70	203,26	4,08	334,09	5764,92	236,05	4,08
Peica	30	290,00	5588,64	231,25	4,11	349,22	6431,37	269,78	4,18
Pasca Traian	50	285,55	4406,97	178,75	4,05	325,76	4887,61	198,02	4,04
S.C. Centana	28	264,81	4707,44	185,40	3,95	344,00	5348,24	213,56	3,98
Galea Cristian	45	292,49	3803,16	154,46	4,06	340,28	4216,83	171,98	4,07

CONCLUSIONS

The main zoo-economical indices that are obtained in the cattle holdings for milk production, are varying in Bistrita-Năsăud county conditions, these being influenced mainly by the functional parameter setting of

the breeders, by the geoclimatic zone in which are placed, by the owner's level of training and knowledge in the field.

Comparing the main attributes in milk production direction of those four population structures results significant differences in most of the cases, but whose evolution is

almost strictly similar mentioning that in most cases the numbers in groups of 50 heads meet better indicators.

From data analysis results that all 15 analyzed holdings, achieved average productions over 4000 kg of milk on normal lactation and 7

holdings accomplished average productions over 5000 kg. The weakest productions were realized in the group with 15-30 heads with average productions between 4102 kg and 4980 kg of milk.

Table 5. Average values of reproductive traits on Romanian black and White breed population

Farm	n	Age of first calving	Calving interval	Mamar repose	Service period
		Days	Days	Days	Days
S.C. Carla	9	1090,25	393,71	48,38	87,20
Ciorba Calin	19	1139,71	336,92	65,67	62,36
Peica	20	1306,91	421,60	87,67	137,60
Onoaie	57	945,50	402,33	63,02	124,43
Pasca Traian	30	925,33	380,43	73,17	91,61
S.C. Centana	57	892,39	409,24	53,87	137,42
S.C. Carmolact	68	821,44	468,09	60,42	184,09
Galea Cristian	34	991,50	396,03	30,32	111,12

Table 6. Average values of productive traits on Romanian black and White breed population

Farm	n	Lenght of normal lactation	Quantity of milk	Quantity of fat	Fat content	Lenght of totall lactation	Quantity of milk	Quantity of fat	Fat content
		Days	Kg	kg	%	Days	Kg	kg	%
S.C. Carla	9	267,11	5202,99	208,94	4,02	340,44	5897,27	243,38	4,13
Ciorba Calin	19	261,68	4442,92	176,96	4,00	280,68	4698,31	186,87	4,00
Peica	20	287,31	5535,74	223,36	3,96	322,06	6026,77	245,50	4,01
Onoaie	57	296,56	7688,05	316,26	4,06	343,67	8549,78	352,00	4,06
Pasca Traian	30	286,24	4278,39	172,19	4,03	306,58	4368,96	176,38	4,04
S.C. Centana	57	292,39	8516,92	340,55	3,99	359,72	9909,16	398,72	4,03
S.C. Carmolact	68	297,68	7794,43	317,92	4,07	404,74	9350,30	383,99	4,09
Galea Cristian	34	300,64	4118,22	168,89	4,10	369,77	4759,84	195,43	4,10

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ORGANIC VERSUS CONVENTIONAL: ADVANTAGES AND DISADVANTAGES OF ORGANIC FARMING

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Abstract

Over the last years, organic food consumption has become one of the most popular trends amongst general public. The perception would be that organic food is much healthier for the consumer and that the farming practices used for producing the food are more environmentally friendly. There are however both advantages and disadvantages when it comes to production of organic food, the choice of many farmers being not to produce organic food.

Key words: organic farming, conventional farming, comparison method

INTRODUCTION

In the past few decades, there has been a rapid spread in organic farming, this contributing to a dramatic change in the agriculture of most developed countries. The organic system is thought to bring solutions to the environmental damages which are caused by conventional agriculture, the exhaustion of non-renewable resources, and also contamination by agricultural chemicals. The internal factors, which relate to the farmers themselves and their personal circumstances regarding their decision to take up an organic farming system, has been greatly researched through international work. In this concern there have been identified a series of characteristics of organic farms and farmers. The activities of an organic farm, which are usually small and extensive, vary from farm to non-farm. Moreover, it has been found that a high percentage of organic farmers are found to be better educated, younger and are thought to more likely have an urban background and also having less farming experience than a conventional farmer [1].

MATERIALS AND METHODS

The paper was accomplished using information from farms from both conventional and organic agriculture. The

method used was that of the comparison, mainly highlighting the advantages and disadvantages of using the organic system as means of cultivation.

RESULTS AND DISCUSSIONS

There are a number of ways in which organic agriculture differs from the conventional one. When it comes to conventional farming, the growth of cultivation is done by using synthetic chemicals. On the other hand, organic agriculture uses organic wastes and compost as fertilizers, this resulting in increase of nutrients which are supplied by plants.

As a method of extinction for pests and weeds, the conventional farming system uses pesticides and insecticides. Oppositely, the farmers operating in the organic system prefer to use birds and some insects that would destroy the insects causing harm. Sometimes, organic farming prefers to destroy the mating season of pests or even trap them, rather than using any sort of chemicals.

One of the main advantages of producing organic food is that farmers are able to cut the amount of greenhouse gases, such as methane and nitrous oxide, which farms release into the atmosphere. The synthetic fertilisers that many farmers use also require a lot of fossil fuels during the manufacturing process, so using less synthetic fertiliser means that less

fossil fuels are being burned. Chemical fertilisers pose a threat to the environment and often chemicals can enter into local ecosystems harming animals and polluting rivers. Organic farming does not pose such risks to the natural environment [2].

As for weeds, the methods used in conventional farming are based on herbicide use. As opposed to that, organic farming opts for crop rotation, which prevents plant destruction by a particular weed. Moreover, organic farmers would rather go in and pick weeds by hand in order to control the growth of weeds.

One of the major disadvantages associated with organic farming is the high costs involved in the process. Because there is no use of pesticides the crops grown are far more vulnerable to pests and disease. The farming can be a lot more labour intensive and the cost of organic feed is much higher than non organic feed. These costs are passed on to the consumer making organic food more expensive to buy than conventionally produced food. Whilst many people are more than willing to pay more for their food because it is organic, during times of hardship and recession people are less likely to buy organic when they can get the same food for a cheaper price [2].



Figure 1. Conventional farming system



Figure. 2 Organic farming system

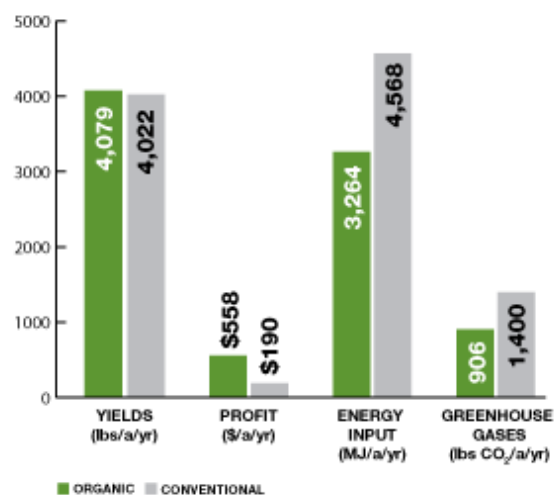


Figure 3. Organic versus conventional

The comparison in Figure 3 shows the following findings:

- There is a match between organic and conventional yields
- The organic system is a more sustainable system seeing as it builds, rather than depletes soil organic matter
- Organic farming is more efficient due to the use of 45% less energy
- Conventional farming produces up to 40% more greenhouse gasses
- There is a greater profitability in organic farming [4].

There have been many studies made on the comparison between an organic cultivation system and the conventional one. For example in the US, economic performance was compared between 14 organic crop/livestock farms in the Midwest and 14 conventional

farms (Lockeretz et al., 1978). The comparison was made on the basis of physical characteristics and types of farm enterprises. The result was that the market values of the crops produced per unit area was 11% less for organic farms. Though, seeing as the cost of production was also less, the net income per unit area was comparable for both systems. Another study (Roberts et al., 1979) had compared information taken from 14 organic farms compared with the same number of representative farms in the area of western Corn Belt, in the Midwestern United States. In most of cases, the net return was greater for the organic cultivation system [3].

The conventional system uses synthetic or chemical fertilizers often containing nitrates in order to promote plant growth. Herbicides are also used to kill off weeds and to exterminate insects and bugs, in order to reduce diseases. Conventional farming uses antibiotics, growth hormones and medications in animals in order to prevent diseases and promote their growth.

CONVENTIONAL	ORGANIC
Seeds are typically treated with insecticides	Uses untreated seeds
GMOs (Genetically Modified Organisms) typically used	Never uses GMOs
Synthetic fertilizers are used	Not needed due to stronger soil via crop rotation
Loss of soil due to mono-crop culture	Soil retains more water because of the organic matter in the soil
Intensive irrigation is required	Rain water is better retained and irrigation requirements are greatly reduced
Herbicides are applied to the soil to reduce weed germination	Weeds are physically removed
Herbicides added to the soil are used to kill weeds	Weeds are physically removed
Accounts for approximately 25% of the world's insecticide consumption	No chemicals are used
Many of the insecticides are known to be carcinogens	Beneficial insects and other natural methods are used
Frequent crop dusting is used causing harm to surrounding eco-system and communities	Trap crop methods are used to lure insects away from the cotton plants
At harvesting, the cotton defoliation process is activated by chemicals	Defoliation through natural seasonal freezing

Figure 4. Comparison chart of basic differences between conventional and organic farming

The organic system of cultivation encourages the use of natural fertilizers as are manure or compost in order to nourish the soil and promote plant growth. By rotating crops, using mulch or hand weed, the organic farmer

provides beneficial crop hygiene, removing pests and reducing diseases. Also on an organic farm, the owner gives organic feed to animals, and allows them access to open pasture while utilizing rotational grazing patterns [5].

Studies of farmers practicing organic farming for many years found the following common reasons:

- effects of chemicals on health
- effects of conventional farming on soil quality and conservation
- dissatisfaction with conventional farming practices
- personal or family health problems
- decline in family farms and rural communities
- opportunity to improve farm profitability

For many organic growers, finances and profitability are less important than personal values of health, environment and other social issues. There is also a greater personal satisfaction that the success of the farm is a result of personal decisions and on-farm inputs with less reliance on outside purchases. Recent converts to organic are attracted by the price premiums and reduced costs. These fluctuate with seasonal factors including product supply and demand. It is anticipated that over time some premiums will decrease as larger buyers enter the marketplace [6].

CONCLUSIONS

Organic food consumption has become one of the most popular trends amongst general public.

The conventional system uses synthetic or chemical fertilizers.

The organic system of cultivation encourages the use of natural fertilizers as are manure or compost in order to nourish the soil and promote plant growth.

Studies have shown that there is a match between organic and conventional yields.

Organic farming is more efficient due to the use of 45% less energy.

Conventional farming produces up to 40% more greenhouse gasses.

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SOURCES OF EUTROPHICATION OF THE WATERS IN CALARASI COUNTY

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Abstract

This paper aims to study the factors leading to eutrophication in Calarasi county and then in the Danube, due to the fact that this county has many cultivated areas. In this regard, many factors that lead to nitrate pollution, especially from agricultural sources have been taken into account. In order to model soil nitrate nitrogen in Calarasi county, which can be partially used by plants or leached, researches on soil with the largest share of the county, a chernozem, were made. This study tried to model in the laboratory the influence of three factors on which groundwater pollution by nitric oxide depends: soil type, environmental conditions (temperature and humidity) and the amount of mineral fertilizers incorporated. The amount of nitrate increased with dose of nitrogen fertilizer, the maximum temperature was 20°C and was favourably influenced by humidity of 70-80% of field capacity.

Key words: eutrophication, nitric chernozem, pollution

INTRODUCTION

Current agricultural practices threaten present and future water reserves in Europe.

Inorganic fertilizers are commonly used in agriculture to achieve higher yields. Most fertilizers are composed of three elements: nitrogen, phosphorus and potassium. The most common are fertilizers containing nitrogen and nitrates. This nitrogen is absorbed by plants, it is a very important nutrient. But plants can not consume all the nitrogen spread on the field so much is washed by rain, reaching lakes, rivers or canals which causes eutrophication. Another quantity of nitrogen enters the soil, being driven into the ground water coming from rain or irrigation. There, nitrogen mixes with water in porous rocks - groundwater - where it can remain for a long time – for years.

Eutrophication affects all categories of aquatic ecosystems, but manifests mainly in stagnant ecosystems. The degree of eutrophication of aquatic ecosystems is expressed mainly by the concentration of nutrients (total nitrogen and total phosphorus), oxygen saturation and phytoplankton biomass.

Nitrogen is the mineral element, essential to plants, it causing crop yields. Mineral fertilizers have risen over time problems, especially the processes of mineralization and nitrification of nitrogen from the soil.

Given that soil organic matter can provide the plants through mineralization processes large amounts of nitrogen, it is required increasingly further research on finding ways to optimize nitrogen regime to ensure efficiency of mineral fertilization [3].

Nitrogen fertilization is very important now, when agriculture is subject to requirements to raise crop yields, which requires optimal nitrogen supply and the need to protect the environment, caused by involvement mineral nitrogen to groundwater. For these reasons, it requires a very precise quantification of soil nitrogen mineralization.

Establishing adequate quantities of nitrogen as fertilizer for different crops is a very difficult operation because of the many factors to be taken into account, the most important being nitrogen needs of crops and the quantities of nitrogen assimilated by soil redundant cycle vegetation.

Transformation of nitrogen fertilizers, nitrogen passing from one form to another can result in chemical often assimilable mineral nitrogen loss and changes in soil reaction, which would reduce the effectiveness of fertilizers.

Nitrogen fertilizers were used in increasingly larger quantities in order to increase production, but they led in time to the increase of the amount of nitrate in ground water in agricultural and default.

These nitrates leaching into groundwater and pollute. About 75% of EU residents depend on water tables for their water supply.

Under the Black Sea Environment Programme (BSEP), studies were developed that revealed that 58% of the total nitrogen and 66% of the total phosphorus in waters reaching the Black Sea from the Danube basin (50% in agriculture, about 25% of household activities and only 10-13% of industrial activities) [3].

Over 50% of the volume of nitrogen entering the Danube in the territory of many countries is due to agriculture. Romania is quantitatively the most important source, because its waters on the entire territory drain into the Black Sea.

Nitrogen mineralization is a key issue for all soils and all geographies. But for Calarasi county, it has great importance because it contributes decisively to the production of grains in Romania and soils of this county contributes greatly to cover crop nitrogen requirements for training. On the other hand, excess nitrate in soil is leached in depth, contaminating groundwater and, in many ways, is transported to surface waters and eventually into the Danube. However, Calarasi county is in the end of the great river, near areas critical to fisheries and tourism in Romania. The county is bordered on its eastern side by Borcea Pond, a little north is the Big Island of Braila and finally - the Danube Delta.

All these considerations calls for very rational knowledge and management in soil mineral nitrogen production Calarasi: should occur as mineral nitrogen as needed for agricultural production, but should be avoided which causes excess nitrate contamination of ground and surface water. In order to solve this

complicated problem - both in Romania and in other European Union countries - stringent rules were imposed on periods of fertilization of different cultures and establishing rational doses of fertilizers.

Since 1999, the Romanian Government adopted a national action plan for environmental protection (NEAP). A component of NEAP is to identify ways to reduce leakage nutrients (nitrogen and phosphorus) into the Danube and the Black Sea and enforce the provisions Nitrates Directive (Council Directive 91/676 / EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources).

The basic principle in resolving disputes arising from pollution is that the polluter pays. As a result, the EU has established strict rules requiring compensation for farmers who do not comply humus mineralization of land they manage and farmers not properly managed composting and waste management resulting from their work.

Problem organic nitrogen mineralization correspondence between intensity and time when it is necessary plant nutrition is of great importance in agriculture. It is known that the activity of micro organisms capable of decomposing organic matter of the soil is usually highest during the crop plants do not exhibits its maximum absorption. Therefore, soil can release large amounts of nitric oxide, which in terms of rainfall can easily be trained with soil depth water [3].

MATERIALS AND METHODS

Pollution sources of mineral waters containing nitrogen (ammonium salts, nitrites, nitrates) are:

- humic substances of which is mineralized annually about 90 kg N active substance and of which up to 30 kg can be leachate to groundwater;
- mineral fertilizers with nitrogen, using a small extent in our country, but that point can be a source of pollution;
- organic substances - animal waste, municipal and communal - which by their

mismanagement of mineralization, is in fact the main source of pollution of nitrogen mineral compounds.

Nitrogen pollution of groundwater nitrates from the soil depends on many factors [3]:

1. Soil type. In Calarasi county there are two types of soil: 80% of the agricultural area is covered with chernozem and 20% the alluvial soil in the Danube Meadow.

2. Environmental conditions. As any biological process, nitrification is influenced by climatic conditions: temperature and humidity.

3. The amount of mineral fertilizers. Production of nitrates in the soil depends on the amount of mineral fertilizers incorporated. Nitrate content best reflects the momentary conditions to ensure nitrogen plants cultivated soils.

Nitrates are the only natural source of nitrogen available for relatively neutral pH soils in Calarasi county. In optimal conditions for nitrifying flora, ammonia nitrogen from mineral and organic fertilizers into the soil is rapidly converted to nitrate.

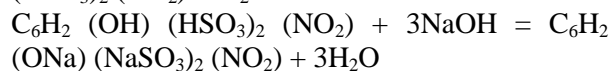
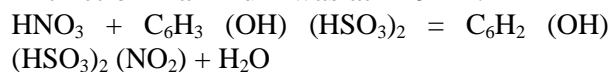
To model soil nitrate nitrogen in Calarasi county, which can be partially used by plants or leached, researches were made on soil samples collected from Amp horizon (0-20 cm) in three repetitions field and were mixed into a composite sample of experimental variant.

The soil studied is a cambic chernozem soil with good fertility: humus in soil from 2.6 to 2.9% 2.9 to 3.1% in irrigated and non-irrigated soil, total nitrogen 0.11 to 0.12%. Soil reaction is characterized by a neutral pH (6.3 to 7), with small differences in the profile. Buffering capacity of the soil is good. Dose of nitrogen fertilizer NH_4NO_3 (N active substance) had graduations: N_0 , N_{60} , N_{120} , N_{160} , N_{240} .

Samples were processed at three extreme regimes of temperature (5°C , 20°C , 30°C) and humidity (40%, 80%, 100% of field capacity) for a better modelling of the nitrification process.

From soil samples subject to conditions above and incubated for 15 days, the amount of nitric spectrophotometer method was determined. [5].

Nitrate extraction was done with a solution of K_2SO_4 . Nitrate dosing was phenol-disulphuric acid, by which nitrates are bound to nitro-acid phenol-disulphuric, coloured in yellow in alkaline medium. Colour intensity obtained depended on the concentration of nitrates. Extinction maximum was at 410 nm.



(alkali salt of the acid 6-nitrophenol - 2.4 disulphuric yellow)

Content expressed in ppm nitrate N in soil was calculated using the formula:

$$\text{N (ppm)} = \frac{\text{C} \times \text{V}_e}{\text{m} \times \text{a}_e}$$

where:

C = N content of the sample, in micrograms;

V_e = volume in ml of extract soil;

m = mass of soil taken into consideration, in g;

a_e = volume of aliquot part of the extract, in ml.

RESULTS AND DISCUSSIONS

The results obtained from the analyzes are presented in tables and figures below:

Table 1. Influence of incubation temperature (5°C) the soil samples according to moisture and chemical fertilizers with nitrogen on nitrification potential.

Temp. ($^\circ\text{C}$)	C.C.A. (%)	Dose nitrogen (Nkg/ha)	NO_3^- (ppm)	
			Initial	Final
5°C	40%	0	1,79	0,56
		60	1,98	0,70
		120	1,74	0,76
		160	2,68	1,08
		240	2,13	1,46
	80%	0	1,79	0,45
		60	1,98	0,86
		120	1,74	1,22
		160	2,68	1,26
		240	2,13	1,64
	100%	0	1,79	4,46
		60	1,98	4,55
		120	1,74	5,93
		160	2,68	5,52
		240	2,13	5,54

Table 2. Influence of incubation temperature (20°C) the soil samples according to moisture and chemical fertilizers with nitrogen on nitrification potential.

Temp. (°C)	C.C.A. (%)	Dose nitrogen (Nkg/ha)	NO ₃ ⁻ (ppm)	
			Initial	Final
20°C	40%	0	1,79	2,85
		60	1,98	3,50
		120	1,74	2,85
		160	2,68	3,39
		240	2,13	3,80
	80%	0	1,79	2,88
		60	1,98	4,21
		120	1,74	4,39
		160	2,68	8,24
		240	2,13	5,92
	100%	0	1,79	5,96
		60	1,98	6,65
		120	1,74	7,21
		160	2,68	6,54
		240	2,13	7,09

Table 3. Influence of incubation temperature (30°C) the soil samples according to moisture and chemical fertilizers with nitrogen on nitrification potential.

Temp. (°C)	C.C.A. (%)	Dose nitrogen (Nkg/ha)	NO ₃ ⁻ (ppm)	
			Initial	Final
30°C	40%	0	1,79	3,48
		60	1,98	4,76
		120	1,74	4,92
		160	2,68	5,99
		240	2,13	3,90
	80%	0	1,79	3,48
		60	1,98	5,08
		120	1,74	6,02
		160	2,68	7,75
		240	2,13	7,10
	100%	0	1,79	3,38
		60	1,98	4,52
		120	1,74	5,33
		160	2,68	5,74
		240	2,13	7,19

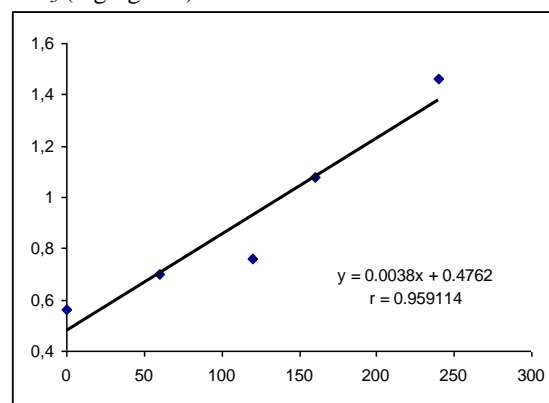
Regarding the nitrification process - depending on the moisture-aeration of the soil during incubation of soil samples - there is a clear increase from 40% to 100% of field water capacity.

Nitrogen fertilization increases mineralization. Also, nitrogen mineralization increases once with the temperature. However, the incubation temperature of 30°C and field capacity water 100% mineralization intensity decreases, probably due to exacerbated de-nitrification.

At 30°C, mineralization, nitrification capacity is much higher than that at 5°C.

This is probably because the 5°C biological processes are slowed down and that the real changes occur at 30°C, temperature optimum soil life. Between 20°C and 30°C temperatures, there are no significant differences.

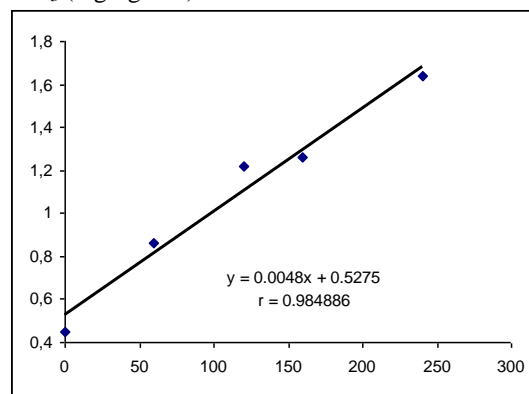
NO₃⁻ (mg/kg soil)



Dose of nitrogen fertilizer

Fig.1. Correlation nitrification capacity of nitrogen fertilizer dose in cambic chernozem, at 5°C and 40% field capacity water.

NO₃⁻ (mg/kg soil)



Dose of nitrogen fertilizer

Fig.2. Correlation with nitrification capacity dose of nitrogen fertilizer on cambic chernozem, at 5°C and 80% field capacity water

In Figures 1 and 2 it is shown that the amount of nitrogen fertilizer positively influenced soil nitrification potential. In both cases, growth is evident. Large correlation coefficients collinearity demonstrates this point.

In Figures 1 to 4 it is observed that the amount of nitrogen fertilizer influenced the nitrification potential.

The amount of nitrate increased with dose of nitrogen fertilizer.

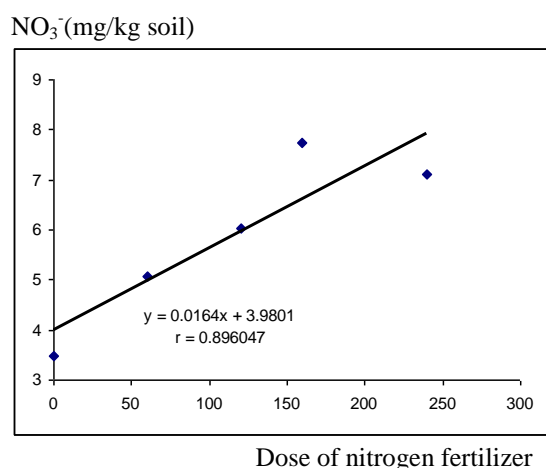


Fig.3. Correlation with nitrification capacity dose of nitrogen fertilizer on cambic n chernozem, at 30°C and 80% field capacity water

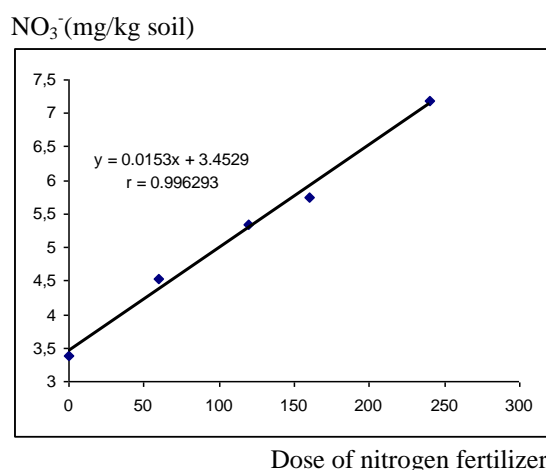


Fig.4. Correlation nitrification capacity of nitrogen fertilizer dose in cambic chernozem at 30°C and 100% field capacity water

The correlation is strong, especially at 100% of field water capacity. These findings confirm previous data presented widely by Ghinea and Stefanic [2] and the finding that they actually provide the ability mineralization, nitrification is the most accurate index for assessing crop nitrogen need [1].

We observed that 100% of field capacity for water nitrification process has not varied in intensity depending on the two factors of influence. It may be only discriminating factor insufficient oxygen, knowing that nitrifying bacteria to oxidize ammonia are designed and that its deficiency conditions are limited nitrification process.

County public wells are dug shallow, leading to their contamination with nitrite poisoning risk for occurrence and bacterial diseases.

In 2011, in Calarasi county, there were 5 cases of infant acute methemoglobinemia caused by well water [4].

CONCLUSIONS

The optimum temperature for the activity of nitrifying bacteria is between 20-30°C. Also, exerts an important role is the soil moisture on nitrifying bacteria that grows and nitrifies best when soil moisture is between 70-80% of field capacity.

For chernozem soil, mainly in Calarasi county, the optimum temperature for nitrification activity and therefore the highest amount of nitrate was obtained at 20°C, regardless of the dose of fertilizer and moisture. At temperatures below 10°C a decrease was in the amount of nitrates in the soil as it blocks the transformation of ammonia into nitrates.

It was found that humidity affects differently the nitrification process. Humidity between 40-80% of field capacity influences the most the nitrates amount, as the optimum conditions for aeration and moisture are met, condition needed for this process.

The use of mineral fertilizers in increasing doses influences the nitrate accumulation in soil. Highest amounts of nitrate were obtained at doses ranging from 150-200 kg nitrogen per hectare NH₄NO₃.

For the pollution prevention and control of the mineral nitrogen, both at European and national level, directives were adopted, that consider the orientation towards sustainable agriculture and a national code of good agricultural practice, compulsory for all Romanian farmers.

To avoid pollution by nitrogen minerals, adopting a rural development plan, including measures of water supply, sewerage all localities and wastewater remediation and livestock waste is the most important measure.

Mineralization of organic matter and nitrates washing phenomena are strongly influenced by use of soil and crop technologies.

Both economically and in terms of protecting the environment, it is necessary to reduce this

loss, which is possible by adopting proper agricultural practices.

Nitrate losses from the soil are more intense in seasons of abundant precipitation, when usually the soil is devoid of vegetation. In specific conditions of Calarasi county, after annual crops, in the soil remain higher or lower amounts of mineral nitrogen fertilization coming from above (about 50% of the nitrogen applied to crops remains unused) and mineralization of soil organic matter.

Mineralization is most intense in autumn (when they meet favourable conditions of temperature and humidity) and there is also an increased risk of water pollution by nitrates. In countering this phenomenon, crop rotation is essential. It is good to be interspersed with the main crop in a crop rotation with rapid growth, able to capitalize residual nitrogen in the spring and it can be used in spring as green manure for spring-summer crops.

In order to reduce nitrogen losses and the risk of pollution of the Danube water, it is good to choose appropriate rotations, ensuring soil covered with vegetation maintenance for a longer period of time, especially in wet seasons, to manage crop residues as fairly (especially where the C/N ratio is high) and is limited to the minimum necessary ground work on mobilization.

Other means of reducing residual nitrogen can be: rotation that also includes a winter crop, intercrop introduction of native species, resistant to cold and frost quickly able to occupy the land and form a vegetation cover often enough and uniform to protect the soil from rainfall effect autumn - winter.

The European Union policy and legislation in the field of pollution in agriculture should be considered in assessing the legal framework for pollution control in agriculture. According to this policy, the agricultural practices defined in the "Code of Good Agricultural Practice" constitute minimum environmental standards to which farmers can be called to join, without the right to compensation.

Regulatory solution to control the diffuse pollution in the agriculture of Calarasi county should be directed towards finding solutions that meet current reality in our country and

contribute to the effective fulfilment of Romania obligations resulted from the international legislation.

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THE DISTRIBUTION OVER TIME AND SPACE OF SULFUR DIOXIDE AND INFLUENCE ON ORGANIC FARMING. CASE STUDY: THE AREA OF SLATINA CITY

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Abstract

The article discusses issues of air quality in the area of Slatina city regarding the pollution index – sulfur dioxide, describing the main characteristics of the polluter, emission sources, and especially its evolution in time and space of the concentrations and the annual trend, correlated with causes that may increase or diminish the monthly and annually concentrator's values. Data was collected and provided by The Environmental Agency of Olt County and The Analysis Laboratory for Evaluation of Emissions of ALRO S.A. Company. During the analyzed period, 1996-2006, there were no average monthly levels in the time and space distribution higher than the maximum allowed concentration, which is of 0,125 mg/m³ in 24 hours; also, the annual average values of the index follow a decreasing trend. However, when put together with other urban polluters, the vegetation along with the population of Slatina city is put under discomfort. Towards the end of the article, there are presented conclusions mentioning the main effects over the environment.

Key words: agriculture, air pollution, organic, Slatina, sulfur dioxide

INTRODUCTION

Pollution has become a characteristic phenomenon of contemporary world, having the most striking effects in the urban area. Usually, the polluted air contains a mixture of different gases and dust, gases absorbed by dust, condensed gases or gases dissolved in water drops in the atmosphere. Gas and steam pollution is much more diverse and powerful, and generates more unfavorable effects than dust pollution. Thereby, complex pollution phenomena result from simultaneous presence of various polluters.

In the urban atmosphere, among various evacuated polluters, the most important regarding the unfavorable effects for the environment are: sulfur dioxide, carbon oxide or monoxide, oxidant substances, nitrous oxides, suspension particles, and lead. These polluters are specific to the urban area, and the percentage of each substance is increasing in the industrial or highly traffic areas.

In the atmosphere of Slatina city, the sulfur oxide (SO₂) is present due to the industrial platform of the city, thermal factories, and road traffic. The polluter is a great danger not only through its presence, but also because of

the compounds which are generated in reaction with water.

MATERIALS AND METHODS

The *sulfur compounds* reach urban atmosphere following the process of coal, wood, petrol burn and other fuels based on sulfur dioxide (SO₂), sulfur trioxide (SO₃), sulfur hydrogen (H₂S), sulfur acid (H₂SO₃) and other sulfates. Among all the sulfur compounds, we will pay attention to sulfur dioxide.

The sulfur dioxide (SO₂) is a colorless, suffocating gas present in the urban atmosphere. The physical properties of SO₂ rationed to air are: a density of 225, a viscosity of 70, thermal conductivity, 39, and magnetic susceptibility of -0.05. It is generated by the reaction of sulfur with oxygen ($S + O_2 = SO_2$) and under ultraviolet radiation it becomes fluorescent.

The reference values of the main atmospheric polluters are determined in Romania by STAS 12574, which became effective on 01.09.1987, thus for sulfur dioxide, the maximum admitted concentrations (MAC) expressed in mg/m³ are: 0.75 for 30 minutes,

0.25 for 24 hours, and 0.06 for the annual average. By the order of MAPM no. 592/2002 the MACs have been modified to: for MAC 1 hour – 0.35 mg/m^3 , MAC 24 hours – 0.125 mg/m^3 .

The European Union's reference values for sulfur dioxide are: $125 \text{ }\mu\text{g/m}^3$ for average daily concentration, or an annual of $50 \text{ }\mu\text{g/m}^3$; as for an interval of 10 minutes, the sulfur dioxide concentration should not exceed $500 \text{ }\mu\text{g/m}^3$ (0.175 ppm) [1].

The SO_2 distribution is conditioned by the weather, landform, water surface percentage, lithological composition interface, type of vegetation amiability, the quantity and type of emission/immission. There has been previously concluded that almost half of the sulfur dioxide present in particles is deposited, on average, in 4 days on the land surface after it penetrated the atmosphere, and the remaining reacts with the water in the air, generating acid rain, deposited later on soil: 8.5% by washing, and around 40% under dry form, becoming the most dangerous immission [3].

RESULTS AND DISCUSSIONS

a. Concentrations and the annual regime of sulfur dioxide as monitored by APM OLT

In Slatina, until 2006 there was no monitoring station for background pollution, nor was there any data about this type of pollution. The process of tracking the quality of environment factors is made by chemical analysis of specific indexes evacuated in the urban atmosphere from the industrial platform.

In Slatina, the network for pollution monitoring (EPA Olt) occurs in three fixed sample station points over 24 hours for the following indexes: sulfur dioxide, nitrous dioxide, ammonia, Fluor, suspension dust.

The interpretation of both the physical and chemical analysis is made according to STAS 12574/97 and the Order of MAPM no. 592/2002 on air quality conditions in protected areas [6]. The units from the industrial platform of the city are evacuating emissions in the atmosphere as follows: nitrous dioxide, *sulfur dioxide*, carbon

monoxide, Fluor, coke dusts, tar, etc. The most representative sources are: S.C. ALRO S.A., S.C. ELECTROCARBON S.A., S.C. ALPROM S.A. and S.C. ARTROM S.A [2].

The fixed sample points for 24 hours of the main atmospheric pollutants measured in the area of Slatina City are: EPA, situated on Ionașcu Street, Oltina on Pitești Street, and ACR situated at the crossing of Nicolae Titulescu Boulevard with Libertății Street (fig. 1) [7].

Besides these measurements could be mentioned those made during the collaboration with The Public Health Authority of Olt County, as episodic measurements in the area of The Hospital of Olt County, situated on Nicolae Titulescu Boulevard.

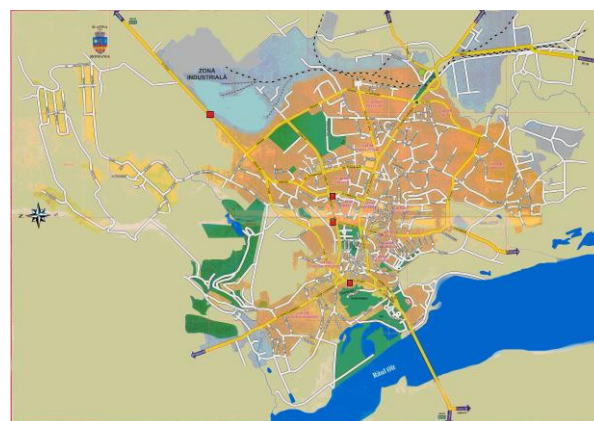


Fig.1. Location of the fixed sample points in the area of Slatina city

The highest values of the polluter concentrations are those located near the sources, but they can also reach a peak point over a certain distance from the industrial furnace, under environmental conditions such as wind direction and velocity.

The sulfur dioxide immissions for the period 1995-2006 concerning monthly average values are situated under the MAC level of 0.125 mg/m^3 , having the peak values in May, which is 0.033689 mg/m^3 . Beginning with July, the monthly average values are under 0.03 mg/m^3 , the monthly minimum being recorded in October, which is 0.018115 mg/m^3 . The evolution of monthly average values of SO_2 is depicted in Fig. 2. The maximum admitted value was not exceeded.

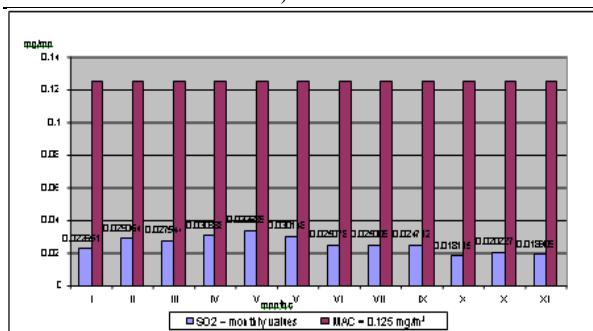


Fig. 2. The evolution of monthly average values of SO₂ in the area of Slatina city, 1995-2006 (Data processed from APM Olt, 2007)

In the evolution of the annual average values of SO₂, depicted in Fig. 3, can be observed a considerable drop of SO₂ emissions in the years following 2001, when the maximum annual of 0.07447 mg/m³ was reached, due to the technology changes made at the thermal urban installations by replacement of fuels rich in sulfur, but also due to endowment with superior burning installations. The graph shows that over 1995-2006, the annual values oscillate around 0.02 mg/m³; the lowest value was 0.01776 mg/m³, recorded in 1999. All the average values are below the MAC level for the SO₂ index, and the multiannual average value of the period is 0.030098 mg/m³, which is only 24% of the MAC.

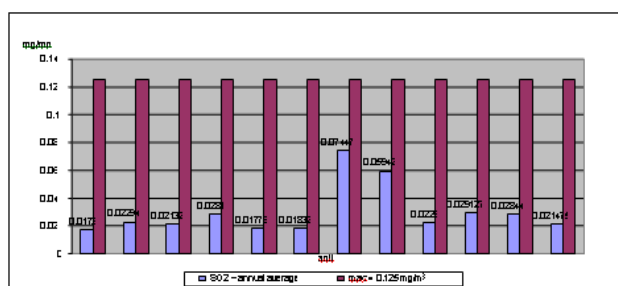


Fig. 3. The evolution of the annual average values of the SO₂ index in the area of Slatina city, 1995-2006 (Data processed from APM Olt, 2007)

The vertical distribution of air pollutants depends on their falling speed, the latter depending on the ratio between the gravitational force and their resistance to air friction; under circumstances of ascendant movements of air masses, the distribution of air pollutants depends on the ratio between air current speed and their falling speed.

In the area of Slatina city there are three highlighted high concentrated layers of sulfur

dioxide, separated by weakly unpurified intervals, being localized as follows:

- *the first layer* is situated above the active surface, being caused especially by road traffic;
- *the second layer* is situated above the average level of buildings, as a consequence of household emissions;
- *the third layer* is situated at heights between 40-60 m, being the striking result of high industrial furnaces and a certain air stratification, especially during thermal inversions.

Any pollutant, and, as a consequence, *sulfur dioxide*, has a daily, weekly, and annually regime.

During the daily regime of sulfur dioxide, there are two points of minimum and two points of maximum, with a main minimum during the night and a second one around noon and over the afternoon, at various hours. The daily point of maximum occurs around 8, due to the beginning of activity and the intensification of road traffic (main maximum) and around 18-22, due to travel intensification (secondary maximum).

During the weekly regime of sulfur dioxide, there is noticed a continuous increase beginning with Monday until the middle of the week, when the maximum is recorded; afterwards, the data show a decrease from Friday until Sunday, due to either economic activity and traffic stop, or, especially, decrease.

During the annual regime of sulfur dioxide, under constant pollution, in winter a maximum is recorded due to decrease of thermal convection along with elicitation of an important supplementary entropic source, which is artificial thermal heating. During the

cold season, the degree of pollution is increased because of thermal inversions, mist and nebulosity. The warm season comes with a decrease in pollution, mainly due to both favorable meteorological condition for pollutant dispersion, and an intense photosynthesis process.

b. The dynamics of sulfur dioxide immission evolution as monitored by S.C. ALRO S.A.

S.C. ALRO S.A. is the main representative of the aluminum industry in Romania, the only producer of primary aluminum in the country and the biggest one in Eastern Europe. The main activity of the company is aluminum production and trade, in Romania and abroad. The company also provides know-how, consulting, expertise, technical assistance, projections, production and trade of primary and refined aluminum blocs, bars, wires made of aluminum and mixes, installations for aluminum production with the help of electro-chemical procedures (capacity: 470 t/day, in 2006), installations for melting non-ferrous metals (capacity: 470 t/day, in 2006), packing activities, transport and services, collecting, processing and delivery of reusable waste [8]. The economic and social development of the city is linked to this important company beginning with 1960; thus, the analysis of data on *sulfur dioxide immissions* due to this economic agent is not a coincidence.

From S.C. ALRO S.A. Slatina the following gases are released into air: burning gases from the thermal heating, sections Anodes and Foundry; gases containing compound of chlorine and fluor due to fluxes in the Foundry section; *sulfur dioxide* (SO_2), dust, petrol coke from the section Anodes and aerosols, carbon monoxide (CO), *sulfur dioxide* (SO_2), dusts containing fluor from the section Electrolytes.

The dynamic of the immissions evolution in Slatina for the *sulfur dioxide* index as monitored by The Analysis and Evaluation of Emissions Laboratory of ALRO S.A. for the period 2000-2006 is presented below.

Regarding the monthly average values, during 2000-2006, the MAC value of 0.25 mg/m^3 is not surpassed, the monthly maximum being recorded in November, which is 0.054718 mg/m^3 , and the monthly minimum being recorded in April, which is 0.009209 mg/m^3 .

In ten months, the monthly average values are situated below the value of 0.0258 mg/m^3 . The evolution of the monthly average values is summarized in Fig. 4.

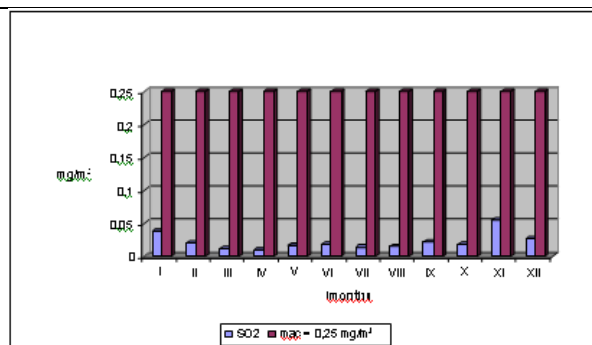


Fig. 4. The evolution of monthly average immissions values of SO_2 index in Slatina city, 2000 – 2006 (Data processed after ALRO – The Bureau of Analysis and Evaluation of Emissions, 2007)

For the SO_2 index, a descending trend is recorded with an annual maximum of 0.038162 mg/m^3 in 2000, and an annual minimum of 0.004423 mg/m^3 in 2006. All the recorded values are situated under the MAC value, as depicted in Fig. 5.

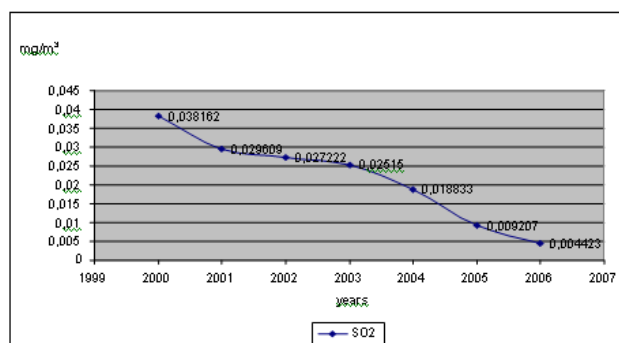


Fig. 5. The evolution of annual average values of immissions of SO_2 in Slatina city, 2000 – 2006 (Data processed after ALRO – The Bureau of Analysis and Evaluation of Emissions, 2007)

c. Development of organic farming in the area of Slatina city

Air pollution and in particular by oxidizing pollutants affect both soil that is essential for plant growth and development, and human existence, including the work and welfare of people who depend on the land, in a considerable degree.

Reduced fertility of agricultural soils, plants with any direct cause damage to crops. There are many policies and programs that have the effect of environmental sustainability and improved quality of which can be mentioned [5]:

- National program for renewal of tractors and agricultural machines autopropelled;

-The project "Irrigation Rehabilitation and Reform";

-Research projects funded by the World Bank;

-Implementation of law package "energy-climate". National Action Plan on Renewable Energy (PNAER);

-National Strategy for reducing the drought effects, prevention and combating land degradation and desertification for the short, medium and long term;

-Strategic elements and fertilizers in agriculture regime;

-Programs on exploitation and soil conservation;

-Programs to promote and support organic farming systems;

-National strategy for drought mitigation, prevention and combating land degradation and desertification in the short, medium and long term;

-Soil and crop management;

-Promotion of energy crops to produce biofuels in non-alimentary, bioliquids and biomass for fuel and electricity.

Due to excessive pollution Slatina is difficult to put into practice such policies and programs. However, there are both small producers who practice organic farming in greenhouses and solariums, conducted in small areas, as well as companies specialized in agricultural production, and using clean production technologies. The thousands of acres for which producers in Slatina were recorded at the Department of Agriculture and have pledged that they will maintain and cultivate ecological means very little in a predominantly agricultural county, but following the trend, it is certain that the example they will be followed by other farmers, even more because organic farming is subsidized with European money.

In Slatina city, the marketing of organic products is performed by traders registered with Ministry of Agriculture and Rural Development, using various channels to market: sales of the company gate, wholesale sales in stores, sales in shops, online sales through stock organic products, sales by market seasonal [5].

CONCLUSIONS

Lately, the *emissions and immissions of sulfur dioxide* have started to diminish quantitatively by the usage of lighter sulfur combustibles, by introducing the process of de-sulfuration of burning gases and by implementing modern production technologies, as depicted in the temporal and spatial analysis of the area of Slatina city during 1996-2006.

However, the effects of sulfur dioxide emissions are still visible both on a local level and regional level, over distances of hundreds of km from the pollution sources, because of pollutant fixation on dust particles or aerosols, easily moved by the wind.

By combining the pollutant with the water particles, these emissions generate sulfur acid, which has a great contribution to acid rain formation and the phenomenon of acidification. The damaging potential of sulfur dioxide is amplified by its synergism with nitrous dioxide [4].

In general, sulfur oxides and their hydrating compounds determine corrosion phenomena, material discoloration and reduced resistance of construction materials or installations (e.g. electrical cables).

The presence of sulfur dioxide in the atmosphere may generate highly salivation, expectorant cough, spasm and breathing difficulties to the human body, as well as loss of olfactory and taste senses. It may also produce metabolic and enzymes process disorders.

It is compulsory practical application of all measures that reduce air pollution by certain compounds (sulfur dioxide, particulate matter) or capping their growth trend. Fortunately, in recent years there have been considerable efforts in this regard, so the impact of air pollution on soils decreased significantly, showing a slight recovery of degraded soils under the impact of acid rain.

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CONSIDERATIONS REGARDING USE AND ROLE OF COLOUR IN MARKETING

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Abstract

Carl Jung considered that color "is the native language of the subconscious." Overlooking the importance of subconscious in creating consumers' behavior, the understanding of the "language" in which color speaks to us can not be neglected in carrying out marketing activities. Speaking the language of the subconscious can be one of the most powerful marketing tools ever created by the human being. We intend in this study to identify the most important elements which characterize the use of color in marketing.

Key words: brand, colour, marketing

INTRODUCTION

Color is a significant element, both of our daily life, but also of the ancestral life. The human being appeared and evolved in a colorful environment.

Trademark can be made in words or in combined pictures. It seems that the marks represented in words are read faster and are stored more easily. Besides the brand symbol, color is the second element in identifying packaging in the whole world.

Use of color in marketing messages has been the subject of certain scientific studies, existing an extensive experience of the use of color for most popular brands.

In the present study, we aimed to identify the most important arguments that support the use of color in marketing.

MATERIALS AND METHODS

There have been extensively studied several bibliographical sources in the fields of marketing, psychology, sociology, and economics.

RESULTS AND DISCUSSIONS

Several researchers have studied the influence of color on human and animal behavior. *Harry Wohlfarth and Catharine Sam* (University of Alberta) showed that 14 children (8-14 years old) with severe disabilities and behavioral disorders, had diminished blood pressure and aggression level, as a consequence of interchanging yellow and blue with orange, white, beige and brown and replacing the neon light with the total spectrum light [22].

Rose H. Alschuler and Berta Weiss Hattwick concluded by studying the drawings of young children, that blue color implies self control and repression of emotions, red color is uninhibited expression, yellow color indicates infantilism and dependence, green color shows balance, few emotional impulses and a simple nature [1].

Faber Birren used to associate warm and cold colors of the spectrum with human personality. Heat means the contact with the environment, and cold means the withdrawal in itself. Thus red color excites, blue color

calms. Also, complementarity exists on the physical and physiological level. Red color increases blood pressure, stimulates the nervous system, while green and blue colors relax [4,5].

Jaensch shows that people are classified into two categories, namely: more sensitive to hot end of the spectrum and less sensitive to the cold end [19].

The identity of a brand is fixed in memory by associative mechanisms. This is evident in global companies: British Petroleum (green), Hershey's Chocolate (brown), Cadbury's Chocolate (purple), Kodak (yellow), Coca Cola (red), Tide (orange) and John Deere (green) (Figure 1).



Fig. 1 The color in the identity of some global brands

Emotions generated by the symbolism of colors are different in different populations and cultures. It is necessary a careful analysis of the attitudes of the target audience at the beginning of any construction based on color marketing. A publication from the year 2000 revealed the perception method of color in different countries and cultures. It has been pointed out that blue is the favorite in 5 of 8 countries, while in the other three countries, blue is on second place [17].

Another example shows that white color symbolizes mourning in Eastern Asia, but happiness and purity in Australia, New Zealand and the U.S.

Blue is the most popular color in the U.S. and most often used by corporates. It is perceived as cold and demonic in Eastern Asia, as warm in the Netherlands, as cold in Sweden. Blue symbolizes death in Iran, purity in India. It shows femininity in Belgium and the Netherlands, but masculinity in Sweden and the USA [17].

There are two schools with separate views, on the reaction of human behavior on color. The first, represented by *Humphrey* (1976) and

Grossman (1999), argues that reactions to colors are instinctual. The second school argues that the reaction to color is related to associative learning [17].

Other studies have shown that demographic factors such as age, sex, ethnic origin, must be taken into consideration regarding the communication through color.

The colors and contrasts decrease in intensity in the areas with very bright sun. For example, people living at the equator have a better sight, due to a larger number of rod cells on retina. These people have an increased intraocular yellow pigment, resulting in a reduced power of differentiating the color shades (reduced blue color perception). Populations from northern latitudes, where light is less reflected directly, have a better color acuity. It can be explained psychologically why different populations respond differently to stimulation by color.

Color is present everywhere and becomes a source of information. People interact with people and objects in approx. 90 seconds, 62-90% of this process being based solely on color. So, use of color can contribute not only to differentiate brands, but also influences buyer's feelings (positively or negatively) and finally the buyer's attitude towards the product. It is necessary for managers to understand the importance of color in marketing, as feelings and moods are unstable and color plays an important role in shaping attitudes [18].

The Seoul International Color Expo 2004 secretary emphasized that 92.6% of buyers consider color as the most important, when purchasing a product. Only 5.6% of the questioned people considered sense of touch as most important, and 0.9% smell as the most important factor. In assessing the importance of color to purchase, 84.7% respondents considered that color is more important than 50% [25].

The **Henley Centre** researches suggest that 73% of the product purchase decision takes place in the store, and a study of the University of Loyola (Maryland) showed that color determines brand recognition by 80%.

Color improves the marketing object activity and influences the behavior of target

audiences. For example, many fast food restaurants are decorated in vivid shades of red and orange, which encourage food consumption rapidly, by increasing consumers' local transit. Intense red and black colors are also used in websites' design for adults, because they have erotic connotations and stimulate sexuality. Sites and books for children are constructed with blocks with bright primary colors. Children respond better to them, than in case of using color mixtures.

The University of British Columbia study on 600 subjects showed that red color helps increasing attention at work, while blue enhances creativity. The red group responded better on tests of "attention" and the blue group subjects responded better to "creativity and imagination tests".

However, the association of colors with a certain meaning can not be standardized. In general, communities react differently to a particular color, based on the cultural experiences. Also, everybody has a personal attitude towards color. For example, choosing the makeup color depends on skin tone. Dark-skinned people prefer bright and warm lipstick colors and those with light skin prefer softer colors. High tech products (MP3 players, mobile phones, consoles etc) are more attractive in fancy colors. The living standard may influence the preference for a color: bright colors attract low-income shoppers, while high income earners prefer more sober colors. Observation is applied in the SEB marketing strategy (Rowenta, Moulinex and SEB).

The beverages packed in red glass can make a brand stronger than blue packaging, and elder people prefer more sober colors. Thus, mineral water brand "Badoit" (owned by Danone) was launched in the new red bottles in 2004, in France. This color was completely new, unusual for mineral water market. Use of red color attracted young consumers, who were searching the original. Sales increased in the following six months, reaching the market share of 3%.

According to Marc Jacheet, director of the aerated waters department, quoted by Capital France, the red color of the glass container Badoit was validated after a year of testing on

consumers in stores. Red color evokes the power of bubbles and gives a slightly transgressive imagine [3].

Other studies emphasized the effect of colors on consumers' behavior. Those who buy on impulse respond well to red, orange, black and royal blue. Buyers purchasing after a plan and a budget respond best to pink, turquoise, light blue and navy. Traditionalists respond well to pastels: pink, blue skies.

Jaguar site is based on silver (prestige) and black (sophistication). The market of the firm is oriented towards high-income and great itself image people, seeking for a vehicle to provide prestige to them [24].

Color influences brand identity in many ways. Thus, we have seen phenomenal success of **Heinz EZ Squirt Blastin 'Green** ketchup, ie more than 10 million doses sold in the first seven months from the day of changing the color of the packaging, and sales of 23 million dollars. An interesting case is that of **Apple Computer**, which introduced color on a market where it was not used. Selling colorful **iMac** computers has led to a renewed brand, which had already suffered losses of \$ 1.8 billion in two years.

Colored ads are 42% more read than black and white ads [21].

Color can increase the number of readers by 40%, learning ability from 55 to 78% and comprehension by 73% [8, 10, 6].

Tests have shown that black and white images can sustain interest for less than two-thirds of a second, while colored images can retain attention for two seconds or more. People can not process visually each object in their visual field. For this reason, the color can also be used to highlight a particular product.

A study made by **Xerox Corporation** revealed that 92% of respondents think that the presence of color determines the quality of an image to impress, 90% think that color can attract new customers, 90% think that the audience remembers best color presentations and documents, 83 % that color gives an appearance of success.

Every year, **Cooper Marketing Group** leads a national research in the United States on the colors preferred by American consumers, and sells the results to manufacturers and retailers

of clothing, automobile manufacturers or producers of household furniture.

This study involved 400 000 people, from a representative sample of the U.S. population. Consumers should answer different questions about preference for colors, such as: "What color is the car you want to buy?", "What is the color of clothing that you like to wear?" etc. Results obtained by **Cooper Marketing Group** allowed the classification of consumers into three categories, named "color lifestyle groups". The first category, called "*The Color Forward group*" includes progressive-minded consumers who want to try everything that is new and are prepared to spend more money for this. This group is dominated by women under 30 or over 50, men under 30 years, urban population, and impulsive buyers who earn less than 35,000 dollars per year.

The second group "*The Color Prudent group*" consists of people who buy a new color only after it has been tested by their entourage. They frequently consider the product quality before color. This group generally consists of men and women aged between 30 and 50 years of pre-urban environment, attentive and caring buyers, who earn over \$ 50,000 per year.

The third group (*The Color Loyal Group*) acquires "safe" colors, validated their experience of life: blue, gray, black colors rather than "trendy". This group includes men over 60 years of pre-urban or rural areas, people who dislike shopping [11]. When manufacturers decide the color chosen for a particular product, they must first analyze the group to which the color is addressed. Marketing Cooper concluded that the first group (Color Forward) is the smallest and also the most influential group of consumers. Prudent buyers group is the largest segment of consumers, while those loyal group is characterized as "small and predictable" [20].

Public preferences about a particular color can be correlated with the events that marked it. *Piirto and Montague* (1997) consider that wearing metallic fabrics, specific to disco generation, were due mainly to the publicity generated by the exhibition dedicated to the

artifacts of the Tutankamon pharaoh, which was hosted between 1976 and 1979 by The Metropolitan Art Museum, exhibition visited by over eight million people, as Wikipedia [23].

Black color's popularity in the 80s was influenced by the personality of Villain and Darth Vader in "Star Wars" and green, another popular color in those years, was maintained in trend by the environmental concerns which have began to emphasize at that time [26]. Periods of economic growth or recession influence people masses attitudes towards black. Economic growth leads to an increased appetite for "trendy" colors, while the recession makes people more lonely, withdrawn, inclined to classic colors (blue, gray, black) [7].

B.J. Eichorn, president of **BJ's Lifecode Merchandising** had to consider how to decorate two bowling alleys, in a specific location. She noticed that most customers who used the two tracks could be divided into two categories: those who belonged among workers and considered this work to be very serious, and those who belonged to the higher income class, who were playing bowling only for pleasure, relaxation and exercise.

Then she redecorated one of the tracks with triangles (suggesting energy) and used specific colors to southwestern U.S. (peach, green) and the other with curved style 'Art Deco', using complex color schemes. After this redecoration revenues for both tracks have soared.

Children tend to respond more directly to color than adults. For most children, the color of food is even more important than taste. *Dave Siegal*, general manager of **Small Talk**, a research company in Cincinnati, Ohio, said in 1991: "Children love neon colors, green and yellow topping the list". Siegal assigned children's preference for green-neon color to a popular show for kids in America (Nickelodeon's) [7].

Sometimes not only color helped creating a successful product, but also the name. Renaming the color of "off white" in "ancient silk" resulted in doubling sales for a paint company. A name such as yellow-sulfur is clearly disgraceful and uncommercial, while

the association of this with egg yoke, canaries' color, or citrine can bring great benefits. *Leatrice Eiseman*, color specialist designer and director of the **Paton Color Institute**, says that "when you name a color, you should choose something romantic. It is not the same thing to tell someone that you painted your room in 36485 color or to tell you painted it pink "angel wings" [9].

Ripolin paint manufacturer ranked in two years, 200 references to his products, not after use (bathrooms, rooms, etc.), but after their effects on customers. The main range of paints of the company, baptized *Colorterapia*, includes 7 parts: from the "moderate" - shades of green, and "tonic" (shades of yellow), to "soothing", characterized by dark red or pale pink tones. The concept of "caught" and brand awareness increased from 28% to 34% in a few months, amounting to today 11% of the french market⁷. Company officials concluded after this experience was that crisp, bright colors are sold best.

The importance of color in building brand identity led to specific enforcement of trademark protection. Registration of colors as own brand color is however difficult. Companies must be able to prove that it is different in relation to the original commodity. Some colors, such as those used to mark certain drugs, can not be recorded.

For a color to be "profitable" in financial terms, it should not have any connection with the recognized characteristics of the product. It could not record yellow color for banana juice, or red color for tomato juice because it had nothing distinctive. Instead, promoting purple color for **Cadbury**, which does not remind anything about the product origin or quality, requires a substantial financial effort to create a link in consumer's minds between chocolate and lilac color. At that time the color becomes profitable, and also becomes a right to be defended. "[9].

The best color for a product cannot always be easily identified. In 1950, **Procter & Gamble**, manufacturer of detergent "**Cheer**" decided to introduce splashes of color in detergent. There have been produced several boxes of detergent stained red, blue or yellow. Consumers reported that detergent with

yellow spots did not clean enough the clothes; some consumers even stated that detergent with red spots destroys laundry.

Detergent with blue spots was the only one who has been associated with a high cleaning capacity. Blue stained detergent helped "**Cheer**" to become one of the brands with the highest life expectancy on the market [7].

Assigning a color to a particular product is always doomed to success. If **Blu Pepsi** became notorious, blue soda bottle is a resounding failure of the company in Romania. It is not singular, however: **Nestle** made a wrong choice five years ago with yogurt or *LCI*, created to compete *Bio* from **Danone** and presented in a gray metallic glass. "Many consumers have assimilated the product to a medicine". *Brice Auckenthaler* from marketing consultancies **Experts Consulting** explained this situation in 2005,. Each color has its own symbolism and can not be used randomly, or applied to any product. Ketchup, for example, is associated with the red color of tomatoes. A record that **Heinz** has understood quite late. His green Ketchup, proved successful in the U.S., launched in Europe in 2001, did not work. Similarly, Romanians refused ketchup from Tommy [3]. Basically, color in shops identifies flavors, brands or products: green suggests the pine for a detergent; as for a toothpaste, green suggests the minty effect, white suggests no additives, red is associated with cherries, strawberries and apples. Brown and gray are less used like they are, as they are considered depressing and somber, but in addition to red can give a sense of weight and strength, attracting strong and stable customers. Certain colors can convey a message of strength and confidence (burgundy, light blue, purple, pearl) [16].

CONCLUSIONS

1. The emotional effect generated by color symbolism varies significantly between populations and cultures, depending on demographic factors such as age, gender and ethnicity. It requires a careful analysis of public attitudes toward color target in the

marketing activity based on this parameter.

2. Association of colors with a particular meaning, regarding the marketing message can not be standardized. In general, communities react differently to a particular color, according to their cultural experiences. However, there is also a personal attitude toward color, connected with makeup shade selection, depending on skin color.

3. Public preferences related to a particular color can be made in relation to the events that marked it.

4. Assigning a color to a product at random, it is not always doomed to success. Each color has its own symbolism and can not be used randomly, or applied to any product.

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CONSIDERATIONS REGARDING THE MOST IMPORTANT 50 ROMANIAN BRANDS

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Abstract

This paper has proposed an analysis of the most powerful Romanian brands, according to a study conducted by Unlock Market Research in September 2010. In this sense, we undertook a statistical processing of the data presented in the study, to analyze the distribution of the main areas of the most powerful Romanian brands. Our results showed that the most successful brands belong to different Romanian food branches, in that they represent secondary and tertiary processing products of raw materials, derived from agriculture or zootechnics. The number of industrial products brands is relatively small (9, representing 18% of total), the associated trade mark services sector is dominated by banks, representing 10% of the total marks. 16% of successful brands belong to Romanian mass-media. Also, best valued branch in the top is the alcoholic beverages one. The most brands in top 50, concerning alcoholic beverages, were valued in the top half of the ranking.

Key words: Romania, top brand

INTRODUCTION

The transition to a market economy was a crucial challenge for Romanian trademarks. A Synovate study from 2005 reveals that in the 10 brands top of notoriety on the Romanian market, there is no local brand [2].

In the top of Romanian brands notoriety, more than 50% were brands created before 1989, like Dacia, BCR and CEC Arctic.

Lack of investment in marketing and also in the western brand competitors, which are the exponents of modern technologies, oriented to quality, has made that a number of well known brands will no longer be on the market: Brifcor juices and Quick Cola, cigarettes Carpathian, Snagov and Marasesti, Drăgășani sneakers, cars Olcit or Lastun.

Even Romanian brands that have survived the transition, were practically relaunched after successful privatization in 2000: Dacia (acquired by Renault), Arctic (acquired by

Arcelik), BCR (Erste Bank) Dero (Unilever), Ursus (1996, South African Breweries).

A 2011 study conducted by Gemius and Evensys companies, concerning Romanian internet users, aged between 18 and 45 years, concluded that the Romanian brands image was enriched from a few years ago. Thus, the criteria defining a brand's online presence, are in order of importance:

- informations about its products / services and contact data available online (42%);
- image online (website, banners, graphic design) (41%);
- the possibility that its products or services to be purchased on the internet (31%);
- online communication with its customers through more ways (blogs, newsletters, social networks) (27%);
- intensive online promotion (25%);
- intense discussions on blogs, social networks, forums, (14%).

In the eyes of Romanians a successful brand is defined by:

- high quality product / service (66%);
- fact that is well known (37%);
- holds products / services, very well sold (32%);
- it differs from other brands (23%);
- products are innovative (20%);
- has a lot of fans (5%) [4].

In September 2010, Unlock Market Research published the study entitled "*Top 50 Romanian brands stronger*". The study aimed to measure the "power" of the Romanian brands, considering the trust and affection given by consumers [5].

The study revealed the general characteristics of strong Romanian brands: pride, popularity / opening, success, ambition / determination, confidence and affiliation.

The results ranged the successful Romanian brands in 5 classes: strong brands ("model", efficient and loved), loved brands (consumers are emotionally attached, but without significant functional performance), efficient brands (providing quality products / service, but less emotionally involving consumers; the consumers respect them, but do not love them), brands with potential (which still strengthens their market position, having potential to become loved, efficient or strong) and latent brands (strong, but stands less in terms of efficiency and customer affectivity).

In the category of strong brands, the study included: Borsec, Dacia, PRO TV, Dorna, Izvorul minunilor, Poiana, Timișoreana Cotnari, Bergenbier BCR, Ursus, Murfatlar.

In the category of loved brands, was included the brand Bucegi beer, that does not excel in quality, but still manage to maintain popular, being economically active.

Efficient brands revealed by the study were: Libertatea, Kiss FM, Transilvania bank, Antena 1, Cristim, Pate Sibiu, Napolact, Romtelecom and Rom [5].

The category of brands with potential was the largest, namely: Ciucaș, Ciuc, Pate Bucegi, Farmec, Arctic, Frutti Fresh, CEC, TVR 1, Radio Zu, Biborteni, Zuzu, Mobexpert, Primola etc.

Dorna was the only brand listed as latent, while BRD was listed as efficient brand. In terms of their evolution over time,

Romanian brands have been grouped into four categories:

- residual brands (with a glorious past, characterized by a high emotional value, but which do not record outstanding performance): Plafar, Doina, Nufărul;
- dominant brands (confirmed by consumers through image and value): Ursus, Bergenbier, Murfatlar, Cotnari, BCR, BRD, Kiss FM, Borsec, Dacia, Dorna, Izvorul Minunilor, Timișoreana, PRO TV;
- emerging brands, being residual (with a "glorious past", revitalized and adapted to the current marketing environment, but which need time to stay strong): CEC, Farmec, Ciucaș, Dero, Magura, Napolact, Pate Sibiu, Romtelecom, Bucegi, Arctic, Petrom, Rom;
- emerging brands, young: Zuzu, Savana, Radio Zu.

The study also revealed that there are four factors that differentiate the image of the strongest Romanian brands: pride (PRO TV, Borsec, BRD, Ursus), trust (Poiana, Ursus, Cristim, Dorna, Murfatlar, Dacia, Romtelecom), ambition (PRO TV) and popularity (Poiana, Cotnari Bergenbier Timișoreana, Izvorul Minunilor, Dacia).

MATERIALS AND METHODS

This study used data from Unlock Market Research analysis made in September 2010, embodied in a top of the most powerful Romanian brands (Table 1).

To assess the top 50 Romanian brands we have analyzed the distribution between the main benchmark areas. Thus, we used the following statistical indicators: the arithmetic mean of seats held by the brands in the reference area (X), standard deviation (s), coefficient of variation (V) and the mean square (Xp).

We considered that the main evaluation criterion of benchmark areas is the mean square (Xp), because it values more the brands classified at the bottom of the ranking and provides a clearer picture of the importance of a benchmark areas against another, in the whole ranking.

Thus, lower values of the mean square reflect fields that include better placed brands in the top.

Table 1. Top 50 - most powerful Romanian brands (Unlock Market Research, September 2010) [6]

Place	Brand	Place	Brand	Place	Brand
1	Borsec	18	Cristim	35	Biborțeni
2	Dacia	19	Napolact	36	Radio 21
3	PRO TV	20	Rom-telecom	37	Zuzu
4	Dorna	21	La Dorna	38	Prima TV
5	Poiana	22	Rom	39	CEC
6	Timișoreana	23	Bucegi	40	Petrom
7	Izvorul minunilor	24	Frutti Fresh	41	Kandia
8	Cotnari	25	Pate Bucegi	42	Poiana Negri
9	Ursus	26	Arctic	43	Perla Harghitei
10	BCR	27	Farmec	44	Covalact
11	Murfatlar	28	TVR 1	45	Mobexpert
12	Bergenbier	29	Radio ZU	46	Savana
13	KISS FM	30	Libertatea	47	Primola
14	BRD	31	Ciucaș	48	Laura
15	Antena 1	32	Ciuc	49	Magura
16	Pate Sibiu	33	Gerovital		
17	Banca Transilvania	34	Dero	50	Elmiplant

RESULTS AND DISCUSSIONS

First top 50 Romanian brands, reflects the characteristics of the Romanian economy and the consumer trends.

As shown in figure 1, the most successful brands belong to different Romanian food branches, in that they represent secondary and tertiary processing products of raw materials, derived from agriculture or zootechnics.

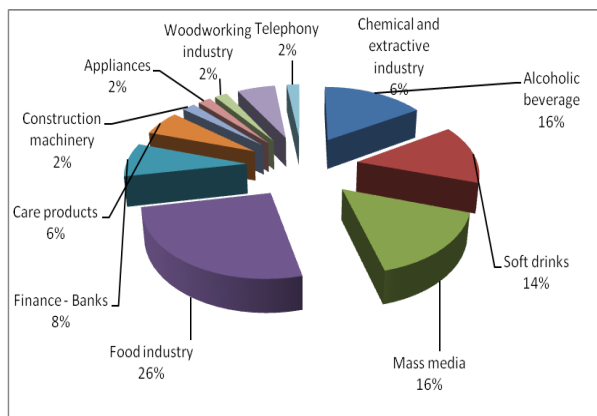


Figure 1. Structure of the strongest 50 successful Romanian brands, in the branches they operate

The number of industrial products brands is relatively small (9, representing 18% of total), the associated trade mark services sector is dominated by banks, representing 10% of the total marks. 16% of successful brands belong to Romanian mass-media.

The large number of brands in the food industry, alcoholic beverages and refreshments are correlated with the consumption spending of population, in the period of the study. According to data from the National Statistics Institute, in the second quarter of 2010, 49.1% out of total population expenses, were allocated to food products, soft drinks (41.4%), alcoholic beverages and tobacco (7.7%) [7].

Table 2 presents the variability estimators for the reference areas, starting from the 50 successful Romanian brands top.

Table 2. Variability estimators for the Romanian strongest 50 brands, in different branches

Reference range	No. of brands	X ± s	V (%)	X _p
Alcoholic beverages	8	16,50 ± 10,56	64,05	370,00
Soft drinks	7	22,29 ± 18,27	81,98	782,86
Mass Media	8	24,00 ± 12,30	51,27	708,50
Food industry	13	30,15 ± 14,71	48,77	1108,92
Finance - Banks	4	20,00 ± 12,99	64,93	526,50
Care products	3	36,67 ± 11,93	32,54	1439,33
Chemical and extractive industry	3	40,00 ± 6,00	15,00	1624,00
Construction machinery	1	2	-	-
Manufacturing household appliances	1	26	-	-
Woodworking industry	1	45	-	-
Telephony	1	20	-	-

Table 2 shows that the best valued field is that of alcoholic beverages. Most brands of alcoholic beverages in the top 50 were placed in the top half of the ranking.

Follow financial - banking, where three quarters of the top 50 successful brands are among the first 20 places. Field of media institutions ranks three, with a value of the mean square close to those of soft drinks field. Trademarks media institutions are better consolidated in top, this field having less variability.

Food industry, best represented as number of brands, occupies only the fifth position.

Care products, chemical and extractive industry, occupy the last places in the ranking, but with the lowest variability. This is because are included compact placed brands, in the end of the 50 ranking of successful Romanian brands.

Results are not random and can be correlated to some extent with the distribution of marketing budgets on the Romanian market.

According to a study by Linea Directa Communications in 2009, on a sample of 250 companies in the areas of: IT, finance, FMCG, pharma, telecommunications, auto, tourism and energy sector, the largest marketing budgets were allocated to companies in the FMCG, pharma and banking fields. In the opposite pole, stood companies operating in the energy, auto, tourism and IT [1]. Given that 70% of FMCG products market was monopolized by food and beverages industry (MEMRB study in 2009), it appears that Romanian brands performance reflects significant the marketing expenses made for it [3,8].

Another argument is offered by the ranking of the major companies which operate on the market of FMCG goods in Romania, ranking in which the companies having successful brands occupy important positions.

CONCLUSIONS

1. The structure of Top 50 Romanian brands, faithfully reflects the characteristics of the Romanian economy and the population consumption trends. Most Romanian successful brands belong to agri supply, a situation that can be correlated with the structure of population consumption expenses, in the period of the study.

2. The best capitalized is the field of alcoholic beverages, followed by the banking sector. Most brands of alcoholic beverages in the top 50 were placed in the first half of the ranking and 3/4 of the successful brands in the banking sector were ranked in the first 20 places.

3. The field of food industry, best represented as number of brands in top 50, occupies only the fifth position.

4. Trends concerning the distribution of areas in which activate the most important Romanian brands, correlate with the marketing budgets distribution on the Romanian market.

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INVESTING OPPORTUNITIES THROUGH PUBLIC-PRIVATE PARTNERSHIP IN MOLDAVIAN ECONOMY

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Abstract

The paper studied the impact of a public-private partnership objectives and scope that are more beneficial for the community's private profit and social welfare for the public, in order to determine the next task: defining, identifying features and principles of public-private partnerships, identifying criteria for their classification, identification of objectives and benefits they can get a public private partnership, public private partnership development analysis in the Republic of Moldova the importance of implementing this and proposed projects, identify gaps in regulation and proposing public private partnership for achieving performance in this direction.

Key words: investments, private sector, public-private partnership

INTRODUCTION

Public-private partnership can be easily defined as one of the basic mechanisms of a company that wants to develop permanent, which is closest to the capitalist state stability achieved through a true and fair relationship between the two sectors participating in the economic social and state: public and private sector. The public sector provides rules, stability and sometimes a redistribution of resources to the private sector. The private sector provides all resources, modern management model, social stability, economic models for public sector performance. Through a public-private partnership legislation properly administered by a coherent and clear interdependence between the two sectors may generate positive results in terms of economic and social sectors.

The concept of public-private partnership expressed a way of cooperation between the public and private sector, namely NGOs, business associations or companies, for the provision of quality public services. Fundamentally, public-private partnerships delivering public services in whole or in part, by private funds raised and calls for know-how of the private sector. Cooperation between public and private sector can take various forms, from the simple relationship

between the buyer and seller of a good joint venture with complex structure. It signaled that govern complex interdependencies and relationships within the public sector developments connected to public services [1].

Public-private partnerships are forms of cooperation between public authorities and the private sector aimed at carrying out infrastructure projects or providing public services. These agreements, which typically involves complex legal and financial arrangements involving private operators and public authorities have been developed in several areas of the public sector and are currently used in the EU, especially in transport, public health, public safety, waste management and distribution.

MATERIALS AND METHODS

In this paper, the practice of developed countries shows that economic infrastructure is more attractive than social infrastructure private partnership, this interest is reinforced by the relatively high profitability of economic infrastructure projects, and growing investment needs in this area (Table 1).

Table 1. Design investment needs worldwide, billion USD annually

Investment directions	Period		
	2000-2009	2010-2019	2020-2029
Telecommunications	654	646	171
Roads	220	245	292
Railways	49	54	58
Electricity distribution	127	180	241
Water supply	576	772	1037

Source: prepared by the author, based on data OECD: Infrastructure to 2030 [online]. [Cited 3 December 2012].

Available:

<http://www.oecd.org/sti/futures/infrastructureto2030/40953164.pdf>

Advantages of public-private partnerships are multiple:

- Project cost sharing between public authorities and third parties.
- Outsourcing of activities of public administration structure that can be better achieved as a result of collaboration with the private sector (such as by license or sale);
- Ensuring financial transparency, concentrating financial capital in the public services and utilities;
- Sharing risks of a business, whether it entails a partnership with the activity for profit;
- Accountability and awareness of the business community to get involved in local community projects that interest;
- The emergence of positive effects on employment and participants in projects of interest to the community;
- Efficient use of expertise held by the private sector;
- Reduce costs for governments or local authorities;
- Use of know-how and private management of public projects;
- Reduce the need for loans / investments borne by the public sector;
- Increased efficiency in project development, implementation period less technical innovation and high quality of service provided.

Some disadvantages of this form of collaboration for the public sector are:

- Loss of control over licensed activities;
- Increased public spending necessary to establish a mechanism for increased control of public institutions involved in the partnership;
- Inability closely monitoring the rights of

citizens, especially in terms of quality of service provided;

- Creating a state of dependency to private public sector and not least, the high degree of complexity of the contracts governing such a relationship;

- Permanent existence of the risk that the private partner to enter into insolvency or bankruptcy, which can lead to sudden interruption of the service provided, with negative effects on citizen beneficiary; However, the advantages of public-private partnership justify taking risks and the public sector, experience proves that this kind of collaboration has brought many long-term benefits than disadvantages or economic loss. The biggest advantage is that some of the risks of the project is transferred to the private partner, in addition to construction risk, the private partner can assume either the operating risk or a risk to availability.

RESULTS AND DISCUSSIONS

In Moldova, the Law on Public-Private Partnership was adopted in 2008 and, to date, there is an advance set of defining a clear policy on development. However, programs initiated and proposed to initiate aimed at increasing institutional capacity and providing technical support for implementation will have a direct impact fully strengthen these capacities aiming at the completion of the entire public-private partnership frame and the involvement of all these institutions for successful projects. In the same vein, the public-private partnership institutional structure, designing importance of financial institutions present on the Moldovan market, the latter having an important role in financing infrastructure. So minor involvement of these institutions in developing and promoting public-private partnerships can bring, by itself, breaks into the development of new concept because their strategy will not be adjusted in time to support involvement in implementation and financing, long-term infrastructure projects, which provides for up to 50 years. As long as the process of involving all relevant actors will be finalized and then submitted adjustments, we

can talk about the quality of investment projects involving know-how of the private sector, which, in fact, is an element of the reform and recovery.

National total number of public-private partnership projects is shown in the figure below (Fig. 1).

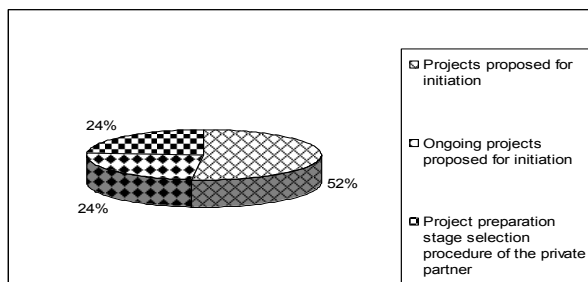


Fig. 1. Total number of public-private partnership projects in 2011

Source: prepared by the author, based on data the Public Property Agency [online]. [cited 10 December 2012]. Available: <<http://www.app.gov.md/md/eventsppp/>>

Notice that the total number of ongoing projects at the end of 2011 they were 15 increasing by a third in the last 2 years. Initiating a number of public-private partnership projects conclusively demonstrates the interest and support of the Government and local authorities and private initiatives presence.

Public-private partnership is a prerequisite to ensure consistency and transparency in implementation of programs to achieve them. At the same time, the partnership thus contributing to the strengthening of governance and local development. While PPP can be critical in certain economic times one of the main sources of economic development or to maintain a constant level of development, job creation or maintenance of a low rate of unemployment, create budgetary resources consistent and secure both local budgets and at the center [2]. Republic of Moldova deals with public-private partnership interest as opportunities for economic development, but applying it in different ways and in different fields such as infrastructure (public roads and highways), health, education, detention facilities, water, energy, transport and telecommunications etc. Construction public-private partnerships can be used in all areas. Is when the private

partner provides both design and construction as a project for public agency. This type of partnership can reduce time, save money, provide stronger security risk and allocate additional projects to the private sector. It also reduces conflict with one entity responsible for design and construction in front of the public partner. Public sector partner owns the assets and is responsible for operation and maintenance. Were initiated in Moldova a number of public-private partnerships in construction [3].

The fact is that public-private partnerships can be an important element of real solutions for Moldova's economic recovery, a factor that must be applied correctly as long as the back, have a broad portfolio of experience international, so successful, and how of failure. Over the years a number public-private partnership is considered to be one of the most promising concepts in dealing with major challenges in the world. As a result, it can be said that the public-private partnership can be divided into four different frames that depend on each other, which means that decisions taken in the framework will take effect automatically on other frames:

- Policy Framework
- The legal framework
- Institutional framework
- The regulatory framework.

Policy framework. To avoid cases return decisions when changing government policy, it is recommended that the idea of adopting the public-private partnership concept is supported by all political parties and not just the government that is in power. This is of particular importance because private partners recover their investments (invested costs) only after a long period of time and so want to be sure that the project will last for the entire period of time provided. Even more, people are dependent on public services (e.g. electricity, heating, etc.) And thus demonstrates a legitimate interest for such services to be offered not only during the period of time provided for a public-private partnership project, but times [4]. Laws and decisions, the spirit which is not shared by those who are responsible for

implementing the decision, have minimal opportunities to be effective. Thus, it is desirable to have a large commitment in the case of the local political and administrative level.

And finally, the concept of public-private partnership tends to establish partnerships between public and private sector (including NGOs). Without the support of the private sector, public-private partnership strategy will be null and void. It is in this moment, prospects must be taken into account when decisions will be taken on the PPP procession.

CONCLUSIONS

In this paper the author aims to examine the development of public-private partnerships in Moldova, to establish the main areas of application, the attractiveness of their current conditions of implementing this law, creating a direction oriented support, the support of state, thus able to conclude:

– 2012 have been prepared and approved list of property belonging to the State and public works and services proposed national public-private partnership, which allows potential investors to choose the subject in which to invest that best suits industry, human and financial capacity of the investor;

– Regulation was approved standard procedures and conditions for selecting the private partner that provides methodological aspects of achieving public-private partnerships and standard application documents;

- An important step was the institutionalization of public-private partnership by establishing the National Council for public-private partnerships;

– Republic of Moldova were initiated in a number of public-private partnerships in construction, particularly housing and socio-cultural objectives in support of state employees, health - renovation / construction, equipping, financing, operation and diagnostic imaging services in several hospitals, water supply to some localities with targets that extend through modernization and expansion of its branch and operating systems capture,

processing, transport and distribution of drinking water, as well as collection and treatment of waste water;

– Under contracts signed in 2010 and 2011, the amount of investments accounted for all million MDL 2200, a record in public-private partnerships. Relatively high profitability and economic infrastructure projects needs increased investment in this area has attracted 95 percent of total FDI, while 4 percent of the investment or MDL 88 million is oriented towards primary health care, construction and operation of hospitals.

In conclusion one can say that the creation of a favorable policy framework for public-private partnership s means creating a broad consensus regarding the sustainability of public-private partnership concept for Moldova, which means that the content of public-private partnership is attractive and understandable to all stakeholders: the private sector and the public sector. Importance for the development of public-private partnership policy framework.

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CONSIDERATIONS ON THE MAIN TRENDS IN THE TOURISTS, RECEIPTS AND EXPENDITURES FLOWS IN THE E.U.-27 TOURISM

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Abstract

The paper aimed to analyze the dynamics of the EU-27 tourism in the period 2006-2011, based on Euro Stat data, processed by usual quantitative methods. The EU-27 is a top tourism destination in Europe and at global level. In 2011, it recorded 1,054 million holiday trips made by its citizen, of which 76 % domestic trips, with an average trip length of 5.4 nights and tourism intensity 4.8 night per resident. The EU citizens spent abroad 2,263,239 thousand nights. The top 10 EU tourism destinations are France, Italy, Spain, United Kingdom, Germany, Greece and Austria. The EU-27 earned Euro 252,032 Millions from tourism and spent Euro 252,032 million for tourism. As a conclusion, the EU-27 will remain a top destination in the world and will have a significant contribution to the development of international tourism.

Key words: analysis, EU-27, features, tourism, trends

INTRODUCTION

Tourism is a major activity with a broadly positive impact on economic growth and employment in Europe. It is an aspect of the European citizens' life, people willingness for leisure and business, an activity which contributes to the sustainable development, to the promotion of cultural and natural heritage, traditions and contemporary cultures of the EU, a tool for reinforcing Europe's image in the world, as a result of centuries of cultural exchanges, linguistic diversity and creativity [12].

Europe is the most important tourism destination, playing an essential role in the development of global tourism. Even though the tourism flows have been fluctuating along the last years, due to the economic and financial crisis, the fast dynamic of the Asian and the Pacific area tourism, the terrorist attacks, political changes and popular movements and other factors, the main trend is a continuous increase in tourist arrivals, nights spent by residents and non residents, tourism receipts and expenditures, and contribution to GDP [8].

Europe, with its performance of 504 million arrivals in 2011, representing over 50 % of the world arrivals is undoubtedly the most, important tourism destination.

France, Spain, Italy, United Kingdom, Germany, Austria, Greece and other countries and with top 10 city destinations: London, Rome, Paris, Istanbul, Barcelona, Berlin, Florence, Prague, Dublin and Amsterdam with its 3 top museums: Louvre, Paris (8.8 million visitors), British Museum, London (5.8 million visitors) and National Gallery, London (5.2 million visitors), the EU shows how important is "destination" in a tourist choice in a region or country image context [6].

The EU tourism has a deep impact on economic growth contributing by 5 % to GDP, 5.2 % to employment and taking into account the related sectors, its contribution is more than 10 % to GDP and 12 % of employment in tourism. And this has been determined by the continuous increase in holiday trips, nights spent and tourism receipts [3].

This reflects how important is tourism marketing [1], tourism markets analysis [7] and tourism management [4], in establishing tourism strategy with its objectives, priorities and targets both at regional and at each country level [10].

Tourism competitiveness has to be a priority in order to strengthen the industry to become a dynamic and sustainable sector and provide high quality travel experience at a balanced price/quality ratio to its customers [2].

In this context, the paper aimed to analyze the evolution of tourism in the EU-27 in the period 2006-2011, based on EuroStat data in order to identify the major trends based on the specific tourism indicators reflecting tourists, incomes and expenditures flows.

MATERIALS AND METHODS

The study was carried out based on the statistical data collected from EuroStat data base for the years 2006 and 2011.

The data were processed by quantitative methods, using index, share and comparison methods and also key tourism indicators: number of holiday trips by destination and length, number of accommodation establishments and number of bed places by type of accommodation, nights spent by residents and nonresidents, tourism intensity (nights spent by residents and nonresidents/resident), nights spent abroad by residents, nights spent abroad/inhabitant, tourism receipts, travel receipts/GDP, tourism expenditures and expenditures/inhabitant.

The analysis was made both at the EU-27 level and by member states, pointing out the results obtained by the top countries and even by the ones situated on the last positions.

RESULTS AND DISCUSSIONS

The holiday trips of the EU residents registered a slight increase of 3.94 % in the analyzed period, from 1,014 million in 2006 to 1,054 million in 2011. The most numerous holiday trips have been made in the tourist country of origin, representing 76.3-76.4 % of total holiday trips. However, the number of domestic trips increased by 3.60 % from 776 million in 2006 to 804 million trips in 2011 and this was determined by the tourists wish to shorter the length of the trips and increase their number.

The EU residents travelled more for spending their holidays abroad, so that the number of outbound trips increased by 5.04 % from 238 million in 2006 to 250 million trips in 2011. As a result, the share of outbound trips increased from 23.5 % to 23.7 % (Table 1).

Table 1. Holiday trips made by the EU-27 residents by destination

	2010		2011		2011/2010
	million	%	million	%	%
Total holiday trips:	1,014	100.00	1,054	100.00	103.94
Domestic trips	776	76.4	804	76.3	103.60
- Outbound trips	238	23.5	250	23.7	10.504

Source: EuroStat, 2012, Own calculations.

The length of holiday trips recorded a decreasing trend, resident tourists willingness was the apply for shorter trips (1-3 nights) in order to benefit of more domestic holidays. Therefore, the share of the short domestic trips was 49.6 % while the share of longer trips (over 4 nights) accounted for 26.7 % in the total number of holiday trips made in the year 2011.

Concerning the holiday trips made outbound, the share of longer trips of over 4 nights was higher than the share of the shorter ones 18.5 %, respectively 5.2 % in the same year (Table 2).

Table 2. Holiday Trips made by the EU-27 residents by length in 2010 (Million)

Total trips	Domestic			Outbound		
	Total	Short trips (1-3 nights)	Long trips (4+ nights)	Total	Short trips (1-3 nights)	Long trips (4+ nights)
1,054	804	522.6	281.4	250	54.9	195.1
100.00	76.3	49.6	27.1	23.7	5.2	18.5

Source: EuroStat, 2012, Own calculations.

The average length of trips in terms of night stays was 4.3 nights for domestic trips and 9.1 nights for outbound trips, with an average of 5.4 nights for all the trips made in 2011 (Table 3).

There are differences from a country to another regarding the number if domestic and outbound holiday trips, and from this print view, the EU countries could be divided into 2 categories: countries whose residents made over 50 % holidays trips abroad like: Luxembourg, Belgium. Slovenia and Netherlands and countries whose residents made less than 10 % holiday trips abroad like Romania, Spain, Greece and Portugal.

Table 3. Average Length of Trips (Nights)

Year	Average length of all trips	Average length of domestic Trips	Average length of outbound trips
2010	5.5	4.3	9.7
2011	4	4.3	9.1
2011/2010	98.1	100	98.9

Source: EuroStat, 2012

In 2011, about 52 % of the EU-27 population took part in tourism, meaning that it was made one trip of at least four overnights stays during last year. However, there are differences from a country to another from this point of view too.

The number of accommodation establishments for tourists increased taking into account the increased demand for tourism services. In 2011, the number of accommodation units accounted for 472,218 being by 11.75 % higher than in 2006. In 2011, the share of hotels and similar establishments for tourist accommodation was 42.85 % compared to 47.60 %, because the number of other collective accommodation establishments/campsites and holiday dwellings etc, increased by 21.90 % from 221,380 in 2006 to 269,868 in 2011.

The number of bed places increased by 2.55 % in the period 2006-2011, accounting for 28,017 thousand places in the last analyzed year. The share of bed places in other collective accommodation establishments was higher (55 %) compared to the number of bed places in hotels and similar establishments (45 %). However, in the analyzed period, the number of bed places increased by 9.04 % in hotels and declined by 2.19 % in other collective accommodation units (Table 4).

The number of accommodation units and bed places by the EU-27 member states is presented in Table 5, where one can notice that there are differences from a country to another.

The top 10 countries in the EU-27 regarding the number of accommodation units and their share in the EU-27 establishments for tourism purposes was the following one in 2011: Italy (32.5 %), United Kingdom (18.1 %), Germany (11.2 %), Spain (9.4 %), France (6 %), Greece (5.9 %), Austria (4.2 %), Czech

Republic (1.6 %), Ireland (1.5 %) and Poland (1.4 %), and all these 10 countries offer totalized 91.8 % of the EU-27 offer.

Regarding the bed places, five countries are on the top: France (17.9 %), Italy (16.97 %), Spain (12.1 %), Germany (11.9 %) and United Kingdom (11.7 % (Table 5).

In 2011, the number of bed places in hotels accounted for 12,585 thousand, of which 46.4 % were concentrated in three EU countries: Italy (2.3 million), Spain (1.8 million), and Germany (1.7 million), accounting for 5.8 million bed places.

The number of accommodation units and bed places registered a different trend from a country to another in the analyzed period.

In 2012, the number of accommodation units registered the highest increase in Greece (+195.3 %), Latvia (+63.1 %), Slovakia (+62.7 %), Bulgaria (+25.8 %), Estonia (+21.7 %), Spain (+22.6 %), while in a few countries it has fallen: Ireland (-22 %), Finland (-14.4 %), Malta (-10.7 %), Cyprus (7.9 %), Austria (-2.7 %), Hungary (-5.4 %), Germany (-3 %) and France (-1.7 %).

The number of bed places increased mainly in Latvia (+50 %), Greece (+41 %), Slovenia (+46.9 %) and Estonia (+24.3 %).

The nights of residents and nonresidents in the EU-27 accounted for 2,421,370 in 2011, being by 5.1 % higher than in 2006. In 2011 the nights spent by residents represented 57.44 % of the total nights spent by tourists in the community. More than 66 % of the total nights in the EU-27 were spent in hotels and the remaining of 34 % in other collective accommodation units. The number of nights spent in hotels accounted for 1,618,928 in the year 2011, being by 6.1 % higher than in 2006.

In 2011, by type of accommodation, the share of residents nights spent in hotels represented 52.66 % and in other collective accommodation units (67.10 %).

The number of nights spent by nonresidents registered the highest growth rate in the period 2006-2011: 8.7 % in hotels and 5.6 % in other collective accommodation units (Table 6).

Table 4. Number of accommodation units and number of bed places in the EU-27 in 2006 and 2011

Year	Number of accommodation units, of which:	Hotels and similar establishments	Other collective accommodation establishments*	Number of bed places, of which: (1,000)	Bed places in hotels and similar units (1,000)	Bed places in other collective accommodation establishments (1,000)
2006	422,550	201,165	221,380	27,318	11,541	15,777
2011	472,218	202,350	269,868	28,017	12,585	15,432
2011/2006 %	111.75	100.58	121.90	102.55	109.04	97.81

Source: EuroStat, 2012, Own calculations.* Other collective accommodation establishments: campsites and holiday dwellings.

Table 5. No of accommodation units and No of bed places in the EU-27 by member state in 2006 and 2011

Country	Number of accommodation units			Number of bed places (1,000)		
	2006	2011	2011/2006 %	2006	2011	2011/2006 %
EU – 27	422,550	472,218	117.7	27,318	28,017	102.5
Austria	20,457	20,009	97.8	935	981	104.9
Belgium	3,484	3,506	1006.6	371	362	97.5
Bulgaria	1,844	2,321	125.8	247	275	111.3
Cyprus	894	824	92.1	94	87	92.5
Czech Republic	7,616	7,657	100.4	442	461	104.2
Denmark	1,076	4,119	103.9	391	408	104.3
Estonia	951	1,158	121.7	41	51	124.3
Finland	1,528	1,389	85.6	214	220	102.8
France	29,008	28,516	98.3	5,704	5,017	87.9
Germany	54,797	53,164	97.0	3,329	3,324	99.8
Greece	9,444	27,892	295.3	787	1,111	141.1
Hungary	3,056	2,892	94.6	315	304	96.5
Ireland	9,101	7,113	78.1	208	197	94.7
Italy	134,793	153,729	114.1	4,500	4,792	105.3
Latvia	393	641	163.1	24	36	150.0
Lithuania	515	538	104.4	32	38	118.7
Luxembourg	519	573	110.4	66	71	107.5
Malta	179	160	89.3	40	40	100.
Netherlands	7,154	6,967	97.3	1,187	1,206	101.6
Poland	6,694	7,039	125.1	1,575	606	105.3
Portugal	2,324	2,346	100.9	455	486	106.8
Romania	4,710	5,003	106.2	287	279	97.2
Slovakia	1,559	2,537	162.7	145	163	112.4
Slovenia	707	997	162.7	145	163	112.4
Spain	36,199	44,397	122.6	3,075	3,391	110.2
Sweden	4,008	4,143	103.3	759	791	104.2
United Kingdom	79,383	85,677	107.9	3,030	3,272	107.9

Source: Eurostat, 2012, Own Calculations

The tourism intensity reflected by nights/resident was in average 4.8 in 2011 by 0.1 higher than in 2006, reflecting a slight increase. The nights/resident are shown by EU-27 member states in Table 7. The highest tourism intensity was registered in Malta (18.4), Cyprus (17.8), Austria (12.5), Spain (8.4), Ireland (8), Italy (6.4), France (6.2), Greece (5.9), Sweden (5.1) and the

Netherlands (5.1), while the lowest intensity was noticed in Romania (1).

Based on the figures reflecting the tourism intensity, one can notice that the most popular destinations are Malta and Cyprus in the Mediterranean area and Austria regarding its mountain and city area (Table 7).

Table 6. Nights of residents and nonresidents in the EU-27 by type of accommodation in 2006 and 2011

Type of accommodation	Nights of residents and nonresidents		Nights of residents		Nights of nonresidents	
	1,000	%	1,000	%	1,000	%
2006						
Total nights:	2,304,498	100.00	1,349,193	100.00	955,303	100.00
- In hotels	1,524,989	66.2	819,700	60.7	705,289	73.8
- In other collective units	779,509	33.8	529,493	39.3	250,016	26.2
2011						
Total nights:	2,421,370	100.00	1,391,061	100.00	1,030,309	100.00
- In hotels	1,618,928	66.8	852,569	61.3	766,359	74.4
- In other collective units	802,442	33.2	538,492	38.7	263,950	25.6
2011/2006 %						
Total nights:	105.1	-	103.1	-	107.9	-
- In hotels	106.1	-	104.0	-	108.7	-
- In other collective units	102.9	-	101.7	-	105.6	-

Table 7. Nights per resident in the EU-27 in 2006 and 2011

Country	2000	2008	Country	2000	2008
EU-27	4.7	4.8	Italy	6.2	6.4
Austria	11.9	12.5	Latvia	1.4	1.5
Belgium	2.8	2.9	Lithuania	0.9	1.0
Bulgaria	2.2	2.5	Luxemburg	5.6	4.6
Cyprus	18.8	17.8	Malta	18.3	18.4
Czech Rep	4.0	2.6	Netherlands	5.1	5.1
Denmark	5.0	5.0	Poland	1.3	1.5
Estonia	3.4	4.0	Portugal	4.3	4.4
Finland	3.5	3.7	Romania	0.9	1.0
France	4.7	6.2	Slovakia	2.0	1.9
Germany	4.3	4.1	Slovenia	3.7	4.3
Greece	5.2	5.9	Spain	8.7	8.4
Hungary	2.0	1.9	Sweden	5.3	5.1
Ireland	8.0	8.0	U. Kingdom	4.4	4.7

The top EU countries based on the nights spent by nonresidents, that is the countries representing top tourism destinations, were Spain, Italy, France, United Kingdom, Austria, Germany, Greece, Portugal, Netherlands and Czech Republic in 2011. All these 10 countries together totalized 894,633 thousand nights with a market share of 86.8 %. The highest market shares belonged to Spain (23.2 %), Italy (17.3 %) and France (11.9 %).

In the period 2000-2011, Ireland lost its 10th position, being replaced by Czech Republic. Also, Portugal passed from the 9th position in 2006 on the 8th position in 2011, while the

Netherlands passed from the 8th position in 2006 on the 9th position in 2011 (Table 8).

The least visited countries were Luxembourg, Lithuania and Latvia.

The top 10 EU countries based on the nights spent by the EU residents abroad have been: Germany (28.9 %), United Kingdom (22.2 %), France (9 %), the Netherlands (7 %), Italy (4.6 %), Spain (4 %), Sweden (3.6 %), Belgium (3.4 %), Austria (2.4 %), Denmark (2.1 %), all together accounting for 1,973,263 thousand nights abroad, representing 87.3 % of the EU-27.

In 2011, the nights spent abroad by EU residents reached 2,263,239 thousands, being by 0.7 % higher than in 2006 (Table 9).

The number of nights spent abroad per inhabitant divides the EU countries into two categories: countries with the highest number of nights spent abroad such as Luxembourg (22 nights), Cyprus (13.3 nights), Ireland (12.5 nights) and the Netherlands (11.5 nights) and countries with the lowest number of nights spent abroad such as Romania, Portugal, Greece, Bulgaria, Poland and Italy, whose residents spent less than 2 nights outbound on holiday in 2011.

The EU-27 tourism Receipts increased by 18.45 % from Euro 254.9 million in 2006 to Euro 271.3 million in 2011 (Table 10).

The top 10 EU countries regarding income coming from tourism and their market share in 2011 have been the following ones: Spain (18.9), France (14.2 %), Italy (11.5 %),

Germany (10.3 %), United Kingdom (9.5 %), Austria (5.3 %), Greece (3.8 %), Netherlands (3.8 %), Sweden (3.7 %) and Belgium (3 %), whose receipts totalized Euro 219,525 Million, representing 80.89 % of the EU-27 tourism receipt in 2011 (Table 10).

Table 8. Top 10 EU countries based on the nights spent by nonresidents in 2006 and 2011

Country	2006			2011			2011/2006 %
	Nights (1,000)	Position	Market share (%)	Nights (1,000)	Position	Market share (%)	
EU-27	955,303	-	100.00	1,030,114	-	100.00	107.83
Spain	224,518	1	23.5	239,371	1	23.2	106.61
Italy	156,861	2	16.4	178,005	2	17.3	113.47
France	105,865	3	11.1	122,963	3	11.9	116.15
United Kingdom	90,741	4	9.5	87,994	4	8.5	96.97
Austria	70,017	5	7.3	73,647	5	7.1	105.18
Germany	52,947	6	5.5	63,081	6	6.1	119.13
Greece	43,055	7	4.5	54,444	7	5.3	126.45
Netherlands	26,887	8	2.8	27,843	9	2.7	103.55
Portugal	26,842	9	2.8	27,880	8	2.7	103.86
Ireland	21,652	10	2.3	-	-	-	
Czech Republic	-	-	-	19,425	10	1.9	
Top 10 total	819,385	-	85.8	894,633	-	86.8	109.18

Table 9. Top 10 EU countries based on the nights spent by residents abroad in 2006 and 2011

Country	2006			2011			2011/2006 Market share (%)
	Nights (1,000)	Position	Market share (%)	Nights (1,000)	Position	Market share (%)	
EU-27	2,247,512	-	100.00	2,263,239	-	100.6	
Germany	748,809	1	33.3	655,598	1	28.9	87.5
United Kingdom	568,904	2	25.3	502,865	2	22.2	88.3
France	151,044	3	6.7	204,139	3	9.0	135.1
Netherlands	139,313	4	6.1	158,425	4	7.0	113.7
Italy	113,836	5	5.0	102,576	5	4.6	90.1
Spain	72,232	6	3.2	89,955	6	4.0	124.5
Belgium	69,853	7	3.1	75,984	8	3.4	10837
Austria	58,285	8	2.5	55,396	9	2.4	95.0
Poland	53,777	9	2.3	-	-	-	-
Denmark	42,973	10	1.9	46,974	10	2.1	109.3
Sweden	-	-	-	81,350	7	3.6	-
Top 10 total	2,019,026	-	89.8	1,973,263	-	87.3	97.7

Table 10. Evolution of Tourism Receipts and Expenditures in the EU-27 in 2006 and 2011 (Euro Million)

	2006	2011	2011/2006 %
Receipts	254,912	271,385	118.4
Expenditures	274,217	252,032	101.90

The lowest income from tourism was registered by Latvia, Estonia, Malta and Lithuania.

The tourism receipts by EU member state is presented in Table 11.

Travel Receipts/GDP reflects the contribution of tourism to the economic growth in terms of gross domestic product. At the EU-27 level, the contribution of tourism to

GDP was 2.15 % in 2011, but from a country to another were differences. On the top there were Malta (15.15 %), Cyprus (10.05 %), Luxembourg (7.58 %), Bulgaria (7.50 %) and Estonia (5.60 %) and at the other end Romania (0.75 %), Germany (1.07 %), Finland (1.46 %), and U. Kingdom (1.48 %) (Table 12).

Table 11. EU-27 Tourism Receipts in 2006 and 2011 by member state (Euro Million)

Country	2006	2011	2011/2006 (%)	Share in 2011 (%)
EU – 27	254,912	271,385	118.4	100.0
Austria	12,355	14,267	115.4	5.3
Belgium	8,199	8,127	99.1	3.0
Bulgaria	2,064	2,852	138.1	1.0
Cyprus	1,882	1,809	96.1	0.7
Czech Republic	4,690	5,484	116.9	2.0
Denmark	4,434	4,442	100.2	1.6
Estonia	811	897	110.6	0.3
Finland	1,891	2,768	196.3	1.0
France	36,912	38,682	104.7	14.2
Germany	26,824	27,903	104.0	10.3
Greece	11,357	10,505	92.4	3.8
Hungary	3,393	4,028	118.7	1.5
Ireland	4,256	3,336	78.3	1.2
Italy	30,325	30,878	101.7	11.5
Latvia	384	551	143.4	0.2
Lithuania	824	966	117.2	0.4
Luxembourg	2,891	3,258	112.6	1.2
Malta	607	909	149.7	0.3
Netherlands	9,037	10,378	114.8	3.8
Poland	5,752	7,647	132.9	2.8
Portugal	6,672	8,146	122.0	3.0
Romania	1,032	1,019	98.7	0.4
Slovakia	1,208	1,803	149.2	0.6
Slovenia	1,555	1,945	125.1	0.7
Spain	40,715	43,026	105.6	15.9
Sweden	7,251	9,967	137.4	3.7
United Kingdom	27,581	25,792	93.5	9.6

The EU-27 Tourism expenditures increased by 1.9 %, accounting for Euro 252,032 Million in 2011 (Table 10).

The Top 10 EU countries based on tourism expenditures in 2011 were: Germany (21 %), United Kingdom (14.5 %), France (11.9 %), Italy (8.2 %), Belgium (6.4 %), Netherlands (5.8 %), Spain (4.9 %), Sweden (4.5 %), Austria (3 %) and Denmark (2.8 %). The countries spending the least money in tourism were: Latvia (0.2 %), Estonia (0.2 %), Lithuania (0.2 %) (Table 13).

The tourism expenditures per inhabitant accounted for Euro 505.55/capita at the EU-27 level in 2011, but it varied between Euro 65.53 per capita in Romania, the lowest level, to Euro 5,414 per inhabitant in Luxembourg, the highest one.

The countries where the tourism expenditure per inhabitant was very high in 2011 were: Luxembourg, Belgium, Denmark, Ireland, Sweden, Cyprus, Austria, Netherlands, Germany and Finland (Table 14).

Table 12. Travel Receipts/GDP by the EU-27 member state in 2011 (%)

Country	Travel Receipts/GDP	Country	Travel Receipts/GDP
EU-27	2.15		
Austria	3.87	Latvia	2.75
Belgium	2.20	Lithuania	3.11
Bulgaria	7.50	Luxembourg	7.58
Cyprus	10.05	Malta	15.15
Czech Rep	3.53	Netherlands	1.72
Denmark	1.85	Poland	2.06
Estonia	5.60	Portugal	4.76
Finland	1.46	Romania	0.75
France	1.84	Slovakia	2.61
Germany	1.07	Slovenia	5.12
Greece	4.89	Spain	4.00
Hungary	3.98	Sweden	2.58
Ireland	2.13	U. Kingdom	1.48
Italy	1.95		

The main factors influencing the EU-tourism have been socio-economic and political factors, but also health and weather factors, market accessibility and technological factors [8].

Among the main socio-demographical factors have to be mentioned the growth of elderly population, the increase number of singles and young couples without children, the wish to travel more times a year, but for

shorter trips, lifestyle change in the sense of more free time for travelling, knowing other cultures, leisure and entertainment, an increased adversity of local population against tourists perceived as invaders, the clandestine migration from developing countries to the developed ones, the higher access of disabled people to tourism services band on the principle “tourism for all”.

Table 13. EU-27 Tourism Expenditures by member state in 2006 and 2011 (Euro Million)

Country	2006	2011	2011/2006 (%)	Share in 2011 (%)
EU - 27	247,217	252,032	101.90	100.0
Austria	7,641	7,531	98.5	3.0
Belgium	12,372	16,055	129.8	6.4
Bulgaria	1,174	960	91.8	0.4
Cyprus	768	868	113.0	0.
Czech Republic	2,194	3,279	149.4	1.3
Denmark	5,968	7,116	149.4	2.8
Estonia	5,464	554	119.2	2.8
Finland	2,723	3,432	126.0	1.4
France	25,965	29,922	115.2	119.
Germany	58,895	60,596	102.9	24.0
Greece	2,383	2,266	95.1	0.9
Hungary	1,503	1,760	117.1	0.7
Ireland	5,446	5,543	101.8	2.2
Italy	18,300	20,709	113.2	8.2
Latvia	563	547	97.1	0.2
Lithuania	722	571	79.1	0.2
Luxembourg	2,793	2,707	108.6	1.1
Malta	253	235	92.9	0.1
Netherlands	13,560	14,748	108.8	5.8
Poland	5,751	5,741	99.8	2.3
Portugal	2,658	2,974	111.9	1.2
Romania	1,032	1,409	136.5	0.6
Slovakia	842	1,609	191.1	0.6
Slovenia	772	828	107.2	0.3
Spain	13,288	12,423	93.5	4.9
Sweden	9,187	11,374	123.8	4.5
United Kingdom	50,300	36,275	72.1	14.5

Among the political factors have to be mentioned the political stability/instability, security issues, with impact on tourism flows and travel behavior, abolition of visa procedures, decentralization of tourism coordination in the new member states and development of private initiatives, the new EU tourism reform and strategy [5].

The economic factors with a major impact have been the economic and financial crisis started in 2008, which affected growth rate

and divided Europe into a “two-speed area”, also the increased unemployment rate and unsecure income source, economic decline in Greece, Italy, Spain, Portugal and Ireland, EU enlargement which stimulated the tourist flows from North to South and East to West, the higher and higher interest of the new member states residents in travelling abroad, the development of low cost air companies and secondary airports.

Table 14. Tourism Expenditures/Population in the EU-27 by member state in 2011

Country	Tourism Expenditure/ Population (Euro/capita)	Country	Tourism Expenditure/ Population (Euro/capita)
EU-27	505.55		
Austria	896.54	Latvia	248.63
Belgium	1,486.57	Lithuania	178.43
Bulgaria	128.00	Luxembourg	5,414.00
Cyprus	1,085.00	Malta	587.50
Czech Republic	312.28	Netherlands	888.43
Denmark	1,293.82	Poland	150.28
Estonia	426.15	Portugal	280.56
Finland	647.54	Romania	65.83
France	472.70	Slovakia	297.96
Germany	744.42	Slovenia	153.33
Greece	200.53	Spain	270.06
Hungary	176.00	Sweden	1,223.01
Ireland	1,259.77	United Kingdom	579.47
Italy	336.73		

Among the health factors could be mentioned: more care for health, body maintenance, development of medical services, tourism complexes for treatment and health recovery which has determined a higher tourist flow for health and medical purposes.

Among cultural factors have to be mentioned: globalization affecting the local identities and values, development of multiculturalism, a stronger defense for preserving local traditions against foreign influence, ethnic conflicts opened in some regions (Russia, Africa, Asia etc).

Among the weather factors could be mentioned: hurricanes, floods, dry weather and forest fires in the Mediterranean areas, hard winters etc.

Among the market and accessibility factors could be mentioned: cultural and sport events (festivals, concerts, matches etc) with a positive impact on tourism flows and receipts.

The technological factors such as: progress in information technologies, high use of internet for a faster getting information on tourism destinations, booking accommodation and air ticketing, development of tourism infrastructure: airports, high roads etc have had a positive impact on tourism flows.

Therefore, due to all these factors, the EU tourist has new features and looks like a more independent, experienced and demanding person, with less working hours and more free time for leisure and entertainment, with a higher interest for more holidays and trips, but shorter, for spending week-ends in the proximity, for last minute travels, low-cost tourism offers, for independent trips, for more contact with nature and environment, adventure, unexplored regions and exotic destinations, for enjoying knowing more cultures, local traditions and tasting local gastronomy.

CONCLUSIONS

The EU is an important “engine” of tourism in Europe and among the main destinations in the world, contributing to the development of international tourism.

The EU-27 tourism can be characterized by the following performance in the year 2011: 1,054 million holiday trips made by residents, of which 804 million domestic and 250 million outbound, 5.4 nights as average length of trips, 472,218 accommodations establishments and 28,017 thousand bed places, 2,421,370 thousand nights spent by residents and non residents, 4.8 nights per residents as tourism intensity, 2,263,239 thousand nights spent by EU citizens abroad, Euro 271,385 million receipts coming from tourism and Euro 252,032 million expenditures in tourism.

All these indicators increased in the analyzed period at the EU level, but differences have been noticed from a country to another.

Top 10 EU tourism destinations are Spain, Italy, France, United Kingdom, Austria, Germany, Greece, Portugal, Netherlands and Czech Republic, based on the nights spent by non residents.

The top 10 EU countries whose citizens travel abroad are Germany, United Kingdom, France, Netherlands, Italy, Spain, Sweden, Belgium, Austria and Denmark.

The top 10 EU countries based on tourism receipts are: Spain, France, Italy, Germany, United Kingdom, Austria, Greece, Netherlands, Sweden and Belgium.

The top 10 spenders on tourism are: Germany, United Kingdom, France, Italy, Belgium, Netherlands, Spain, Sweden, Austria and Denmark.

As a conclusion, the EU tourism is a high dynamic sector of its economy with an important contribution to the economic growth, to the promotion of cultural and natural patrimony, of its image in the international tourism.

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RESEARCH CONCERNING APIARY SIZE, HONEY YIELD AND BEEKEEPERS' INCOME IN TELEORMAN COUNTY

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Abstract

The paper aimed to analyze apiary size, honey production and beekeepers' income in Teleorman County using a questionnaire based survey on a sample of 16 apiculturists. The processing of answers pointed out that in 2011, the interviewed beekeepers kept 1,248 bee families which produced 32,206 kg honey, meaning 25.80 kg/bee family. Honey was sold at Lei 9.67 lei/kg in average, total income accounted for Lei 338,083, that is Lei 21,130 in average per beekeeper and Lei 270.89 per bee family. Apiary size varied between 150 bee families (1 apiary = 6,25 %), 50-100 bee families (81.25 %) and the remaining 12.50 % less than 40 bee families. About 86.23 % of honey production was achieved in the apiaries whose size belonged to the category 50-100 bee families and 8.19 % in the apiary with more than 100 bee families. About 73.20 % of total profit was carried out in the apiaries keeping 50-100 bee families and 18.74 % in the apiary with over 100 bee families. As a conclusion, beekeeping is a profitable sector of agriculture in Teleorman County and for this reason beekeepers are stimulated to increase the number of bee families per apiary, honey quality and finally their income and living standard.

Key words: beekeeping, questionnaire survey, Teleorman County

INTRODUCTION

Beekeeping development is stimulated by the increased honey demand on the European market and by the insufficient offer [7].

The growth of honey production depends on the number of bee families and their power, variety of food resources, bee families maintenance and health [1,2,3,4].

Apiary size is the major factor which determines the extracted honey production and is closely linked to production cost and beekeepers income [8,9,10].

Romania's geographical position and large variety of cultivated and wild flora are favorable factors for the development of beekeeping. Despite of its long tradition in the field, honey consumption is still small, about 0.9 kg/inhabitant/year, but as long as on the EU market demand is not yet covered by offer, Romania has a big chance for honey export [5,6].

Economic impact of beekeeping is very important both for beekeepers, communities in the rural areas, processors and retailers [2,8,10].

Therefore, Romanian apiculturists have to be encouraged to develop their business, increase honey quality and export more honey on the EU market.

In this context, the paper purpose was to present a study on apiary size, honey production per bee family, and beekeepers income in Teleorman County, an area less specific for beekeeping but where the number of apiculturists and the number of bee families is continuously increasing.

MATERIALS AND METHODS

The study was carried out in the month of June, 2012 on a sample of 16 beekeepers of various ages, training level, professions and experience in beekeeping. They took part to an opinion test regarding the statement of apiculture in the Teleorman County, using a structured questionnaire based survey. The main aspects approached in this study are the following ones: socio-professional characteristics of the interviewed individuals, results obtained in beekeeping in the year 2011 regarding: number of bee families,

honey production per bee family, extracted honey production, marketed honey and its structure by honey type (acacia, linden, poliflora, sun flower etc), average selling price, selling procedures, beneficiaries, income from marketed honey, income per beekeeper, per honey kilogram and per bee family, inputs bought for apiary modernization, operating and business development, the major problems beekeepers are facing in Teleorman County which is not a suitable area for apiculture.

The data collected from questionnaires were statistically processed according to the marketing research procedures specific for such a study.

RESULTS AND DISCUSSIONS

Beekeepers structure according to their locality of origin included 18.75 % respondents from Alexandria, 12.50 % from Talpa and 6.25 % from other 14 ocalities of the Teleorman County (Table 1).

Table 1. Beekeepers' structure by apiary location

Locality		Locality	
Alexandria	No. 3 % 18,75	Brânceni	Nr. 1 % 6,25
Călinești	No. 1 % 6,25	Tigănești	Nr. 1 % 6,25
Slobozia	Nr. 1 % 6,25	Frâsinet	Nr. 1 % 6,25
Ulmeni	Nr. 1 % 6,25	Scorțeni	Nr. 1 % 6,25
Prunaru	Nr. 1 % 6,25	Roșiori	Nr. 1 % 6,25
Săcele	Nr. 1 % 6,25	Ciuperceni	Nr. 1 % 6,25
Talpa	Nr. 1 % 12,50		

Beekeepers age structure was the following one: 43.75 % individuals between 51 and 60 years old, 25 % individuals belonged to 41-50 years category, 18.75 % interviewees were 31-40 years old and 42.54 % over 60 years, reflecting that about 75 % beekeepers were between 40 and 60 years old (Tabel 2).

Beekeepers sex structure was the following one: 93.75 % men and 6.25 % women, reflecting that the activities in apiary are preferred by men, but they recognized that

sometimes, mainly during honey extraction they are helped by their wives and even some close friends.

Table 2. Beekeepers' distribution by age category

	20-30 years	31-40 years	41-50 years	51-60 years	Over 60	Total
No.	-	3	4	7	2	16
%	-	18.75	25.00	43.75	12.50	100.00

Beekeepers structure based on their experience in apiculture showed that 50 % interviewees had 11-20 years of experience, 37 % less than 10 years and 12.50 % over 20 years (Table 3).

Table 3. Beekeepers' structure according to their experience in beekeeping

	1-5 years	6-10 years	11-15 years	16-20 years	Over 20 years	Total
No.	3	3	4	4	2	16
%	18.75	18.75	25.00	25.00	12.50	100

Beekeepers' structure based on their training level showed that 50 % of them were highschool leavers, 25 % attended 10 years of school, and 25 % interviewees graduated a higher education institution (Table 4).

Table 4. Beekeepers' structure based on their training level

	Higher education graduates	Highschool leavers	Training 10 years of school	Total
No.	4	8	4	16
%	25.00	50.00	25.00	100

From a juridical point of view, all the interviewed beekeepers were „Authorized Physical Person” (PFA) and members of Beekeepers Association, Teleorman branch.

Beekeepers structure according to apiary size in terms of number of bee families. Most of beekeepers have over 50 bee families and only 12.50 % have between 20 and 40 bee families, 37.50 % have 81-90 bee families, 18.75 % have 51-60 bee families, 12 % have 61-70 bee families, 6.25 % have 71-80, 91-100 and over 100 bee families (Table 5).

Table 5. Beekeepers' distribution based on apiary size (No. of bee families)

	10-20 bee fam.	21-30 bee fam.	31-40 bee fam.	41-50 bee fam.	51-60 bee fam.	61-70 bee fam.	71-80 bee fam.	81-90 bee fam.	91-100 bee fam.	Over 100 bee fam.	Total
No.	-	1	1	-	3	2	1	6	1	1	16
%	-	6.25	6.25	-	18.75	12.50	6.25	37.50	6.25	6.25	100

Distribution of number of bee families by apiary size is presented in Table 6. A number of 532 bee families are kept in apiaries whose size belongs to 81-90 category, 14.10 %, that is 176 bee families are in apiaries of 51-60 category, 12.05 %, that is 150 bee families are kept in only one apiary, the largest in the Teleorman County, 11.21 %, that is 140 bee families are kept in an equal number in two apiaries belonging to 61-70 category (Table 6).

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Table 6. Distribution of bee families by apiary size category

	21-30 bee fam.	31-40 bee fam.	41-50 bee fam.	51-60 bee fam.	61-70 bee fam.	71-80 bee fam.	81-90 bee fam.	91-100 bee fam.	Over 100 bee fam.	Total
No.	30	40	-	176	140	80	532	100	150	1248
%	2.40	3.20	-	14.10	11.21	6.41	42.62	8.01	12.05	100

Structure of apiaries according to average honey production per bee family reflected that 6 apiaries, that is 37.50 % of their total number, produced between 21-25 kg honey per bee family, 5 apiaries, that is 31.25 % carried out 16-20 kg honey per bee family, 12.50 % achieved 26-30 kg honey per bee family and 18.75 % apiaries produced over 30 kg honey per bee family (Table 7).

family reflects that 30.60 % bee families produced 16-20 kg honey per bee family, 34.93 % between 21-25 kg/bee family, 11.21 % achieved 26-30 kg honey/bee family and 23.26 % over 30 kg honey per bee family (Table 9).

Table 7. Distribution of apiaries according to honey production per bee family

	Less than 10 kg	11- 15 kg	16- 20 kg	21- 25 kg	26- 30 kg	Over 30 kg	Total
No.	-	-	5	6	2	3	16
%	-	-	31.25	37.50	12.50	18.75	100

Table 8. Distribution of extracted honey by category of honey yield

	Less 10 kg	11- 15 kg	16- 20 kg	21- 25 kg	26- 30 kg	Over 30 kg	Total
No.	-	-	6,886	10,650	4,200	10,470	32,206
%	-	-	21.38	33.06	13.04	32.52	100

Distribution of extracted honey according to the category of honey yield. About 33.06 % honey production was achieved in apiaries where honey yield varied between 21-25 kg/bee family, 32.52 % honey was obtained in apiaries with over 30 kg honey per bee family, 21.38 % was extracted in apiaries with 16-20 kg honey per bee family and 13.04 % was carried out in apiaries where production was 26-30 kg honey per bee family (Table 8).

Table 9. Distribution of bee families according to the category of honey production per bee family.

	16-20 kg	21-25 kg	26-30 kg	Over 30 kg	Total
No. of bee families	382	436	140	290	1248
%	30.60	34.93	11.2	23.26	100

Distribution of bee families according to the category of honey production per bee

Honey yield by production category varied between 18.02 kg/bee family for 16-20 kg category and 36.10 kg/bee family for the category over 30 kg. The average honey production per bee family was 25.80 kg, taking into consideration all the 1,248 bee families kept by the interviewed apiculturists (Table 10).

Table 10. Honey yield by production category (Kg/bee family)

16-20 kg	21-25 kg	26-30 kg	Over 30 kg	Total
18.02	24.42	30.00	36.10	25.80

Distribution of honey production according to apiary size. About 8.19 % honey production was achieved in apiaries with over 100 bee families, 33.49 % in apiaries with 81-

90 bee families, 9.31 % in apiaries with 91-100 bee families, 8.19 % honey was achieved in apiaries with 71-80 bee families, 10.09 % honey is carried out in apiaries with 61-70 bee families and 15.15 % in apiaries with 51-60 bee families. Only 5.58 % honey was obtained in apiaries with less than 40 bee families (Table 11).

Table 11. Distribution of honey production according to apiary size(kg)

21-30 bee fam.	31-40 bee fam.	41-50 bee fam.	51-60 bee fam.	61-70 bee fam.	71-80 bee fam.	81-90 bee fam.	91-100 bee fam.	Over 100 bee fam.	Total
600	1,200	-	4,880	3,250	2,640	10,786	30,000	5,850	32,206
1.86	3.72	-	15.15	10.09	8.19	33.49	9.31	8.19	100

Honey yield by apiary size category varied between 20 kg/bee family in the apiaries where 21-30 bee families were kept and 39 kg/bee family in the apiaries with over 100

bee families. Also, a yield of 33 kg/bee family was achieved in the apiaries with 71-80 bee families, in general in the ones having between 50 and 100 bee families (Table 12).

Table 12. Honey yield by apiary size category

21-30 bee fam.	31-40 bee fam.	41-50 bee fam.	51-60 bee fam.	61-70 bee fam.	71-80 bee fam.	81-90 bee fam.	91-100 bee fam.	Over 100 bee fam.	Total
20	30	-	27.72	23.21	33.	20.27	30	39	25.80

The extracted honey was entirely sold. The structure of the marketed honey showed that acacia honey was achieved just in 10 apiaries (62.50 %), linden honey was carried out in a few apiaries (12.50 %), poliflora honey was carried out in 13 apiaries (81.25 %) and sun flower honey was produced in 13 apiaries (81.25 %). Honey was marketed especially in bulk, but also packed in cans and glass jars. In the Teleorman County honey was obtained conventionally, no apiary produced organic honey.

The main beneficiaries were represented by Beekeepers Local Association, but also by direct clients.

Honey sale price varied according to honey type (acacia, linden, poliflora, sunflower etc) and beneficiary. Acacia honey was sold for the best price, while the other honey types were marketed for a similar price. The average purchasing price offered by Beekeepers Association varied between Lei 7.5-8.5 per kg according to honey type. But for direct clients, sale price was higher

ranging between Lei 9.5 per kg and Lei 20 per kg. The average sale price was Lei 9.67 per honey kg, taking into account all the honey marketed by the interviewed beekeepers.

Income from marketed honey accounted for Lei 338,083 for the whole sample representing Teleorman County. Income varied according to apiary size category. It was noticed that over 74 % income was obtained by the beekeepers keeping 50-100 bee families and 18.74 % income was earned by the beekeeper keeping 150 bee families (Table 13).

Income per beekeeper, income per bee family and income per honey kilogram. Taking into account that the total income earned by all 16 beekeepers accounted for Lei 338,083 and resulted from 32,206 kg marketed honey produced by 1,248 bee families, income per beekeeper in the year 2011 was Lei 21,130, meaning Lei 270.89 per bee family and Lei 10.49 lei per honey kg (Table 14).

Table 13. Income distribution by apiary size category (Lei)

21-30 bee fam.	31-40 bee fam.	41-50 bee fam.	51-60 bee fam.	61-70 bee fam.	71-80 bee fam.	81-90 bee fam.	91-100 bee fam.	Over 100 bee fam.	Total
5,100	22,200	-	44,260	28,735	22,080	99,958	52,500	63,250	338,083
1.50	6.56	-	13.09	8.50	6.53	29.56	15.52	18.74	100

Table 14. Income per beekeeper, income per bee family and income per honey kilogram

Total Income Lei	Extracted Honey kg	No. of Bee Families	Income/Beekeeper Lei/person	Income/Bee family Lei/Bee family	Income/kg Honey Lei/Kg	No. of Beekeepers
338,083	32,206	1,248	21,130	270.89	10.49	16

Inputs bought by beekeepers in 2011 for apiary modernization and keeping bee families are presented in Table 15. Most of beekeepers bought combs and frames, 68.75 %, 18,75 % beehives, 25 % apiculturists bought biostimulators, 12.50 % bought bee queens,

12.50 % purchased apiary inventory, 6.25 % apiculturists bought masks, coats, bee queen boxes, honey extractor, nails, wire, fuel and 56.25 % bought medicines for bee families treatment.

Table 15. Inputs bought by beekeepers in 2011

Input	No. of beekeepers	%	Input	No. of beekeepers	%
Combs and frames	11	68.75	Wire tacks	1	6.25
Beehives	3	18.75	Wire	1	6.25
Beekeepers mask	1	6.25	Fuel (Diesel)	1	6.25
Beekeeper coat	1	6.25	Bee queens	2	12.50
Medicines	9	6.25	Biostimulators	4	15.00
Queen boxes	1	6.25	Inventory: knives, chisels	2	12.50
Honey extractor	1	6.25	Total	16	100.00

The major problems beekeepers from Teleorman County were facing in 2011 are presented in Table 16.

Table 16. Major problems that beekeepers had in 2011 in Teleorman County

Problem	No. of beekeepers	%
Crop spraying with insecticides and pesticides which have a long remanence and killed bee families; spraying advertising was not done in time or at all	5	31.25
Crop spraying maintenance during pickings	7	43.75
Difficulties regarding honey marketing	3	18.75
Lack of meliferous crops	1	6.25
Low purchasing price offered by honey processors	1	6.25
Lack of antibiotics to treat bee bacterian diseases	1	6.25
Hard winter which affected the bee families	1	6.25
New self polynating varieties for technical crops which do not allow bees to collect nectar	1	6.25
Honey stealers which impose to pay guardians to protect bee families in pastoral pickings	1	6.25

Clients who bought honey are presented in Table 17.

The most profitable bee products in beekeepers' opinion are honey, wax, combs

with honey, propolis (Table 18). All the interviewed beekeepers considered that beekeeping is a profitable activity bringing them additional income.

Table 17. Honey beneficiaries

Name of client	No. of beekeepers who sold honey to this client	Share %	Name of client	No. of beekeepers who sold honey to this client	Share %
Albina SA Bragadiru	2	12.50	Medicofarma Bujoreni	1	6.25
Atlanta Slobozia	3	18.75	Agro Market Roşiorii de Vede	1	6.25
Agro Market Alexandria	1	6.25	Piatra Fair	1	6.25
Albina Cooperative Alexandria	8	50.00	Apicola Pastoral	1	6.25
Private persons	10	62.50	Georgescu Jilava	1	6.25
Dobre and Sons Baicoi	1	6.25	Akibud Gorj Tg. Jiu		
Biofar SRL Alexandria	1	6.25			

Table 18. Profitable bee products

	Honey	Wax	Polen	Propolis	Combs	Virgin wax
No of beekeepers	14	8	2	4	1	1
%	87.50	50	12.50	25.00	6.25	6.25

CONCLUSIONS

The 16 apiculturists from the Teleorman County used in this survey owned 1,248 bee families in 2011 and produced 32,206 kg honey, meaning 25.80 kg in average per bee family. Honey was marketed for Lei 9.67 average price per honey kilogram bringing Lei 338,083 income. This means that an apiculturist earned Lei 21,130 in 2011 from marketed honey, Lei 270.89 per bee family and Lei 10.49 per honey kilogram.

Only one beekeeper, representing 6.25 % owned the highest number of bee families (150 bee families), but the majority of beekeepers, more exactly 81.25 % owned apiaries with 50-100 bee families and just 12.50 % less than 40 familii albine.

Honey yield varied between 21.38 kg and 33.06 kg per bee family, reflecting a low performance deeply influenced by bee families feeding in close connection with climate and other factors.

About 5.58 % honey production was produced by the apiaries with less than 40 bee families, 8.19 % was achieved in the apiary with 150 bee families and 86.23 % in the apiaries with 50-100 bee families.

All these figures reflect that apiaries are still small sized in Romania compared to other countries, and honey performance per bee family is still at a low level.

As a conclusion, apiary size has to be increased in order to produce more honey and beekeepers to get a higher income.

The subsidies and funding coming from the EU in the last years have been an important financial support and a strong incentive to encourage beekeepers to keep more bee families and improve honey production and their income and living standard.

As a conclusion, beekeeping is a profitable activity in Teleorman County even thou beekeepers are facing with some problems regarding beehives transportation, pickings and marketing.

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RESEARCH ON CONSUMER BEHAVIOUR ON BUCHAREST MEAT MARKET

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Abstract

The paper aimed to analyze consumer behavior for meat on Bucharest market, using a sample of 100 individuals, representatives as age, sex and profession, who were interviewed within a structured questionnaire based survey on their preference to buy and consume meat. The answers were processed using the semantic differential and Likert Scale. The obtained results pointed out that white meat is the top preference, because it is healthier and its price is more acceptable compared to red meat. However, men prefer red meat, no matter its price. The most preferred meat sorts in order of their importance are chicken meat, pork and beef. Consumers prefer to buy 1-2 kg fresh meat from supermarket every 2-3 days. Income/family and meat price are the major factors limiting the amount of consumed meat and buying frequency. The term of availability and meat origin have become more and more important criteria on which buying decision is based, besides meat quality. All consumers prefer to consume Romanian meat which is tasty and has a pleasant flavor. As a conclusion, consumers expectations from meat producers are related to a large variety of meat of a higher quality. Also, presentation form in packed portionated meat parts on the shelf as well as hygiene come on the next positions from consumers side in order to satisfy their needs better.

Key words: Bucharest, consumer behavior, meat market, trends

INTRODUCTION

Meat occupies a central place in human diet because of its nutritive value and especially its content in high value protein, essential aminoacids, vitamins and minerals [2].

Among the most important factors influencing consumption behavior there are: age, gender, training level, income per family, information, meat type, meat properties (taste, smell, tenderness, aspect, succulence), quality, food safety and health assurance, easy preparation [7,9,17].

Consumer behavior is a dynamic phenomenon, being featured by new trends regarding easy supply from supermarkets and hypermarkets, easy meat preparation, choice of high quality meat sorts with less cholesterol, lean consistence, succulence and tenderness, special flavor, fresh meat packed in small packages corresponding to a diversified diet and quantitative needs of a modern family interested to assure health and life for all the family members at a convenient price [5,8,11,12].

Meat consumption increased in all the EU countries by 46 % in the last years, except Italy, Belgium, Spain and United Kingdom [16]. Meat consumption in Romania registered a flexible evolution along the last two decades. In 1990, meat consumption accounted for 68.28 kg/inhabitant and in the year 2000 it declined to 44.90 kg/capita. Then, it started to increase again reaching 62 kg at present, of which pork comes on the 1st position (34.18 kg), poultry meat on the 2nd position (21 kg), and beef on the 3rd position (7,8 kg) [13,14].

To study consumer behavior, a large variety of methods of marketing research could be used [5,6,15]. Important research results emphasized major aspects of meat product [1,3,4,10,18].

In this context, the paper aimed to analyze meat consumer behavior in order to establish consumer profile and major trends with a deep impact on producers future strategies.

MATERIALS AND METHODS

The research work aimed to study meat consumer behavior in order to evaluate consumer profile based on buying preference, frequency of buying, motivation used in purchasing decision, place of buying and perception on essential meat characteristics. For this purpose, a sample of 100 individuals of various age, gender, training level and income was used and involved in a structured questionnaire based survey. The interviewees responded a list of various questions mainly with bipolar and multiple choice answers. Their answers were processed using semantic differential and Likert Scale, specific marketing methods for such a study [5,15]. The experiment was carried out in one of the supermarkets of the capital in November 2012.

RESULTS AND DISCUSSIONS

Cultural and socio-professional features of the individuals used in the sample

Age structure reflects a balanced ratio between young persons and elder persons, the share of individuals younger than 40 years being 30 %, the ones aged between 40 and 50 years accounted for 20 %, the ones belonging to 50-60 years category represented 30 % and the ones older than 60 represented 20 %. (Table 1).

Individuals' gender ratio was balanced: 50 women and 50 men, for allowing to test

gender differences regarding meat buying behavior.

Table 1. Age structure of the interviewed persons

Younger than 20 years	21-30 years	31-40 years	41-50 years	51-60 years	Older than 60 years	Total
5	10	15	20	30	20	100

Individuals' structure by profession pointed out that 64 % of the interviewed persons were employees, 14 % pensioners, 10 % housekeepers, 10 % students, 2 % unemployed.

Individuals's structure by average monthly income per family reflects a higher share of the persons belonging to the category Lei 1,001-1,500 (36 %) and also of the ones belonging to income category Lei 1,501-2,000 (34 %). About 5 % of the interviewed persons received in average over Lei 2,500 per family per month, while 14 % of the respondents received less than Lei 1,000 (Table 2).

Table 2. Structure of the interviewed persons by average monthly income per family (Lei/month/family)

Less 1,000	1,001-1,500	1,501-2,000	2,001-2,500	Over 2,500	Total
14	36	34	11	5	100

Frequency of meat buying pointed out that 26 % interviewees buy meat 2-3 times a week, but most of them, more exactly 56 % respondents buy meat once a week, and 11 % buy every two weeks. However, 4 % respondents buy only 1 time a month and 2 % buy every 2-3 months (Table 3).

Table 3. Frequency of meat buying

2-3 times a week	1 time a week	1 time every two weeks	1 time a month	1 time every 2 -3 months	Rarely than 1 time every 2-3 months	Total
26	26	11	4	2	1	100

Consumption frequency. About 42 % individuals consumed meat daily, 36 % respondents consumed every 2-3 days, 14 % once a week and 6 % consumed every two weeks.

Consumer preference for meat presentation form. Most of the interviewed persons (87 %) answered that they prefer to buy fresh meat and not frozen meat.

Consumer preference for the place where to buy meat. About 42 % interviewed persons answered that they prefer to buy meat from supermarket and hypermarket, 22 % buy from minimarket in the district where they live and 17 % buy from the butcher's shops situated in agromarket and less persons buy from small shops and cash and carry. (Table 4).

Table 4. Consumer preference for the place where to buy meat

Hypermarket	Supermarket	Mini market	Cash and carry	Specialized shop	Butcher's in Agromarket	Total
19	23	22	8	11	17	100

Differences regarding consumer preference for the place where to buy meat in close relation to occupation. The answers pointed out that employed persons, but also students prefer to buy meat from supermarket and

hypermarket, but also from mini market in the district where they live, while pensioners, unemployed people and housekeepers prefer to buy meat from butcher's and specialized shops in agromarket (Table 5).

Table 5. Consumer preference for the place where to buy meat by occupation

Occupation	Hypermarket	Supermarket	Mini market	Cash and carry	Specialized shop	Butcher's in agromarket	Total
Students	2	3	3	-	-	2	10
Employees	15	16	16	8	6	3	64
Pensioners	2	2	2	-	3	5	14
Unemployed	-	-	-	-	-	2	2
Housekeepers	-	2	1	-	2	5	10
Total	19	23	22	8	11	17	100

Consumer preference for the type of consumed fresh meat. Most of the interviewed persons (51 %) mentioned that they prefer to consume white meat, 37 % prefer red meat, while 12 % consume both red and white meat (Table 6).

Table 6. Consumer preference for white and red meat

White meat (poultry, fish)	Red meat (pork, beef, sheep)	White and red meat	Total
51	37	12	100

Consumer preference for white and, respectively, red meat is influenced by gender. While men prefer especially red meat, women prefer to consume white meat (Table 7).

Table 7. Differences regarding consumer preference for white and red meat depending on gender

	White meat	Red meat	White and Red Meat	Total
Men	13	33	4	50
Women	38	4	8	50
Total	51	37	12	100

Consumer preference for various meat sorts. About 35 % respondents prefer poultry meat, 31 % prefer to consume pork which is traditional in Romania, 22 % prefer fish, 11 % prefer beef (Table 8).

Consumer preference for various meat sorts depending on age. From the category younger than 40, representing 30 % of the interviewed persons, 43.3 % prefer red meat and 56.7 % prefer white meat. About 40 % respondents belonging to 41-50 years age category prefer red meat and 60 % prefer white meat. From the 51-60 age category, 43.3 % respondents prefer red meat and 56.7 % prefer white meat. From the persons older than 60, 45 % prefer red meat and 55 % prefer white meat. Therefore, the most aggregated meat is white meat, no matter age (Table 9).

Buying habit. About 44 % of the interviewed persons prefer to buy between 1-2 kg at once. Obviously, the amount of bought meat is close correlated with consumption need of the family. Thus, 33 % prefer to buy 0.5-1 kg meat, 11 % less 0.5 kg and 10 % between 2 and 3 kg. During the last years, meat was bought in smaller amounts because of the limited budget, on one hand, and on the other hand, because of the wish to diversify diet by including more vegetables and fruits (Table 10).

Criteria fundamenting buying decision. Among the most important criteria fundamenting the buying decision, the respondents mentioned: meat sort, aspect and freshness, nutritive value, cholesterol content, color, taste, brand, presentation on the shelf (in bulk or prepacked), easy preparation, price and advertising (Table 11).

Table 8. Consumer preference for various meat sorts depending on gender

	Pork	Beef	Sheep	Venison	Chicken	Fish	Total
Men	27	7	1	-	6	9	50
Women	4	4	-	-	29	13	50
Total	31	11	1	-	35	22	100

Table 9. Consumer preference for various meat sorts depending on age

	Younger than 20 years	21-30 years	31-40 years	41-50 years	51-60 years	Older than 60 years	Total
Pork	1	3	6	6	10	5	31
Beef	-	1	2	2	2	4	11
Sheep	-	-	-	-	1	-	1
Venison	-	-	-	-	-	-	-
Chicken	3	4	3	7	11	7	35
Fish	1	2	4	5	6	4	22
Total	5	10	15	20	30	20	100

Table 10. Buying habit for fresh meat

Less than 0.5 kg	0.5-1 kg	1-2 kg	2-3 kg	Over 3 kg	Total
11	33	44	10	2	100

Table 11. Observed values for the importance of criteria used for consumer's buying decision for meat

Criterion	Very important	Important	Satisfactory important	Less important	Unimportant
Meat sort	62	25	8	2	3
Aspect and freshness	78	14	4	1	8
Color	44	20	18	10	8
Nutritive value	40	47	5	6	2
Cholesterol content	42	36	7	10	5
Taste	60	25	8	3	4
Brand	38	30	10	12	10
Presentation type on shelf (in bulk, prepacked)	36	28	12	9	4
Easy preparation	37	43	8	5	7
Price	66	20	4	4	6
Advertising	10	15	17	18	34

The score achieved by each criterion is presented in Table 12.

Table 12. Ranking of criteria used in buying decision for meat depending on importance

Criterion	Score	Criterion	Score
Aspect and freshness	4.68	Cholesterol content	4.00
Meat sort	4.41	Easy to prepare	3.95
Sale price	4.36	Presentation form on shelf	3.90
Taste	4.34	Brand	3.74
Nutritive value	4.17	Advertising	2.31
Color	4.02	-	-

The score emphasizes how important are meat sensorial characteristics (aspect, freshness, taste, color), nutritive value and cholesterol content which determine meat quality and price. Easy cooking is linked to time saving during cooking and meat presentation (in bulk and prepacked). Producer brand is important as a guarantee of meat quality and advertising is on the last position being less important.

Consumer interest to know meat origin, manufacture date and shelf life has been more and more evident during the last years. The interviewed persons confirmed this aspect mentioning that 67 % are interested of meat origin, more exactly of producer name, 45 % are very attentive to manufacture date and 70

% pay attention especially to availability term (Table 13).

Table 13. Consumer interest for meat origin, manufacture date and expiration date

	Meat origin	Manufacture date	Expiration date
Interested	87	90	95
Uninterested	13	10	85
Total	100	100	100

Regarding meat origin, most of the interviewed individuals specified that they prefer Romanian meat because it is very tasty while it is prepared compared to imported meat. The degree of importance for meat origin, manufacture date and expiration date are presented in Table 14.

Table 14. Importance of meat origin, manufacture date and availability term

Criterion	Very important	Important	Satisfactory important	Less important	Unimportant
Meat origin (Romanian or imported)	51	30	4	2	13
Manufacture date	50	28	8	2	8
Expiration date	56	27	8	4	5

The score achieved by these criteria was the following one: on the 1st position it is placed expiration date with the score 4.25, reflecting how important is as meat to be fresh, non altered, healthy. On the 2nd position it is situated meat origin which registered a score of 4.04, because 87 % of Romanians prefer Romanian meat and 13 % prefer to taste imported meat too. The manufacture date registered a score of 3.98.

Consumer satisfaction degree for fresh meat market of Bucharest is good in general, despite that it varies from a criterion to another used to appreciate this aspect. So, 62 % respondents affirmed that Bucharest market offers „high quality meat” and 17 % respondents appreciated that its quality is „very good”. About 57 % respondents affirmed that

meat sorts commercialized in the market are „good” and 15 % appreciated to be „very diverse”. Meat presentation form is considered „good” by 37 % respondents and „very good” by 8 %. Also, packaging way is considered „good” by 35 % respondents and „very good” by 8 % of them. Fresh meat price is considered „acceptable” by just 22 % respondents and „very acceptable” by 10 % of them. About 38 % interviewed persons mentioned that meat price is „high” and 10 % respondents consider that meat price is „very high”.

Quality/price ratio is considered „good” by 40 % respondents. The interviewed persons’ opinion on meat market of the capital is „good” in general (Table 15).

Table 15. Consumers’ satisfaction for Bucharest meat market

	Very good	Good	Satisfactory	Weak	Very weak	Total
Meat sorts	15	57	26	1	1	100
Meat quality	17	62	19	1	1	100
Presentation form	8	37	29	10	16	100
Packaging way	8	35	29	10	18	100
Price	10	22	20	38	10	100
Quality/price ratio	15	40	24	20	1	100
Total	73	253	147	80	47	-

The scores calculated based on Likert Scale for each of the aspects taken into account are presented in Table 16. The scores reflect that consumers would like a more accessible price

for a higher quality meat presented in a large variety of sorts and mainly prepacked on shelf, advertising being lacked of importance.

Table 16. Ranking of criteria characterising consumers satisfaction degree for Bucharest meat market

Meat sorts	Meat quality	Presentation form	Packaging	Price	Quality/Price ratio
3.84	3.73	3.11	3.05	2.84	3.48

The interviewed persons considered that meat sort is on the top position as importance. Then meat quality and quality/price ratio are also very important, a reason to be placed on the 2nd position. Finally, presentation and packaging forms are also important.

Consumers’ future expectations from meat producers. In order to identify the aspects of major importance for meat producers to set up their future strategies in order to cover better consumers need, the individuals included in the sample were asked to express their opinion on the aspects which producers

have to pay attention to. Their answers are presented in Table 15. About 79 % respondents agreed that producers have to pay more attention to meat quality, 67 % are expecting to a large range of meat sorts (turkey, pheasant, rabbit, goose, duck, quail), 52 % respondents are expecting to more prepacked meat, 48 % respondents would like to find an improved presentation form for meat on shelf, and 20 % respondents are satisfied by meat market in the capital (Table 17).

Table 17. Consumers’ agreement/disagreement regarding the future expectations from meat producers

Aspect	Total agree + 2	Agree + 1	Neutral 0	Disagree - 1	Total disagree - 2
Meat quality improvement	48	32	18	2	-
Diversification of meat sorts	40	34	12	10	4
Improvement of presentation form	47	30	10	3	-
Increased prepacked meat	38	32	12	10	8
More accessible meat price	40	50	10	-	-
Intensified advertising	12	10	64	9	5
I am satisfied by meat offer in the capital meat market	35	10	17	28	10

Note: Likert Scale: Total agree +2, Agree +1, Neutral or zero, Disagree – 1, Total disagree - 2

The scores calculated based on Likert Scale for each of the aspects taken into account are presented in Table 18.

Table 18. Scores calculated for consumers’ opinion upon the future expectations regarding meat supplied by producers

Aspect	Score
Meat quality improvement	1.26
Diversification of meat sorts	0.86
Improvement of meat presentation form	0.27
Increased share of prepacked meat	0.82
More accessible meat price	1.30
Intensified advertising	-0.09
General satisfaction for meat offer on Bucharest market	0.32
Total score	4.74

The scores reflect that consumers would like a more accessible price for a higher quality meat presented in a large variety of sorts and mainly prepacked on shelf, advertising being lacked of importance.

CONCLUSIONS

The opinion test regarding consumer preference for meat commercialised on the capital market pointed out that the actual market meets consumers expectations but there are still several aspects which should be improved as follows: meat quality, sort, presentation form, packaging and price. White meat is preferred by most of consumers being healthier, tender, with less cholesterol and cheaper.

Gender creates differences regarding consumed meat sort, so, men prefer red meat while women prefer white meat (chicken, fish).

The preference ranking depending on meat origin placed chicken, pork and beef on the 1st three positions, while sheep and venison meat are less agreed. Fresh meat is preferred by everybody and not frozen meat.

Income is a major factor influencing buying frequency, amount of bought and consumed meat and is close related to meat price and buying place.

Persons with a smaller income buy eat rarely and mainly from specialized shops and butcher's in agromarket, while persons with a higher income buy more meat per week and mainly from supermarket and hypermarket.

It was noticed a continuous increasing trend as consumers to buy meat from supermarket and hypermarket, taking into account that they need to buy many other products at a single transport in order to save time.

Availability date is very important for all the consumers, but also meat origin, because Romanians prefer Romanian meat which is tasty, easy to cook and with a special flavor while is prepared.

As a conclusion, Romanian consumer profile is characterized by its preference for fresh and tender meat, of Romanian origin, mainly white meat, of good quality and hygiene, correspondingly packed and presented on the shelf of a supermarket or hypermarket and sold at an accessible price.

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THE E.U. TEXTILE AND CLOTHING TRADE AND ITS IMPACT ON SILK WORM REARING DEVELOPMENT

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Abstract

The paper aimed to analyze the major trade flows in the E.U. textile and clothing industry in close connection with the future development of sericulture using the data provided by EU Market Access Data Base for the period 2007-2011. The world market of textile and clothing is divided into two parts: raw material providers mainly situated in Asia, but also in South America and large processors situated in the E.U. such as Italy, France, United Kingdom and Spain, whose contribution to the EU production is 75 %. The main E.U. supplier of raw material for textile and clothing industry is China, followed by India, Bangladesh, Turkey and Brazil. About 33 % of the E.U. production of textile and garments is successfully exported as long as demand/offer ratio is unbalanced at world level. Import and export price have substantially increased. At present, the EU is the 2nd silk products exporter in the world. The new E.U. policy strategy regarding sericulture is focused on the stimulation of silk worm rearing for producing cocoons mainly in Bulgaria, Greece, Italy, Spain, France and Romania where climate conditions are favorable, it is a long tradition in the field and rural population needs jobs. At the same time, the E.U. is focused on technology improvement and silk product design in order to create more value added and increase export and sales.

Key words: clothing, E.U., silk worm rearing, textile, trade

INTRODUCTION

The textile and clothing industry is an important sector of the E.U. manufacturing industry. In 2009, the 188,449 enterprises operating in the field generated Euro 142.4 billion turnover.

The continuous increased demand for textiles and garments, but also for carpets, home and technical textiles has obliged producers to diversify production using high processing technologies, invest in innovations and design, but also using a large variety of raw materials.

During the last decades, more exactly since 1995, it is a strong competition between various textile fibres such as: cotton, wool, silk, flax and jute and „man-made” fibres such as viscose, acetate, polyeter, nylon, polyamide, acrylic, polipropylen etc.

More and more synthetic fibres with a natural appearance and less costing used in the textile and clothing industry and less natural fibres, which are difficult to produce. Among the natural fibres, cotton comes to the 1st position

with 90 % of total production of natural fibres, while silk accounts just for 0.18 %.

Silk as a raw material has remained a „luxury” textile and clothing as long as its fineness, brightness, elegance, pleasant touch and high protection for human body can not be replaced by any other fibre. Also its utility for medical purposes, in aeronautics etc. still keep it as an important raw material [8].

Silk is the „queen” of textiles and it is a highly priced agricultural commodity, accounting for about 0.2 % of the total world production of textile fibres [11].

In this context, the paper aimed to analyze the trade flows of the EU textile and clothing industry in close connection with the future development of silk worm growing in order to establish the main trends of the textile and garments market as well as what challenge the sericulturists have to face in order to maintain this traditional sector of agriculture.

MATERIALS AND METHODS

In order to set up this paper, the following indicators were used: textile and clothing

exports, imports and balance in the EU, import value and quantity of silk products by category, share of silk products in their import value, the main EU suppliers of silk products, import price for silk product and also the EU suppliers and beneficiaries of textile and clothing.

The data were collected from EuroStat data base and EU Market Access database/Comext for the period 2007-2011[16].

RESULTS AND DISCUSSIONS

The EU textile and clothing producing countries are Italy, France, United Kingdom, Germany and Spain, whose contribution to the EU-27 production of textile and garments is about 75 %.

The EU producers of textile and clothing could be divided into two groups taking into account their specialization by sector of activity: textile or garments.

The countries located in the Southern Europe such as Italy, Greece, Portugal, Romania, Poland, Spain and France are more oriented to clothing production, while the Northern European countries, including United Kingdom, Germany, Belgium, the Netherlands, Austria and Sweden are mainly focused on textile production[2,15].

Also, within each production sector there is a specialization by product. For example, regarding textiles, wool yarns are produced mainly in France, Italy and U. Kingdom, man-made fibres and yarns are achieved by Austria, Germany, Italy and Eastern European countries, cotton fabrics are mainly created in Italy and France, wool fabrics are produced in United Kingdom, all silk yarns are imported and processed mainly by Italy and France, technical textiles are achieved in Germany, France, Italy and Belgium, carpets in Belgium, Germany and Italy, woven garments are produced in Romania and Bulgaria, knitted garments in Portugal, Italy and Germany, households textiles are mainly carried out in Italy, Portugal, Germany and France.

Therefore, textile as well as clothing production have been positively influenced by the EU enlargement in 2004 and 2007,

bringing new producers in the community. About 65 % of the production achieved by the 12 countries which adhered to the EU is carried out in Poland, Romania, the Czech Republic and Hungary [2].

Changes in the international textile and clothing market

The continuous increasing demand for textile and clothing has stimulated the import suppliers to develop raw material sector but also processing industry. As a result, the main producing countries of raw materials for textile and clothing industry are situated on the Asian continent, while the main processors are in the EU countries.

With its high labour and raw material cost, in a word, high production cost and severe regulations, the EU could not compete with China, India, Bangladesh and Brazil.

At the beginning, for protecting the local producers, import quotas played a benefic role, but after 2009, when quota and license have become free, and textile and clothing have been treated according to the other commodities in the international trade, the EU policy has been changed.

In this context, under the pressure of the economic crisis, of the high production at low cost in the Asian countries, the EU has decided to increase its imports of textile and clothing, to involve research and development in textile and clothing industry in order to create more value added in the final products and diversify its offer, to intensify exports of textile and clothing mainly on the emerging third countries markets where demand was expected to go up. As a consequence, 33 % of textile and garments produced in the EU are sold on the external markets. The textile and clothing products carried out in Portugal, Greece, Lithuania, Poland, Slovakia, Romania, Bulgaria and the Czech Republic represent about 10 % of the total EU exports of manufactured products.

The textiles trade value has registered a different situation in the EU. *The export value of textiles* has recorded a continuous decrease since 2007 to the year 2009, but then it started increasing so that in the year 2011 it reached Euro 19,282 million being by 3.10 % lower than in 2007.

The top export markets for the EU textiles in 2011 have been: the USA 9.4 %, Turkey 8.4 %, China 7.8 %, Tunisia 7 %, Switzerland 6.9 %, Morocco 6.3 %, Russia 5.4 %, Hong Kong 3.4 %, Ukraine 2.9 %, Japan 2.7 %, the percentages represent the share of each beneficiary in the total export value.

The textile import value has increased by 11.09 % from Euro 22,318 million in 2007 to Euro 24,794 million in the year 2011. As a result, the textile trade balance has registered a higher and higher deficit from a year to another. This deficit was 2.27 times higher in 2011 compared to the one recorded in the year 2007 (Table 1).

Table 1. The evolution of Exports and Imports Value in the EU Textile Industry, 2007-2011 (Euro Million)

	2007	2008	2009	2010	2011	2011/2007 %
Exports	19,898	18,913	16,015	17,772	19,282	96.90
Imports	22,318	21,063	17,678	21,833	24,794	111.09
Balance	-2,420	-2,150	-1,663	-4,061	-5,512	227.76

Source: EuroStat, 2012 [16], Own calculations.

In 2011, the EU had 10 main extra-EU textile suppliers, whose contribution to the textile import value have been the following one: China 28.2 %, Turkey 17.2 %, India 11.2 %, Pakistan 7.4 %, the USA 4.6 %, South Korea 4.5 %, Switzerland 3.4 %, Japan 2.9 %, Egypt 2.1 % and Indonesia 2 % (Eurostat).

The Export and Import Value of Clothing

The export value has registered variations from a year to another, but its general trend was an increasing one, so that in 2011, it accounted for Euro 18,126 million, being by 9.03 % higher than in the year 2007.

The top 10 EU export markets for the EU clothing in 2011 have been: Switzerland 18 %, Russia 14.8 %, the USA 9.9 %, Hong Kong 6.3 %, Japan 6 %, Turkey 4.2 %, Norway 3.7 %, China 3.1 %, Ukraine 2.6 %, U.A. Emirate 2.4 %.

The import value of clothing has increased by 15.68 % from Euro 58,098 million to Euro 67,213 million. As a import value was higher than export value, the clothing trade balance has registered a higher and higher deficit whose level was by 18.3 % higher in 2011 compared to 2007 (Table 2).

Table 2. The evolution of Exports and Imports Value in the EU Clothing Industry, 2007-2011 (Euro Million)

	2007	2008	2009	2010	2011	2011/2007 %
Exports	16,624	17,356	14,506	15,148	18,126	109.3
Imports	58,098	59,514	57,541	62,103	67,123	115.68
Balance	-41,474	-42,158	-43,035	-46,955	-49,087	118.35

Source: EuroStat, 2012[16], Own calculations.

In the same year **the Top extra EU** clothing suppliers and their contribution to the clothing import value have been: China 43.8 %, Turkey 12.2 %, Bangladesh 11.2 %, India 6.8 %, Tunisia 3.6 %, Morocco 3.2 %, Vietnam 2.5 %, Pakistan 1.9, Sri Lanka 1.8 %, Indonesia 1.8 % (Eurostat).

The Import Value of Silk products has a low share ranging between 1.40 % in 2009 (the lowest level) and 1.89 % in the year 2008 (the highest level) in the period 2007-2011. However, in 2011, imported silk products represented 1.61 % of imported textiles.

This was a consequence of the increasing value of silk product import by 1.11 % from Euro 395 million in 2007 to Euro 399.4 million in the year 2011 (Table 3).

The silk products imported by the EU have been represented by silk worm cocoons, raw silk not thrown, silk waste, silk yarn, yarn spun from silk waste, silk yarn spun from silk waste, woven fabrics, whose imported value is presented in Table 4.

In 2010, the share of the import value by silk product was the following one: woven fabrics 67 %, raw silk not thrown 11.80 %, silk yarn 11.42 %, silk waste 4.89 %, yarn spun from silk waste 4.11 %, silk yarn and yarn spun from silk waste 0.40 % and silk cocoons 0,007 % (Table 5).

Table 3. Import Value of Silk Products in the EU-27, 2007-2011(Euro Million)

	2007	2008	2009	2010	2011	2011/2007 %
Imports of Silk Products	395.0	397.9	248.4	319.9	399.4	101.11
Textile Imports	22,318	21,063	17,678	21,833	24,974	111.09
Share of Silk products in Textile import (%)	1.76	1.89	1.40	1.46	1.61	-

Source: EuroStat, EU[16], Market Access Data Base, 2012, Own calculations.

Table 4. Import Value of Silk Products by category in the EU-27, 2007-2011(Euro thousand)

Silk product	2007	2008	2009	2010	2011	2011/2007 %
Silk worm cocoons (5001)	31.9	12.6	27.3	24.3	8.4	26.33
Raw silk not thrown (5002)	49,581.7	54,761.0	21,873.5	37,758.4	58,019.0	117.01
Silk waste (5003)	21,044.0	16,651.9	9,825.3	15,651.8	19,069.7	90.61
Silk yarn (5004)	48,754.0	52,210.9	26,189.2	36,524.8	52,414.5	107.50
Yarn spun from silk waste (5005)	21,976.4	20,208.1	10,686.9	13,156.5	19,073.9	86.79
Silk yarn and yarn spun from silk waste (5006)	1,622.4	1,222.0	922.1	1,289.6	1,411.4	86.99
Woven fabrics (5007)	252,33.0	252,838.5	178,846.8	215,460.5	249,365.8	98.94
Total EU-27	395,046.4	397,905.0	248,371.1	319,865.9	399,362.7	101.09

Source: Eurostat, EU[16], Market Access Data Base/Comext. Last updated 23.07. 2012, [17]

Table 5. Structure of Import Value by Silk Product in the EU-27, 2007-2011 (%)

Silk product	2007	2008	2009	2010	2011
Total import value	100.00	100.00	100.00	100.00	100.00
Total import value of silk product, of which:					
Silk worn cocoons	0.008	0.03	0.010	0.007	0.002
Raw silk not thrown	12.55	13.76	8.80	11.80	14.52
Silk waste	5.32	4.18	3.95	4.89	4.77
Silk yarn	12.34	13.12	10.54	11.42	13.12
Yarn spun from silk waste	5.56	5.07	4.30	4.11	4.77
Silk yarn and yarn spun from silk waste	0.41	0.31	0.37	0.40	0.35
Woven fabrics	63.812	63.530	72.030	67.310	62.468

Source: Own calculations.

The imported amounts of silk products has registered a decline compared to the import value. The reduction accounted for 40.71 % in case of silk yarn and yarn spun from silk waste, about 35 % for silk yarn, yarn spun from silk waste and raw silk not thrown, about 38 % for silk waste, 25 % for woven fabrics and 93 % for silk worn cocoons. Therefore, the EU is more oriented to silk products involving a processing grade and deeply reduced its imports of silk worm cocoons (Table 6).

The imports of silk products has been determined by the fact that the EU countries can not compete with the Asian countries which are able to produce cocoons, silk and silk products at lower cost as long as labour and raw material are very cheap.

The main EU suppliers for silk worm cocoons. If in 2007, the main suppliers of silk worm cocoons was India with a share of 59.59 % in the import value of silk cocoons, followed by the USA with 27.69 % and Philippines with 9.63 % in the year 2008, the EU imported 27.64 % from China, 24.38 %

from Philippines 23.82 from Kenya and 13.89 % from Malaysia. In 2009, the main suppliers of silk cocoons were Turkey 46.42 %, China 36.76 % and India 16.80 %.

Table 6. Imported Quantities of silk Products in the EU-27, 2007-2011 (Tones)

Silk product	2007	2008	2009	2010	2011	2011/2007 %
Silk worm cocoons	1,400	1,000	3,100	4,000	0.500	0.07
Raw silk not thrown	2,129,100	2,387,600	904,900	1,158,600	1,387,500	65.16
Silk waste	1,880,500	1,486,000	919,700	1,131,100	1,165,400	61.97
Silk yarn	1,894,400	2,144,600	1,051,000	1,124,100	1,249,100	65.93
Yarn spun from silk waste	880,100	770,900	432,200	477,900	579,200	65.81
Silk yarn and yarn spun from silk waste	51,300	27,100	15,500	26,600	25,800	50.29
Woven fabrics	5,047,400	5,395,700	3,895,900	4,116,900	3,836,400	76.00
Total EU-27	1,884,200	12,212,900	7,222,300	8,039,100	8,243,400.5	69.36

Source: EU Market Access Data Base./Comext; Last updated 23.07. 2012, [17]

In 2010, the silk cocoons were imported from Pakistan 60.57 % and China 11.89 %. In 2011, about 70.78 % of cocoons were imported from China and 27.31 % from India. Therefore, just in 5 years, China passed from the 3rd to the 1st position and is the main supplier of silk cocoons, being followed by India, Pakistan and Turkey.

The main EU suppliers for raw silk not thrown are China, Brazil, Vietnam and India. China accounts for about 89 % of the import value of raw silk not thrown, Brazil for about 9 %, Vietnam and India with the smallest percentages in all the analyzed period.

The main EU suppliers for Silk Waste are China (91 %), India (8 %), Japan (1 %) in all the analyzed years.

The main EU suppliers for Silk yarn are China (71 %), Vietnam (15 %), Brazil (5.5 %) and Tunisia (5 %) in all the analyzed periods.

The main EU suppliers for yarn spun from Silk waste are China (81%), India (8.5 %), Switzerland (7.4 %) and also Thailand and Japan in all the analyzed years..

The main EU suppliers for Silk Yarn and Yarn Spun from Silk Waste are Japan (28 %), China (24 %), Tunisia (23 %) and Switzerland (9 %) in all the years, only in 2007 India and Turkey claimed of 4th and 5th position.

The main EU suppliers for woven fabrics are China 74 %, India 20 %, Switzerland 14 %, Republic of Korea 1.1 % and Thailand 0.8 %. During the analyzed period, China and

India kept their 1st and 2nd positions, but the other countries changed their positions among them. Therefore, China is the main supplier for silk worm cocoons, raw silk not thrown, silk waste, silk yarn, yarn spun from silk waste and woven fabrics and also is situated on the 2nd position, after Japan for silk yarn and yarn spun from silk waste.

The average import price has decreased by about 26 % from Euro 22.75 /kg in 2007 to Euro 16.84/kg in 2011, while the import price for other silk textiles has continuously increased. In 2011, the price for raw silk not thrown reached Euro 41.81/kg, being by 79.59 % higher than in 2007. Silk waste import price accounted for Euro 16.36/kg, by 46.20 % more than in 2007. Silk yarn import price increased by 63.08 % from Euro 25.73/kg in 2007 to Euro 41.96/kg in 2011. The import price for yarn spun from silk waste increased by 31.87 %, reaching Euro 32.93/kg in 2011. Silk yarn and yarn spun from silk waste price accounted for Euro 54.70/kg in 2011, being by 72.99 % higher than in 2007.

Woven fabrics import price is the highest one among the other silk textiles, in 2011 reaching Euro 64.99/kg, by 30 % more than in 2007, when it was Euro 49.93/kg (Table 7).

The import price reflects the demand/offer ratio. The increased demand for more processed silk products including more value added has led to a higher price.

Table 7. Average Import Price, EU-27, 2007-2011 (Euro/kg)

Silk product	2007	2008	2009	2010	2011	2011/2007 %
Silk worm cocoons	22.75	12.59	8.80	6.07	16.84	74.02
Raw silk not thrown	23.28	22.93	24.17	32.58	41.81	179.59
Silk waste	11.19	11.20	10.68	13.83	16.36	146.20
Silk yarn	25.73	24.34	24.91	32.49	41.96	163.07
Yarn spun from silk waste	24.97	26.21	24.72	27.52	32.93	131.87
Silk yarn and yarn spun from silk waste	31.62	45.09	59.49	48.48	54.70	172.99
Woven fabrics	49.93	46.86	45.90	52.33	64.99	130.16

Source: Own calculation, 2012

The decline of raw silk cocoon import price was determined by the fact that this raw material is less required at import as long as it could be produced in the EU countries with a long tradition in the field.

The impact of textile trade on silk worm growing development. In general, on the EU market it is a lack of silk textile offer, which has determined a new orientation for increasing imports which has affected the local producers.

Also, other additional commodities (garments, internal house decorations, surgery threat etc) are subject for import.

The trade liberalization between the developing countries and the developed ones based on GATT regulations and China's adhesion to WTO in 2001 have stimulated China's exports to the EU. In this context, a new strategy was issued by the EU in order to strengthen the textile industry. In this respect, the foundation of high level Textile Group involved in the textile sector modernization has changed the global textile and garment trade.

The EU has been focused more on new production technologies able to develop new products of high value added and in this way the EU has become the 2nd world textile exporter.

Because the internal production and textile industry are deeply affected by the large imports of textiles coming from the third country markets, the EU has decided to stimulate sericulture development in the countries such as Bulgaria, Greece, Italy, Spain, France, Romania, which have a long tradition in silk worm rearing and silk

processing. In this respect a subsidy of 132 Euro was provided per silkworm egg box and also mulberry tree plantations are encouraged to be established in order to produce leaf for silkworm feeding.

The development of sericulture within the EU in an alternative to put into practice durable development of the rural areas by offering to the rural population a chance to get additional income and new jobs and also a challenge for the development of the local communities.

The EU subsidy payment is a financial support for obliging silk worm breeders to produce high quality silkworm cocoons and silk filament [10].

Romania has a high potential for producing silk worm cocoons, but it can not process them as the textile industry failed. However, silk cocoons could be used for producing egg boxes which could be delivered to other breeders encouraging sericulture development and cocoon processing either at local level in various handicrafts or being used in decorative art [9,10]

In Bulgaria, about 70 % of cocoon production is used for egg production and the remaining of 30 % is dried and processed into raw silk and silk commodities [3].

In Greece, sericulture is well developed having a long tradition in producing cocoons and processing them in silk fibre and various textiles [4].

In the countries from the Black and Caspian Seas and Central Asia it is a long experience in sericulture, there are mulberry tree resources, favorable climate conditions for silk worm rearing, governmental support and

also an increasing demand for natural and biological products in the EU silk market. The main problems the countries situated in these areas are facing are: the low raw silk quality, the technologies applied which are still traditional, management system is not market oriented, the low raw silk price for the East European countries in the international market, the insufficient amount of silkworm eggs which does not meet the local needs. As a result, regional cooperation could be a solution for solving these problems and develop and revival the EU silk market [13,14].

Sericulture in the Black and Caspian Seas can not compete because of the low subsidies provided by state to the local producers, the „dumping” price of China textile imports, the extended use of synthetic fibres in the textile and clothing industry, the lack of modern technologies and endowment for producing textile and clothing which restrain the Eastern countries to compete with Italy and France is silk fabrics and commodity printing and design.

All these countries are advantaged because they have high silkworm genetic resources (breeds and hybrids), the EU subsidy payment Euro 132 per egg box under the condition as sericulture to be practiced in associative forms of organization, special EU measures refer to young farmers who are encouraged and financially supported to establish new modern sericultural farms and also production has to be oriented to find products involving a high value added [13,14].

China is the largest silk producer and exporter in the world contributing by 70 % to the world silk production and by 80 % to world exports. As long as the global silk market and consumption are relatively stable, the solution is to develop new silk products and improve technologies [1].

Japan accounts for 20 % of the world silk consumption and it is a major silk consumer but also a raw silk and silk products importer [7].

Brazil contributes by 95 % of the silk yarn production processed in silk industry and by 87 % of silk yarn exports mainly to Japan, South Korea, India, USA, Turkey and EU [6].

India has a great opportunity to strengthen sericulture in order to support its position at global level as producer and exporter [12].

CONCLUSIONS

The largest textile and clothing producers are Italy, France, United Kingdom, Germany and Spain contributing by 75 % to the EU production.

The EU enlargement has had a benefic effect on textile and clothing production. About 75 % of the CEEC's countries is carried out in Poland, Romania, the Czech Republic and Hungary.

As long as raw material market is continuously developing in Asia and South America, the main EU suppliers are China, India, Bangladesh and Brazil.

The increased demand for textile and garments in the international market is an incentive for the EU to be more focused on research involvement to design new models and create more value added and intensify its export. About 33 % of the EU production is sold on external markets. About 10 % of the EU export of manufactured products is carried out by Portugal, Greece, Lithuania, Poland, Slovakia, Romania, Bulgaria and the Czech Republic.

The EU import value has increased by 1.11 % in the period 2007-2011 being represented mainly by woven fabrics (67 %), raw silk not thrown (11.80 %), silk yarn (11.42 %), silk waste (4.89 %), yarn spun from silk waste (4.11 %) and very few silk cocoons, in the year 2011 and the textile import value increased by 11 % in the same period of time.

China is the main supplier of silk worm cocoons, raw silk not thrown, silk waste, silk yarn, yarn spun and woven fabrics and Japan for silk yarn and yarn spun.

The import price as well as export price for textile and garments has deeply increased in the last years.

The EU has become the 2nd textile exporter in the world.

As the huge import of silk textile has deeply affected internal producers, the EU new policy strategy stimulates sericulture

development allotting Euro 132 subsidy per silk worm egg box.

Countries like Bulgaria, Greece, Italy, Spain, France and Romania with a long experience in silk worm rearing and favorable climate conditions for mulberry tree growing are mainly interested to develop durable sericulture in cooperation.

As long as the global silk market and consumption is relatively stable, new silk products design and improved technologies are the major solutions to support textile industry in the EU.

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CAUSES THAT LEAD TO THE SEVERE DECLINE IN THE NUMBER OF CATTLE BRED BY SUBSISTENCE FARMERS IN PLATARESTI COMMUNE, CALARASI COUNTY, ROMANIA

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Abstract

Romania is a country of contrasts especially as agriculture is concerned. On one side we have state of the art machinery and equipment being used on farms larger than 100 ha and on the other side we have small subsistence farms operated by an aging and poor population. The paper aims to highlight few causes that have stressed even more the difficult situation of the rural population of this country; especially those that have been brought about by the financial crisis initiated in 2008 and that have gotten even worse with the passing of time. We have performed a qualitative and quantitative analysis showing the decline in the number of cattle bred, either for milk or meat, by the subsistence farmers from Plataresti commune, Calarasi County, Romania, allowing us to identify few causes that could be counteracted by a proactive social measure. The results of our research indicate one possible measure meant to counteract negative effects that subsistence farmers are now facing.

Key words: aging population, beef, cattle, farmer, meat, milk, rural area, subsistence

INTRODUCTION

There are two types of beef in Romania, specifically there is domestic beef and import beef. The domestic beef, the fresh one, is produced in Romania, either in large, medium, small or subsistence farms. The beef that is consumed from import usually comes from countries such as Argentina, Brazil, New Zealand and other places around the world. National statistics show that most of the beef consumed is from import and is shipped to Romania as frozen meat. Romanians eat more frozen beef than fresh beef. Also it is important to mention that the import beef is found mostly in urban areas, being served in restaurants, and this loses physical, chemical and organoleptic qualities due to the freezing process compared to the fresh beef.

In Romania the beef quantity consumed is up to 7 kg/inhabitant, according to the reports issued by processors and slaughterhouses in

2012. If to this we also consider the animals sacrificed in house, by subsistence farmers is highly likely that the quantity consumed will be 2 or 3 kg/inhabitant larger than the official figure. Worldwide the average beef consumption is of 12 kg/inhabitant. From this we can conclude that there is a real need for breeding cows for their meat. [1]

Beside this, beef is a pharmaceutical product used in advanced technology countries that succeed in extracting nutritional compounds from the cows' muscles, creative and other enzymes capable to replace certain human enzymes and ensure a good health state. Also, it is helpful to know that most anabolic substances, normally considered as drugs for sportsmen are extracted from cows' meat.

This subject was approached because of the facts and information we observed during the past 5 years. It is our professional opinion, reinforced by our professional work experience that a new problem has aroused due to the low employment rate, an aging population, a low revenue level in rural areas,

and all these seen in the context of an economic crisis that does not seem to cease, leading to a severe decline in the number of cattle bred by subsistence farmers – either for milk or meat.

We have chosen for our study a small rural locality in Calarasi County, having a population of 4,317 inhabitants - declared, Plataresti comuna, comprising of 4 villages. [2]

Agriculture is the main element of the local economy, this being founded on the available land: arable land 4,261 ha, grasslands and meadows 210 ha, vineyards 60 ha, forests 57 ha, ponds and lakes 256 ha. [3]

Agriculture here consists of crop growing (wheat, corn, sunflower, clover, beets or canola) – either small farm, farmers’ association or subsistence farming, and of animal breeding (pigs, cows, rabbits, chickens, ducks, geese or turkeys).

Most of the farmers are elders who work with out-dated technology or still use draft animals for working the land.

MATERIALS AND METHODS

The present paper has been prepared using data collected directly from the local hall and from the field (inhabitants) in February 2013 and from the available statistics on national and local levels.

The methods used were: comparative, qualitative and quantitative analysis of data with the purpose of creating a context that would in turn allow us to draw pertinent conclusions and facilitate the process of planning a viable solution. In our quest we were given the opportunity to observe that our target area and population have both the human and land resources that could represent the grounds for re-launching, on a small scale, the local economy, thus encouraging the development of other activities in the area.

RESULTS AND DISCUSSIONS

About 20 year ago Romania had approximately 8 million cattle, with the last agricultural census we were given to observe that in 2011 there were even less than 2

million cattle. For the survival of this sector of the economy there is a need for strategy and government support, where farmers would embrace the cooperation concept and apply it in order to negotiate with the beef and milk processors.

The census also revealed that most of the cattle belong to natural persons and around a quarter belong to private businesses. Also, private businesses face this market with difficulty due to the great efforts implied by breeding cattle compared to other animals – nutrition, disease etc. Also the cattle’s breeding is affected by an intricate legislation and a media war meant to discourage this type of business (due to the fact that we are trying to enter to the EU “free” market that is close to saturation).

Another issue to be taken into account in this analysis is that private businesses operating in producing beef have great operation expenses that add to the costs incurred by the slaughterhouses to develop their activity in the fit conditions (safe, secure and in a timely manner). [5]

Similarly, milk processors face difficulties due to the fact that local farms cannot provide the milk quantities their equipment should process daily and the milk collected from subsistence farmers (peasant households) cannot be processed in class A processing units, being sent only to certain units designed for traditional products processing.

Table 1. Animal production for human consume [3]

	MU	2008	2009	2010
Meat	Thousand tons, live weight	1,426	1,442	1,305
of which beef	Thousand tons, live weight	306	264	205

From the data above we can observe that the production of beef has steeply decreased with almost 100 thousand tons between 2008 and 2010.

Table 2. Livestock number [3]

	MU	2008	2009	2010	2011
Cattle	Thousand heads	2,684	2,512	2,001	1,989

From the table above we can observe again a significant decrease in the number of cattle

bread for the period 2008-2011, that is expected to be even lower for 2012.

Another aspect we have considered in our analysis is population. On January 2011 there were 11.8 million individuals living in urban areas, meaning more than half of the country's population.

In the rural areas of the country the population was counting no more than 9.6 million individuals. A different important figure recorded in 2011 was that of people changing domicile from rural to urban areas, specifically 324.6 thousand people.

Also we have analyzed the employability and unemployment as follows: there was a continuous increase for the years prior to 2008; starting with 2009 the working population began to drop, reaching in 2011 the lowest value recorded in the past 23 years (9,138 thousand individuals). 2011 furthermore recorded the lowest concerning the occupied rural population. The number of unemployed individuals was in 2011 of 730 thousand individuals of which 28.8% were young, aged between 15-24 years. The share of individuals employed in the primary sector - agriculture was of only 2.2%, having dropped with 0.1% from the previous year, still having increased with 0.1% compared to 2008. [4]

The rate of activity relating to the working population ranging between 15 to 64 years was of 63.3% in 2011 (63.9% urban, 62.6% rural).

Between 2008 and 2011 the main source of income were the households was cash, although the income in kind recorded for the same period an ascending trend reaching in 2011 to 18.3% due to the value of the agro-food product consumption from own sources (an increase of 2.7% compared to 2008). [4]

In 2011 the salaries and all the other benefits formed the most important class of income, representing 59.6%, showing an increase of 0.8% compared to 2010. Noticeable is moreover the fact that incomes from agriculture, independent activities, and property rights bring about a small share of the household financial resources.

In Plataresti commune there are 123 milk cattle, counted in 2013, having the following

distribution: Plataresti village - 47, Dorobantu village - 23, Cucuieti village - 32, Podu Pitarului village - 18). The same commune had 402 cows only 5 years ago, in 2008.

In 2013 the data collected physically from the analyzed place revealed that only the elder population grows and breeds milk cows for domestic consumption, the owners of the livestock having an average age of 70 years.

The severe decline in the livestock number was caused by the economic crisis that led in turn to a decrease in the purchasing power (revenues in this locality mean to lei 566 - minimum national net salary, lei 450 - retirement allowance, lei 200 lei - baby allowance, lei 42 - child allowance, lei 125 - social allowance), the fact that the young population had to go look for work in the nearest city (Bucharest) in order to support themselves and their families, lack of state support, insufficient education, lack of support from processors, old and outdated equipment etc.

The consumption of beef in the area is relatively reduced, people preferring to breed cattle for milk and not meat. The meat consumption is mostly represented by home grown pork and poultry.

The livestock that is no longer in the local records has been sold to livestock owners from other areas - from hill or plateau - where pensions were established and other people try to operate agro-tourism, or for reproduction. Correspondingly, most of the livestock that is no longer in the area were sacrificed in legal or improvised slaughterhouses.

An additional significant fact we were given to observe was that the local meadows and pastures are not fitted and no visible efforts are made to obtain fodder. The workers that used to take the cows to feed on the local meadows and pastures from April to late September have found themselves without jobs.

CONCLUSIONS

The evident aging rural population, lack of money and fodder - either due to drought, lack of irrigation, or of that the land is not

being worked by the people any more have determined an accentuated drop in the number of cattle in the analyzed locality.

Other causes we identified were that cattle are a type of animals that are more difficult to breed than others, or that the young population rather migrates to the cities in search for work, or lack of investment in the sector.

We are not going to generalize, although the solution we propose with the purpose to give a little incentive to the population, in order for this to breed milk cows and to the processors so that they would come collect the milk, could work for a larger scale. We propose to introduce a new type of private agricultural practice stages (agricultural internships) that would bring the young closer to their elders. For the young this would be an opportunity to practice, to acknowledge the real situation, to come closer to traditional habits, and warm and hardworking people. The aging local population, the elders, would get the chance to share their life experience, find out about new technologies and methods of caring for their livestock, and the processors would in time obtain good milk from our own rural areas.

ACKNOWLEDGEMENTS

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THE UTILIZATION OF THE SEA BUCKTHORN IN ROMANIA, PAST, PRESENT AND FUTURE

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Abstract

Sea buckthorn is called by the Romanian peasants “berries of the Holy Virgin”. They use from hundreds of years the fruits for health problems. From fruits they are obtained many products in feeding. Romania had great specialists in forestry, horticulture, medicine, bio-chemistry with many studies and applications of sea buckthorn. In Romania Hippophae rhamnoides L. was the object of many national research programs. Now there are not serious investitures and are not mobilized foreign institutions which may use modern instruments for the obtaining all advantages of this plant. Some institutions, industrial units, particulars continue the tradition with good results, that is not the level which is possible in the actual potential of Romania. It must be a solution of the rehabilitation of thousand of hectares of Romanian denuded grounds.

Key words: “berries of the Holy Virgin”, denuded grounds, Hippophae rhamnoides L., sea buckthorn, treatments

INTRODUCTION

Sea buckthorn, Euro-Asiatic specie, was classified in 1753 in “Speciae Plantarum” by Karl von Linné at the position 1023. The great botanist seems to be its godfather, Hippophae rhamnoides has two significations. Now, because it has a positive signification is accepted the etymology from Greek words: horse and shine. Romanian specialists demonstrate the influence of sea buckthorn which induces health for all animals, externalized in the aspect of their skin. The second signification is also from Greek, horse and poison, this is reflected in occidental Europe tradition. Romanian specialists’ conception at the beginning of the XX century was the same; it may be caudated by the plant’s negative effect. Other opinions are relative to the effect in elimination of intestinal worms. Romanian “catina” seems to become from Latin “catena”, the image from Romans invaders was a chain around rivers, the colour of leafs suggested them the silver. Its natural area was one of the largest of the world, from Atlantic Ocean to the Pacific, (fig. 1). Now it is also a subject of research programs in Northern and South America. If we consider Jawaharlal Nehru’s idea, that actual world situation is the result of the European domination in ancient social economical and military development; maybe

sea buckthorn could have had another position in the history of plant utilization.

MATERIALS AND METHODS

In this paper, is the result of more of 30 years of accumulations in sea buckthorn studying and publishing. Important results were obtained regarding the role of Hippophae rhamnoides L. in the environmental protection and human health economy (Berca, M, Proorocu Angel, 2005, 2010). Researchers are involved in the promotion of a new interdisciplinary science Seabuckthornology and with cooperation of more of 30 states involved in this plant studying and using, the terminology and data base necessary in a global activity have been made (Proorocu Angel, 2010). Also a handbook of Seabuckthornology was proposed by Proorocu Angel, 2010 because it is necessary to any person who is involved in sea buckthorn studies. A unilateral view is not benefice for their results. Also students need to have a point of view on the possibilities of using sea buckthorn actual human crises.

RESULTS AND DISCUSSIONS

In Romania, the modern scientific statute of agriculture started in the inter-war period. In 1938-1943, Constantin Filipescu coordinated a large staff and published “The Great

Agricultural Romanian Encyclopedia". "Any country with pretensions of civilization must have in the cultural treasure agricultural encyclopaedia and dictionaries needed by anyone who is concerned by this millenary activity"- said the author in the introduction.

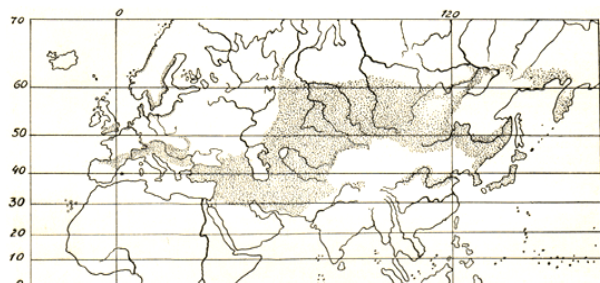


Fig. 2150. *Hippophaë rhamnoides* L. Verbreitungskarte unter Zugrundelegung der Darstellung von Servetatz.

Fig. 1. Sea buckthorn area from *Illustrierte Flora von Mittel - Europa* von Dr. Gustav Hegi Munchen J.F. Lehmanns Verlag 1926

In the first volume of this work sea buckthorn was ample described at page 710: "cătina albă bot. *Hippophae rhamnoides* L. Fr. Saule epineux, germ. Sanddorn, engl. Sea buckthorn (sea, buck, thorn) bush usually 2-5 m. it may become a little tree of 5-6 m. from slippery grounds of river's gravels. One year stems has silver scaly brush and ferruginous rust colored down, early they get thorns, old steams has a great number of short steams transformed in thorns. The ovoid buds are covered by a small number of golden yellow scales with silver brush. Leafs are linear lancelet or narrow oblongs 4-5 (6) cm. long and 5-6 (10) mm. breadth, short petiolated, petiole of 1-3 mm., entered edge; superior face at first has silver scales, at maturity dark green, glabrous and only the long of principal nervure with down, inferior face is silver with scaly silver thread to golden yellow which at friction are taken on the fingers. Dioeciously flowers are little, less apparent, greenish, situated on annual stems on which it appear simultaneous with leafs by 2-3 at the base of inferior leafs which are hiding integrally. Male flowers sessile with yellow-green perigonium on intern face have silver scaly thread in tubular form, evidently separate at the extremity in two lobes on square disk. Female flowers in raceme specula form, with a perigonium evidently separate at the extremity in two lobes, covered

in exterior with scaly thread; unilocular pistil, one only box, with one ovule. Blossoms from April to May. Fruit is an achene covered in exterior with an indurion, seems that in the inferior part persists the perigonium which became fleshy. Fruit is ovoid like a pea bean brown-orange to golden yellow, the fleshy part has acidulous taste, contains a poisonous principia, which don't hinder birds to devour them after the snow fall. The pip, achene with solid brown shining cover, usually has one seed. The trunk may be strong developed 4-6m. and at soil level it may be 10-15 cm. in diameter with many ramifications has lateral direction, sinuously, covered at the beginning with brown smooth bark, in time it has a rhytidome dark brown scaly profoundly cracked. The hardwood yellow-brown, became by drying weighty, solid, may be polish, don't resists in air, the ashes are rich in potassium. The striking root is profound, because the pivoted part penetrate depth the soil and superficial by lateral roots parallels with the surface, from lateral roots in sands there are starting many suckers. In roots there are tuberosities in which leaves in symbiosis an Actinomicete capable to assimilate atmospherically nitrogen. Is spread on marine dunes, alluvional sands along rivers and around lakes on stonily versants and crumbling bank, coasts and cliffs, detritus degraded pasture lands, etc. Its principal area is in Central Asia from Caucasian territory to North of Persia and Ural, to the East of Asia. In Europe it is along of Scandinavian coasts, in Baltic Countries to North Sea, South of England to the south of Europe vegetating on a narrow band on Mediterranean littoral in interior on vales in mountains or hills in North of Spain, South of France, North and Center of Italy, Yugoslavia, Down Austria, Hungary, South of Romania and Bulgaria. In our country *Hippophae* is in hills territories, Meridional and Eastern Carpathians valleys of versants from Moldavia and in Muntenia brings along valleys to field to the Danube. An insular center of sea buckthorn is in Danube Delta on Black Sea littoral in the place called Cardon at north of Sulina (5 km.). the optimum of its area is in under Carpathian zone of aflorismment of salifer, age

Mediterranean inferior aquitanian in Ialomita valley, Laculete, Prahova valley and its affluent Campina, Comarnic, Telega, Slanic, Teleajan valley, Homoraciu, Buzau valley, Cislau, Nehoiasi, Ramnicu Sarat valley, valleys from Vrancea Country etc. and it continues in all basins to Bucovina. Utility in forestry for the fixing of dunes or moving grounds supports more salts in soil Na Cl, it may be the national essence for the restoration of Vrancea Country and other regions deforested from salifer under Carpathians in which the installation of forest on salt soils is difficult. Its ample ramification and numerous thorns make it valorous for hedges. As bush it is very ornamental also with its silver leaves and its numerous orange fruits and persists on branches after the snow fall. It may be multiplied by seeds, slips, marcotage and suckers." Authors declared that the activity of elaboration of the encyclopedia was along the after first war period. I proudly may affirm the experience of Romanian specialists in the utilization of *Hippophae rhamnoides* in soil amelioration. In 2005 spring Romania has a great surface of flood. The economic phenomenon from the end of XIX Century when forests were destroyed and sailed for the construction of railways in Central Europe was the same in the legislative vide after 1990 and the situation in Romania is dramatic because the amplitude of destruction is incomparable. The mistake in the tackle of sea buckthorn is the attempt to define all varieties as one kind of assortment. It has a great variability and adaptability. Romanian researchers had demonstrated that the specie has the capacity to accumulate in its tissue a great level from some radioactive elements, characteristically for the soil and subsoil in its habitat zone. In soil and subsoil there are slowly transformations of radioactive elements, with variable times of halve which give to the crust a certain natural radioactivity. Alfa radioactivity results from the transformation of radium in radon, the beta radioactivity is given in special by the isotopic form of potassium being in soil near K40 ions. Romanian measurements of fruits in regions which are known with the particularity of radioactivity, established that

there were 34-37 less alfa global concentration like the maxim admitted limit in potable water and 2-3 more beta radiations. This illustrated the capacity of fruits to indicate the presence of natural radioactivity in soil, there are storing of beta radiation from absorbed radioactive elements on soil particles or dissolved in soil solution. There are other species like *Solanum nigrum*, Romanian zarna, *Veratrum album* stregoaie which has toxic components influenced by the soil composition. These explain many contradictions about the benefice or lethal effect of fruit utilisation. The authors of the Romanian Encyclopaedia considered it like not recommended in feeding, their occidental formation and sources are explaining this opinion. Conclusion is that the variability of this specie is the motive of many contradictions about the concentration of components and the large utilisation of it. I think that International Sea buckthorn Association must be the promoter of a scientific map-drawing of varieties on the global areas first step for research in the various domains of utilisation. The regional people's millenary experience in conditions of maintaining of environmental parameters must be an important yielding point in research activity. *Hippophae rhamnoides* L. has an opportunity to become the solution of the modern environment and feed global crises only in conditions of a global conception in research, integration of the production, processing, management and marketing. In my opinion the complete view of sea buckthorn resources must be as my schematic presentation in fig. 2. Important in all the world is to use it in soil degradation treatments. I had the privilege to see China works in Yellow River antierosional measures. Sea buckthorn is used in Bolivia in Amazonian region.

Romania has many natural resources in all domains of agriculture but we now are isolated, due to many causes, principals of them being corruption and the precarious management. This makes now sea buckthorn a solution like in China for the rehabilitation of soil, also a resource for the development of production of derivates. In Danube Delta a

research program on 1450 ha. and other surfaces demonstrate the capacity of the plant to be utilized in soil erosion protection. Actual situation needs thousand of environmental plantations, possibilities of rehabilitation are certified.

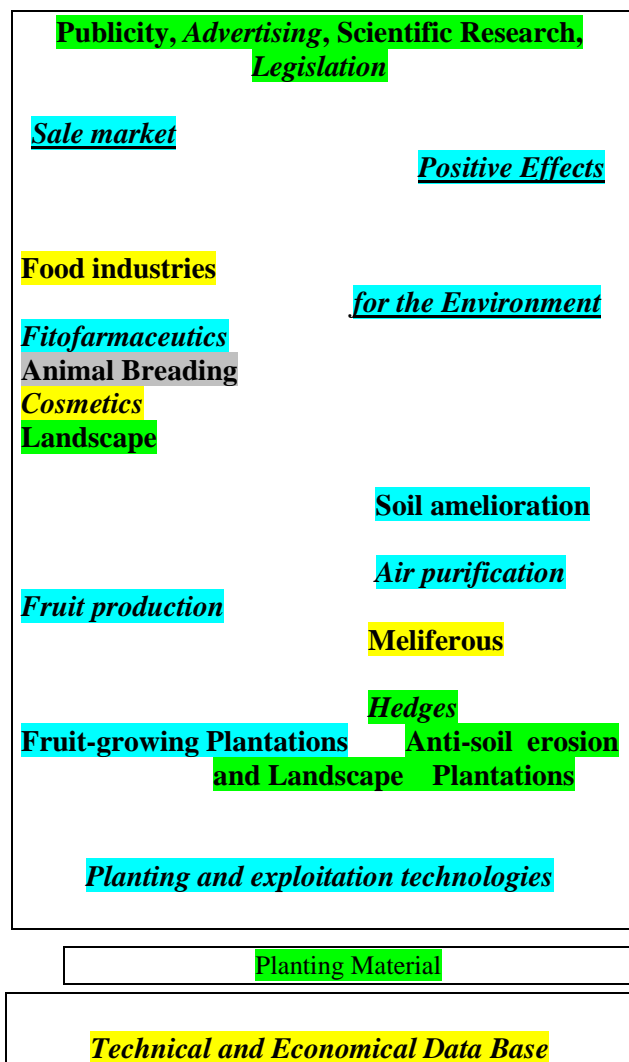


Fig. 2 Schematic presentation of principal aspects which are logically necessary for the scientifically implementation of sea buckthorn utilisation in Romania.

Sea buckthorn is called by the Romanian peasants in Buzau county “berries of the Holy Virgin”. Romanian people used from hundreds of years the fruits for the treatment of anaemia, diarrhoea, rheumatism and rash. From fruits they obtained many products in feeding: juice, vine, jam (with cherry, apples and plums), butter etc., they used it as textile colorant. In Romanian “Medicinal and Aromatic Plants from A to Z” guide book, the

two appreciate specialists Ovidiu Bojor and Mircea Alexan recommend sea buckthorn as vitamin complex (C, B1, B2, PP) carotenes, folic acid, oil, izoramnethol, fitosterol. Recommended in avitaminose Fructus Hippophae in combination with Fructus Cynosbati (hip rose), Folium Urticae (stinging nettle), gooseberry, Folium Menthae (mint), Folium Rubi idaei (raspberry) and Folium Primulae (cowslip), infusion, cooling drinks, syrups, gout as reach in vitamins and diuretic, pneumonia in combination with colt’s foot, linden tree, hyssop, cowslip, savory, elder tree, rickets Fructus Cynosbati (hip rose), Fructus Hippophae, Folium Primulae (cowslip), Folium Melissa (balm mint), adjuvant in pulmonary tuberculosis in winter and spring for vitamins with Fructus Cynosbati (hip rose), Folium Urticae (stinging nettle), Folium Primulae (cowslip), uremia in combination with diabetes Folium Betulae (birch tree), Folium Myrtilli (bilberry) and Herba galegae (goat’s rue), xerophthalmia in combination with Fructus Cynosbati (hip rose), Folium Urticae (stinging nettle), Flores Tagetes (marigold) and Fructus Myrtilli (bilberry).



Fig. 3 Variety of Sea buckthorn oil products of S. C. HOFIGAL S. A. from Romania

PRODUCTS PRESENTATION:
 Phials with 10 ml; 20 ml ; ±3%, 100ml; 500 ml; ±2% or capsule with 0,4 or 0,6 ml sea buckthorn fruit oil the active principia extracted through an original proceeding being a natural food concentrate. Liposolubil components of the sea buckthorn oil represent a polivitaminic complex with regenerating action for the cellular metabolism. Active principia contained are, in principal β-carotenes, vitamins D, E, F, K, therefore all liposolubil vitamins, also o series de polifenolic products strong anti-infectious.

Also contains lecithin in easy assimilability forms (calcium and magnesium salts), unsaturated fatty acids like β -linolic acid as precursor of a lot of organic enzymes. ACTION: general tonifiant, antianemic, vitaminizant; imunomodulator; synergic action with interferon; contribution for the syntheses of proteins raw-material for interferon; coronaries protector; antiaterosclerotic; slowing down the process of ageing by consumption of undesirable free radicals; detoxifying the liver and assure the trofic function for the hepatic cell; anticancerigen by the great contain of β -carotene; in extern administration good for cicatrizing, dermoregenerator effect, anti-inflammatory, nutritive; excellent protector against solar radiations or de other nature. INDICATIONS: Intern use: Prophylactic: slowing down the process of ageing and anticancerigen, tonic general in stress situations, imunomodulator. Adjuvant: intern treatment of some dermatological affections (psoriasis, LED cutanate forms), ORL affections with component atrophic and inflammatory, cardio-vascular affections being a good coronaries protector affections ale digestive system. Active in chronic hepatitis, uro-genital affections, neurological psychical affections, antianemic, excellent role in slowing down of some ocular affections (hemeralopia, presbytism, keratomalacie, myopia, astigmatism, hipermetropy, glaucoma, cataracts) being rich in β -carotenes.

Extern use: local treatment of eczema, thermal and chemical burns, chilblains, alergodermatitis, psoriasis, lent recovery wound. It is the only natural product recognized for the activity of protection against solar radiations or other nature. Cosmetically use: ant-lifting and nutritive creams, gels and lotions of protection and maintenance for all kinds of skin.

S.C. CCPPM Plantavorel S.A. Piatra Neamt, continue the traditions of Vorel pharmacists family which in 1880's initiate Green Pharmacy, in 1942 produced 120 products. In 1948 it was nationalized. In 1983 Plantavorel Laboratory initiates new research and production in utilisation of Romanian "Green

Gold'. Now there are sea buckthorn homologated products "Cevisol", natural dietetic and food supplement extract of fruits. Tonic general, for children, convalescents, intellectual and physical effort. "Vorisol granule" natural dietetic and food supplement extract of fruit extracts of *Hippophae rhamnoides* and *Rosa* species. Granules may be used also like tea, 2 spoons at 100 ml. water. There is "Hebe radix" protection cream extracts of sea buckthorn, marigold and blackwort, volatile oil of mint, excipients, conservants. Recommend in solar and thermo burns, contact dermatitis, etc. Research programs recommend plants from "Curvature Carpathians" as optimal for pharmaceutical products.

Ioan Lupe, Romanian forestry specialist had modern initiative in sea buckthorn utilisation. In the work „Pomicultura generală și specială Editura Didactică și Pedagogică 1982, authors Popescu M. and other pomologists presented the first technology and presentation of sea buckthorn, now the research is focalised on conservation, evaluation and development of genetic resources, establishment of plantations with suitable varieties, identification of new valuable genotypes, analyses of biochemical fruit characteristics, studies of physical and chemical soil improvement, and studies of symbiotic association between the plant and fungi and bacteria. Unfortunately this plant was never approached in a global conception in Romania; this made it a permanent a theoretical resource.

The approach should be in two directions of implementation in Romanian agricultural system: horizontally: plantations on large surfaces on degraded soils, eroded, salty, etc.; vertically: creation of a data base, of some productive centers, biological material selected budgets, systems of plantation, technologies, a system of processing of the production, diversification, creating a large game of uses and obtaining economical superior results, competitive products for export creation of an informational system and publicity for sea buckthorn products, changing mentalities and wrong treatments with artificial products (Fig. 2.).

CONCLUSIONS

This plant is fixing lands which are most degraded (has many suckers), assimilate atmospherically nitrogen directly by roots (has an ameliorative effect to the soil), Frankia is the bacteria which is responsible of this quality estimative it is considered a volume of 2 – 179 kg. N / ha/year.

In modern pharmaceuticals it is also used in cosmetics, many treatments and for burned and irradiated tissues. In the feeding of domestic animals were used some products, for the aspect of the hair of dogs, cats, and horses, the quality of eggs and the immunity.

Plants are used like decorative plants and hedge; their green-white colour is in contrast with the orange of flowers and fruits.

Lupe Z. Ioan, Grigorescu Emanoil, Brad Ion, Cireasa Victor, Manea Stefan are some of Romanian specialists in forestry, horticulture, medicine, bio-chemistry with many studies and applications of sea buckthorn as we can see in the summary attached bibliography.

In Romania Hippophae rhamnoides L. was the object of many national research programs, now it was abandoned. Now there are not serious investitures and are not mobilized foreign institutions which may use modern instruments for the obtaining all advantages of this plant.

Some institutions and industrial units continue the tradition with good results, but I think that is not the level which is possible in the actual potential of Romania. It must be a solution of the rehabilitation of thousand of hectares of Romanian denuded grounds.

In the doctorate thesis: “Studies about the importance of sea buckthorn (Hippophae rhamnoides L.) in the environmental protection and human health economy”, there were presented solutions for the implementation of the plant but in Romania but it is difficult to be initiating a national programme in this domain at this moment when the national interest is inexistent. Romania is considered to be the place where many vegetables have some conditions which made them most good like in other regions, sea buckthorn is one of them and here it has a great variability. The Romanian biotypes fruits contain a lot of vitamins, 2 x

vitamin C like hip roses, carotene, citric acid etc. The oil contains E vitamin which is revitalizing the human organism, near vitamins P, B1, B2, A, K, F (F vitamin defend cells of cancer and irradiation, there are also 15 microelements Fe, Mn, B, Al, K, F, Ti etc. From fruits it is possible to obtain many products in feeding: juice, vine, jam (with cherry, apples and plums), butter etc. All products are very rich in vitamins.

Plants of Hippophae rhamnoides L. are valuable like decorative plants; their green-white color is in contrast with the orange of flowers and fruits, it is a melliferous plant, aspect important in its polenisation.

Interesting was the EU-Project G5ST-02-71999, SEABUCK Innovative products obtained from fruits of Sea buckthorn (Hippophae rhamnoides). Milestones of Seabuck project funded by the European Commission are:

- optimization of the extraction, purification and stabilization technology for carotenolipoprotein complex from Sea buckthorn fruits;
- detailed analysis of obtained carotenolipoprotein complex on chemical composition, stability and activity;
- large scale realization of the extraction and purification technology for the carotenolipoprotein complex at one of the participating technology companies and estimation of the production costs;
- development of three different cosmetic products containing the Sea buckthorn carotenolipoprotein complex ready for commercialization
- sensory and dermatological trials of the developed cosmetic products.

International Sea buckthorn Association has an important role in the future development of Romanian evolution, the natural potential of Romanian biotypes may be integrated in research and production programs, international collaboration, creating a world data base in research, commercial and technological domains. In Romania must be initiate an environmental and food and health program, the logical succession of problems was presented in Fig.4, there are many problems, one of them being the resistance and opposition

of artificial producers of food, juice, syrup, vitamins etc.

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SOME CONSIDERATIONS ON THE STRATEGY FOR SUSTAINABLE DEVELOPMENT OF ROMANIA AGRICULTURE

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Abstract

Currently, one of the most important problems of mankind is the reason to ensure sustainable development that take into account environmental protection. At the beginning of the third millennium, framing the concept of sustainable agriculture is seen as the only viable alternative to economicosocialevolution, the only one able to meet the needs of today's generation without compromising the ability of the future generations to achieve their own requirements. The overall objective of sustainable development is to find an optimal interaction of four systems: a economic, human b, c and d environmental technology in a dynamic and flexible operation. Minimum requirements for achieving sustainable development refers to resize economic growth from a more rational and equitable use of resources to improve the quality of people's lives. The accession of Romania to EU economic and social structures, including at the agricultural ones have brought on the forefront also concerns for sustainable agricultural development. Considered part of the economic and social strategy of sustainable development, sustainable development in agriculture is a paramount concern for whose realization will depend the statute Romanian rural area.

Key words: agriculture, efficiency, environmental protection, food safety JEL Classification: Q1, Q5, P28, P32, sustainable development

INTRODUCTION

The veg Concerns about sustainable development at individual country level and therefore at world level are the result of a complex factors who target the degradation of environment, poverty, uncontrolled expansion of urbanization, employment insecurity of a job, youth migration, inflation, unemployment and others .

The concept of sustainable development is a complex one widely accepted by experts the one of development sustainable or viable, sustainable, within which aims to "com the interaction compatibility of four systems: economic, human, environmental and technology so as to ensure meeting the needs the present without compromising the ability of future generations to meet their own needs. For achieving comparability condition of the four systems that are interrelated (economic, human, social, technological) sustainable development through his mechanisms they subscribe to all four dimensions.

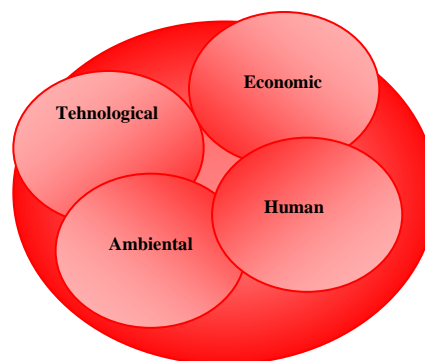


Figure 1 : The four systems of sustainable interaction

Sustainable agriculture subordonate to sustainable development and sustainable agricultural systems - must be productive farms, organic, profitable and to conserve resources.

Coordinates of "sustainable development" aims the interdependence relationship economic, social and ecological plan - as a condition of the Romanian agriculture rehabilitation and progress, requiring reconsideration in this context, on one hand, of the perception way of integration of their of

agriculture in requirements and sustainable flow, on the other hand, of place, interference, of interconditionality his activities of its global sustainable development process.

The experience of developed countries has showed that practicing sustainable agriculture that has appropriate technical equipment and production factors necessary for compliance production technologies, lead to the increase of labor productivity to reducing personnel employed in agriculture leading to the development and diversification of production and services for rural economy.

In Romania there is a broad current of opinion whereby the problems on sustainable development are predominantly related to the lack of financial resources and productive technologies (impossibility of applying modern technologies because of land fragmentation, little diversified activities, lack of integration production processes, etc..) than applying certain raised consumptions and of polluting technologies such as in countries with developed agriculture.

Knowledge Problem

The concept of sustained development (sustainable) or new theories belong sustainable economic development itself relatively new branch of general economic theory that split off and individualized as theoretically autonomous body in the 50s and 60s. In literature meet a number of formulations of the concept of sustainable development. In principle the, sustainable development is interpreted as a new type of economic growth that dominated the opposite current economy nineteenth and twentieth centuries, and which prevails today, and whose essential feature of is destructive of emerging new type and affirmation circumscribe the "use of natural resources of the planet, forms of conventional and non-conventional energy, while protecting and preserving our environment" [1].

According to Robert Allen, durability express the a use of "species and ecosystem levels and in ways that allow them to renew themselves for any practical purpose ... development that makes long-term human needs and improve quality of life"[2]. Goodland R. and G. Ledec,

believes that "sustainable development is a model of structural economic and social transformations available without jeopardizing the likely potential for similar benefits in the future ... sustainable development in natural resources rejuvenated so that is not depleted or degraded or not to undermine their usefulness for future generations also involves, depletion of non-renewable resources at a rate that ensures high probable transition to renewable energy resources ... "[3].. After Lynam J. K. and RW Herdt, sustainability is "the ability of a system to maintain output at a level approximately equal or higher than its historical average[4]. In conception of David Pearce "sustainability criteria required conditions for equal access to basic resources that are available for each generation" which presupposes a series of constraints by which resource consumption rates not be higher than the rates of regeneration of the thereof and the environment use to be a waste of storage space, so that "waste production rates do not exceed rates of assimilation (natural) by the corresponding ecosystems"[5]. Sustainable development in the minds of Tolbc MK, aims to: help for the very poor because they have no other option than to destroy their environment, the idea of a secure development within the constraints of the development of natural resources, developing cost-efficiency, using different traditional approaches to economic growth, which means that development must not degrade the environment or reduce long-term productivity, food security, clean water and shelter for all[6]. Giliman R. defines sustainability as "the ability of a society, ecosystem or any such existing system to operate continuously in the indefinite future without reaching to resource depletion key. In terms of Rockelshaus WD, "sustainability is the emergency doctrine by which development and economic progress must occur and be maintained over time, within the limits set by ecology in the broadest sense ..." [7].

Sustainable development issues has been treated by other specialists in a series of articles here can remember: George Hughes, [8]. Sirak Ercan and Choi HwankSuk [9],

Joachim Spangenberg[10], Ko Tae Gyou[11], M. Redcliffe and G. Woodgate[12]., Andrew Holden[13]. As for the FAO concept, sustainable development assumes planning and conservation of natural resources and targeting technical and institutional change in a vision that ensure the needs of current and future generations ... conservation of land, water and plant assets and zootechnical, use of hazardous materials to the environment, technically adapted, economically viable and socially acceptable. Therefore, sustainability is not only the environmental aspects of sustainable development, on the contrary, this process objective is prefigured in a global perspective, overall agronomic, economic and social given equal importance and refers to optimization of resources, environmental management and abundant supply products, stable and healthy[14].

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MATERIALS AND METHODS

The material presented was developed principally based on the study of numerous professional papers, articles and studies in international databases.

Methodological approach undertaken has comprised three steps summarized in the figure below:

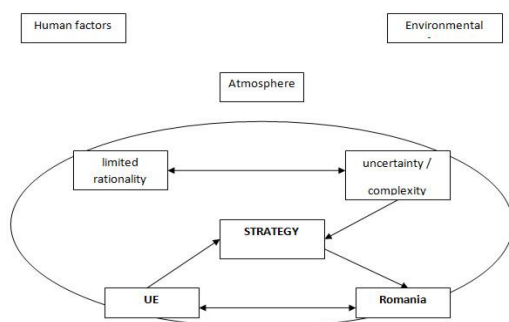


Figure 2: Framework for analysis of sustainable development

1. Defining the process of sustainable development.

The approach was done in those presented previously, just mentioning that internationally, the concept of sustainable development has begun to be addressed more intensively used since 1987, with the publication of the report "Our Common Future" by the Commission World Environment and Development report better known as the "Brundtland Report". Otherwise, experts around the world agree that the largest and most comprehensive definition of this concept is provided by this

report that sustainable development is "development that allows meeting the needs of the present without compromising the ability of future generations to meet their own needs "[15].

1. Delimitation of the concept of strategy. In economic literature the concept of strategy is widely debated, both macroeconomic and microeconomic level.

In the international literature, popular approaches to strategy have authors like Igor Ansoff, Peter Drucker, Alfred Chandler, RE Miles and C.C. Snow [16] A. Campbell and M. Goold[17], R. Lynch[18] and others. Igor Ansoff, otherwise considered the father of strategic management considers strategy as "joint shaft organizations activities and products / markets, defining the essential nature of economic activity, which accomplishes or requires the organization to do so in the future"[19].

2. Romania contextualization strategy for sustainable development based on the sustainable development strategies of the European Union.

The chosen instrument of the European Union[20] to carry out the objectives of sustainable development set is represented by an integrated strategy addressed to all Member States, for example to increase the general welfare level components and whole and also as a condition of operation partnership with them.

In the Strategy, in addition to goals very important is the set of indicators which may help the assess how and project duration to progress leading to achieve the desires sustainable development.

We consider: human development index (Human Development Index - HDI) proposed by UN sustainable economic prosperity index (Index or Sustainable Economic Welfare - ISEW) proposed by Herman Daly and theologian John Cobb and consumption of cereals per capita. Recent research in our country, concluded that sustainable human development, can be expressed by a system of indicators covering three groups of parameters:

- a) indicators of economic sustainability,
- b) indicators of social sustainability,

c) indicators of the sustainability of the natural environment.

This system can measure, on the one hand, the extent of the process of sustainable development that is performed in each country, and on the other hand, allows international comparisons in the degree (level) sustainable human development.

Human Development Index (HDI) is composed of three indicators: longevity, knowledge and control of resources needed for a decent life.

For longevity is proposed average life expectancy for knowledge - enrollment quotas to and of resources control - gross domestic product (GDP) per capita.

HDI is considered as a complex indicator for measuring progress, says nothing about environmental degradation.

He may know a long-term improvement, when in fact, there is a natural worsening of environmental conditions.

Index of sustainable economic prosperity (ISEW) is considered to be most complete indicator of living environment today, because he measures both average consumption and distribution of environmental degradation.

Using this indicator requires more accurate and comprehensive information about the quality of the natural environment.

Per capita grain consumption is a relevant indicator of the standard of living in low-income countries as a barometer cereal production is more sensitive to degradation of the natural environment than it is the income.

The basis for creating strategies is represented by models of sustainable design in maximal variations (strong sustainability), who sought for compulsorily structural organization and functional conservation of natural capital, or less ambitious versions (weak sustainability), which involve substitution of acceptance components of natural capital respectively the resources and services produced by socio-economic components of the system, ie the goods and services in the market to increase the welfare[21]. There were several versions of the Sustainable Development Strategy of the European Union in 2001 and 2006, which

emphasizes conservation and prudent use of natural capital because evidence problems in the environment and society caused by overexploitation and pollution.

Romania must assume, as a member of the European Union[22], the implementation of the *acquis communautaire*, favoring it required changes in all areas and especially necessary steps to adopt sustainable development model, conforming in every respect with obligations imposed by the European Union.

This means creating and harmonizing National Strategy for Sustainable Development so that it can achieve its objectives phenomenon which aim at developing of nature and economy at the same time.

RESULTS AND DISCUSSIONS

In November 2008, the Government of Romania and the Ministry of Environment and Sustainable Development, in collaboration with United Nations Development Programme experts - National Centre for Sustainable Development, developed and submitted to economic environments of our country and abroad Sustainable development strategy in medium and long term of Romanian economy.

The economic conjuncture and financial crisis, reflected by the financial crisis and then economic that broke out in October 2008 put in difficulty, and then in the situation to be delayed and / or canceled, his objectives.

In short, the defining element of the Strategy is fully connecting Romania to a new philosophy of development, the European Union and widely shared its own world - that of sustainable development [23].

In the preamble of the document, the authors started from the finding that at the end of the first decade of the XXI century, after a long and traumatic transition to pluralist democracy and market economy, Romania has to recover considerable differences from other Member States of the European Union simultaneously with acquiring and putting into practice the principles and practices of

sustainable development in the context of globalization.

With all progress made in recent years, experts believe that it is a fact that Romania still has an economy based on intensive use of resources, and an administration society still in search of a vision and natural capital affected by the risk of damage that can become irreversible.

The strategy sets concrete targets for passing, within a period reasonable time and realistic at the development model generator of high added value, propelled by interest in knowledge and innovation-oriented continuously improve the quality of people's lives and their relationships in harmony with the natural environment.

As a general guideline, the strategy aims at achieving the following main objectives in the short term, medium and long :

Horizon 2013: Embedding organically the principles and practices of sustainable development into all policies and programs in Romania, as an EU Member State.

Horizon 2020: To reach the current average level of EU countries in the main indicators of sustainable development.

Horizon 2030: get significantly close to the average in that year of EU countries from the standpoint of sustainable development indicators.

It is considered that achieving these strategic objectives will provide in medium and long term of term, high growth and therefore a significant reduction in socio-economic gaps between Romania and the other EU Member States.

Through the synthetic indicator which measures the real convergence process, the Gross Domestic Product per capita (GDP / capita) in purchasing power standard (PPS), the Strategy creates the conditions as GDP / PPS exceed 50% in 2013, half of the EU average in that time, approaching 80% of the EU average in 2020 and be easy superior to the level EU average in 2030.

As a complement of the objectives derived from the actions, national development plans and programs, approves the main directions of action strategy for the adoption and

implementation of sustainable development principles in the immediate aftermath[24]:

(I)Correlation of rational development objectives, including investment programs in inter-sectoral and regional profile, with the potential and capacity of sustaining of natural capital;

(II)The accelerated modernization of education and training and public health servicestaking into account the the unfavorable demographic developments and their impact on the labor market;

(III)The use of the best available technologies, economically and environmentally, in the investment decisions of public funds at national, regional and local levels and stimulate such decision from the private capital, introducing strong eco-efficiency criteria for all productive activities or services;

(IV)The anticipation of the effects of climate change and the development of certain long-term solutions for adaptation as well as of plans for the inter-sectoral convergence measures, including portfolios of alternative solutions to crisis situations generated by natural disasters or anthropic;

(V)Ensuring the food security and safety by harnessing the comparative advantages of Romania regarding the development agricultural production including organic products;

(VI)Correlation of quantitative and qualitative measures to increase agricultural production in order to ensure food for humans and animals with the requirements of increasing biofuel production without compromising the the requirements on the maintenance and enhancing soil fertility, biodiversity and environmental protection;

(VII)The need to identify additional sources of funding, in the conditions of sustainability for realization of large projects and programs, particularly in the fields of infrastructure, energy, environment, food security, education, health and social services;

(VIII)The protection and enhancement of cultural heritage and national connecting to norms and standards regarding quality of life should be accompanied by revitalization, in modernity, of the traditional ways of living

together. According to the authors, the Strategy proposes a vision of sustainable development of Romania in the next two decades, with goals that go beyond electoral cycles and cyclical political preferences.

CONCLUSIONS

So is considering targets for who lead in a reasonable time and realistic to a new development model of the European Union in the world - that of sustainable development are obtained high added value due the interest in knowledge and innovation and is oriented towards the welfare of human life and harmonious relations between people and the natural environment. The strategy at Romania level as a member state of the European Union follows agreed objectives at Community level, in particular those stated in the Accession Treaty, in EU renewed for Sustainable Development. The goal that is considering the strategic objectives represents obtaining a high economic growth and a reduction in the economic and social gaps between Romania and other European Union member states. Thus it is envisaged that the indicator GDP per capita of Romania in 2013 to exceed the EU average since then, to approach the that from 2020 and be higher than the average of 2030. European Union Strategy includes procedures for implementation, monitoring, reporting taking into account fulfilling their commitments every two years by the European Commission and the Member States.

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EVALUATION OF THE IMPACT OF INNOVATIVE PROJECTS ON THE COMPETITIVENESS OF AGRICULTURAL HOLDINGS IN SLOVAK REPUBLIC

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Abstract

The scientific paper evaluates the impact of innovative projects on the competitiveness of agricultural holdings in SR. Evaluation of the impact of innovative projects on competitiveness of agricultural holdings was realized on the selected holdings in Nitra and Trnava region. For the evaluation was used RCR coefficient. With the use of RCR coefficient could be confirmed the scientific hypothesis - The innovative projects realized through Program for rural development SR 2007-2013 have positive impact on competitiveness of agricultural holdings. The possibilities for EU financial support for innovative projects in SR represent important source for introduction of new innovative technologies into production process and in future they can significantly contribute to the growth of competitiveness of agricultural subjects. Therefore, to increase competitiveness of agricultural holdings it is important to focus on modernization of machinery and buildings, use of natural sources for energy production, but also to increase the education and the flow of information between rural inhabitants, mainly farmers. In competitive area of EU agricultural sector it is necessary that agricultural holdings will innovate, not only to create independent flow of innovative products and knowledge, but also to increase its value on internal market. Agricultural holdings – receivers of financial support – have expressed the opinion that financial support realized through PRD SR 2007-2013 had definitely allowed them to implement new processes and products.

Key words: agricultural subject, competitiveness, financial support, Innovations projects, Program for rural development SR 2007-2013

INTRODUCTION

Innovations present one of the most important motive forces for business and economic development. Innovations are basis of gaining and sustaining enterprise competitiveness. However, they have more significant meaning at the level of agricultural subjects, which produce adequate amount of high quality food not only for region population; they also ensure sustainable regional development and landscaping. The aim of the paper is to evaluate level of innovative efficiency of Slovak Republic focused on evaluation of supporting the innovative project (realized via PRD SR 2007-2013) in agricultural holdings in Slovak Republic, mostly those in west region of Slovakia.

Traditional understanding of innovations as a science based on technological process can be also applied in rural areas [7].

Modernization and implementation of new technological innovations needs to be understood as a very important component of supporting dynamic development of agriculture in Slovak republic, which will be competitive not only on the domestic market, but also on the European one.

In the frame of regional integration, competitiveness of agriculture is influenced by factors connected with innovations, financial sources, productivity, vertical coordination and other support and market regulations. They can be supplemented by marketing, informational and integral techniques [4].

It is necessary to understand rural development as a very important factor of reconstruction, diversification and innovation in rural areas, whereby it helps to stabilize the employment and life in rural areas. At the level of EU we can identify the growing relationship between natural sources and

innovations in connection with strategic importance of sustainable technologies based on the use of local rural sources (e.g. wind, water and biomass).

For the creation of multifunctional agriculture and rural development are the measures of Common agricultural policy EU oriented to setting out the sustainable agriculture in EU member state, where the use of agricultural land defines the main task in the competitiveness of rural economies and rural areas. European community puts accent on increasing the competitiveness of agriculture. Therefore also Slovak republic involves this goal in its plans. SOP agriculture and rural development 2004-2006 and Rural development Programme for SR 2007 – 2013 [5] are based on measures which are oriented on increasing the competitiveness in agriculture and forest sectors. Based on given facts was the research oriented on appraisal of the impact of innovative projects on competitiveness of agricultural holdings in region Nitra and Trnava. If we are facing the tasks of evaluation of competitiveness in sector of national economy, it is important to consistently consider all possibilities of research.

The competitiveness in sectors is reached, if individual enterprises are able to sell products and services for the price and in quality which is at least on the same level as their competitors. Therefore - basically – the competitiveness should be seen as economic efficiency or productivity [2]. By the ambition to define the competitiveness we can see, that there is no uniterm definition. It is necessary to realize, that the competitiveness is not only in comparative advantage, but also has to include the condition of sustainable development and rural development and throughout also the condition concerning the quality of life. Several points of view for this parameter do exist, which allow focusing on the competitiveness in agriculture in various dimensions [1],[8]. Besides the tasks of choosing the level of competitiveness there comes out the question, what is it main indicator. If it is reaching profit, high salability of enterprises products or reaching good economic results in other economic

indicators. It is clear that the complexity in evaluation of competitiveness is necessary. We will try to fulfill this condition by evaluating the competitiveness on by using the complex competitiveness indicator (RCR). Also the issue of financial support in agriculture is very specific. It is necessary to note, that by solving the financial support stimulus we are facing with the wide range of opinions. By evaluating the direct and subsequent effects of support policy in agricultural sector the effect of agricultural support is very important in productive regions as well as in less favoured areas. The support policy and supported programs do significantly contribute to the economic growth in enterprising in agriculture and it is important to mention also their influence on quality, production as well as on rural development.

Identification of knowledge together with results of scientific-technological research represents important basement for innovations, which are realized in rural areas [3] and definition of rural innovations is to be understood as introduction of new element (significant change) into economic and social life in rural areas, which adds new economical and social value to the life in rural areas. Mahroun et al. [3] are identifying 3 types of rural innovations:

- ⇒ Innovations created in rural areas which are applicable widely
- ⇒ Innovations created in industrial centres and applied in rural areas
- ⇒ Innovations which can be understood as all-purpose genesis and are having strong impact on life in rural areas (f.e. internet)

Named types of innovations are linked to each other in the frame of market mechanism in rural area.

MATERIALS AND METHODS

The research was realized as a part result of the VEGA project n. 1/1213/12 Variant approaches of measuring competitiveness of regions. As materials were used data (economic indicators) of 38 observed agricultural holdings (Nitra and Trnava

region) as well as data provided by Payment agency of SR and Eurostat data. Evaluated period was 2007-2011 (compared to period 2004-2006).

The evaluation of the impact of innovative projects was realized by using the statistical method:

RCR coefficient („Resource Cost Ratio“) for determination of the competitiveness level of agricultural enterprises

RCR <0 – 1,0> competitive enterprise

RCR > 1,0 the enterprise is not competitive

The RCR coefficient is calculated as ratio of costs and revenues. Costs included material costs, production costs, depreciation of fixed assets, taxes and charges. Revenues included profit from goods sales, production profit and financial support realized via PRD SR 2007-2013.

Evaluation of the RCR coefficient was used for confirmation of the hypothesis.

Research hypothesis:

Innovative projects in agriculture do have positive impact on competitiveness of agricultural subjects in region Nitra and Trnava. In paper were used also qualitative methods - dialogue with selected beneficiaries of Programme for Rural Development for SR 2007 – 2013. Other methods used for the fulfillment of the research were mathematic-statistical data analysis, regional comparative analysis of selected economic indicators and driven dialogue with the Payment agency of SR experts.

RESULTS AND DISCUSSIONS

The scientific paper focuses on the identification of innovation factors and the evaluation of the impact of innovation projects supported by EU Funds (European Agricultural Fund for Rural Development – EAFRD) oriented on agriculture and rural development for improving the competitiveness of agricultural enterprises.

Innovations can be understood in wide range complex. They can be understood through introduction of new product, new technological process, new organization or new markets. This definition can be applied in

rural areas as well as in urban areas. Based on the low population density and relatively insufficient level of human and physical sources have the rural areas arranged connection to the research centres, therefore they are limited by production of innovations. Innovations in rural areas can include adaptation of wide range applicable innovations, modernization of traditional know-how, or search for new solutions in connection to rural problems, which can not be solved by intervention of other policies in sustainable way.

Agricultural holdings in SR can receive EU financial support for innovative projects through Programme for Rural Development (PRD SR) for the years 2007 – 2013. This document involves the priorities of National strategic program for rural development of SR and contributes to the fulfillment of Lisbon strategy in areas focused on knowledge, innovations, internal market and enterprise environment, growth and employment and sustainable development. Programming period 2007-2013 continues on focusing on main priority - rural development which can be reached by improving competitiveness in agriculture and forestry sector through modernization of primary sector. Agricultural enterprises in Slovakia are using the possibility to receive the EU financial support from the EAFRD on innovative projects inside the priority 1 – Support of modernization, innovations and efficiency of agro food and forest sector.

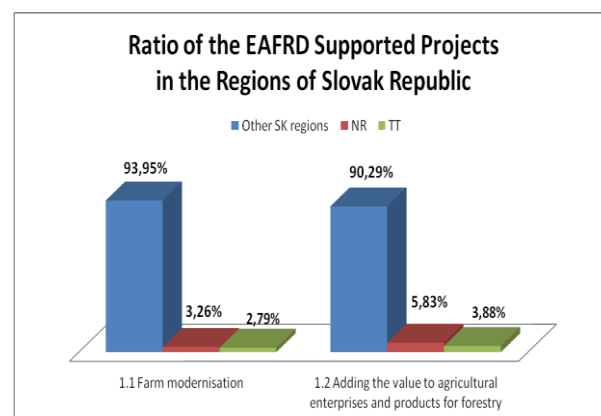


Fig 1. Ratio of the EAFRD Supported Projects in the Regions of Slovak Republic

Source: Author's calculations based on Agriculture Paying agency (APA) data, 2011

Fig.1 evaluates the distribution and the intensity of financial support expended from the Fund EAFRD for the innovation support view during the years 2007 – 2010 realized in the frame of Rural development Programme for SR 2007 - 2013, axis 1 improvement of competitiveness of agricultural and forestry sector, measure 1 - modernization of agricultural holdings and measure 2 - adding value to agricultural and forestry products. As shown in fig.1, in convergence regions of Slovakia (whole area of Slovakia except Bratislava region) and other regions in the frame of measure 1.1 - Farm modernization, there were 645 contracted farms, in total amount of 263,72 mio. EUR (32% from planed number of supported farms for the years 2007-2013 - data until 31.12.2011). Under the measure 1.2 - Adding the value to agricultural enterprises and products for forestry, there were 103 contracted agricultural subjects in total amount of 121,1 mil. EUR. This represents support of less number of agricultural subjects comparing to the measure 1.1, only 23% from planned number of 450 subjects [6].

The possibilities for EU financial support for innovative projects in SR represent important source for introduction of new innovative technologies into production process and in future they can significantly contribute to the growth of competitiveness of agricultural subjects. Therefore, to increase competitiveness of Slovak enterprises it is important to focus on modernization of machinery and buildings, use of natural sources for energy production, but also to increase the education and the flow of information between rural inhabitants, mainly farmers.

The impact of innovative projects based on improvement of market access and on increase of the market share of agricultural subjects can be evaluated through following criteria – introduction of new products or technological processes. Based on the innovation definition was analysed the number of projects introducing new techniques, technologies or products, which are to be understood as innovative projects in Nitra and Trnava region, as shown in table 1.

The share of mentioned agricultural subjects on total number of observed subjects was low, mostly the holdings tend to introduce new products.

Table 1. Number of projects introducing new techniques, technologies or products, which are to be understood as innovative projects. (Region Nitra and Trnava)

	Number of holding	Share on total observed holdings
New techniques	5	46,7%
New products	6	2,1%
Without introduction of changes	4	44,6 %

Source: Author's calculation based on information from observed agricultural holdings, 2011

The aim of the research was also to evaluate how the effective change of production or use of productive factors caused the change in basic structure of agricultural products. For the evaluation were compared selected economic indicators by observed agricultural holdings in Nitra and Trnava region (fig 2).

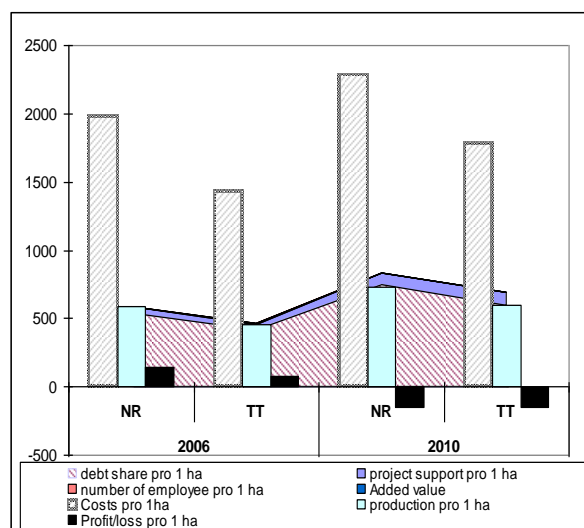


Fig 1: Comparism of selected economic indicators evaluated by observed agricultural holdings in Nitra and Trnava region years 2006 and 2010 (EUR.ha-1)

Source: Author's calculation based on data from observed agricultural holdings, 2012

Based on the comparism shown in fig. 2 we can state that the debt share pro 1 ha u.a.a. increased in agricultural holdings in Nitra and Trnava region. Increase was also observed by indicator – production pro 1 ha u.a.a. in Nitra as well as in Trnava region. Indicator added value showed plus value in year 2006, but due to the economic stagnation in years 2009 and 2010 was the added value negative. The same

results were calculated also by the indicator profit. Based on the employment evaluation it is possible to determine evident decrease of employees. In evaluated agricultural holdings of Nitra and Trnava region were observed changes in profit as a contributor of added value. We can state, that in certain evaluated agricultural holdings based on specific conditions in agriculture a significant change in structure of basic products was observed. This change was caused by introduction of alternative products, or by the use of other technique based on the realization of projects. In these holdings was also the increase of added value observed.

Based on the evaluation the innovative projects contributed to the creation of profit. The main contribution was evaluated in the decrease of labour production intensity. Also was observed the stabilization and moderate increase of utilized agricultural area (u.a.a.) and increase of shareholding assets pro 1 ha u.a.a. in Nitra region holdings and moderate decrease of shareholding assets pro 1 ha u.a.a. in Trnava region holdings.

Based on the research were following factors influencing the realization of innovative projects determined:

- Professional management of projects – significant influence on the positive project implementation
- Production extensity
- Regional support
- cooperation (mainly with research centres)
- suitable enterprise plan (from the long term view)
- agricultural holdings assets (financial position)
- farm size – the results showed dominant interest for innovative projects by agricultural holdings with u.a.a. over 1000 ha, number of employees more than 25, legal entity – Ltd..

Agricultural holdings – entitled to receive project support stated, that financial support realized through PRD SR 2007-2013 allowed them to introduce new techniques and products. Based on this statement, we can evaluate the positive impact of financial

support realized via PRD SR on enterprising of agricultural holdings.

Evaluation of the impact of innovative projects on competitiveness of agricultural holdings was realized on the selected holdings in Nitra and Trnava region. For the evaluation was used RCR coefficient. With the use of RCR coefficient could be confirmed the scientific hypothesis.

In the research were compared two programming periods of SR (realized during years 2004-2006 in the frame of Sectoral Operational Programme Agriculture and Rural Development and during the years 2007-2010 in the frame of axis 1 of Rural development Programme for SR 2007 – 2013) in terms to evaluate competitiveness of agricultural holdings.

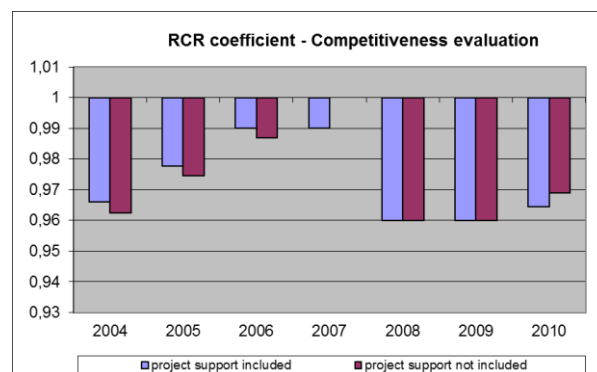


Fig 3: Competitiveness evaluation calculations based on RCR coefficient

Source: Author's calculation based on data from observed agricultural holdings, 2012

Based on shown fig. 3 agricultural holdings are competitive if the RCR index is between the range $<0-1>$. Based on the calculations we can state that during the years 2004– 2006 – implementation of SOP for Agriculture and Rural development – compared agricultural holdings were competitive. By the comparism of economic data with included financial support based on projects and without included financial support was the evaluated level of competitiveness lower compared to financial support realized via projects. During the programming period 2007-2013 was observed slightly lower level of competitiveness compared to the programming period 2004-2006. One of the main reasons is relatively higher financial costingness of projects in programming

period 2007-2013 connected to modernization, mainly to introduction of new techniques and technological processes. The competitiveness level of holdings in year 2010 was lower due to the higher credit carrying-capacity and due to the overall decrease of profit in observed agricultural holdings. It is necessary to state, that the return of investment is long term and needs to be evaluated for longer time period.

Main agricultural holdings are located in rural areas which do have special structural features, e.g. relatively low economic basis, limited business opportunities, low interface between sectors, relatively low level of knowledge transfer and lower competitiveness. Because of listed features, these rural areas belong to less favorite areas to implement innovations. Therefore, support of implementation of innovation on agricultural level is the main task of government support via Programme for rural development in Slovak republic for the years 2007-2013. Support goes to production facilities (agricultural buildings, storage capacities, machinery, technologies with the emphasis on innovative approach) and support on projects oriented on effective use of renewable sources should secure creation of strong and viable agricultural sector, which will fulfil the requirements of consumers by wide range high quality food supply fulfilling all requisite health and sanitary standards. It is requisite that agricultural subjects will realize technological innovations to reach the competitiveness not only on regional, but also on European level.

CONCLUSIONS

The scientific paper evaluates the impact of innovative projects realized via PRD SR 2007-2013 on competitiveness of agricultural subjects.

Summarization of results based on the realized research:

- Based on the realized research the scientific hypothesis was approved – Innovative projects in agriculture do have positive impact on competitiveness of

agricultural subjects (researched in region Nitra and Trnava)

- Holdings consider financial support (via projects) as an important support in connection to the competitiveness level
- Evaluated positive impact on competitiveness of agricultural holdings and increase of labor productivity (significant positive impact – evaluated in economically strong holdings)
- As one of the main determinant were indentified the costs of the project and approach to external financial sources (loans) – impact on differences in competitiveness level
- Innovative projects allowed holdings multifunctionality through diversification
- Based on evaluation of sustainability, the observed holdings realized new economic activities (not connected to the main production) in connection to use secondary products and diversification

Financial support allowed receivers of support to strengthen the production capacity, improve the use of factors of production and introduction of new techniques and products in short time period, which caused the maintaining and moderate increase of the competitiveness level (holdings in Nitra and Trnava region) in connection to their future activity, increase of the market share and more stable production and development in future.

Project support had indirect influence on added value in connection to short term evaluation – from the long term evaluation it is possible to assume more positive impacts on holdings.

The evaluation of PRD SR requires longer period for evaluation based on the long term returns on investments.

It is necessary to state, that not only the innovations and their introduction into production process, but also rational allocation of productive structures into the most favorable natural and production conditions and optimal combination and cohesion of main production factors use are contributing to strengthen the competitiveness of agricultural subject.

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BIOGAS AS AN ALTERNATIVE ENERGY SOURCE TO PROMOTE INDIGENOUS COMMUNITIES DEVELOPMENT

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Abstract

The key areas that determine the food and nutrition security are: availability, access, consumption and biological utilization. For this reason it is necessary to promote the health of vulnerable groups, in this case, indigenous communities, protecting and establishing conditions to ensure the human right to food. The initial plan focuses on developing facilities for small swine and poultry farms, familiar, non-commercial. The main objective of the pigs raised at the site will be the production of animal waste in order to implement digesters for the production of biogas as an alternative energy source, the production of meat stays in the background, thinking only about the community consumption and helping to ensure their food source, from this perspective, the technologies applied to rural and indigenous progress are environmentally friendly, socially just, economically viable and culturally acceptable. The theme of rural and indigenous Development is focused on their food security and the use of alternative energies, considering that energy is a key element in achieving sustainable development in all sectors, therefore sought from a broad perspective solidarity and actively promote greater and more rational use of energy and the environment in remote communities, through diversification of supply sources and efficient use, thereby contributing to environmental conservation and reduction of health problems through the use of appropriate technologies.

Key words: *alternative energy, biodigester, indigenous, rural development*

INTRODUCTION

According to the United Nations Organization for Food and Agriculture (FAO), the food security concept appears in the 1970s and refers to when people, at all times, have physical, social, and economic access to sufficient, safe and nutritious food to meet their nutritional needs and cultural preferences for an active and healthy life. (FAO, 2011)

The key areas that determine the food and nutrition security are: availability, access, consumption and biological utilization. It is for this reason that from the Transfer Program of the Experimental Station Fabio Baudrit Moreno (University of Costa Rica) has been promoted the care of vulnerable groups, in this case, indigenous communities, protecting and establishing conditions to ensure the human right of food.

Currently the world is undergoing major adjustments at the environmental level, humanity has been talking about climate change since several years ago, and how this change in the Earth's global temperature is affecting and will continue to cause all kinds of havoc; this project raises food production and sustainable energy options, seeking to

mitigate carbon emissions and above all are fit to deploy in areas of high socio-economic risk.

It is a given fact that human activities release greenhouse gases into the atmosphere, Botero (2000) says that agriculture and livestock are some of the most important, due to the release of methane gas, which is one of the gases responsible for global warming and climate change. Of the methane gas emissions generated by human activity, 30% comes from livestock.

Most of the methane released by livestock is produced by the "enteric fermentation" of food, by bacteria and other microorganisms in their digestive tracts. The methane gas emission due to anaerobic decomposition of manure also contributes to this effect, though to a lesser extent. (Castles, 2006)

Moreover, the use of chemical fertilizers increases emissions of other gases causing the greenhouse effect, nitrous oxide for example. According to Castles (2006), nitrogen containing fertilizers and many mineral fertilizers increases the natural processes of nitrification and de nitrification producing bacteria and other microbes in the soil. These

processes convert some nitrogen into nitrous oxide. The amount of this gas emitted for each unit of nitrogen applied to the soil, depends on the type and amount of fertilizer, soil conditions and climate.

It is an irrefutable fact that one of the new challenges we face today is, among others, the proper use of resources, to prevent misuse of them and eventually harm to us, to future generations and the ecosystem general. The use of biogas has become an excellent tool for the proper use of resources. An example of this is the possible cycling which could give agricultural products, which have the potential, through anaerobic decomposition, producing biogas, clean energy source. In this context, the biogas is an option to search for reducing dependence on small and medium producers to oil, and optimize agricultural production systems, in addition to helping reduce the environmental impact of human activities on the planet (Olivares et al. 2009). Works by Rojas et al., Canales et al. (2010) Dominguez et al. (2012) and Rivera (2010), are a good guide for the implementation of methodologies to study the variables related to the incorporation of digesters in rural areas. The methods include the study of different variables that indicate the status of the digester, the balance between carbon and nitrogen of the raw materials used the pH of the product, process temperature, and the components of biogas, among others.

The implementation of the technology developed in this project, allows the development of renewable energy (biogas), which in turn helps to mitigate climate change by reducing emissions of methane from the manure's anaerobic decomposition and to replace the use of nitrogen fertilizer, while ensuring vulnerable communities a more sustainable option to cook their food and eventually generate electricity and reduce costs.

MATERIALS AND METHODS

The project is being directed to different indigenous communities in the country, but mainly in the areas of Talamanca and Moravia Chirripo, specifically the Bribri and Cabecar ethnicities; looking for a strengthening of the

capacity to produce food for human consumption as well as how to cook these, thus enhancing food security within these social organizations. In order to aim this, we are promoting the operation of demonstration farms to transfer animal species for human consumption and grains and seeds preservations, assisting in the training and management of these demonstration farms, working with participatory techniques, in addition with the support of universal values such as friendship, trust, solidarity and active respect, it has been possible to build bonds between the University of Costa Rica and these indigenous communities.

Supported by the conviction that knowledge and study immerse in an area of freedom and mutual respect, indigenous families are able to organize and deliver their work. The people exchange seeds, build chicken coops and pigsties, the project provides species of poultry and pork. We have given training and support in the management of laying hens (Sex Link and Plymouth Rock) and herding chickens. According to this guideline, there is a total of more than 7000 animal species that have been delivered to them.

In the environmental axis, it is important to mention that biodigesters have been built; by this method animal excrement is transformed into methane gas, which is useful for carrying out the cooking of food. This practice has been a great impact on families benefited since the alternative they have always had is deforestation for cooking with firewood, a situation that is not sustainable with nature at all, also presents an immediate health problem.

To address these concerns, there is then the goal of the project: generate biogas as an alternative energy source, recording the response of the digesters over the use of different types of biomass for deployment in rural areas, comparing the use of mesophilic microorganisms and thermophilic as decomposers of organic matter used (agricultural products both animal and vegetable), and thus determine which is most suitable for implementation in high-risk areas. Beneficiary families have continued the project broodstock poultry and swine; this has

been a great impact on the families' diet and ensures the food needed to survive. We make regular visits to monitor the progress of the communities, also to extend assistance and training, both in the breeding of animals and preservation of grains and seeds. Special emphasis is on the participation of women and promotes gender equity which allowed even a very successful job. Stated above, then stated that parallel the main objective of the project (see above), it supports indigenous communities in establishing sustainable agricultural projects and activities become socially sustainable, economically viable and environmentally friendly; giving farmers, by the University of Costa Rica, a consulting and training services, helping to increase organic production and use of alternative energy such as biogas, establishing a sustainable and integrated farming system; promoting training in resource management natural and appropriate technologies to increase production by training in management and agricultural production, using the organic farm as a model that promotes the organization and self-sufficiency.

The methodology that has been followed is as follows:

A.Preparation of conventional digesters under low-load system, with plastic bag. It's important to mention that we consider several types of variables to be analyzed, such as: types of biomass to be used, for example, corn stover and sorghum, corn stover and manure, dung alone, corn stover and manure, swine manure, among other combinations of substrates.

B.Characterization of the biomass used. We determine the physical, chemical and biological properties of each substrate, and its dry matter yield and volatile solids.

C.Comparison of the efficiency of thermophilic and mesophilic bacteria versus time needed for decomposition of organic matter determined shall be taken into account parameters such as gas quality obtained: physical and chemical qualities, concentration of methane, etc.

D. Identifying the biodigester. Be appointed each digester with a key to the type of bacteria (mesophilic or thermophilic), and organic

matter used. For mesophilic digesters the key used is BM (BM1, BM2, BM3 ...) and for thermophilic is BT (BT1, BT2, BT3 ...).

E. Analysis of random samples for chemical studies, physical and biological. As for the sampling, normally there are a total of 15 samples for analysis.

In the case of the raw material that feeds the digester take samples of 500 g. in plastic bags, and the effluent was taken in 500 ml plastic containers. Laboratory tests are done in batches, following the standard norm #4630 from the Directors of the Association of German Engineers (VDI, for its acronym in English). For each test 1500g of bacterial inoculum is needed for each substrate and compare the ratio to 2:1 related volatile solids. To determine how much mass of the substrate is needed, the following formula is used:

$$\frac{M_{\text{substrato}} \cdot MS \cdot SV}{M_{\text{inoculo}} \cdot MS \cdot SV} = 0,5$$

For analysis of the obtained biogas production, records are taken and gas obtained characterization. Samples were measured in the content of methane, carbon dioxide and oxygen.

F.Temperature measurement. There are thermometers to determine the average temperature of the different digesters. Results are documented to have a scientific basis to tell us which method is best for us to develop in this case, comparing building materials, substrates used and the temperature of the medium.

G.Bacteriological analyses are done periodically in the laboratory, in order to determine the microorganisms' health and thus the digestate. Overall, it looks for "flakes of bacteria" look of golden brown under the microscope, if not, it means that the inner content of anaerobic digester is contaminated, usually with heavy metals which are inhibitors of the fermentation process bacterial and this leads to lower production of biogas.

RESULTS AND DISCUSSIONS

1.Diagnosis

1.1.About the indigenous communities

In Costa Rica there are identified eight

indigenous communities, spread across 22 territories. The gap characteristic of the country is also present in indigenous rural areas. The national indigenous population is 63,876 people representing 1.7% of the total population, the percentage of 60% of the population live in "shacks" with floor and roof made of palm leaves, 69% of territories have no water and use the water directly from rivers and streams, and only 65% have latrines

The majority of the Indigenous population is employed in agriculture and faces the same difficulties of rural households engaged in these activities.

Table 1. Distribution of indigenous areas in Costa Rica

Zones	Territories	Ethnicities
Huétar Norte	Quitirrisí y Zapatón	Maleku
San Carlos	Guatuso	Maleku
Chorotega	Matambú	Chorotega
Atlántico	Salitre, Cabagra, Talamanca, Kekoldí y Cocles	Bribri
Cabécar	Alto Chirripó, Tayni, Talamanca Cabécar, Telire, Bajo Chirripó, Nairi Awari y Ujarrás	Cabécar
Brunca	Boruca y Rey Curré	Boruca
Pacífico Sur	Abrojo Montezuma, Coto Brus, Conte Burica y Osa	Guaymí
Teribe	Térraba	Teribe

However, some of the indigenous people are located in rural areas in decline, with a significant deterioration in their economic and social fabric. This becomes more acute their poverty and food and nutrition insecurity. The people and territories are divided as follows:

1.2. Geographic Location of Indigenous Territories: inherent in its development.

There were a total of 63,876 Indigenous, of whom 79% live in rural areas. (Saborio 2011). It is necessary to specify the situation of indigenous people and territories in defining strategies and rural development initiatives that respond to their specific conditions regarding the disadvantages certainly show these territories, settlements as a remote location, lack of public services, lack of communication; is successful for these reasons the implementation of socio-productive development strategies, as this system takes into account the particular forms of social organization, modes of relationship established with the local base of natural resources, cultural identity and the possible development budget that can be given relating to the academic community and the private sector in a sustainable manner.

1.3. Contribution to increase organic production and use of alternative energy.

The project is supported by a sustainable agricultural system, integrated and organic; promoting the use of alternative energy through biogas production based on the waste generated by animal species. Also everything is conceived within the indigenous culture whose ancestral part is based on a vision of sustainability. The poultry component relies on this specific objective but like any other laying hen project requires concentrate or supplements, the vitamins required for these birds and at this point have been productive deficiencies due to lack of resources, however the values are acceptable and are around 75% position. Progress in integration understood as it has been found that all households in the project work within the framework of organic production.

Specific achievements have been made, for example: improving the quality of life of many indigenous families, as they are currently having a good number of laying birds and have consumed more than a thousand chickens. Clearly satisfaction between the families is seen, by having a continuous supply of pigs, including a boar of excellent quality. Today over 200 people have received maize seeds birds and Diamonds, about 20 families have benefited from the project pigs and now has three demonstration

gardens with their piggeries and poultry. At the administrative level there are two instruments, one for data and one participating families to make the visit reports. Furthermore, the garment has four manuals:

1. Recommendations for the care of newborn chicks and chicks
2. Guidelines for the construction and management of poultry farms
3. Guide management of laying hens
4. Food Safety Manual: Transfer of appropriate technologies for preservation of grains and seeds, to develop pig and implementation of alternative energy.

We plan to translate these books into the languages Cabecar, Guamé and Bribri, to facilitate communication with the people involved and continue with the dissemination of the project.

2. Impact

2.1. Food Security

It is unquestionable that food security is an issue of global and national course and that, changes in climatic conditions affect it through their impacts on all components of the global and national food systems.

Climate problems are accentuated more in our country as a tropical territory are droughts and floods, which are already suffering now direct impact on food production, the food distribution infrastructure, the incidence of food crises, goods and opportunities for livelihoods and human health in both rural and urban areas. (Arauz, 2008)

These project initiatives encourage better use of natural resources by indigenous rural communities in order to build facilities with appropriate technologies for livestock and livestock interest for planting, harvesting and preservation of grains and seeds. All this, in order to mitigate the negative effects that humans have made to their environment. The loss of biodiversity and ecosystem functioning in natural habitats should be mostly deforestation indigenous families performed in order to obtain heat energy to cook their food, that besides being environmentally destructive is a problem immediate public health because all the smoke from the burning of wood is inhaled by people and cause diseases such as whooping

cough, pneumonia, lung cancer, among others.

Families recognize the urgent need to address the needs of produce and consume their own food, but more than that they are pleased with the opportunity to cook their food in a more clean and healthy through biogas.

2.2. Productive

The main indicator of success is formed by low mortality rates poultry and swine, this shows that they are concerned about raising animals, participating families have achieved expertise in managing care techniques for poultry and pigs.

All families have poultry houses and piggeries in good condition. However weather conditions and terrain did not allow easy handling and installation of the biodigester.



Photo 1. Don Heriberto Herrera, working on cleaning the swine installations. Photography: C. Saborío

One digester was constructed in the Upper Chirripó, specifically in the family plot Aguilar Garcia, this was kept running until the weather caused the plastic bag was torn and therefore stopped working. We sought private sponsorship Olefins Company (marketer of plastics for agriculture in Costa Rica) and with the help of them are implementing organic digesters built with better materials, this to ensure the smooth functioning of the same and thus generate steadily biogas.

2.3 Training

Since its inception, the whole scheme of this project is based on the philosophy of knowledge transfer, therefore is to train future trainers. For this, we have completed different

activities for participants to interact with other participants and their future learners. Within this framework, it should take several steps to successfully carry out the project, as described below serves almost as a pre-feasibility study:

Table 2. Attendance at training workshop "Alternative Energy Transfer: Biogas"

Name	Procedence
Olivieth Cruz Arias	Cerere
Emilse Fernández M	Cerere
Heiner Fernández M	Cerere
Jairo Reyes Domínguez	Cerere
Abraham García Méndez	Bajo Chirripó
Abelino País País	Talamanca
Belkis Leiva	Talamanca
Micaías Morales	Talamanca
Acdiel Pita Smith	Talamanca
Ruth Leiva García	Talamanca
Jeannette Marín Mejía	Guatuso
Iris Blanco Elizondo	Guatuso
Mercedes Hernández	Guatuso
María Adelita Lázaro	Rey Curré
Alderico Aguilar García	Tsipiri Chirripó
Maricela Rosales H	Tsipiri Chirripó
María Dominga Lázaro	Rey Curré
Gerson Moya Reyes	Tsipiri Chirripó
Jorge Aguilar Rosales	Tsipiri Chirripó
Humberto Fernández	Tsipiri Chirripó
Mardania Moya Herrera	Tsipiri Chirripó
Gabriel Barquero	Tsipiri Chirripó
Dimas Durán Araya	Talamanca

1. Selection of participants should be clearly defined who or who will be the direct beneficiaries of the project, in that sense, they have already established links with different leaders and indigenous families.

We performed a digester building at the headquarters of the University of Costa Rica in Turrialba which was built for educational purposes in a training workshop was held on the first day of October, 2012, who attended the workshop will be the first beneficiaries.



Photo 2. Costarrican Indigenous building a biodigester with academic purposes. Photography: J. Rodríguez



Photo 3. Biodigester finished. Photography: C. Saborío

2. Availability of a suitable site for the construction of the biodigester: it must take into account that most areas where it wants to impact are highly rural and hard to reach, so you must choose the best, you can also find suitable properties soil, groundwater and not very high spaces available for further application of organic fertilizer produced.

3. Consistent long-term availability of suitable substrates that, since the composition and the paper should at least amount possible variable. If possible, only work with substrates with high energy potential and avoid transportation costs of organic material.

4. Marketing medium and long term products seeking to strengthen the subsistence economy of the indigenous communities involved, it is intended that once started and stabilized the production of biogas, every family will be able to exchange or sell gas and

fertilizer hours, as a method of interacting with each other.

CONCLUSIONS

Regarding the development of communities, it is recognized that there has been a significant transformation of rural indigenous, we have tried to create an environment with better links between urban and rural, the emergence of new product agricultural labor markets in the which handles increasingly population. The increased participation of women and youth in these markets is a significant fact that poses new challenges in terms of equity. The socio economy should be integrated as a systemic, thought in terms of local development regional-national, seeking to address rural-urban joint and regional imbalances generate permanently vulnerable populations migrate to the greater metropolitan area of the country. Also become relevant issues of gender equality, protection of natural resources and the participation of the municipal system, and introduces new guidelines for rural development, particularly in regard to the extension of principles, such as citizen participation in the processes of development, equity and sustainability. The main purpose of this work sustainably pursued, is to promote the welfare of vulnerable populations in more rural areas. Strengthening agricultural activities, diversification of the territories, creating diverse employment opportunities and ensuring food not only in quantity but also in quality, pursue reverse the decline and stagnation of indigenous, disadvantaged with changes in the economic growth model and the institutional system. Encourage the use of biogas among rural communities, bring great benefits both environmentally (reducing GHG emissions and mitigating the ecological footprint), and in terms of human health (by reducing the puffs of smoke, product of burning wet wood). Within this context it is important articulation of universities in designing comprehensive strategies, looking triangular efforts among producers (beneficiaries), academia (government) and business

(private), that go beyond the sum of shares sector performed in the territories, and achieve effective integration into the planning and development goals, defined from rural areas, is one of the major challenges faced in promoting the development of rural and indigenous.

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ECONOMIC AND SOCIAL ASPECTS OF THE DEMOGRAPHIC AGEING PROCESS IN THE REPUBLIC OF MOLDOVA

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Abstract

Purpose of this paper consists in analyzing economic and social aspects of demographic aging process in Moldova. To interpret the accumulated data and calculations performed analytical method of calculation tabular method and graphical method was applied. Intense process of aging is associated with changes in all spheres of social and economic life and affects equally the interests of older people and society as a whole. In Republic of Moldova aging population has grown in the last two decades, being conditioned both declining birth rate, which is very low and does not provide simple reproduction of the population and the mass migration of population that leads to the depopulation of the country. Maintaining the natural and migration increase with negative values amplifies the negative demographic deterioration of the country, which influences economic development, competitiveness and stability of the country and welfare of its citizens. In this situation it is necessary to respond positively to the challenges of demographic change through the complex and multisectoral approaches designed to correct current unfavorable demographic evolutions.

Key words: adult population, demographic aging, demographic situation, young population.

INTRODUCTION

The UN report regarding the analysis of the population age structure modification in the period 1950-2050 indicates that the current century will witness the rapid population ageing which is a global phenomenon affecting the life of everyone. The main problem, caused by the transformation of population age structure, consists in the multitude and complexity of population ageing consequences and their resolution can be hampered by the fact that social institutions of contemporary society were formed under conditions of young population. Population ageing presents a shift of the population age structure to mature ages and it is determined by the demographic transition process from high levels of natality and mortality, specific for the reproductive system of agrarian societies, to low levels of natality and mortality, characteristic for industrial societies.

Population age structure represents an important characteristic of each country. Population ageing is a consequence of the population age structure modification occurring in the process of demographic

transition or demographic revolution [5].

Population is considered „young” when people aged 60 and over are less than 8%. If their share is 8-12% - the population is in „the pre-ageing period”, and if it is 12% and more the population is ageing. The level of population ageing in a particular country is determined as follows: 12-14% - medium level, 16-18% - high, 18% and more - very high level. UN experts, analyzing the demographic processes and classification of countries according to the ageing degree, use the following criteria: young population has in its structure 4% of people aged 65 years old and older and for the mature population this index varies between 4-7%. If the share of people 65 and older is more than 7%, the population is considered aged.

In the Republic of Moldova, working population means men aged 16-61 years old and women aged 16-56 years old. The persons who exceed the limit of retirement age are considered aged. In the socio-demographic analysis the following classifications are used: children 0-14 years old, working-age population 15-59 years old and elderly people - 60 years old and over. [3]

Population ageing is a complex phenomenon having important implications in all spheres of life. In economics, population ageing have negative consequences on the economic growth, accumulation of savings, investment and consumption, labour markets, pensions, tax charges and transfers between generations. In the social sphere, population ageing influences family size and living conditions, dwelling requirements, migration trends, epidemiological situation and structure of medical services. On the political arena, population ageing may influence the outcome of elections and political representation system.

Globally, the growth rates of the elderly population is of 2,6% per year, considerably exceeding the growth rates of the total population. It is expected that by 2050, compared with other age groups, the elderly population will increase much faster. All the above mentioned require to elaborate and implement deep socio-economic reforms in most countries. [3]

MATERIALS AND METHODS

In order to achieve the purpose and objectives of our study there were used quantitative and qualitative research methods, allowing to determine the prevalence and extent of investigated characteristics as well as to evaluate the level and quality of life of elderly people. The quantitative research was based on the analysis of NBS statistical data obtained from household budget surveys, survey on labour force in the agricultural farms and other statistical data. There were also used a number of administrative data provided by National Social Insurance Office, National Agency for Employment and other institutions.

RESULTS AND DISCUSSIONS

Economic development of the contemporary world during the XXth century and at the beginning of XXIst century is characterized by the internationalization and integration of the world economy, increase of migration and information flows, development of new technologies which, in turn, caused significant

changes in the lifestyle of the population, value orientations, including the reproductive behaviour of the population. All this has led to deep changes in the demographic development of the world countries, manifested primarily by significant decrease of the birth and fertility rate, establishing a clear trend of population ageing.

The modification of population age structure, as a result of past demographic development features and disturbances of different nature, leads to economic, social and other consequences both for the entire country and for different parts of it. As a rule, these are long-term consequences gaining increased proportions or reducing to some stages of demographic development depending on the type of age structure. It should be mentioned that often the consequences of population age structure change are treated superficially, being reduced only to issues related to population ageing. But they have a much broader spectrum and include all age groups putting their mark on many social processes.

The changes in the age structure of the population involve changes in the general structure of social needs. For example, reduced number and share of children in the population structure results in fewer places in school and preschool institutions, and respectively, fewer teachers, educators, etc. Increased share of elderly people in the population structure causes the necessity to supplement medical and social institutions as well as to train special staff. Important changes related to the modification of population structure occur as well in other spheres of human life: personal, family, professional, economic, political, cultural, etc. So, this means emphasized changes in all spheres of the contemporary society, especially the society of tomorrow.

Population ageing is the most important and long-lasting change in the age structure of a population in the process of demographic transition. In the Republic of Moldova, population ageing has started later compared to many developed European countries because the decline in birth rate began with a disparity.

Statistical analysis proves that at present the demographic process in the Republic of Moldova started to repeat the demographic transition model that has been developed in recent decades in the developed countries and which is characterized by the shift from high levels of mortality and natality to lower levels. Having an inevitable character linked to the general trend of society modernization, the demographic transition in the Republic of Moldova performs some specific features because of the negative changes in mortality levels and a rapid decline of birth rate, fact that will contribute much to increase the rate of population's demographic ageing.

Population structure by age has the specific feature of population ageing, i.e. increased share of elderly men and women and reduced share of persons aged 0-14 years old. According to the population census in 2004 compared to 1959, the share of persons aged 60 and over increased from 7,7% to 13,78% and the share of young people aged 0-14 year old significantly reduced from 33,4% to 19,77%. During the same period the specific

share of adult population aged 15-59 years old increased from 58,9% to 66,45% (Fig. 1). Numerically, the number of elderly people increased by 3,3 times, from 222,5 thousand people in 1959 to 484,9 thousand people in 2004. At the beginning of 2008, the absolute number of persons aged 60 and over compared to 2004 decreased slightly reaching 488,4 thousand, which constituted 13,67% of the total population.

Due to the high mortality level of the working age men the population ageing phenomenon is mostly a women-specific process, fact which reconfirms the specific regularity of population ageing depending on gender. Currently, women represent more than 60% in the structure of population aged 60 and over. In elderly population the share of women aged over 60 is about 30,8%, while the share of men is 6% lower – 24,8%. Although, during the reference period the population of working age (16-56/61 years old) increased, the forecasts show that by 2013 this figure will decrease continuously.

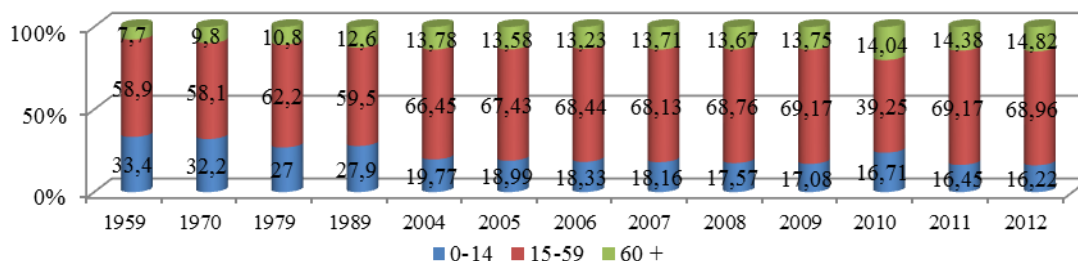


Fig. 1 Population structure by age groups (in %) in the Republic of Moldova in the period 1959-2012

Source: Elaborated by author based on data of NBS, Statistical Yearbook of the Republic of Moldova 2012, p. 36

In the evolution of population structure by age groups from territorial perspective, the transformations occurred similarly by reduced number of young people and increased share of the elderly population, due to the high level of birth rate decrease. Population ageing in the Republic of Moldova is uneven, from a territorial perspective the share of the elderly population in some districts varies from 10,7% in the center up to 24,3% in the north. The highest share of elderly population is concentrated in the north of the country, the estimated average being of 18,3%. The most affected districts are: Donduseni, accounting for 24,3% of the elderly population, Drochia – 21,6%, Briceni – 21,4%, Edinet – 21,1%,

Riscani – 20,4% and Ocnita – 19,8%. Only in three administrative-territorial units (Ialoveni, Chisinau and Calarasi) of the Republic of Moldova, the share of population aged 60 and older is less than 12%. Thus, it can be stated that, in a greater or lesser extent, all other administrative-territorial units are affected by the demographic ageing phenomenon. Analysis of population structure by large age groups - children (0-14 years old), adults (15-59 years old) and elderly people (60 years old and older) - demonstrates the existence of extremely large differences in the number of these groups at administrative-territorial level. It was highlighted a high concentration for the adult population (15-59 years old),

respectively, of the working age population, primarily in Chisinau municipality which has reached a share of 74,%. This is due to intense internal migration flow toward the capital, which is an administrative, political, economical and cultural center of our republic, the main reasons being related to work and study. Obviously, high development rate of the capital, residential construction, higher employment opportunities make Chisinau very attractive, especially for young people. A high share of adult population (working age) is also recorded in some districts located near the capital. Thus, in the districts Anenii Noi and Ialoveni, the share of working age people is of 70% and 70,6% respectively of the total population. In the north part of our republic the share of population aged 15-59 years old is the lowest, averaging 65,7%. Balti municipality located in the north is marked by a prominent concentration (72%). In the south, the estimated average (68,9%) is exceeded only in Basarabasca district, reaching 70,3%. [3]

It should be mentioned that the category of territorial administrative units with a relatively young demographic structure includes the localities with a high degree of economic development, which, in recent decades, have received a great part of immigrants (flows of people of working age) coming from localities with a low economic level, mainly from rural areas. Two municipalities: Chisinau and Balti attract young working-age population, allowing them to maintain a favourable age structure of the population, however, these two cities record the lowest number of children aged 0-14 years old. Children share in the capital, in the period 1990-2011, decreased from 23,9% down to 13,6%. The same situation is specific for Balti, where the percentage of children (0-14 years old) constituted 13,9% in 2011. In hierarchical order, Chisinau and Balti municipalities are followed by the districts located in the north of the country which record the lowest values of young population share and a high level of demographic ageing. The largest number of children in the population structure was recorded in Cantemir and Telenesti districts (21,1%). It should be noted that on the whole

territory of the Republic of Moldova, the rural areas compared to urban areas have a higher share of children in the age structure of the population.

In the next few decades, in the Republic of Moldova, population ageing process will continue rapidly. Even if effective measures are taken to stimulate birth rate, they will not significantly influence this phenomenon. Unstable socio-economic situation, underdeveloped labour market, low wages in the country, as well as the possibilities of free movement at least for medium term will stimulate negative external migration, which will continue to affect the age structure of population. Given that subsequent changes in the population age structure emerge quite clearly, they can be anticipated through the elaboration of appropriate measures that will allow the adjustment of all structures and society as a whole to these long-term demographic changes. Although the ageing process is inevitable, its consequences are largely determined by the approach to solve the discussed problem and by the elaborated sectorial options and programs.

The process of population ageing in the Republic of Moldova, unlike global trends, is more pronounced in the rural areas (table 1).

Table 1. Stable population by areas, gender and age groups on January 1, 2012, thousand people

	Total, thousand people	of which		
		Men and women aged 0-15 years old	Men aged 16-61 years old, women aged 16-56 years old	Men aged 62 years old and over, women aged 57 years old and over
Total,	3559,5	624,0	2369,5	566,0
of which:				
-women	1847,8	303,1	1150,3	394,4
-men	1711,7	320,9	1219,2	171,6
including:				
- urban areas, total	1485,7	221,5	1038,7	225,5
of which				
-women	787,4	106,5	522,3	158,6
-men	698,3	115,0	516,4	66,9
- rural areas, total	2073,8	402,5	1330,8	340,5
of which:				
-women	1060,4	196,6	628	235,8
-men	1013,4	205,9	702,8	104,7

Source: Elaborated by author based on data of NBS, Statistical Yearbook of the Republic of Moldova 2012, p. 39

The variations in population distribution by areas are unessential. In 2011, the urban population ratio was of 41,7%, the lowest

found level in Europe which indicates the country's economic underdevelopment. In absolute values we observed that urban population decreased more than the rural one, leading to a relative process of ruralization, contrary to global trends, but which is also an indicator of disadvantageous character.

Population ageing, evaluated from territorial perspective, is more pronounced in the rural areas, establishing significant differences between towns and villages. Statistical data analysis according to the area of residence, shows that almost 15,5% of the rural population is over the age of 60 years old (in urban areas – 13,7%), and the share of elderly women in the total female population was of 18,4% at the beginning of 2012.

Statistics confirms that male population in the urban areas in recent years is characterized as a relatively young population (the share of age groups over 62 years old is only about 10%) and in rural areas it exceeded the ageing limit, accounting for 12%. Urban female population aged over 57 years old makes up 20% and in rural areas it is characterized by a high degree of ageing (23%), which suggests that population ageing is primarily determined by the ageing of female population in rural areas. Population ageing is a consequence of the increasing share of adults and the elderly people, while the share of children and adolescents is lower and therefore there is an increase in the average age of the population. The evolution of ageing process is characterized by the following features: it is more intense for women than for men due to higher life expectancy of the female population; it happens more intensely in the rural areas compared to urban areas due to longer life expectancy in urban areas. Therefore, population ageing is mainly a women-specific process, due to high mortality of the working age men. Currently, in the structure of population aged 60 and over, the women constitute more than 60%.

Population ageing coefficient (the number of persons aged 60 and over per 100 inhabitants), in the period 1980-2011, had an unstable evolution, with a tendency to increase from 10,7 in 1980 to 13,9 in 2003, then it decreased insignificantly reaching 13,5

in 2006. From 2007 to 2011 it had a tendency of increase up to 14,8 (if the value of this index is of 12,0 the population is classified as aged).

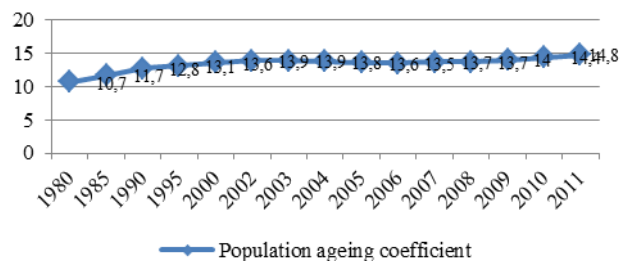


Fig. 2 Evolution of the population ageing coefficient in the Republic of Moldova in the period 1980-2011

Source: Elaborated by author based on data of NBS, Statistical Yearbook of the Republic of Moldova 2012, p. 39

This trend will obviously have impact on the age structure of human resources in the health care system so that the average age of the medical staff will continue to increase and the rate of retired medical staff will increase too.

The effects of population ageing are multiple and complex, having a significant influence on the social development and economic growth. This influence is manifested by health care systems, social insurance and labour force. A major concern is connected to the problem of ensuring the stability of retirement funds and increased expenses to form it.

It should be mentioned that in order to accomplish the objectives related to social protection of the elderly people, whose number is steadily increasing, offering them opportunities to get a worthy job in spite of the need or desire to remain economically active, and access to appropriate health care services will be difficult, especially for the Republic of Moldova. In the economically developed countries, the current and coming generation of elderly people, who live in conditions of economic stability and high living standards, had the opportunity to accumulate materials resources and are able to pay, for example, some social assistance or home care services or others, while in the Republic of Moldova current and future generations of elderly people have lost the accumulated money during the economic crisis in the 90's of last century, were unemployed or worked in the agricultural sector, receiving extremely low wages and

therefore fund allocations reduced. Without achieving an increased rate of economic growth and in order to solve this problem it would be necessary to increase the burden on the elderly working age population (raising taxes or other contributions).

The average life expectancy at birth is one of the main indices characterizing population health. Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.

At international level, there are deep contrasts, reflecting the economic gap between developed and developing countries. Technological, economic and cultural progress as well as policies and programs implemented over the last decade in the Republic of Moldova, generated positive results in many areas: increasing the level and quality of life, enhancing the access to medical services, improving population health and as a result, increasing life expectancy.

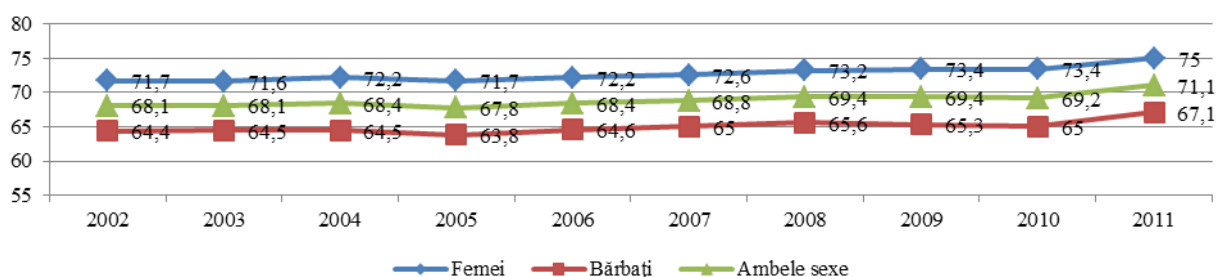


Fig. 3 Life expectancy at birth (in years) in the Republic of Moldova in the period 2002-2011
 Source: Elaborated by author based on data of NBS, Statistical Yearbook of the Republic of Moldova 2012, p. 40

Life expectancy at birth increased from 68,1 years old in 2002 to 71,05 years old in 2011, including 67,1 for men and 75,0 for women, which means that on average for both sexes during ten years it increased by about 3 years. Women live longer than men by 7,9 years. This difference is due to higher levels of premature mortality of men. Because of different mortality levels, the average life of urban residents was longer than of those from rural areas, respectively by 3,5 years for men and 3,2 years for women. Increased life expectancy, along with the reduction of fertility rate causes population ageing and this trend of increasing life expectancy at birth will continue in the future being a characteristic process of the European countries.

In terms of population ageing, the share of working age population is inevitably reducing and there is an inevitable ageing of the labour force itself. In this context, population ageing can become a factor that will hinder the economic growth, if we don't find the possibility to stop rate reduction of labour force and to implement effective measures to increase labour productivity. However, it should be noted that countries with relatively

young working population, including the Republic of Moldova, have a potential that can ensure economic growth. At present, we should not focus on measures that will be necessary only when there is labour force shortage, but it is necessary to focus our efforts on creating jobs for the economically active generations, especially for young people who will reach the working age. Labour market development, stimulated employment in the formal sector of economy will help to increase tax revenues and opportunities for expanding social programs for elderly people.

The transition to older age groups is often accompanied by lower living standards. Often reduced economic possibilities and worsened health make the elderly people vulnerable in terms of poverty. In the Republic of Moldova, the main material source for this category of people is the pension which is very modest, representing 28,7% of the national average nominal salary in 2011. Average old age pension in the Republic of Moldova is the lowest in Europe and covers only 58-60% of the subsistence minimum. More than 90% of retired people receive pensions of less than one thousand lei, which prevent some elderly

people to live a full life. The majority of elderly people are protected from health risks, disability and low living standards. Demographic transition submits a very difficult problem related to the insurance of pension systems viability i.e. creating conditions for the economic security of elderly persons. Thus, adjusting the rate of pensions to the living standards is still an important objective of policies connected to the population ageing phenomenon.

At the end of 2011 the number of pensioners was of 638,3 thousand persons, including 473,1 thousand reaching the retirement age, their share being lower compared with the year 1999, which is explained by the fact that currently, the generations entering retirement are less numerous as they were born during the war and post-war years and because of increased retirement age. In 2003, the share of 57 years old women reached the lowest value, while in the following years there was recorded a gradual increase in the number of women of this age, which obviously leads to increased number of retired women. Because of the difference between the retirement age for men and women, established by law (62 years old versus 57 years old) the wartime generations of men reach retirement 5 years later than women, thus, for men this process is just beginning.

Along with declining fertility rates and increasing life expectancy at birth, pension expenditures will have to increase, which presents a huge challenge for social insurance systems. Also, we have to mention that in the Republic of Moldova, the retirement age is much lower compared to developed countries. One of the measures that will help to reduce social expenditures would be to equalize the retirement ages for men and women which also could be a measure to stimulate participation in the labour force.

Insuring pensions for the elderly people, increased expenses for the health care and social services will be the most difficult medium and long term social problems in the Republic of Moldova, because of the fact that by 2015 the number of elderly people will increase continuously and taking into consideration that after 2020 the retirement age

will be reached by the people who are currently not employed or work without labour contract. Therefore, the minimum social service costs for them will be incurred by the social funds.

There are enough reasons to suppose that in the next few years, people who have reached retirement age will be professionally more active than their precursors. In the future, reduced natality rate will decrease the pressure of young people on the jobs of elderly people. Elderly people will have to work, because their significant number will not allow the young people with a relatively small share in the population structure to maintain them.

It should be noted that population ageing occurs in permanently changing social conditions: reduced family size, modified intergenerational relationships, concerns about caring for the elderly people. In 2011, in the Republic of Moldova, the number of families consisting of one person increased up to 25,9%. The persons aged 60 and over recorded the share of 20,2% in the total number of households. [4]

Changes concerning the disorganization of family structure and reduced size of households will have social consequences at both individual and society level. If before, the problems related to the elderly people were solved within the family, then at present and in the future, the society will have to involve itself more and more in order to solve these problems. Family alienation, rural-urban exodus of young people, industrialization and urbanization processes, as well as pension and health care insurance systems transferred some of the responsibilities for the elderly people outside the family, thus changing intergenerational relations. It is an obvious fact that the relative independence of the elderly people from their descendants caused some rupture between parents and children, accompanied by undesirable effects such as isolation, abandonment or institutionalization of the elderly person. The problem concerning the maintenance of an elderly person within the family raises the issue of developing the social assistance services at the community level.

Population ageing is accompanied by the process of epidemiological transition, characterized by the shift from the prevalence

of infectious diseases, high levels of maternal and infant mortality to the domination of chronic diseases in the population mortality structure. Demographic changes and epidemiological transition are in a strong correlation. As low birth rate and deadly infectious diseases take place, the average life of the population is increasing. In addition, there is an increasing life expectancy of people who have suffered from various childhood diseases. Consequently, the share of the elderly people, who are subject to chronic diseases in a greater extent than younger people, increases in the population structure. The higher numbers of elderly people the higher spreading degree of the non-infectious diseases. Thus, population ageing accelerates the epidemiological transition.

Population ageing will have a significant influence on the health care system, caused by increased mortality because of chronic diseases and by the number of people with disabilities (elderly people are more at risk of disability than younger people) fact which will require the restructuring of social services and extension of gerontological, rehabilitation and palliative care services.

CONCLUSIONS

Socio-economic status of any country is decisively determined by the quantity and quality of human resources. Contemporary demographic situation in the Republic of Moldova and outlined trends in this field can't ensure the sustainable development of the country. The process of population ageing becomes increasingly evident. Population structure records the constant growth of the elderly population, especially in rural areas. Other specific trends for our country include: the "ruralization" and "feminization" of the elderly population, increased number of elderly people who live alone and those who received a degree of disability. These events take place on the background of massive and long-lasting migration processes of young people for employment, fact which contributes to artificial ageing, to the transformation of the family role and importance - the main social institution to assist the elderly people.

In the next decades, the intensity of population ageing will increase the by the expanding number of elderly generations born in the 70-80's of last century, simultaneously with the reduced number of working age population as a result of less numerous generations born in the 90's of last century.

All the demographic processes and phenomena affect the sustainability of economic and social development of the country in general as well as the situation of the elderly people in particular. Therefore, our society must find ways to solve the dual problem: on the one hand - to ensure sustainable social and economic development of the state and on the other hand - to ensure the possibility that elderly people could live safely and decently and would be able to participate in society's life as full citizens.

For the Republic of Moldova, the stabilization of population ageing process involves removing demographic and discriminatory imbalances and asymmetries and adjusting the ageing process to real socio-economic conditions. In the short term, the solution for this issue consists in stabilizing the reproduction by consistent demographic and family policies. In the long term, it would be necessary to use these resources in the socio-economic development and adjust the social sphere to the demographic trends and sustainable standards.

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PARTICULARITIES OF EMPLOYMENT IN RURAL AREAS OF THE REPUBLIC OF MOLDOVA

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Abstract

The majority of employed population in rural areas is engaged either in agricultural activities mostly being informal activities, or they are employed in the public sector through the activities of education, health care, culture, social welfare, which are quite modest share in rural employment structure. Both agricultural activities, which can not ensure a rapid growth of labor productivity and employment in the public sector can not provide a level of income needed for a decent living where salaries depend on the limited possibilities of local budget. In the created conditions, in order to improve the situation of employment in rural areas the necessity to develop non-agricultural activities appears, it would increase rural incomes and would reduce urban migration.

Key words: agricultural activities, non-agricultural activities, rural areas

INTRODUCTION

The last two decades are marked by large-scale changes. The rejection of a centralized system of economic and social management and the appeal to some new principles of social and economic system organisation caused a massive economic recession in the 90s of the last century accompanied by a significant degradation of the society. Though some structural, institutional, legal, behavioural and so on changes, adjustments and readjustments were made during this period, that aimed to ensure the best possible functionality of the new economic mechanism based on market relations, competition and efficiency, we experienced a series of failures characterized by diminishing economic indicators, worsening quality of life and human capital degradation. The global financial and economic crisis, which with some delay impacted the Moldavian economy has worsened these disturbances by: the increased number of the unemployed, the reduced crediting of economic agents by commercial banks and the increased bank austerity, and correspondingly the decreased employment opportunities, the increased degree of inactivity, the increased migration

factor and the comparatively decreased social care.

Economic reforms in Moldova have led to significant changes in rural life too. The agrarian structure has changed; new forms of organization have appeared, such as: farm households, farms, individual enterprises. Fixed assets in agricultural production have been privatized, the era of safe sales with stable prices and unlimited capacity of the domestic demand for agricultural products has finished, competition as a market element has emerged. All this has led to the polarization of farmers, separation of a small number of efficient and competitive producers and marginalization of a significant number of other manufacturers on the one hand and to the emergence of unemployment, reduced living standards in rural areas on the other hand.

The ability of an economic system to function, in terms of labour power, is largely determined by the population number and structure as a part of this system. Therefore, the knowledge of various aspects of interaction between the population and labour market will initially require, an approach to the demography, as a system to provide the national economic system with the manpower.

Quantitative and qualitative changes of the demography produced throughout the post-war period determined the differences between the two residential areas, which are in their turn aspects that caused quantitative and qualitative changes in the labour force of the country. [3]

Poor social and economic conditions resulting from the reforms of transition to the market economy in Moldova, led to the reduction of natural population growth and increased permanent migration, which, in their turn, caused the steady decrease of the total population, which negatively impacted employment indicators. Although the socio-economic situation has made some progress in the country in the past five years, the number of the population continues to decline.

Rural poverty in Moldova is extensively studied in the special literature and perceived by the society as a crucial moment in the national development. To solve this problem one should increase rural incomes derived from farming, non-agricultural activities and migration of the rural population to urban areas. The former involves the increase of the farm product demand that will be faster than the growth of labour productivity in agriculture. Based on Engel's law, it is only possible by implementing agricultural protectionism, promoting local agricultural products on the world market and maintaining technologies that require the implication of the labour force in agriculture. Migration of the rural population to towns will contribute to the depopulation of rural areas, over-urbanization, loss of a part of the national culture and traditions related to rural lifestyle, other unintended consequences. If the rural population is not able to compete on the urban labour market, this will also lead to the shift of the rural poverty into towns.

The developed countries which faced the strong growth of the labour productivity in agriculture, finally stated the need to develop alternative employment in rural areas as an optimal strategy for absorbing surplus of the labour force in rural areas. The alternative employment in rural areas in Moldova is also evolving, but in most cases it is a spontaneous

process, which is monitored and supported by the public policy.

MATERIALS AND METHODS

The main sources of information used in the study are official statistics data provided by the National Statistics Bureau, the Ministry of Labour, Social Protection and Family, the National Agency for Employment and from other relevant studies. Taking into consideration the data collected we analyzed the population number and movement, employment and unemployment in rural areas of Moldova. The analytical methods of calculation, tabular and graphical methods were used to interpret the data collected. The analysis method was applied in order to interpret the received results. To draw conclusions the author focused on the method of induction and deduction.

RESULTS AND DISCUSSIONS

Against the background of radical changes in social and economic life of the country, the studied situation on the labour market is difficult. In other words, the labour market as one derived fully reflects the recorded success or failure of the national economy.

The labour market is a segment of the economy, which entered the crisis later than others. The rural market of the labour force faces greater difficulties, whose features make it difficult to realize a balance and must be taken into consideration when developing measures on employment and social care of the unemployed. The main characteristics of the rural labour market are dispersed employment (and labour force), lack of the territorial access due to the underdeveloped infrastructure, limitation of non-agricultural activities and employment spheres of the labour force, lack of the information of the rural population concerning vacancies, reduced liquidity of assets owned, low competitiveness of the labour force compared to the urban labour market, psychological factors, insufficient guidance for small business, seasonal fluctuations in labour demand. [2]

The second half of the twentieth century was characterized by the positive dynamics in the population number of the country. Thus, almost 30 years the number of the Moldavian population impressively increased - from 2,884,500 inhabitants in 1959 to 4,335,400 inhabitants in 1989 (Table 1), the absolute increase was 1.45 million people (about 50%). The discourage of the people due to the economic downturn that took place in the 90s of the last century, unfavourable age structure of the population and negative values of the natural and migration increase, caused a recession of the population number of the republic in the following period, which may be observed in our days too.

Table 1. The dynamics of the stable population by area and sex in Moldova, thousand people

Years	Total population	of which: on average		In % of the total	
		urban	rural	urban	rural
1959	2884.5	642.2	2242.2	22.3	77.7
1970	3568.9	1130.1	2438.8	31.7	68.3
1979	3949.8	1532.9	2416.9	38.8	61.2
1989	4335.4	2020.1	2315.3	46.6	53.4
1999	3649.9	1516.8	2133.1	41.5	58.5
2009	3567.5	1476.1	2191.4	41.4	58.6
2010	3563.7	1476.7	2087.0	41.4	58.6
2011	3560.4	1481.7	2078.7	41.6	58.4
2012	3559.5	1485.7	2073.8	41.7	58.3

The source: Developed by the author based on the NSB data, labour market in the Republic of Moldova 2012, p. 15

Thus, in 2012 about 3,559,500 inhabitants were registered in Moldova, this is about 90 thousand people less than in 1999 or 2.5%. Under these conditions, there were essential household and structural changes in the two residential areas, caused by some urbanization promotion policies, which resulted in the excessive growth of the urban population level compared to rural areas. The period from 1959 to 1989 was characterized by a three-fold increase in the urban population level, the increase was from 22.3% in 1959 to 46.6% in 1989 (+24.3 %), the increase of the rural population for the same period being as much as only 3.2%, its share decreased from 77.7% to 53.4%.

Overpriced housing and its increased maintenance costs determined a considerable flow of the population from towns to surrounding areas, which would explain the slow dynamics and hence the relative stability of the proportion of the rural population. The

sedimentation tendency of the rural population, which manifests itself in the last decade, associated with administrative-territorial reforms through which a series of villages obtained the status of an urban settlement, led to a slight decrease in the share of urban population in the last 10 years (the so-called ruralization trend of the population), characterized by an average annual growth of the rural population by about 0.1 per cent. A stabilization of the population structure by the residence are is observed in these conditions.

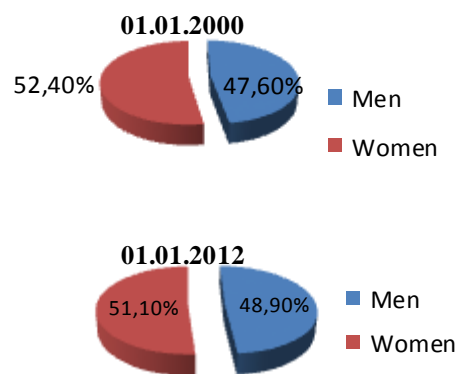


Fig. 1. The sex structure of the rural population in Moldova, on 1 January 2000 and 2012, %

The source: Developed by the author based on the NSB data, Moldova's population by age and sex, on the territorial basis, January 1, 2012, p.6

Thus, on January 1, 2012 Moldova had a relatively balanced population structure by sex: 48.9% men and 51.1% women, and it is relatively stable over the time, the rural area is characterized by a more balanced share of the two sexes than the urban one. So, early in 2012, the share of men in villages was 48.9% and the share of women - 51.1%. Meanwhile, about 52% of the total number of women and 48% of the total number of men live in rural areas. The above mentioned information indicates that the labour force demand may be greater in the country than in towns. According to the analysis, the dynamics of the gender structure of the population in rural areas is characterised by a slow, but continuing tendency to balance the shares of the two sexes. Thus, the difference of about 4.8 % between the sexes in favour of females in 2000 reached the value of about 2.2 % in 2012. This situation can be explained by an increased migration of women from villages

to towns, driven by higher benefits and labour market prospects that exist in towns.

Table 2. The distribution of the rural population by participation in economic activity in the Republic of Moldova during 2005 - 2011

Indicators	Years						
	2005	2006	2007	2008	2009	2010	2011
Active population, the total number, thousand people	776.2	739.4	724.5	710.9	669.6	639.6	650.8
of which:							
- engaged	745.1	696.4	698.6	691.8	636.1	605.0	616.7
-unemployed (ILO)	31.2	43.1	25.9	19.1	33.5	34.6	34.1

The source: Developed by the author based on the NSB data, Labour force in the Republic of Moldova, employment and unemployment 2012, p. 28

The aspects concerning the evolution of the key indicators of labour force participation in rural economic activity shows a continuous decrease in recent years.

Thus, from 2005 to 2012 the economically active population decreased dramatically, from 776,200 to 650,800 people (by 125,400), simultaneously there was registered a reduction of the employment from 745.1 to 616.7 thousand people or by 17.2 %. The share of the economically active rural population decreased too - from 36.5% in 2005 to 31.3% in 2011.

However, according to ILO, the number of the unemployed people increased from 31.2 thousand in 2005 to 34.1 thousand people in 2011 or by 9.2%. It should be noted that the increase of the number of the unemployed in rural areas took place against the background of a general decrease in the number of the unemployed from 103,700 in 2005 to 84,000 people in 2011 (-19.7%). A weaker consolidation of the labour market relations in rural areas, that is still in the formation stage and on the other hand, the lack of employment opportunities in this area results in the reduced flexibility of the market and therefore an increase number of the unemployed.

Although general trends of the number of the employed people in rural areas shows a major decrease in number, almost continuous, seen in terms of the age structure, this may show some peculiarities.

Table 3. The distribution of the rural population by age groups employed in the Republic of Moldova during 2005 - 2011, %

The age group	Years						
	2005	2006	2007	2008	2009	2010	2011
The total employed population	100	100	100	100	100	100	100
of which:							
from 15 to 24 years old	9.7	11.6	9.4	9.7	10.8	10.8	10.1
from 25 to 34 years old	16.2	16.5	16.5	17.7	17.0	19.8	20.3
from 35 to 49 years old	42.3	41.9	42.1	41.7	42.2	38.2	37.8
from 50 to 64 years old	24.9	24.7	26.6	25.7	26.9	28.9	29.1
over 65 years old	7.0	5.3	5.4	5.2	3.2	2.4	2.7

The source: Developed by the author based on the NSB data, Labour force in the Republic of Moldova, employment and unemployment 2012, p. 31

The analysis (table 3) of the labour force employment in rural areas by age reflects changes in the number of the employed population from age groups. In the period 2005-2011 the most stable manifestation in terms of the age structure show people between 15-24 years old. Thus, the number of young people employed in this period showed a slight increase of about 0.4 %. This situation can be explained by the young people's tendency to remain in the system of education for a longer period.

In 2005-2011 a growing trend registered the population aged 25-34 years old (+4.1%), followed by the employed of 50-64 years old whose share increased by about 4.2 %. Structural changes that are observed in the group of 50-64-year old people can highlight the "accumulation" of the rural employment at the level of a more advanced age, which is associated with an "aging" of employment. The decrease of the employed population of 35-49 years old can be explained by the increasing inactivity of such cohorts, in respect of their active involvement in the processes of international labour force migration. [3]

Another feature of the dynamics of the population employed in rural areas is a substantial reduction in the number of people aged over 65 (- 4.3 %), which is mainly due to the great increase in economic inactivity of the retired people. This situation on the labour market in rural areas is disadvantageous

because the employed elderly population will leave the labour market in about 10 years. Therefore, it is important to renew the labour force (inactive young people able to work, the unemployed) as soon as possible, especially as the Republic of Moldova lacks it.

The reorientation of a part of the rural population to other fields of activity caused changes in its professional status. So, the most common forms became the employees and the self-employed, the majority of the latter being employed in additional one's own households. Thus, in 2011 employees held a share of 55% (+9.6% in comparison with 2005) and the share of the self-employed was about 39.1% (-13.4% compared to 2005) of the total employed population, respectively 52.5%.

Table 4. The distribution of the rural population by the professional status in the Republic of Moldova during 2005 - 2011, thousand people

The professional status	Years						
	2005	2006	2007	2008	2009	2010	2011
The total of the employed population	745.1	696.4	698.6	691.8	636.1	605.0	616.7
of which:							
- Employees	339.1	354.9	355.4	359.4	349.7	332.1	340.1
- Employers	1.7	2.5	2.1	4.0	3.5	3.2	3.7
- Self-employed	391.3	304.0	313.5	300.2	255.8	242.1	241.0
- Other	13.0	35.0	27.6	28.1	27.1	27.6	32.0

The source: Developed by the author based on NSB data, Labour market in the Republic of Moldova 2012, p. 38

The large share of the self-employed in rural areas, employed as a rule in additional households illustrates a critical situation in terms of the sustainable development prospects of rural communities. Moreover, rudimentary agricultural activities practiced by them are characterized by low productivity, which ensures only their existence. The largest part of the products obtained in additional households is subject of the personal consumption. Changes in the structure of the employment status of people in rural areas were greatly affected by the changes in the structure of the employment status of women, who are about 53% of employees and 44% of freelancers.

However, the rapid growth of the number of entrepreneurs is encouraging. Thus, in 2011 the number of rural employers doubled compared to 2005, decreasing by about 300 people in comparison with 2008.

Another unfavourable aspect that occurs in rural areas is the presence of about 32 000 employees that work at family enterprises (about 19% of the employed population). The share of women of this status is even more tragic which confirms that women are largely employed in their own farms.

The lack of employment opportunities in rural areas, their poor regulation, extensive bureaucracy and inability of local governments, the pressing tax system, mistrust towards the state as well as the advanced level of poverty influenced the socio-economic development of the country in recent decades. The above mentioned difficulties caused the appearance of the behaviors typical for underdeveloped economies in the labour market, among them: employment without employment contracts, employees that were not registered by employers, the absence or incomplete declaration of incomes, tax evasion, subsistence activities. [4]

These and many other factors have led to the appearance of some forms of employment, for example an informal employment. An important point that determined the formation of the informal sector in the rural economy was the collapse of big agricultural households and the distribution of the agricultural land among rural residents.

Table 5. The distribution of the rural population by the type of job and employment status in the Republic of Moldova during 2005 - 2011, thousand people

The professional status	Years						
	2005	2006	2007	2008	2009	2010	2011
The total of the employed people	745.1	696.4	698.6	691.8	636.1	605.0	616.7
of which:							
formally employed	439.9	364.2	379.0	390.1	361.7	330.0	336.5
of which:							
- employees	282.4	282.9	292.2	293.1	292.3	274.7	282.0
- freelancers	155.8	78.9	84.7	97.0	69.3	55.3	54.5
informally employed	305.2	332.2	319.6	301.8	274.5	275.0	280.3
of which:							
- employees	56.8	72.0	63.2	66.5	57.3	54.7	58.1
- freelancers	248.5	260.2	256.4	235.3	217.1	217.6	222.2

The source: Developed by the author based on NSB data, Labour market in Moldova 2012, p. 40

The employment in rural areas in our country is characterized by a relatively high share of informal activities. In 2011 the rural economy

was represented by 616,700 employed people, 336,500 (about 54.6%) of which were formally employed, and 280,300 people (about 45.4%) - informally. It is important to note that informal employment in rural areas is much higher than in urban areas. In 2011 more than three quarters of the population was engaged in informal activities in the country.

The informal sector manifests itself quite differently as a professional status. Thus, in 2011 more than three quarters (about 79.3%) of the informally employed population were freelancers, who were engaged in only 22% of informal activities, with small differences between the sexes.

The informal employment is almost entirely specific for the private sector, the share of the public sector is microscopic. Thus, in 2011 only about 196 of 280,300 people employed informally, worked in the public sector. Therefore, informal employment both appeared and grew more intensively due to the accelerated growth of the private sector.

The distribution of activities from the point of view of the organizational and legal form of enterprises is quite relevant in the analysis of the specific character of the informal employment in rural areas. So, the majority of people employed in rural areas – 190,000 out of 280,300 people or 67.8% - worked in their own households and about 41.0 thousand (or 14%) people were engaged in individual work. These are typically farming households, where business is often informal. Unfortunately, informal employment was also quite high in enterprises, organizations and institutions as legal bodies.

The analysis of the rural informal employment by the level of education shows a great predominance of the population with a low level of education in the informal sector. Thus, the largest share of the informal employment in 2011 is held by people with secondary education (103,800 people or about 37%). Generally speaking, the people who graduated from special secondary or secondary institutions, lyceums represent about 89% of rural informal activities.

The largest share in informal activities belonged to the people trained in agricultural sciences (about 80%). 8% and 6% of people

informally employed in rural areas worked in construction and trade respectively, other types of activity had insignificant shares.

Economic reforms carried out over the years caused a substantial change in the employment structure according to the form of the ownership. People from rural areas employed in the private sector predominate almost in every activity field, with the exception of the public, social, transport and telecommunication sectors. Virtually all fields of rural, with the exception of budgetary, social, transport and telecommunications sectors, most employed people working in the private sector. [4]

Thus, in 2011 there was registered a situation of absolute dominance of the private sector over the public sector (Table 6). The proportion of people employed in the private sector was about 75.7%, those employed in public enterprises - about 24.3%. Large shares of employment in the private sector may be found in agriculture, construction, trade and industry.

Table 6. The distribution of the rural employed population by fields of activity regarding the ownership form in Moldova during 2009 - 2011, thousand people

The field of activity	Years, the ownership form					
	2009		2010		2011	
	Private	Public	Private	Public	Private	Public
The total of the employed population	462.3	155.4	430.3	149.7	466.7	150.0
of which:						
Agriculture, hunting, forestry and fishing	313.6	3.9	290.7	4.3	299.4	4.1
Industry	39.3	4.2	36.3	3.1	53.8	4.1
Construction	32.3	0, 0	31.1	0, 0	30.0	0, 0
Wholesale and retail	53.1	3.6	50.6	3.3	52.8	2.7
Transport and communications	12.7	8.7	10.9	7.2	11.14	7.9
Public administration, education, health and social assistance	0, 0	125.9	0, 0	125.2	1.8	123.0
Other fields of activity	10.2	8.7	9.4	6.5	11.3	8.2

The source: Developed by the author based on the NSB data, Labour force employment and unemployment in Moldova 2010-2012

However, there is a tendency to reduce the rural population employed in the private agriculture sector from 313,600 people in 2009 to 299,400 persons in 2011 or by 4.5%. The rural population employed in the public sector increased insignificantly from 3.9

thousand in 2009 to 4.1 thousand people in 2011, or by 24%.

The rural population employed industry in the private sector increased in 2011 compared to 2009 by 14.5 thousand or 37%, however there were no changes in the public sector.

About 30 thousand and 50 thousand people that live in the country and work in the private sector are employed in construction and trade respectively, however the number of people from rural areas employed in business activities decreases from 3,600 in 2009 to 2,700 people in 2011 or by 25%.

The transport and communications sector attracted about 11,000 people of the rural population employed in the private sector and, correspondingly, about 8,000 people in the public sector.

However there were significant changes in the employment of the rural population in public administration, education, health and social care, where there were employed mostly

women. The employment situation of women in the public sector can be considered as a favourable one. The work in this sector is safer, providing social guarantees provided by law. The status of the public sector employee allows regulation of labour relations under a contract of employment. Thus, about 85% of rural workers are employed under the contract of employment (about 39% of men and about 46% of women). Hiring employees by contracts, considered as an additional opportunity for the employees rights observance, manifested differently depending on the type of activity. Almost all employees in public administration, education, health and social work are employed under the contract, while only about 92% of those employed in transport have signed employment contracts, in industry - about 90%. The lowest share of employees with employment contracts can be observed in agriculture (about 70%).

Table 7. The population employed in rural areas by working hours depending on the economic activity in 2011 in Moldova, thousand people

Working hours	The total	in which economic activities						
		Agriculture, hunting, forestry and fishing	Indus trie	Constructi on keep	Wholesale and retail	Transport tourists and communists cations	Public administrat ion, education, health and social	Other types of activiti es
The total of the employed population	616.7	304.1	57.9	30.3	60.9	19.3	124.8	19.5
of which:								
<i>full time</i>	553.2	262.7	54.5	26.6	57.6	17.2	117.2	17.4
of which:								
- less than 40 hours	194.7	129.6	6.9	5.0	9.0	2.6	38.8	2.9
- 40 hours	176.0	39.0	35.2	9.5	19.9	8.6	53.4	10.4
- more than 40 hours	182.5	94.2	12.4	12.1	28.7	6.1	25.0	4.1
<i>part-time</i>	63.5	41.3	3.4	3.7	3.3	2.1	7.6	2.1
of which:								
- less than 20 hours	48.7	31.7	2.4	2.1	2.0	1.7	7.1	1.9
- 20 hours and more	14.8	9.7	0.0	1.6	0.0	0.0	0.0	0.0

The source: Developed by the author based on the NSB data, Labour force employment and unemployment in Moldova 2012

The difficulties faced by business agents of the republic due to the lack of funds and materials, retail sale crises, as well as tax evasion and illegal intentions to maintain a

double accounting, resulted in a variety of ways of the population employment, including part-time employment. One of the part-time employment forms is hiring workers

with a incomplete work program manifested primarily through a reduced working week. It should be noted that the working week in specific fields of activity may be shorter than that traditionally provided by law, 40 hours.

In 2011 most of the rural population (85.5%) were employed full-time and only 10.3% of it was employed part-time. Since the majority of the rural population is employed in agriculture this economic activity has the highest proportion of the population employed both full- and part-time, 47.5% and 65.0% respectively.

However, a significant share of the rural population employed full-time program (21.2%) belongs to the public administration, education, health and social care.

According to the official statistics in the country, in 2011 the average working week was 37.5 hours, it is higher for employees (39.1 hours) and lower for freelancers (35.8 hours). Being season-dependent and strongly influenced by climatic conditions, agricultural activities recorded an average working week in rural areas equal to about 35.9 hours. [2]

Taking into consideration the large share of people employed in agriculture, the average working week in this sector has reduced drastically compared to the average number of working hours in rural areas. However, agricultural workers had a working week equal to the ordinary one (40.6 hours), while self-employed people in this area worked on average 35 hours a week.

Another activity in rural areas with a large number of employees - public administration, education, health and social care - registered an average working week of 35.9 hours. The longest working weeks were registered in trade, construction and transport, on average of 43, 41 and 40.7 hours respectively.

Analyzing the average length of the working week in rural areas by sex, we observed that it was longer by men than by women (39 hours compared to 35 hours). Studying the average length of the working week of people employed in rural areas by activities, we notice that it is longer by men than by women. Thus, the greatest difference between the average working week of both sexes may be found in public administration, education,

health and social care, where men work 6 hours per week more than women (40 hours for men and 34 hours for women). Transport and telecommunications follow, men work there about 5 hours more per week than women, then comes agriculture with a difference of 3 hours in favour of men. The remaining activities showed insignificant differences of 1-2 hours, all in favour of men. Therefore, the men's working time is longer than the women's, it is on average 40 hours or even more in all activities except agriculture. Taking into consideration the fact that women are the ones who assume the full burden of domestic work, manages the household, they are clean, care, are busy with community activities, the length of their working week increases considerably.

Demands and different socio-economic availabilities, launched by two residential areas, made the activities become traditional and they also caused a social division of labour that separates the profile of urban activities from that of rural activities. Thus, fields of activity in the two residential areas register significant differences in terms of the population number and employment structure. In 2011 the majority of the urban population were in employed in trade, most residents of rural areas worked in agriculture.

Besides the general reduction in employment in rural areas, the recession of farming activities, associated with some sparse and discontinuous processes of its modernization and land parceling, led to the declining share of the employment in this field. Thus, the number of employed people in villages reduced substantially from about 936,100 people in 2000 to about 616,700 people in 2011 (-34%), while the number of people employed in agriculture decreased from 713,300 to 304,100 people. [2]

Under these conditions, a double reduction (-57, 4%) of workers employed in agriculture corresponds with the reduction of about one third (34%) of the employed population in rural areas. The substantial reduction in agricultural employment was mainly driven by a lower agricultural productivity, which resulted in lower revenues, a phenomenon that forced a part of people to shift to other fields

of activity. Because of the great reduction of employment in agriculture, in 2000-2011 there was observed an increase in the number of people employed in construction (+23,700 people or a 3.5-fold increase), in trade (+25,600 people or 74%), industry (14,800 people or 36.8%), public administration, education, health and social care (21,700 people or 20.6%).

Table 8. Evolution of the employed population by economic activity in rural areas of the Republic of Moldova

Sphere of activity	2006		2007		2008		2009		2010		2011	
	thousands of people	Share, %	thousands of people	Share, %	thousands of people	share,%	thousands of people	Share, %	thousands of people	share,%	thousands of people	share,%
The total number of employed population	696.4	100	698.6	100	696.4	100	698.6	100	605.0	100	616.7	100
of which:												
Agriculture, hunting economy, forestry and fishing	403.2	58.0	381.4	54.6	403.2	58.0	381.4	54.6	295.8	48.9	304.1	49.3
Industry	57.6	8.0	58.0	8.3	57.6	8.0	58.0	8.3	54.8	9.06	57.9	9.4
Construction	24.2	3.0	33.5	4.8	24.2	3.0	33.5	4.8	31.8	5.26	30.2	4.9
Wholesale and retail	49.2	7.0	55.9	8.0	49.2	7.0	55.9	8.0	58.2	9.62	60.9	9.9
Transport and communications	19.3	3.0	22.4	3.2	19.3	3.0	22.4	3.2	19.3	3.19	19.3	3.1
Public administration, education, health and social protection	127.5	18.0	126.4	18.1	127.5	18.0	126.4	8.1	126.6	20.9	124.8	20.2
Other types of activity	18.4	3.0	21.0	3.0	18.4	3.0	21.0	3.0	18.5	3.07	19.5	3.2

The source: Developed by the author based on the NSB data, Moldova's population by age and sex, on the territorial basis, January 1, 2012, p.6

Unfavourable dynamics of the number of people employed in agriculture and other fields in rural regions in 2000-2011 led to major structural changes in employment. If in 2000 training in agriculture was about 76.2% and about 11.3% of the budgetary rural employment, in 2011 the population engaged in agriculture was about 49.3% and the employment in public administration, education, health and social care - 20.2%. Therefore, the recession of agricultural activities in 2000-2011 let a large number of people move to other fields of activity, so that the share reduction of employment in this activity was -26.9%, while the assimilation of a part of people with the agricultural background by budgetary activities increased the share of employment in these activities by about 8.9%.

The structure of the rural employment by economic activities shows increases in all activities (except agriculture) in 2011 compared to 2000. Therefore, there is a tendency to standardize employment fields in rural areas. Employment in public administration, health, social care and education (8.9%) endured the largest structural changes, as well as trade (+6.2%), industry (+5.1%) and construction (+3.9%). Under these conditions the diversification of employment by economic activity may boost the rural economy, which can cause a further increase in the number of people employed in this area. [2]

The disintegration of the rural employment by economic activity and sex reveals insignificant differences observed in the activities traditionally considered female or male. When choosing a profession, women

from rural areas are mainly oriented towards areas considered traditionally female, such as public administration, health, social care, education (14.7% of the employment in rural areas) and trade (5.8 % of the total employment), where the female employment shares were higher than male. The fact that men dominate in better paid activities (construction, transport and telecommunications) is a distinctive feature of the rural employment by economic activities. At the same time, it is worrying that in some activities requiring great physical effort, such as agriculture and industry, the share of employed women is quite high. Unfortunately, gender was ignored in policies and development programs of areas of economic activity – the fact which often places women in more difficult situations than men, causing the retirement of the former immediately after they reached the retirement age and, respectively, the loss of additional sources of existence.

CONCLUSIONS

The study of employment peculiarities in rural areas of the Republic of Moldova states quite a deplorable situation in the volume and structure of employment by gender, age, fields of activity, employment status, etc. Among the most important features of the employment evolution in recent years in rural areas are the following:

- ✓ poor conditions in rural areas determined the decrease of the employment against the background of the growth of both the unemployed and inactive population;
- ✓ part-time and informal employment are increasingly widespread in the new economic conditions;
- ✓ the absence of viable mechanisms of the market economy in agriculture led to a significant increase in the self-employment rate and the spread of some natural elements in the rural economy;
- ✓ people employed in their own additional households practice so-called "survival" farming that can not ensure a decent living, and their activity is mainly directed towards their own consumption, at the same time these

people easily move from the category of active workers to the category of inactive ones;

✓ rural population is the largest, is the largest training base labor is the reserve fund of labor resources;

✓ national policies aimed at the development of rural areas are not directly oriented and do not directly include human resources from rural areas;

The diversification of the rural employment structure in order to ensure more efficient use of human capital in rural areas and to diminish the role of productive agricultural activities in all economic activities in the countryside and to reduce the intensity of labour flows is possible by:

- developing and implementing sustainable mechanisms to support farmers in order to transform the agricultural activity from the category of a "survival" farming in a modern competitive and profitable economic sector that can cope with the demands of the market economy;
- promoting the development of business enterprises in the service sector, processing activities, non-traditional and non-agricultural activities including rural tourism which would help to improve profession structure in rural communities;
- making more consistent efforts in terms of the revival of crafts specific to a given locality, which would make it possible to employ a certain part of the population able to work;
- promoting social entrepreneurship; stimulating rural economic diversification in areas other than agricultural.

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DEVELOPMENT OF THE AGRICULTURAL SECTOR FROM MOLDOVA THROUGH AGRICULTURE LOANS

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Abstract

Financial institutions present on the market become more attentive when they have to give loans to the agriculture sector. The lack of necessary guarantees the low profit registered in agricultural district, economy instability and other things had and continue to have a negative impact on the evolution of agricultural sector, this being seen as one with a high level of risk. Commercial banks use less own funds for lending to agriculture and especially when the loans are guaranteed from various funds, programs or foreign donor agencies. Farmers find it difficult to bank loans because of collateral amount required is too high. However, commercial banks in Moldova provide agricultural loans, thus increasing the economic efficiency of agriculture.

Key words: agricultural loans, economic effects, economic efficiency, investment decision

INTRODUCTION

Recognizing the large productive potential of the agricultural sector and the short, medium and long-term development needs of the agrorural population, the banks assigns attention and support to efforts to accelerate development in this sector.

At the moment we need a national policy to improve the focus on the development of the agricultural sector through bank loans (including livestock) and to provide support for development of sound agricultural policies and effective national strategies, as well as sectoral planning, long-term national and regional planning, the increased flow of coordinated resources directed to agricultural development and the generation of adequate levels of savings to support the sector's capital formation.

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, Financial Ministry, financial reports of National Bank, commercial banks

and 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

Bank loan is like a system of relations between banks and economic agents where the money accounts that are temporarily available in bank, and of the financial banking system, become loan sources, in the meaning that they are given by the banks through loans to different branches of national economy. The value of given credits to agricultural sector constitutes only 16% of total credits offered, because the small income and low financial power make agriculture less attractive sphere for commercial banks.

To contribute to the growth of efficiency of agricultural sector, there were implemented the definition of agriculture credits offered by commercial banks from Republic of Moldova. Credits are given to the agriculture manufactures with the purpose of keeping the development of agriculture.

The aim of giving these credits for agriculture is to invest for a longer period in utilities with good performance, irrigation equipment, in

building of special places for animal grown in keeping plantations in provisions with food and others, the purpose being to enlarge the production.

Agriculture manufactures receive credits from commercial banks together with financial institutes and state subventions. With the help of AIPA, agricultural sector can receive financial support from commercial banks.

In 2011 the Rule made the credit agriculture to get closer to commercial banks and organizations, microfinance, economic and borrow institutions, but in 2012 by financial institutes. In this context, there were 535 financial agriculture companies in 2012 who receives compensation on the size of interest to the contract credits and were returned during the period 2011-2012, afferent subventions with number of 25, 5 million lei.

The most frequent obstacles in the way of efficient agribusiness lending:

-A lot of manufactures prove a low level in accounting of economic activity, harvest marketing evidence products on the marketing evidence, establishment of business plans on medium and long term viability.

-The bookkeeping of state subventions are wrong by agriculture manufactures, sooner it is like an income source anticipated more than under covered source of investment expenditures.

-The pledge guarantee scheme is poor and doesn't work very fine, so most of they propose guarantee with high level of liquidity appropriate for received credits.

-Very few of the farmers assure their cultivated territory (only 2,5 % of the Republic of Moldova agricultural fields so as to minimize the risk of the harvest lost.

-The lock of a functional institutional from work for use of certificated deposit as pledge instrument. [3]

It is very difficult to find of all those 15 banks one that is strongly established in the rural zone, the industry and trade distract their attention from the agricultural sector. And even if according to bank reports, 12 of the 15 banks have given credits for agriculture yet it is difficult to find out now many of those credits went directly to the agricultural producer. The data shows that in 2012 were

credited in the national currency approximately 700 projects and the number of currency loans is five times smaller.

Table 1. The information of agriculture activity (2012)

Loans granted for agriculture	The number of granted loans		The sum of granted loans (in thousands)		Average interest rate	
	In lei	euro	lei	euro	In lei	euro
Moldova Agroindbank S.A	375	19	212,5	56,7	12,89	7,18
Banca de Economii S.A	14	5	2928,5	1435,1	15,66	9,37
Victoriabank S.A	22	27	24,1	196,5	11,69	6,61
Eximbank S.A	21	2	169,7	14,8	13,58	7,97
Energbank S.A	52	16	567,8	259,7	12,5	5,96
FinComBank S.A	97	11	55,9	19,8	10,57	8,9

Source: It's elaborated by author on the basis of information of credit activity

Note: The sums of credits in foreign currency are calculated on the basis of official course National Bank.

Despite the fact that there is a strong competition in the banking sector between banks to gain some market quotas as large as possible, streets that only Moldova AgroindBank sees the agricultural business as potential source of growth for their operations. Moldova AgroindBank is a leader with 19,7 % of total credits in lei and 23,2% of the total foreign currency granted to given sector.

The conditions for giving credits in agricultural flexibility vary from one bank to another. But the goals are capital formation and financing it. The investment activity includes:

- Soil, seeds, forage preparations;
- Cultivation of fruits, growth of animals and birds;
- Harvest gathering , products receiving and processing;
- Buying of mechanism , transport, equipment and other that deal with their business;
- Construction repairing or purchasing of the spaces.

Although banks offers diversify the number of formers remain small even the companies farmers which have good results and profits don't have pledge that correspond with the

banks requirements. Few farmers have the financial possibility to invest money, the work that has been taken into account banks.

Commercial banks from Republic of Moldova can serve as intermediary between different funds or international financial programs that provide loans to the agricultural sector and farmers. So the PNAET program is used for youth, that want to develop their entrepreneurial abilities to launch or to extend an own business in rural zones in agricultural or production domains. Eight local intermediary banks are working on this project that assumes all the risks connected to credit at lending the funds to beneficiaries: Moldova Agroindbank, Fincombank, MoldinCombank, MobiasBanca, Banca de Economii, Energbank, Eximbank, Victoriabank.

Moldova Agroindbank is the most active IFP, accepting and assuming the risks of credit for 425 as-borrowings of youth from rural areas of the country, or 59,5% followed by the Moldincombank with 145 as-borrowings or 20,3% from the total number.

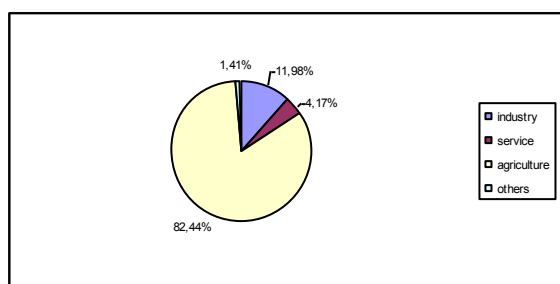


Fig 1. Distribution of loans disbursed by branches of the national economy PNAET

Source: <http://mts.gov.md/docs/2010/Raport-PNAET.pdf>

So 82,44% from provided credits were placed in agricultural industry and food industry. The solution was granted to the beneficiaries for purchasing the modern equipment, were 537 sub-project(75,21%) was provided to the new companies, 177 sub- projects(24,79%) for development of exiting business.

Due to PNAET were purchased: 395 tractors, 312 things used as agricultural equipment, another technical equipment. [1]

European Bank of Investment (BEY) through the Social Bank also finances the wine

industry through the restructure program of wine industry “Filiera Vinului” of Republic Moldova. Credits in minimum amount of 25.000 EURO and maximum of 5 million EURO, it is accorded for a period of 10 years with a use period of 4 years. Beneficiaries can use these credits for reutilization, modernization of equipment of wine companies, expansion of existing business activities by installing bottling lines, growing mechanization process, installing irrigation systems and other protection systems for vine creating, creating small ventures in rural areas and other activities what contribute to the wine sector.

These credits can't be used to finance buying agricultural field financing recoverable feels and planting vines, thus rising discontent among farmers and those who would like to start a business in agriculture.

In February of 2009 started a program of rural financial services and marketing, the fourth program IFAD IV from Republic of Moldova, but in July 2011 IFAD V. The projects have a national character and will be implemented until March 2014 and June 2016.

Table2. The budget structure program of IFAD

	IFAD IV (mln dollars SUA)	IFAD V (mln dollars SUA)
The budget of the program includes:	18,9	34,8
- The sources of IFAD	13,2	19,8(includes 0,5 granted millions)
-The sources of the Government of Republic of Moldova	1,4	1,5
- The contribution of the beneficiary of the program	2,7	11,7
- The financial institutions that participate as a co-financing of the projects of investments in IMM	1,5	1,8
- The given grants from the Ministry of External Affairs of the Denmark Kingdom	-	4,5

Source: It's elaborated by author on the basis of information <http://www.ifad.md>

The program IFAD IV is directed for financing rural enterprises specialized in producing, processing and marketing of horticultural products .

IFAD IV program is directed by loans to finance agricultural enterprises in rural areas.

The both programs are focused on giving competitive grants for financing the construction of objects linked to economic infrastructure. Compared to the program IFAD V, the program IFAD V offers financial support also for other activities with agricultural profile:

1. Production, harvesting, storing of: fruits, berry cultures, vegetables on protected areas and open fields, of aromatic and medical plants, grapes field and technical cultures (with the exception of technical types, tobacco, forest cultures and plants that are used in the arrangement of the area);
2. Production, harvesting and storing the seeds and the material used in planting;
3. The production of products of animal origin, inclusively the buying of breeding animals and of the equipment and the outfit.[4]

Thus in the period 2009 -2011 through these programs for development was granted 207 loans to a number of 268 beneficiaries, totaling \$ 3.5 million. Projects IFAD loans are issued by financial institutions participating in the implementation of projects such as: Moldova Agroindbank, Energbank, Social Bank, Moldindconbank, Victoriabank and Mobiasbanca-Groupe Societe Generale. [4]

CONCLUSIONS

We can mention that the lack of own financial resources is the most important problem for the majority of agricultural industrial units. The loans that were granted to the agricultural sector from Moldova in majority of cases from two zones of village crediting: the commercial banks and financial nonbanking institution. The difficulties of the legal concluding of the foreign investment in the conditions of economical and political instability let us suppose that in future, a decisive role will be played by the internal sources, indifferently of the activating allocation of foreign capital in the last year.

The credit of the agricultural business is characterized through very big interest and difficult processes and the requirements of commercial banks besides the pledge are exaggerated. In these conditions, the enough

financial support that will be suitable to the requirements of the developing the business. The state institutions must be more active in the drawing the external, technical assistance, because the technical assistance of external donators could be on important factor of impassioning of the modernizing of the agro-feeding and of the structured organization sector of the most important valor chain.

Besides of all the registered success of the banking system, the agriculture remains yet, unattractive for the banks. The banking sector manifests restraints in granting loans to economical agents from agriculture and from the investments wade don't highlight a strong competition between banks towards offering this bank product.

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ESSENCE AND ROLE OF THE INVESTMENT STRATEGY WITH REGARD TO REALIZATION OF ENTERPRISE'S INVESTMENT ACTIVITY

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Abstract

The article presented is dedicated to the problem of investment strategy within the framework of an economic entity. Numerous specialized references have been examined in this regard. Different visions of investment strategy concept within the framework of an enterprise and their importance in the course of enterprise's long-term development have been analyzed. As a result of this study, factors of influence on investment strategy elaboration have been systemized; principles of investment strategy elaboration have been established; investment strategy goals have been determined; and investment strategy types have been identified. The author proposed her vision of the contents of the investment strategy elaboration process, having divided it into certain phases.

Key words: essence, factors, principles of the investment strategy.

INTRODUCTION

Investment activity of an enterprise represents a long-term process and that's why it shall be carried out with a certain perspective. At the present stage, enterprises have been realizing more than ever that stable and equilibrated social-economic development is based on permanent investments. Long-term management of investment activity shall rely on scientific methodology of foreseeing directions and forms of this activity, as well as on adjustment to the general goals of an enterprise and to change of conditions of the external investment environment. An investment strategy is an efficient instrument of long-term investment activity management. Successive development of investment activity at the economic scale needs investment strategy elaboration. An investment strategy within the framework of an enterprise is examined in the specialized references from many points of view: its contents and importance [3], [6], [7]; determinant factors [12], elaboration principles [8], elaboration stages, goals and typology. In the course of this article elaboration, there has been set the goal to systemize theoretical approaches regarding importance of investment strategy elaboration

within the framework of an economic entity, as well as development of investment strategy concept and contents of this strategy elaboration process.

MATERIALS AND METHODS

Study of the problem of enterprise's investment strategy has been carried out on the basis of numerous scientific works in this sphere. Methods applied include: monographic study, analysis of scientists-economists' visions and opinions and their synthesis. Application of these methods has allowed us proposing our own vision of the contents of the investment strategy elaboration process.

RESULTS AND DISCUSSIONS

This In general, the word "strategy" means a way followed for the purpose of set goals realization; as for an investment strategy of an enterprise, different scientific visions have been formed in the economic theory and practice.

To a wide extent, a strategy is a way followed for the purpose of set objectives realization [1].

As for an investment strategy, different scientific visions have been formed in the specialized references.

An investment strategy shall be viewed at the macro- and microeconomic level [10].

Some authors view an investment strategy of an enterprise as a general plan composed of two component parts [4], [6], [7], [8]:

1. System of long-term goals of investment activity of an economic entity, determined by general development objectives and enterprise's investment environment;
2. Complex of efficient measures for goals realization.

I.A. Blank mentions that an investment strategy shall be subordinated to realization of enterprise's general goals under conditions of substantial modifications of macroeconomic indicators, market processes regulation by the state, and investment market conjuncture and unstableness relating to it [3].

Finally, an investment strategy shall give an answer to those three questions [9]:

- 1) What directions of economic activity shall be developed?
- 2) How much will constitute the necessity in long-term investment resources?
- 3) What will be a feasible output from the chosen directions of assets allocation?

In other economists' opinion, an investment strategy is viewed from a greater number of interrelated aspects: institutional, economic, legislative-normative, information and analytic ones [10].

Institutional aspect of an investment strategy is composed of such elements as: investments types, investment portfolio, and risks.

Legislative-normative aspect includes:

- 1) Legislative and normative acts of the state that form a legal base and fiscal environment, within the framework of which an enterprise (corporation) forms an investment strategy and realizes an investment process.
- 2) Accounting policy of an enterprise (corporation) and internal regulations acts that assure, in their aggregate, a unique investment process within the framework of an economic entity, subdivisions of a corporation.

Economic aspect represents economic parties of an investment strategy, namely: a system of economic indicators for investment strategy evaluation, management and financing of the investment process.

Information and analytic aspect of an investment strategy represents a data processing system and includes the following components: data selection and sorting subsystem, data storage subsystem, data search subsystem, and data analysis subsystem. The data processing system forms the base of operative information circuit within the framework of an investment strategy and allows: a) responding in the operative way to modifications into the legal base and fiscal environment; b) forecasting economic perspectives of a market; c) planning modifications within the framework of investment aspect; d) correcting principal parties of economic aspect of an investment strategy.

Enterprise's investment strategy is one of the most important characteristics of an enterprise. But it is often formed occasionally [10].

A direct premise for forming an investment strategy is the general strategy of enterprise's economic development, in comparison to which, an investment strategy has a subordinated character [12].

Necessity in forming an investment strategy of an enterprise (corporation) is conditioned by the fact that investment resources are limited but potential objects of investing have different investment attractiveness. That's why there is a need in formulating an investment strategy in order to optimally distribute investment resources [1].

Investment strategy elaboration within the framework of financial management of an economic entity is a relevant problem, as well. Relevancy of investment strategy elaboration is determined by some factors that may be arranged in groups as follows [5]:

1. External factors:
 - a) Economic situation in the country;
 - b) Development of technical-scientific progress;
 - c) Fluctuations in the financial market;

d) State's policy with regard to investment activity;

2. Internal factors:

a) Evolution of an enterprise from a life cycle stage to another one;

b) Modification of operational activity objectives in connection with appearance of new commercial feasibilities.

An investment strategy of an enterprise is elaborated on the basis of a complex system of principles including the following [8]:

1. Environmentalism principle examining an enterprise as an open social-economic system with a capacity to contact with external investment environment and to self-organize.

2. Conformity principle that stipulates compliance of an investment strategy with a strategy of enterprise's economic development, and that's why an investment strategy shall be coordinated with strategic goals and directions of operational activity. In other words, an investment strategy is deemed to be a principle factor of assurance of enterprise's efficient development.

3. Combination principle that means realization of operative, current and perspective management of investment activity of an enterprise.

4. Priority orientation towards the style of a strategic management entrepreneur. This style is based on search for efficient investment solutions regarding all directions and forms of investment activity. Directions, forms and methods of investment activity realization have been permanently modifying, depending on factors of the external investment environment.

5. Investment flexibility and alternative, this meaning that an investment strategy shall be elaborated with adjustment to modifications of the external investment environment. An investment solution may be made as a result of examination of alternative variants of directions, forms and methods of investment activity, selection of an optimal one and formation of general investment strategy and a

mechanism of efficient realization basing on this solution.

6. Innovation principle providing that investment activity is a mechanism of implementation of technological innovations that assure consolidation of the enterprise's competitive position in the market. Success of enterprise's strategic development substantially depends on the degree of applying the results of progress in science and technologies in the course of investment strategy realization.

7. Minimization of investment risks.

This principle reflects the fact that solutions of investment nature, made within the framework of an enterprise, modify the degree of investment risks. Depending on investment behavior in the presence of a risk, its acceptable degree is established in the differential way within the process of investment strategy elaboration.

8. Competence principle. It promotes necessity of involvement of specialists-professionals in the sphere of investment activity management.

Investment strategy elaboration is a process going through a number of stages. Number of component stages varies in various economic researches. The most frequently met stages in the process of elaboration of enterprise's investment strategy refer to [3], [13], [7], [8], [12]:

1. Determination of general period of investment strategy formation;

2. Examination of factors from external investment environment and investment market conjuncture;

3. SWOT-analysis of an enterprise, determining the specificity of investment activity;

4. Formation of investment activity goals;

5. Analysis of strategic alternatives and selection of investment activity directions and forms;

6. Determination of strategic direction for investment resources formation;

7. Investment policy formation with regard to principal aspects of investment activity;

8. Elaboration of organizational and economic actions system with view to investment strategy realization;
9. Appreciation of efficiency of the investment strategy elaborated.

As it results from the presented structure of the process on elaboration of enterprise's investment strategy, the most detailed structure may be found in the works by [4], [8], [12].

We consider that the structure of the process of investment strategy elaboration may be improved. From our point of view, this process can be systematized in phases and stages.

We consider that the starting point of this process is appearance of the idea on developing investment activity in a certain or several directions.

The process of investment strategy elaboration goes through analytic stage, after appearance of the idea. The following actions are realized at this phase.

- Retrospective analysis of enterprise's development;
- Analysis of the present economic-financial state of an enterprise;
- SWOT-analysis;
- Examination of capacity of the realization market – internal and external ones;
- Study of resources suppliers;
- Analysis of the external investment environment factors and investment resources market conjuncture.

Upon carrying out respective analysis, one shall proceed to the determination and projection phase. This phase foresees elaborations in the following directions:

- Determination of investment directions;
- Formation of investment activity goals;
- Elaboration of investment policy, programs and projects with regard to realization of investment activity goals;
- Determination of financing policy for investment activity in the perspective;
- Examination of strategic alternatives and selection of directions and forms for investment activity;

- Elaboration of a complex of measures of organizational nature with regard to investment activities realization.

Realization of this phase results in enterprise's investment strategy that is to be appreciated and approved. This refers to the phase of appreciation of the investment strategy elaborated and realization of some corrections if necessary. At this phase:

- Efficiency of investment activity is evaluated from the point of view of incomes evolution, financial results, realization market development, enterprise's position in the certain market segment, indicators of economic efficiency of production, economic-financial profitability of an enterprise;
- Principal investment risks and possible financial consequences are examined;
- Economic results obtained are also examined (growth of the enterprise's image, improvement of labor conditions of the personnel, improvement of customers servicing, etc.);
- Corrections in projects and programs are made in case of detection of some insufficiencies.

A decision on adoption of the investment strategy elaborated is taken.

Enterprise's investment strategy has certain goals and objectives. In other words, we shall mention that in the specialized references, there are more restricted and more broadside approaches to this problem.

As for the restricted approach, goals of enterprise's investment strategy are mostly viewed through the prism of operational activity development.

These goals include [10]:

- Maintenance of production capacities;
- Production expansion;
- Production intensification and modernization;
- New products launching;
- Loans contracting;

At the same time, Mihailov O.V. admits the goal of obtainment of incomes from financial investments, as well [10].

Other authors present a more broadside approach to the goals of enterprise's investment activity. Thus, Sohin E.I.

considers that an investment strategy has two principal goals [12]:

1. Maximization of profit from investment activity;
2. Minimization of investment risks.

The following objectives shall be realized in order to achieve these goals:

- Examination of external investment environment and forecasting of investment market conjuncture;
- Technical marketing examinations;
- Search for new, more profitable, investment possibilities;
- Appreciation of attractiveness investment projects and financial instruments with selection of the most efficient ones;
- Budget elaboration;
- Formation of optimal investment structure.

The author I.A. Blank emphasizes other objectives of enterprise's investment strategy [4]:

1. Assurance of strong rhythm of development of enterprise's operational activity through investment support.
2. Assurance of maximal profitability of real and financial investments apart and of enterprise's investment activity as a whole at the acceptable level of risk.
3. Minimization of risk of real and financial investments apart and of enterprise's investment activity as a whole.
4. Optimal liquidity of investments and possibility to rapidly reinvest assets in case of modification of internal and external conditions of investment activity.
5. Formation of sufficient investment resources in conformity with forecasted proportions of investment activity.
6. Search for way of acceleration of investment program in effect.
7. Financial equilibrium of an enterprise in the process of investment activity realization.

E.V. Kalinikova considers that formation of investment strategy goals is the initial stage in the process of investment activity and proposes the following [7]:

- Assurance of capital growth;

- Growth of profitability of investments and incomes from investment activity;
- Modification of proportions in forms of real and financial investments;
- Modification of branch and regional directions of investment programs, etc.

Goals of enterprise's investment strategy shall be determined on the basis of a system of principles including [3]:

1. Subordination of principal goal to investment management within the framework of an enterprise.
2. Orientation towards high results of investment activity.
3. Reality of goals.
4. Valuation of results – each goal shall be expressed in concrete value indicators.
5. Equivalence of treatment. Each goal of an investment strategy shall be perceived in the same way by all persons involved in its realization.
6. Scientific rationale – the base of formation of investment strategy goals shall be composed of objective economic laws determining the level of enterprise's investment activity and efficiency of its investment activity. Methodology of real evaluation of investment process parameters shall be used and system of goals correlation shall be determined.
7. Support – a system of investment strategy goals shall be formed so as realization of some goals would assure achievement of others. In order to do this, goals shall be classified depending on priority, dividing them into direct ones and supporting ones in the general hierarchy.
8. Flexibility – this means feasibility of correcting a system of investment strategy goals as a whole or some quantitative parameters due to modification of external investment environment factors or of internal potential parameters.

Selection of a strategy is a central problem of enterprise's strategic plan. As a rule, a company chooses a strategy from several possible variants.

Investment strategies of enterprises include several types.

From the point of view of the economists, investment strategies can be divided into 3 types [9]:

a) aggressive; b) stabilizing, c) defensive;

Within the framework of these strategies, basic strategies of a company are identified, depending on the role of long-term investments and financial resources.

Aggressive strategy can be realized through:

a) Penetrating strategy (of restricted growth);
b) Strategy of accelerated growth.

A penetrating strategy (of restricted growth) directs its efforts towards deeper penetration into market and additional services in order to increase growth rhythms of sellers. Long-term investment programs and investment projects foresee organizational, technical and economic measures. A special attention is drawn to modernization of fixed assets, scientific researches and consolidation of financial positions.

A strategy of accelerated growth is aimed to absolute use of internal and external possibilities for company's development. This stage of growth shall be accompanied by economic efficiency growth. An investment program and portfolio of investment projects shall be oriented towards realization of the strategy of accelerated growth. Plans of capital allocations shall be correlated with long-term and current plans of a company.

Stabilizing strategy. Under conditions of economy not adjusted to enterprise's development cycles, the latter may go through a difficult period of unstableness when sales incomes and profits are lowering. There appears a necessity in elaboration of some special procedures of analysis that allow capturing the period when an enterprise is going from the stage of growth to the stage of decrease, i.e. reorientation from an aggressive strategy to an aggressive-defensive strategy.

A stabilizing strategy is oriented towards compensation of sales and profits and their future growth, i.e. towards going to the following stage of growth.

The defensive type manifests itself through a surviving strategy that is implemented in case of total disaster of economic activity, under conditions proximal to bankruptcy. The goal of this strategy is stabilization of the situation,

i.e. going to a stabilizing strategy and later – to a strategy of growth. Such a strategy cannot last long. Here is a necessity in taking rapid and coordinated actions, on the one hand, and in great precaution in the decision-taking process, on the other hand. Due to these reasons, in the process of surviving strategy realization, severe centralization of management takes place and a managerial anti-crisis body is created promoting the following program:

- Management reorganization;
- Marketing reorganization;
- Financial reorganization.

It is extremely important to mobilize financial resources in order to realize investment projects with a high degree of recuperability for the purpose of launching new products and modernization of production capacity.

A variant of a defensive strategy is a liquidation plan. Such a plan includes measures for elimination of objects, which an economic entity does not need any more and which impede its development, these being non-profitable products and measures, non-efficient assets, and some subdivisions of an enterprise.

As for classification of enterprise's investment strategies, there is also another position.

Investment strategies can be divided in two types depending on the investment activity goal [10]:

- 1) pure ones if a goal has been determined;
- 2) mixed ones if two or more reasons have been determined.

Pure investment strategies are divided, in their turn, into:

- a) conservative ones having the goal to maintain production capacities;
- b) extensive ones – orienting towards production extension;
- c) intensive ones – their reason being production intensification and modernization;
- d) progressive ones – aspiring to new products promotion;
- e) a strategy based on loans.

Mixed investment strategies mean various combinations depending on goals determined. For instance:

- a) conservative-intensive one – foresees maintenance of production capacity but based on production intensification and modernization;
- b) extensive-progressive one – foresees production extension and renewal of products assortment.
- c) extensive-intensive one – foresees production extension based on its intensification and modernization.
- d) conservative-progressive one – foresees maintenance of production capacity and renewal of products assortment.

Selection of an investment strategy depends on various factors. Pure investment strategies are selected due to significant influence of a factor.

Thus, a conservative strategy is chosen due to insufficiency of circulating monetary assets. An extensive strategy is determined in case of qualified personnel deficiency; an intensive strategy is accepted due to great competitiveness from the part of imported products; a progressive strategy takes place in case of scanty demands.

Enterprise's investment strategy is elaborated and later realized in correlation with other strategies, such as a financial strategy, innovational strategy, and market price strategy.

It is known that the principal goal of a financial strategy of an economic entity is maximization of its owners' prosperity based on increase of enterprise's market value. Realization of investment strategies is impossible without respective financing. Since a financial strategy has two aspects in its final – formation of monetary funds and use of monetary funds, it is evident that realization of activity, including investment one, will attract accumulated sources, on the one hand, and will bring new incomes and profits, on the other hand.

Investment strategy financing and obtainment of successful (economic and non-economic) results will lead to the following effects:

- increase of net profit value;
- maintenance and improvement of dividends policy;
- growth of equity capital;
- synergism effect;

- improvement of enterprise's image.

Aggregate of these effects will result in increase of enterprise's market value.

An investment strategy shall be combined with an innovational strategy. Their symbiosis contributes to appearance of new products in the market, to a better quality, to reduction of production costs and, respectively, to competitive and adequate prices. These phenomena will be reflected in successive settlement of social-economic problems both at the micro- and macroeconomic level.

Connection between an investment strategy and a market price strategy is evident, in our opinion. An economic entity forms its incomes and, respectively, a part or all its investment resources namely through prices. At the same time, specificity of connection between these strategies is observed under conditions of unstableness (crisis and post-crisis period).

That is to say, the economist N. Raiskaia mentions that [11]:

An investment strategy means technological modernizations of products. From the aspect of competitiveness reestablishment, an investment strategy has maximal efficiency but it needs significant financial resources. It is evident that concomitant consolidation of financial resources in big volumes is very difficult under crisis conditions. During this period, efficiency of economic operations decreases and enterprises face the necessity in forming reserves for covering eventual losses in operational activity. Support of the real sector from the part of creditors is minimal namely during the crisis period. Insecurity of the future supplemented by reduction of resources base of banks (deposits withdrawal and diminution of capital market) provokes a more conservative strategy of banks under crisis conditions than under economy extension conditions) [11].

A market price strategy is a compensation for insufficient competitiveness of products through a flexible price policy. Under crisis conditions, enterprises promoting such a strategy maintain and even reduce prices through assimilation of controlled losses. A price strategy allows accumulating financial resources in accelerated way through increase

of prices in a quicker rhythm if compared to expenses.

CONCLUSIONS

An investment strategy is an extremely important element for long-term development of enterprise's activity. A number of moments shall be taken into consideration when elaborating an investment strategy, such as: internal and external factors; elaboration principles, determination of the system of objectives, investment strategy type and establishment of relation between investment strategy and other strategies. Approach to an investment strategy through the prism of these essential moments will contribute to successful management of enterprise's investment activity in the competitive environment.

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THE PECULIARITIES OF THE ACCOUNTING OF CONSUMPTIONS CONCERNING GAPS REMOVAL IN VINEYARDS

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Abstract

Today's methodology of the accounting of the economic operations concerning gaps removal in vineyards is imperfect; it generates numerous uncertainties and it doesn't take into account some factors that directly influence gaps removal technology. In our opinion, the rationality of gaps removal in fruitful vineyards may be argued from both economic and biological points. Some authors suggest solving this problem by classifying current accounts that is doubtful as these suggestions don't have a sound accounting basis and they neglect the fundamental principles of the accounting. That is why, this article suggests the economic way of solving this problem by determining the time of consumptions recovery when planting, caring and growing the cuttings till they give fruit.

Key words: biological fixed assets, consumptions capitalization, consumptions recovery, vineyards

INTRODUCTION

Today there may appear some gaps (lack of a plant) in vineyards from various reasons: the most frequent causes are exceptional events (drought, frost, etc.) as well as wrong procession and plant protection technologies (plant damage from plowing, tillage between rows, plant protection activities with delay, etc.). As a result the firm will obtain a smaller volume of agricultural products, the relative cost will grow and the profit from these products' sale will decrease, all the indicators used in the efficient evaluation of the exploitation of biological fixed assets will reduce. We consider that the firm can perform certain activities to eliminate those gaps. In this respect it is important to solve the following problems: to determine the period of time that is necessary for gaps elimination in fruitful vineyard; to show the features of precaution principle when finding the gaps; to identify the methods of determination of the consumptions related to planting, caring and growing the cuttings till they give fruit; to expose the method of accounting of the mentioned consumptions; to identify the way of improvement of balance sheet value of the long-term mature biological asset from which

it is necessary to calculate the depreciation according to the precaution principle.

MATERIALS AND METHODS

In The researches in the field have been carried out being based on the generalization of problems, disagreements and uncertainties related to highlighting of the consumptions concerning gaps removal in vineyards in several entities from the agro-alimentary sector of the Republic of Moldova (Ltd "Focaro-Agro", Ltd "Bebei-Prim" from Stefan-Voda region, etc.). The methodological support of the researches is fundamental conventions and basic principles of the accounting [1], legislation in force related to the theme. The preference was given to monographic study method also using analysis and synthesis elements, induction and deduction elements.

RESULTS AND DISCUSSIONS

This The problem of gaps removal in vineyards while determining the year when it is rational to perform these operations hasn't been studied. In our opinion, the rationality of gaps removal in fruitful vineyards may be motivated from biological and economical

points of view. The economical solution of the mentioned problem needs the determination of the recovery period of the consumptions (capital investments) when planting, caring and growing the cuttings till they give fruit. Thus, there appears the problem of the determination of these consumptions amount. Besides cuttings' price, the consumptions of digging or soil drilling and cuttings planting, the other consumptions conditioned by technological operations (vine cuttings, vines tying, plant protection, etc.) have common features, they are simultaneously assigned to exploitation consumptions and to the consumptions that are to be capitalized after young plants have grown. The consumptions of cleaning the soil and the cost of mineral and organic fertilizers used while executing this technological operation won't be included in the consumptions of growing and caring of this plant in order to remove gaps, because they are the elements of the input value of the fruitful vine lot. It is known that at the beginning long-term biological assets are assessed at the entry cost according to N.A.S 16 "The accounting for long-term tangible assets" [2] that includes (while planting and cultivating perennial plantations till they bear fruit or till the completion of tree crowns for protective forest strips or for forest areas) the amount of the effective costs concerning the first year plantation plus the accumulative costs concerning plantations caring and growing in the following years the cumulative sum till the plantations are given in service (in case of performing the operations on own), as well as the cost of the cuttings and slips and respectively the cost of the activities when planting them (in case dry seedlings are replaced or destroyed in the first and the second year of vegetation) if their share is significant. The cost of dry seedlings and cuttings will be scrapped and the repair costs will be capitalized.

In 201N Ltd "Focaro-Agro" planted 15 hectares of vine, according to the scheme 2.75×1.4 m the number of the cuttings constitutes 38340 cuttings, the cost is 526500 leis, and the costs of caring in the first year of vegetation are 120000 leis. At the end of the

year 201N there was found that because of weather conditions 8% of the cuttings perished that is 3067 cuttings at the price of 41000 leis. In spring of the year 201N+1 these cuttings were planted in order to replace the perished ones. The price of these cuttings is 7210 leis.

According to the data from the example, in order not to allow vine overvaluation, the entity will:

- scrap the cost of the perished cuttings with the discount of the costs of caring in the first year to 51709.71 leis $[(526500 \div 38340) \times 3067] + [(120000 \div 38340) \times 3067] = 42110 + 9599.71 = 51709.71$ leis;
- increase the cost of the vine planted with the costs of the cuttings that replaced those perished at the amount of 48210 leis $(41000 + 7210)$;
- account the contract value of vines planting and caring till they bear fruit (exploitation) in case when the works are performed by others. The perennial plantations are considered active in progress until they get the category of the plantations that bear fruit [3]. When including the perennial plantations into the structure of mature biological assets (those that bear fruit), they are evaluated at the effective price at the moment of transfer that constitutes the sum of the costs accumulated during the period of growth and care with the cumulative total reduced by the value of the products obtained from these young plantations.

As we have mentioned above, the foundation of perennial plantations requires the record of the costs concerning soil cleaning, seedlings and saplings planting, and of the costs with the cumulative total during the whole period of growth, care and plant protection (vegetation years) till they are transferred to bearing category. All these costs are accounted by increasing tangible assets during the execution and by decreasing the costs of current assets, support activities, indirect production costs and by increasing the liabilities and the depreciation of tangible and intangible assets. The costs of seedlings and saplings and growth and care costs concerning the losses because of weather conditions in

the first and second years of vegetation, when the number of seedlings is significant, are considered losses, and the costs of soil cleaning and its preparation for the foundation of perennial plantations (bushes clearing, bushes loading and transportation, plowing, land leveling and picketing, marking, incorporating manure, including manure costs, project cost, etc.) are not included in the amount of these losses. The mentioned losses are accounted as the increase of other expenses and the decrease of tangible assets during the execution. The costs, concerning the replacement of the perished seedlings, are accounted by increasing tangible assets during the execution and by decreasing current assets and other current debts.

The net achievable value of the harvest (grapes, fruit) obtained during the period of growth and care of perennial plantations till they bear fruit is recorded at the entries by increasing products and decreasing tangible assets during execution.

In April 201N Ltd. "Bebei-Prim" planted vine with wine grapes varieties on the area of 10 hectares according to scheme 2.75×1.4m. 24840 seedlings at cost of 360000 leis were planted, the cost of soil cleaning, soil preparation and the cost of the project – 125312 leis, espalier installing that started to be used on 1.06. 201N-524262 leis, plant care and protection in the year of vegetation 201N – 195000leis, in 201N+1 – 38500 leis, in 201N+2 – 88273 leis, in 201N+3 – 107850 leis. In the second year there were found dry cuttings (because of drought) that constituted 8%, this amount exceeds the materiality threshold established in the entity accounting. These gaps were eliminated by planting 1988 new cuttings at the cost of 27832 leis, the costs of dry cuttings replacement – 5650 leis. In the third year of vegetation there were harvested 28q, and in the fourth year – 35q, the market price of 1q of grapes is 280 leis, sale expenses of 1 q of grapes are 30 leis.

On 1.04.201N the entity gets a 2-year loan of 300000 leis with an interest rate of 15% annually, on 1.08.201N it receives a subvention of 200000 leis (20000×10), and on 1.06.201N it repays to the bank the first installment in the amount of 80000 leis.

According to the data from the example the entity will account the following economic facts:

1. 1.04.201N: loan receiving in the amount of 300000 leis by increasing money means and long-term liability;
2. 201N. The recording of the costs of vine plantation and care in the first year of vegetation – 680312 leis (360000+125312+195000) as the increase of running tangible assets and the decrease of current assets, of indirect production costs and the increase of current liabilities;
3. 1.04.201N – 1.06.201N The recording of the costs of espalier installing in the amount of 524262 leis by increasing running tangible assets and decreasing current assets, by increasing liabilities and decreasing the costs of auxiliary activities;
4. 1.04.201N – 1.06.201N The capitalization of liability costs for the first 2 months of vine plantation and caring and of espalier installing, in total 7500 leis $[(300000 \times 0.15) \div 12 \times 2]$, of which 3250 leis for the espalier, 4250 leis for the vine as the increase of tangible assets and of the current liability;
5. 1.06.201N – 31.12.201N. The capitalization of the costs of the liability of vine plantation and caring in the amount of 8400 leis $[(300000 \times 0.15) \div 12 \times 2] + [(300000 - 200000) \times 0.15 \div 12 \times 5]$ as the increase of running tangible assets and of the current liabilities;
6. 1.06.201N – 31.12.201N. The attachment to the costs of the liability cost 8750 leis $[(100000 \times 0.15) \div 12 \times 7]$ as the result of other basic expenses and of the current liability;
7. 1.06.201N. The recording of the espalier at the entries in the amount of 527512 leis (524262+3250) as the increase of fixed assets and the decrease of running tangible assets; next the espalier's depreciable value, the period of use and the amount of the depreciation amount are determined. Under the condition that the exploitation time is 20 years, for the espalier it will be 23 years, the scrap value of the espalier will be 65000 leis. The amount of the annual depreciation will be 20109.22 leis $[(527512 - 65000) \div 23]$, and

monthly the amount will be 1675.77 leis (20109.22÷12);

8. June 201N – December 201N+3. The calculation of the espalier's depreciation allotted to the cost of vine growing and caring at 72031.05 leis [(20109.22×3)+(1675.77×7)] as the increase of running tangible assets and fixed assets depreciation;

9. 1.01.201N+1–1.06.201N+1.

The calculation of the profit in the amount of 6250 leis [(300000-200000)×0.15÷12×5] as the increase of anticipated current expenses and of current liabilities;

10. 1.06.201N+1. Credit redemption in the amount of 80000 leis as the decrease of current liability and of money means;

11. 1.06.201N+1. The subvention for vine plantation credit at 4964.38 leis [(0.15×80000÷365×151)] as the decrease of the current liability to the bank and the increase of financing and special payments (anticipated current profits);

12. 1.01.201N+1 – 1.06.201N+1. 1285.62 leis (6250-4964.38) by increasing running tangible assets and the decrease of anticipated current expenses;

13. 1.01.201N+1–1.06.201N+1. The appropriate amount of calculated profit is attributed to expenses- 4964.38 leis as the increase of other expenses and the decrease of anticipated current expenses;

14. June 201N+1. The acceptance of the profit that originated from the subventions 4964.38 leis as the increase of other profits and the decrease of special financings;

June –December 201N+1. The capitalization of liability costs 1750 leis [(300000-200000-80000)×0.15÷12×7] as the increase of running tangible assets and of the current liability;

15. April 201N+1. The disposal of the costs of the perished cuttings and the costs of the cuttings caring – 34388.62 leis [(360000÷24840×1988)+(195000-125312)÷24840×1988] as the increase of other expenses and the decrease of running tangible assets;

16. April 201N+1. The capitalization of the costs of the replacement of the perished cuttings in the first year of vegetation -33482 leis (27832+56450) as the increase of running tangible assets;

17. January-March 201N+2. The calculation of the profit as the increase of running tangible assets at 3750 leis [(100000×0.15)÷12×3], the increase of other basic expenses to 7500 leis [(200000×0.15)÷12×3] as the increase of other basic expenses, the increase of current liabilities-11250 leis [(300000×0.15)÷12×3];

18. 201N+2 – 201N+3. Stating the costs of vine caring in the amount of 196123 leis (88273+107850) as the increase of running tangible assets, the decrease of current assets, the increase of current liabilities and of the depreciation of tangible and intangible assets;

19. 201N+2 – 201N+3. The recording of the obtained harvest during the period of vine growing and caring – 15750 leis [(28+35)×28.0]-[(28+35)×30] by increasing finished products and decreasing running assets;

20. December 201N+3. The vine transfer to the category of fruit bearing – 953210 leis (680312+7500+8400+72031+1750+34388+33482+3750+196123-15750) as the increase of fixed assets and the decrease of running tangible assets.

Let's examine further the accounting of the operations concerning the consumptions for gaps removal in fruitful vineyards. If we admit that the entry value of a vineyard lot with the area of 5 hectares is 600000 leis, the probable remained value is 0, the exploitation time-20 years, the amount of cumulative depreciation is 97500 leis, and the gaps constitute 25%, then the balance value at the moment of gaps removal is of 502500 leis (600000-97500), and its share for the disposal - 125625 leis (502500×0.25).

Thus we have the accounting recording: the partial disposal of the balance sheet value of the mature biological asset as the increase of exceptional expenses and the decrease of tangible assets to the amount of 125625 leis.

The depreciation of the lot with vineyard after the partial disposal of the balance sheet value of the object will be calculated from the balance sheet value partially disposed (502500) leis, that annually will constitute 22500 leis [(502500-125625):16.75], and monthly it will be 1875 leis (22500:12) where

16.75 will be 16 years and 9 months transformed into years after disposal.

If in the fourth year of the fruitful vineyard lot exploitation (5 hectares) there have been carried out gaps removal works, the firm will calculate the depreciation 4 years more – the period of growing and caring of young plants at the same amount. In this period we suggest direct consumptions concerning young plants and all the consumptions concerning their plantation and growing to be accounted as the increase of running tangible assets and the decrease of the stocks, of the costs of auxiliary activities, of current liabilities, etc. The common consumptions will be distributed among young plants and they will constitute a component part of the entry value of the young plants when they pass to the category of fruitful vines that will constitute exploitation consumptions of these mature biological assets.

CONCLUSIONS

While removing gaps in fruitful vineyards the following actions are necessary:

1. The compliance with the precautionary principle that requires partial disposal of the vine balance value;

2. The determination of the consumptions concerning young plants according to the described above method;

3. The identification of the cumulative consumptions concerning young plants plantation and growing reduced by the cost of the obtained harvest in the third and the fourth years;

4. The recalculation of the balance value of the long-term mature biological assets (fruitful plants) when finding gaps and when passing the young plants to the category of fruitful plants in order to calculate the depreciation.

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EUROPEAN COOPERATION FOR THE DANUBE REGION

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Abstract

The paper aims to show the importance of Danube Region for the European countries. The European Union Strategy for the Danube River provides a framework for cooperation for the problems of the region: floods, transport, environment, energy, sustainable development. The reunions organized in EU countries try to highlight the importance of the EU Strategy for the Danube River. The paper highlights the Strategy work as key to Cohesion Policy as engine of growth. The Strategy for the Danube Region is a new way to overcome 20th century division and conflicts in the Region, and as an important impulse for overall socio-economic development.

Key words: cooperation, Danube, strategy, development, macro-regional approach

INTRODUCTION

Danube, the second largest river in Europe, covers about 2850 km, linking the Black Forest to the Black Sea, across ten countries and has tributaries from other four countries. [1]

An ideal location for placement of hydroelectric power plants, a pan-European transport corridor and a refuge for the rarest species in Europe - the pressures on the river are often in conflict with each other and political changes in the region also influenced the way the difficulties are dealt. Following the example of the EU Strategy for Baltic Sea, which was the first macro-regional approach, the EU strategy for the Danube was based on stakeholder efforts in the region, allowing them to create a region where all 115 million people to enjoy security, prosperity and equal opportunities. [2]

EU Strategy for the Danube is a model of regional cooperation at European level. [3]

A strategy to boost the development of the Danube Region was proposed by the European Commission on 8 December 2010. Member States endorsed the EU Strategy for the Danube Region at the General Affairs Council on 13 April 2011. [4].

With its 100 million inhabitants, a fifth of EU Danube Region is a key factor for the overall

welfare of the European Union. Many of the problems of the region are in nature: floods, transportation lines and energy, environment and security all require a unified approach. [5] European Union Strategy for the Danube Region refers mainly to 14 countries, of which eight are EU Member States (Germany, Austria, Hungary, Czech Republic, Slovak Republic, Slovenia, Bulgaria and Romania), and six are non-EU countries (Croatia, Serbia, Bosnia and Herzegovina, Montenegro, Ukraine and Moldova).

The people living in the Danube Region will benefit from: faster transport by road and rail, cleaner transport by improving the navigability of rivers, cheaper and more secure energy thanks to better connections and alternative sources, a better environment with cleaner water, protected biodiversity, and cross-border flood prevention, a prosperous region, through working together on the economy, education, social inclusion, and research and innovation, attractive tourist and cultural destinations, developed and marketed jointly, a safer, well-governed region, thanks to better cooperation and coordination of government and non-governmental organizations [6].

MATERIALS AND METHODS

The strategy is based on a new method which is based on "macro-regional" approach, following the steps of the EU Strategy for the Baltic Sea. The originality of the method lies in the way it combines different countries to cooperate in setting goals to align funds and to join efforts to achieve the objectives and the European Commission will play a major role in coordination.

Representing a united response to the problems affecting a fifth of the EU and more than 100 million inhabitants, the EU Strategy for the Danube Region is the example of the EU Strategy for the Baltic Sea and it leverages best practices.

With no new EU funds, no new laws enacted in the EU and non-EU new structure instead, the focus is to create synergies ties between authorities at all levels to maximize the impact of actions and funding. Areas of innovation and cutting-edge research are among the region's strengths: strategy facilitates mutual communication of knowledge and networking to support growth. There are needed infrastructure and modern communication methods to make an opening in the region, both to itself and to its outside world.

The strategy provides a framework for sustainable cooperation actions aimed at all these problems and others. For the strategy to succeed, however, the people in the region need to take actions in order to build a sustainable future for themselves and their children. Preparation of large projects in the Danube area has accelerated in recent years as witnessed by so many conferences organized lately.

RESULTS AND DISCUSSIONS

At Regensburg (Germany), was held the first Annual Forum of the EU Strategy for the Danube Region (27-28 November 2012), an event attended by representatives of local governments in the Danube region.

The European Union Strategy for the Danube Region has proposed to interconnect the Danube region, to protect the environment,

provide increased prosperity and strengthen the institutions of the region. Under the patronage of the European Commission and the Regional Government of Bavaria (Germany), the Forum Annual European Union Strategy for the Danube Region was held under the slogan "How can the Danube Region help build a more competitive Europe?"

The discussions at the forum were focused on topics such as building the future Danube Region, improved environmental adaptability, perspectives energy region of modern Danube, a river basin sustainable tourism and environmental assets, innovative action Danube successful businesses, promoting delegation, skills and overall growth and modern governance in Danube area.

The Forum at Regensburg was a good opportunity to celebrate the results of the first year of implementation of this strategy, which aims to find common solutions to the challenges facing all 14 participating countries in various fields, such as transport, employment labor, environmental, security and economic growth.

Another example is the Danube Financial Dialogue - Second edition (23-24 January 2013) held in Belgrade, Serbia. At the event were presented the financial perspectives of the EU project enough to cover the entire macro-region lying within the 14 states. In this dialogue was discussed and agreed with the delegates of the Danube countries and representatives of the European Commission and the European Union to organize a forum dedicated to Bucharest Danube macro-region strategy.

Financial Dialogue Danube - Second Edition already open financial perspective pragmatic and robust enough for the great transformative EU project covering the entire macro-region lying within the 14 states.

Recently, an agreement was signed between Bulgaria and Romania to sustained development of river transport on the Danube section which forms the border between the two countries. According to the Convention on the Danube transport, the development responsibility is an interdepartmental committee composed of representatives of

Bulgaria and Romania. Benefits of cooperation between Bulgaria and Romania will be the development of joint projects with real impact in the Danube Region, developing links between South-East and the rest of Europe by Pan-European Transport Corridor IV with bridge building number 2 over the Danube between Vidin and Calafat. Other benefits will be the development of river navigation in the Danube between Bulgaria and Romania, multiple links between the two countries and the rehabilitation and expansion of Ruse and Giurgiu Bridge. Is expected to improve port infrastructure development and construction of new terminals in Vidin and Russe modular and collaborative construction of an icebreaker.

CONCLUSIONS

As 2013 is the International Year of Water Cooperation in the field, its purpose is to raise awareness, both in terms of the potential for increased cooperation, and on the challenges facing water management given the increasing demand for water allocation and services.

For Romania, the consolidation of the Danube's cooperation is a priority taking account of the potential for sustainable development of the region and we want to contribute at making the Danube a backbone of the European area as part of the Rhine-Main-Danube corridor.

The problems we face are numerous and the dimensions of regional cooperation are multiple: transport, energy, tourism, agriculture and environment.

The economic and social development of the Danube region must be a sustainable development, which respects the European legislation regarding the environmental protection.

Romania supports this approach given that manages most of the climate change's reserves and the need to protect villages against natural disasters and national parks in the Danube region are extremely important aspects and need to be considered in the current strategy.

The Strategy's projects can be financially supported by developing strong synergies

between different EU policies: cohesion, transport, tourism, agriculture, fishing, social and economic development, energy, environment, neighbourhood and development policies.

The EU has called on civil society in the Danube Basin to start a process of higher self-organisation and to build up a platform for trans-national, trans-regional and interdisciplinary cooperation, consultation and networking. The Danube Civil Society Forum is the forum for civil society cooperation within the Danube Strategy.

This year, in October Romania will host the forum dedicated to the European Union Strategy for the Danube Region. The Forum is dedicated to discussion activities, consultation on revised actions and develop new approaches. In this country will take part in EU institutions and stakeholders (including intergovernmental organizations, the private sector and civil society).

We hope that this event will find us ready, able to find solutions to the problems facing the 14 riverain countries, but especially able to absorb projects able run in the Danube macro-regional strategy. Contribution to the public consultation process representatives of civil society, NGOs and the business environment is encouraged, as the final beneficiaries of the strategy are all Romanian citizens.

Romania is, along with Austria, the author of EU Strategy for the Danube Region. Romania has contributed to the development of the EU Strategy, together with all other riverain states on the basis of national positions defined in the ministerial working group specifically created for this purpose. Danube Strategy is a priority for the Government of Romania in conditions where sustainable development potential of the region is considerable. The plan wants to impose a transformation Danube backbone of European space as part of the Rhine - Main - Danube. Ministry of Foreign Affairs provides national coordination of project realization.

Civil society organizations and private companies are also involved in the implementation of actions and projects and in achieving goals.

The strategy should focus on results. Closer cooperation will allow more efficient exploitation of existing policies and funding. Extensive work is needed, involving appropriate combinations of institutions, sectors and countries.

Strategy - a tool for integration and better use of EU funds - is also a political innovation and a new stage in EU regional policy.

Cooperation is a year of good cooperation is needed between state institutions and civil society members. Success in the Danube region will contribute to the prosperity of Europe as a whole.

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VALUE CHAIN ANALYSIS FOR LIVESTOCK FEED PRODUCTION USING SALINE IRRIGATION DRAINAGE WATER IN TURKMENISTAN

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Abstract

Irrigation return flows increase the salt concentrations of receiving water bodies and cause water logging which affect agricultural productivity in Turkmenistan. Flooding irrigation drainage water using on natural pastures has also had adverse effects on the long-term productivity of desert ranges. This study examines the economics of halophytes as feed for sheep using saline irrigation water from drainage collector systems on a representative farm. Cost-benefit and rate of return analyses show that the project is economically feasible for reused water with 1400 mg/l mineralization levels or less. At higher mineral concentrations in water, or in more saline soils, bioremediation through halophyte fodder production can be profitably implemented if new market incentives exist. Value chain analysis is applied to evaluate alternative incentive systems for sheep operations based on saline water irrigated halophyte fodder production.

Key words: halophytes, pasture land conservation, saline drainage water reuse, sheep production, soil salinity, value chain analysis

INTRODUCTION

Due to the inherent soil salinity and the consumptive use of water by irrigated crops, salt concentrations have been increasing in irrigation water return flows in Turkmenistan. A majority of the return flows from irrigation are now collected through extensive drainage networks and channeled away. This prevents or reduces the saline water from water-logging or infiltrating into the ground water. The collected saline water, called Collector Drainage Water (CDW), could be used to grow halophytes, many species of which are known to be excellent feed for livestock. Halophytes not only tolerate high levels of salinity, they also remove salts, bioremediating highly saline soils. The purpose of this paper is to evaluate the economics of halophytic fodder production for sheep using irrigation return flow water on saline soils. The practice would also conserve

water quality and restore natural pastures, providing social benefits.

Turkmenistan has a total land area of 49.1 million hectares (ha) of which 40.2 million are classified as agricultural land. About 1.7 million ha are irrigated (less than five percent). The agricultural crops on the irrigated hectares are cotton (42%), wheat (49%), fodder (5%) and other crops (4%). The remaining 38.5 million ha of non-irrigated agricultural land is used for pasture. Approximately a quarter of a million hectares of pasture land (0.65%) is under private ownership. The rest is held by Daikhan Unions (DUs), loosely translated as farmers' associations. The productivity of natural pastures is extremely low. The Karakum Desert region produces 80 to 150 kg forage per hectare. About 7 million hectares of pasture (18% of the total) have been identified as priority areas for land reclamation [1]. Turkmenistan's Amu Darya River, the major source of water for the country, provides 22

km³ per year. Other rivers and streams contribute another 3 km³ per year. Ground water withdrawals contribute 1.3 km³ per year [1]. Irrigation water use is about 17.6 km³. There is an estimated total of 41,200 km of irrigation canals in Turkmenistan, of which 33,200 km are intra-farm canals. The Collector Drainage Water (CDW) system is 35,500 km long, of which 26,500 km are intra-farm networks. The mineralization level of CDW is as high as 5000mg/l. Previously, CDW was discharged into lakes, rivers and onto deserts. Now CDW is diverted into Turkmen Lake, a 130 km³ capacity man-made reservoir. Turkmen Lake receives CDW from two collection systems: 3.7 km³/ year from the main system, and up to 6.7 km³ per year from the Dashoguz system [1]. The diversion of CDW into Turkmen Lake reduces the flow of CDW into the Amu Darya River and other places. Over 400,000 ha of desert pastures are currently flooded with CDW drainage water, increasing soil salinity and decreasing the productivity of the pastures. A proposal currently under serious consideration is to use some CDW to produce halophytic feed for sheep, especially if it could raise sheep output or sheep industry profitability. For example, if 10% of the CDW were used to grow fodder for sheep, irrigating approximately 100,000 ha (at the rate of 10,000m³/ha), it might expand sheep output while conserving water quality and natural pasture land.

Sheep production in Turkmenistan is organized by Daikhan Unions (DUs) in each velayet (province). The DUs allocate public pasture to sheep producers much like federal grazing allotments in the U.S. The DUs also provide ewes and replacement ewes to start or maintain producers' herds. The allocated grazing lands have shallow wells for watering livestock and other uses. The well water is slightly saline on top, and more saline at greater depths. Each producer's operation is monitored carefully by the DU to ensure proper management. The DUs also provide veterinary services. In return, each producer shares 50% of their lamb crop with the DU, which are sold, redistributed as replacement ewes, or allocated to new producers. Thus the

reuse of saline water to grow halophytes and other feed will depend on cooperation with the DUs. To be adopted, the practice must generate private economic returns for the producers and the DU, which may also depend on government subsidies related to the social benefits due to the project. The non-market, social benefits may include reduced water-logging, improved water quality in rivers and streams, improved desert wildlife habitat, as well as higher range productivity for both wildlife and livestock.

Numerous recent studies investigated various halophyte species, cultivation methods, productivity, and halophytes as an animal feed from a nutritional point of view [2], [3], [4], [5], [6], [7], [8] and [9]. Studies of halophytes in Turkmenistan include [10], [11], [12], [13], [14] and [15]. There are no detailed economic analyses of halophyte fodder production in general, much less about arid lands in Central Asia in particular, where the economy is less privatized.

Experiments conducted by the Turkmenistan Institute for Deserts, Flora and Fauna in the Ministry of Nature Protection, and by other scientific institutions in Turkmenistan, indicate that CDW water with mineralization levels between 2,800 to 4,800 mg/l can be used to grow many livestock feeds such as beets, sorghum, Sudan grass, corn and barley [13].

Experiments conducted in Central Asia, including Turkmenistan, estimate the productivity of halophytes irrigated with water at 2500 mg/l mineralization level at yields from 4.5 to 21.1 tons per hectare dry weight. And from soils with 30 to 48 t/ha salinity in the 0-100 cm layer, the halophytes remove an estimated at 9 t/ha salts per year. For soil salinity between 8.4 to 21 t/ha, halophyte-alfalfa combinations (70% /30% or 50% / 50%) remove 4.5 to 6.3 t /ha salts per year [15].

Field trials were conducted [16] on sowings of eight halophyte species under no irrigation, saline water irrigation, and fresh water irrigation on lands of the Dashoguz Velayat Daikhan Union (DU). Table 1 summarizes the data from these trials about *Climacoptera turcomanica*, the most productive halophyte

species. This yield parameter is used in this paper to evaluate the economics of halophytes irrigated with CDW as feed for sheep.

Table1: Productivity of *Climacoptera turcomanica*

treatment	<i>Climacoptera turcomanica</i> plant weight (air-dry), kg/ha			
	2004	2005	2006	Average 2004-06
no irrigation	3810	2140	2730	2893
saline water irrigation	8850	11280	7450	9193
Fresh water irrigation	12100	9258	8842	10066

MATERIALS AND METHODS

Two procedures are used in this study. First, cost-benefit analysis is used to evaluate the economic feasibility of growing fodder for sheep using drainage water on saline soils from a private producer's point of view. It does not consider any measures of the social benefits since data are scant. Second, because private adoption of the practice depends on the profitability of the sheep industry, value chain analysis is used to evaluate alternative incentive mechanisms and policies as well as other ways to improve economic efficiency that could make the practice economically attractive.

Cost-benefit analysis

The cost-benefit analysis is based on a 250 ha representative farm growing combinations of perennial alfalfa and the halophyte *Climacoptera turcomanica*, which establishes and produces comparatively well in the desert conditions of Turkmenistan as shown by [16]. Nine cropping scenarios are considered, corresponding to three mineralization levels in the CDW irrigation water (1400 mg/l, 3000 mg/l, and 5000 mg/l) and three levels of soil salinity in the top 100 cm of soil profile (10 t/ha, 25 t/ha, and 50 t/ha). A different proportion of alfalfa and halophyte are planted in each scenario, as specified in Table 2. The rationales are that a larger proportion of alfalfa can be planted where water quality is better and soil salinity is lower, given the

sensitivity of alfalfa to salts. At higher soil salinity levels only the halophyte can be grown. Cultivating halophytes on saline soils, however, reduces the salinity each year.

Because the productive life span of a typical alfalfa stand is three years in Turkmenistan (with seven annual cuttings), the ground is plowed up every three years, and a new mix can be established based on the soil salinity at that time, accounting for the salt removal by the halophyte. For example, a farm that has 50 t/ha saline soil and irrigation water at 3000 mg/l will plant 100% halophytes for the first 3 years. After 3 years the soil is expected to have less than 25 t/ha of salt in the top 100 cm of soil, so the farm would be planted with 30% alfalfa and 70% halophyte. After six years, the soil salinity is expected to be around 10t/ha, so a mix of 50% alfalfa/50% halophyte could be established. Similarly, three phase 3-year rotations are proposed for all cases with 50 t/ha soil salinity, as shown in Table 2. In the case of 3000 mg/l water quality and 10t/ha soil salinity, 50% alfalfa/50% halophytes will be planted every three years. For the case of 3000 mg/l water quality and 25 t/ha soil salinity, there will be a two phase 3-year rotation. In the first three years, 30% alfalfa/70% halophytes will be planted. The soil salinity after that is not expected to exceed 10 t/ha. For the next 3 years 50% alfalfa/50% halophytes will be grown.

Table 2: Proposed Cropping Patterns

Soil Salinity (t/ha in 0-100 cm soil layer)	Applied Water Quality (mg/l)		
	1400 mg/l	3000 mg/l	5000 mg/l
10	100% Alfalfa	50% Alfalfa/ 50% Halophyte	30% Alfalfa/ 70% Halophyte
25	50% Alfalfa/ 50% Halophyte	30% Alfalfa/ 70% Halophyte	100% Halophyte
50	30% Alfalfa/ 70% Halophyte	100% Halophyte	100% Halophyte

For all scenarios it is assumed that the water table is low enough for alfalfa to grow well (because it has deep roots). Where the water

table is a problem, other fodder crops may be considered for planting with the halophyte. It is also assumed that the leaching fraction varies as dictated by the soil and water salinity conditions. Leaching in late autumn or early spring when abundant good quality water is available is recommended so that seeds can effectively germinate.

To complete the cost-benefit analysis, forage yields, sheep production and the average annual money value of the meat and wool produced are calculated for each cropping pattern in Table 2. Revenues from hides and milk are currently insignificant in Turkmenistan and so are excluded from this analysis. The estimated monetary returns from the sheep and wool measure the gross private benefits. The revenues net of expenses accrue to the producer and the DU. Expenses are estimated using the standard procedures established by the Turkmenistan government. Both sunk costs and annually recurring costs are included in the standard accounting framework. The share of net revenue retained by producer is the return to his labor. The share to the DU is the return to natural pasture (economic rent) plus the returns to the services, including managerial and veterinary services, provided by the DU.

Subtracting the costs (C_t) each year from the returns (R_t) gives the series of net private benefits $\{V\}_{t=0}^T$ for the life of the project (from time $t=0$ to $T=20$), for each soil and water quality scenario. Net present values (NPV), benefit-cost ratios (B/C), and internal rates of return (IRR) are calculated to examine economic feasibilities. The measures indicate if the project is worth undertaking at market prices (without subsidy) or if a subsidy is needed to make the project economically viable.

$$(1) \quad NPV = \sum_{t=0}^T \frac{V_t}{(1+i)^t}$$

$$(2) \quad B/C = \sum_{t=0}^T \frac{R_t}{(1+i)^t} \div \sum_{t=0}^T \frac{C_t}{(1+i)^t}$$

(3) IRR = the interest rate (i) that results in a zero NPV.

Value chain analysis

Value chain analysis is a technique for evaluating national, industry, industry sub-sector or firm level competitiveness [17]. Accessible explanations of value chain analysis can be found in [18], [19] and [20]. It is applied here to show how different mechanisms can affect the incentive to adopt the practice of reusing saline water to grow halophytes for feed. Value chain analysis begins from the world (or border) price of the product. This analysis proceeds through each stage of the supply chain from the border to the farm, computing the returns to each stage. At each stage in the supply chain, the services provided or regulations in place can be seen as activities. The set of activities can be disaggregated into subsets of activities in much the same way they were conceived by "activity analysis" scholars to investigate the efficiency of various operations of firms or industries [21] and [22].

From a producer's perspective, the main idea of the value chain is that at each stage, activities may be undertaken to raise productivity or lower costs, differentiate products, or raise product quality, to increase net revenue. The decisions made at one stage in the value chain may change the revenues at other stages in the chain, including at the farm level. Value chain analysis is a visual tool that aids in the analyses of how these activities impact the revenue stream along the entire supply chain. In the presence or absence of competitive markets, it shows the distributional implications of alternate incentive mechanisms and thus helps parties to discuss or negotiate and make decisions.

To investigate the economics of halophyte fodder production we apply value chain analysis to compare the status quo to several different alternatives or combinations of alternatives. The basic alternatives chosen after discussions with the Turkmenistan Institute for Deserts, Flora and Fauna include: 1) investment in the irrigation infrastructure to use CWD to grow halophyte fodder, 2) reduce grazing and conserve natural pastures; 3) government bearing the capital cost of the irrigation infrastructure capital 4) adding supplements to the sheep diet; and 5) meat

pricing alternatives with quality assurance and grading.

Economic returns and project cost data

All the parameters used in the calculations and their sources are listed in Table 3. The yield estimates for alfalfa is 15t air-dried based on application of fresh water at 10,000m³/ha. The halophyte biomass is 8.3 t/ha based on Table 1 with fresh water application. Only 55% of halophyte biomass is edible matter because the plant has thick stems [23]. Percentage yield reductions due to irrigation with saline water for alfalfa and halophyte are also shown in Table 3 at different levels of irrigation water quality (items 4-7). Alfalfa yield reductions are 10% at the mineralization level of 1400 mg/l, 33% at 3000 mg/l and 50% at 5000 mg/l. Halophyte yields are 8% lower than fresh water yield for all salinity levels.

Karakul sheep, the predominant breed in the Karakum Desert of Turkmenistan, are a fat-tailed breed. They are capable of storing a large percent of their body weight in energy and protein to meet gestation and lactation needs. Karakul sheep consume about 1.7 kg per day per head (Table 3, item 8).

Table 3: Parameters Used to Calculate Yields and Economic Returns

Parameter Source	Value
alfalfa biomass (air dry); fresh water (500 mg/l) [13]	15t/ha
halophyte biomass (air dry); fresh water (500 mg/l) [11]	10t/ha
halophyte edible matter [23]	55%
Alfalfa yield reduction at 1400 mg/l irrigation water [24]	10%
Alfalfa yield reduction at 3000 mg/l irrigation water [13] and [24]	33%
Alfalfa yield reduction at 5000 mg/l irrigation water [24]	50%
Halophyte yield reductions at 1400, 3000, 5000 mg/l [11]	8%
Average forage consumption/sheep at 1.7 kg/day [25] and [26]	0.62 kg/yr
Percent of live animals slaughtered [27]	63%
Average animal weight at slaughter [26]	45 kg
Dressed weight/carcass weight [25]	53%
Price of lamb meat at wholesale [28]	\$2.72/kg
Sheep and Wool production [26], [28] and [29]	1.75 kg
Price of wool [29] and [30]	\$0.94/kg
Natural pasture land to sustain one sheep [26]	8 ha

The analysis will consider alternative cropping and management scenarios to match various water and soil qualities. Table 4 shows the air-dry annualized yields of combined fodder for each cropping scenario (Table 1) as the first numbers in each cell, (based on Table 3, items 4-7). Yields range from a high of 13.5 t/ha for 100% alfalfa planting to a low of 5.06 t/ha for 100% halophyte. The second number in each cell of Table 4 shows the number of sheep sustainable based on the combined fodder yields from 250 hectares and the rate of feed consumption (Table 3, item 8) assuming that no pasture is grazed.

Table 4: Fodder Yields, Numbers of sheep, and Sheep Farm Revenues

Soil Salinity (t/ha in 0-100 cm soil layer)	Applied Water Quality (mg/l)		
	1400 mg/l	3000 mg/l	5000 mg/l
10	13.50 t/ha 5,439 \$ 231,242	7.56 t/ha 3,044 \$129,410	5.79 t/ha 2,334 \$99,212
25	9.28 t/ha 3,739 \$158,958	6.56 t/ha 2,642 \$112,293	5.06 t/ha 2,039 \$86,673
50	7.59 t/ha 3,059 \$130,044	5.06 t/ha 2,039 \$86,673	5.06 t/ha 2,039 \$86,673

The estimates of sheep slaughtered annually (lambs, culled ewes and rams) as a percentage of the stock of sheep (Table 3) varies over time due to a number of factors such as the price of meat, feed costs, availability of feed on natural pastures due to drought etc. From 1992-2010 FAO data the percent varied from 44% to 63%, with an upward trend [27]. The percentages are low relative to other countries due to a relatively low lamb crop yield rate of about 110% and relatively high death losses (of both sheep and lambs). We use the most recent 2010 estimate of 63% for this study. Given the average live weight of 45 kg/sheep, and meat dressed weight as 53 percent of carcass weight (or higher, if supplements are fed), total meat in kg is computed. Given the wholesale price in Turkmenistan of \$2.72/kg, gross revenues from meat sales are calculated. Wool revenues are calculated assuming 1.75

kg of wool per sheep, at the 2010 autumn price of \$0.94/kg, as compiled by [30] based on Neutral Turkmenistan, a government English weekly publication.

From these calculations, total annual gross revenues are shown in the last figure in each cell of Table 4, in 2012 U.S. dollar terms. Total annual revenues vary from a low of \$86,673 in the high soil and water salinity scenario to a high of \$231,242 for the low salinity scenario. These are the estimated gross private benefits to farmers and their DU. It is important to note that the productivity of the sheep operations is higher per hectare when CDW water is used to grow halophyte fodder. A farmer can raise the same number of sheep feeding them fodder irrigated with saline water instead of grazing them. There is a trade-off between conserving pasture and expanding the number of sheep with halophyte/alfalfa feed produced from saline water.

The project cost for using CDW to grow fodder is estimated by Aganov, 2012 based on Turkmenistan Government guidelines. Both capital costs (direct outlay and indirect outlays) as well as annual operating costs are shown in Table 5. Fixed costs include the design of the drainage water conveyance system to the farm, intake structure, on-farm take-outs, intra-farm irrigation network, surveying, and other costs. The total fixed cost is \$832,800 borne at the beginning of the project. Of the \$188,000 total operating cost, according to Turkmenistan guidelines, item 7 in Table 5 is a \$69,400 one-time overhauling cost in the tenth year (not a variable cost). And \$34,700 (item 8 in Table 5) is depreciation, paid into a project replacement fund to equal the direct capital outlay (also not a variable cost). Variable costs include seeds, other inputs, repairs and maintenance, and costs such as materials or hired labor. Thus only \$84,700 is the estimated annual variable cost.

Table 5: Estimated Costs of Project per 250 hectare farm (2012 U.S. Dollars)

Item	element	Cost per Unit (\$)	Amount	Total (\$)
	A. Direct Capital Outlay			
1	Main waterway network/ha	68	250	17000
2	Irrigation network/ha	1914	250	478500
3	Head water intake/ha	222	250	55500
4	Collected drainage network/ha	572	250	143000
	Total Direct Capital Outlay			694000
	B. Indirect Capital Outlay			
5	Projecting and surveying work (5% of direct outlay)			34700
6	Unforeseen expenses (15% of direct outlay)			104100
	Total Indirect Capital Outlay			138800
	Total Capital Outlay			832800
	C. Operating Costs			
7	General overhaul (10% of direct, once in 10 years)			69400
8	Annual Depreciation (5% of direct, each year)			34700
9	Seeds and fertilizers/ha	200	250	50000
10	Running repairs (5% of direct outlay)			34700
	Total operating costs (including capital related costs)			188800
	Annual variable cost			84700

RESULTS AND DISCUSSIONS***Economic Incentives to reuse saline water in halophyte fodder production***

Assuming a 20 year project life, net present values (NPV) at 5% and 2% discount rates, benefit-cost (B/C) ratios, and the internal rate of return (IRR) are calculated to assess the economic feasibility of the project, ignoring the project replacement fund and abstracting from any explicit consideration of the project's unpriced environmental ("social") benefits. When the reused water has a mineralization level of up to 1400 mg/l, the NPVs are positive for all three cropping patterns (100% alfalfa, 50% alfalfa /50% halophyte and 30% alfalfa /70% halophyte) at all three levels of soil salinity. The internal rates of return (IRR) are 21%, 13% and 9% for the positive NPV scenarios, respectively. The corresponding benefit-cost (B/C) ratios are 1.5, 1.25 and 1.09 at the 5% discount rate, and 1.67, 1.38 and 1.22 at the 2% discount rate. The other scenarios have negative net present values at both discount rates, and less than unitary B/C ratios.

This analysis makes it clear that there may be private incentives at current market prices to reuse 1400 mg/l saline drainage water. But in general, for water quality worse than 1400 mg/l, there is currently no private economic incentive to use saline water to grow feed for sheep.

Value chain analysis and implementation for the sheep industry

There are a variety of alternative mechanisms for adoption by farmers, the DUs, and/or the government that could change the incentives to invest in the infrastructure and use CDW to grow halophytes for feed rather than grazing sheep. As noted earlier, they are: 1) private investment in the irrigation infrastructure to use CWD to grow halophyte fodder, grazing on 1/3 and idling 2/3 of the pasture; 2) government investment in the irrigation infrastructure and private use of CDW to grow halophytes for fodder while also idling 2/3 of the pasture; 3) alternatives (1) & (2) plus adding supplements to the sheep diet; and 4) the alternatives in (3) plus quality grading and pricing.

To understand how these alternatives affect incentives throughout the sheep industry, value-chain analysis can be prepared for each cropping pattern scenario (Table 2). For this paper, we focus on a representative farm with CDW at mineralization level of 3000mg/l and the soil has 25 t/ha salinity, growing 50% alfalfa/50% halophytes, where the project would not be cost-effective, all else equal (Table 4). Figure 1 shows the value chain(s) for both the baseline and three of the four alternative mechanisms (indicated by dashed boxes). Note that because the effects of the alternatives on net revenue are additive, it is possible to examine any combination or levels of the alternative mechanisms.

The value chain in Figure 1 is based on: i) the yield and price parameters in Table 3; the production parameters in Table 4 for this scenario; iii) project costs shown in Table 5 (\$832,400 capital costs plus the \$64,900 overhaul cost in the tenth year, amortized over 20 years at 5% interest, resulting in a \$69,324 annualized capital cost; and annual variable costs of \$84,700); iv) a shearing cost of \$0.094/kg (at 10% of revenue); and v) a slaughter and meat cutting cost of \$15/animal. The results of the analyses of the following alternatives corresponding to the above scenario are summarized in table 6.

Baseline Analysis (Status Quo)

In the baseline/status quo, there is no CDW water project, no subsidies, incentives, or feed supplements. To sustain 2,642 sheep on 250ha with yields of the 50/50 fodder, (needing 8ha per sheep to graze), will require 21,135ha of natural pasture. The baseline sheep farming operation's net private benefit is \$86,898, shared by the producers and the DU.

CDW Project (Expand Flock and Conserve Natural Pastures)

For the scenario under consideration, (i.e. applied water quality of 3000 mg/l and soil salinity of 25t), a flock of 2,642 head of sheep can be sustained by the fodder grown on 250ha as shown in Table 5. However, there is no reason to abandon grazing altogether. Here we assume that the farmers will conserve 2/3 of the natural pasture, and graze the other third. This means they can increase

their flocks by 1/3, to 3,515 head. If demands for sheep meat and wool are perfectly elastic (for example, when the additional supply is sold on world markets), the gross revenues (and costs) from the wool and meat from the larger flock of sheep will also be a third again higher. Nevertheless, as shown at the end of the second column of value chain alternatives in Figure 1, the net private return will be a loss of \$38,418. If producers and the DUs were to bear the full cost of the saline water irrigation infrastructure, there is no private incentive to finance this project which would also conserve water quality and natural pasture land.

CDW Project with Feed Supplementation

In the baseline, no supplements or concentrates are added to the sheep diet. In practice this is due to the additional cost, or to lack of local availability. Information about sheep rations from other major sheep producing countries suggests adding concentrates to the rations in Turkmenistan could also raise revenues. In other countries, the recommended supplemental sheep ration is about 0.7 kg in dry weight roughage and up to 1 kg of concentrates. This increases weight gain, promotes a healthier herd and multiple births, and produces a higher quality lamb crop. Feed supplements are particularly important if the sheep are fed halophytes. Based on [3], if barley is added to the diet for 120 days at 250gm/day/animal, this will increase the dressed weight by 6 kg per sheep slaughtered. At \$250/t barley, the feed supplements would cost an additional \$26,354 per flock. However, due to the gained weight, the producers will also earn higher gross meat revenue of \$179,737. The economically profitable alternative of feed supplementation does not, however, make the whole CDW project preferred to the status quo. If the producer and the DUs bear the full costs of the CDW project as well, they face an annual net loss of \$28,644 (not shown in Figure 1).

CDW Project Capital Cost Subsidy (k-subsidy)

There are two aspects to getting CDW water to sheep producing farms: conveying it to the farm; and distributing it within the farm

through intra-farm canal systems. There are three possible financial sponsors: the sheep producers, the DUs, or the government. Where market opportunities, soils and CDW water quality supports net returns at least as large as the status quo, producers and the DUs may be willing to finance the project. Otherwise, the government may consider financing the project. The motivation would be to secure the unpriced environmental (social) benefits from the project: improved water quality, reduced soil salinity, conserved pasture lands, etc. For similar benefits, other country governments either pay for the infrastructure or subsidize such projects by providing low or zero interest loans. In Turkmenistan, if the project is approved, the government would pay the capital and capital-related operating costs (the infrastructure costs of \$832,400 and the overhaul cost of \$64,900 in the tenth year). Farmers and the DUs would pay the annual variable costs of \$84,700. In that case, producers would avoid the \$69,324 annualized capital and related costs, and earn a net return of \$30,906 annually. This is shown at the end of the third set of value chains in Figure 1.

CDW Project with K-Subsidy and Feed Supplementation

If the sheep farmers graze on a third of the natural pasture as well as grow fodder through a CDW project, plus supplement the feed with the barley ration, and the government bears the capital costs as in, the net private return to the farmers and their DUs are \$40,680, shown at the end of the fourth value chain in Figure 1. This also has a positive NPV and a B/C ratio > 1, but it does not yet dominate the net private return of the status quo.

Quality Grading and Pricing (G&P)

In Figure 1, both the world market (border) prices of sheep meat and wool and their domestic prices in Turkmenistan are shown. The world wholesale market price for sheep meat is \$6.50/ kg [27]. The domestic wholesale price in Turkmenistan is \$2.72/ kg in the baseline or status quo scenario.

The \$3.78/ kg difference or margin is due to the government's trade and pricing policies, transport costs from major shippers of sheep meat to Turkmenistan, and the quality of

domestic sheep meat. Consider the implications along the value chain of lowering the margin to \$2.00, so that producers earn a higher domestic price for sheep meat. For example, higher domestic prices may be paid for higher quality domestic meat. With a sheep meat grading system and quality pricing, farmers who would like to increase meat quality would have economic incentives to do so.

When sheep are graded and priced for quality, the higher prices will provide incentives to use saline irrigation water to grow halophytes for fodder in addition to feeding supplements.

The value chain analysis highlights that if quality is graded and priced accordingly--at \$4.50/kg, still well below border prices-- the net private return of \$88,978 would exceed the private net return from the status quo of \$86,898 (at the end of the last value chain in Figure 1).

A privately financed CDW project that conserves two-thirds the natural pastures, without any subsidy, would be more attractive to producers and DUs than the status quo. This underscores the power of efficient private markets with respect to investments that benefit the public.

Table 6: Summary of Alternative Value Chains for a Sheep Operation with 250ha fodder

	Status Quo	CDW project	CDW project + feed supplement	CDW project + K-subsidy	CDW project + K-subsidy + feed supplement	CDW project + Quality G&P + feed supplement
head of sheep	2,642	3,514	3,514	3,514	3,514	3,514
hectares grazed	21,136	6,975	6,975	6,975	6,975	6,975
meat revenue	\$ 107,947	\$ 143,609	\$ 179,737	\$ 143,609	\$ 179,737	\$ 297,360
meat cost	\$ 24,960	\$ 33,206	\$ 59,560	\$ 33,206	\$ 59,560	\$ 59,560
meat net revenue	\$ 82,987	\$ 110,403	\$ 120,177	\$ 110,403	\$ 120,177	\$ 237,800
wool revenue	\$ 4,346	\$ 5,780	\$ 5,780	\$ 5,780	\$ 5,780	\$ 5,780
wool costs	\$ 435	\$ 578	\$ 578	\$ 578	\$ 578	\$ 578
wool net revenue	\$ 3,911	\$ 5,202	\$ 5,202	\$ 5,202	\$ 5,202	\$ 5,202
CDW project cost	\$ -	\$ 69,324	\$ 69,324	\$ -	\$ -	\$ 69,324
Variable costs	\$ -	\$ 84,700	\$ 84,700	\$ 84,700	\$ 84,700	\$ 84,700
Net Revenue	\$ 86,898	\$ (38,418)	\$ (28,644)	\$ 30,906	\$ 40,680	\$ 88,978

CONCLUSIONS

This study evaluates the economics of halophyte production for livestock feed using saline irrigation drainage (CDW) water. If the applied water has mineralization levels of 1400 mg/l or less, benefit/cost analysis shows that the CDW halophyte project is economically feasible in Turkmenistan. At higher concentrations of water and soil salinity, if there are no improvements in market pricing policies or sheep nutrition, the project will not be economically preferred to the status quo even if capital costs are fully subsidized. Value-chain analysis shows that if sheep farmers feed supplements, graze a portion (~33%) of the pasture while conserving 67%, and participate in quality grading and pricing, the CDW project

economically dominates the status quo without any subsidization by the government. Four major points should be noted. First, the cultivation and feeding of halophytes allows for an increase in sheep production as well as pasture land conservation, water conservation, and the bioremediation of saline soils. Second, because CDW conveyance and halophyte cultivation projects are not costless, market or nonmarket incentives (subsidies) will be required to encourage implementation. Third, although subsidies may be justified by the social benefits in terms of improved water quality and soil conservation, in the absence of market incentives, even a full capital cost subsidy would not make such projects economically preferred by private farmers and their associations (DUs) to the status quo. However, market incentives such as a legal

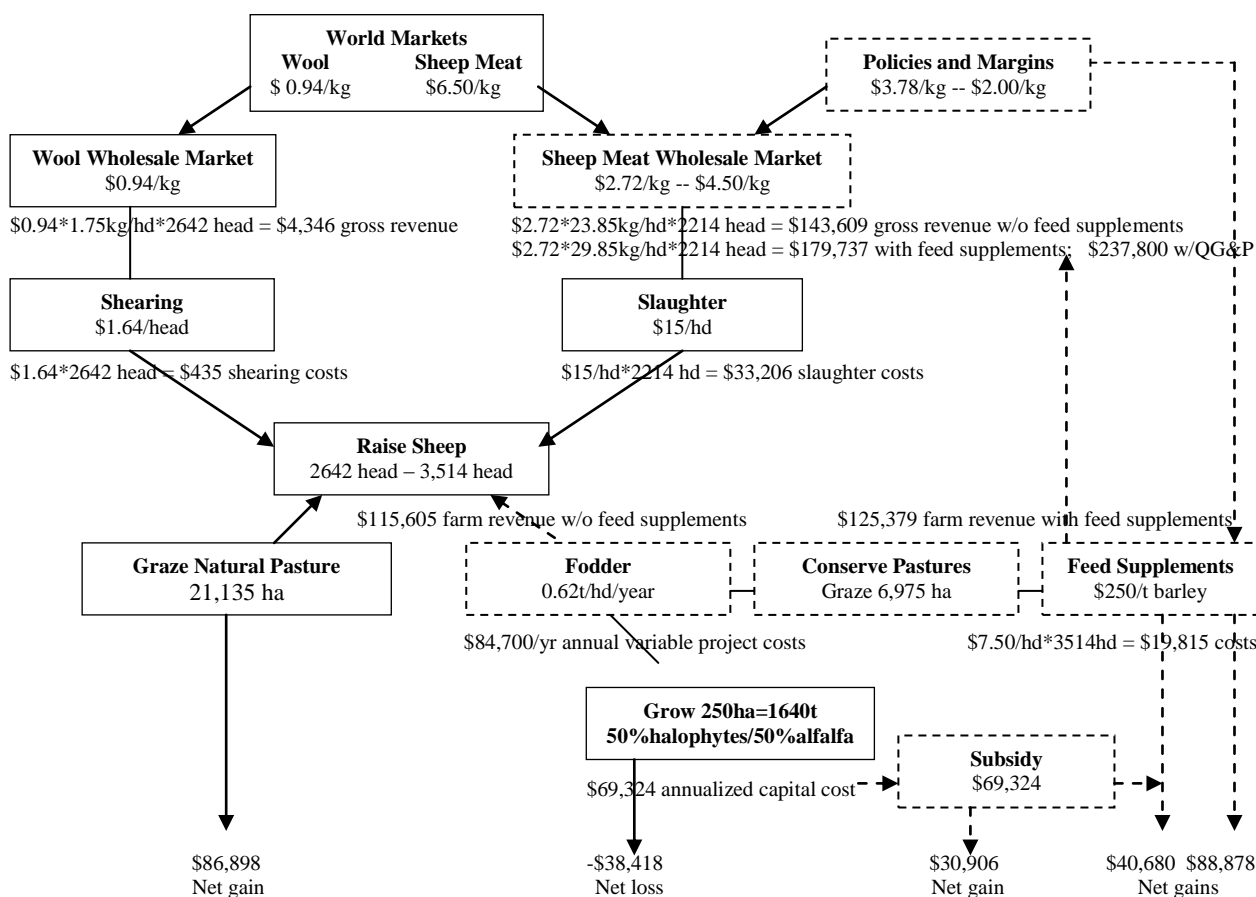
system of meat quality grading and pricing are sufficient to encourage CDW project implementation (no subsidies needed). Fourth, the net economic benefit of adding supplements to sheep feed rations, necessary to leverage the productivity benefits of implementing a CDW halophyte project, also depend on market incentives such as quality grading and pricing.

In sum, Turkmenistan has an opportunity to use their saline drainage water to expand their sheep industry and conserve their environment. Even if only 10% of its CDW is used, up to 100,000 hectares of halophyte fodder could be irrigated. That fodder could sustain 1 to 2.5 million head of sheep while

conserving at least 1.5 million hectares of natural pasture. No subsidies would be needed if market reforms such as quality grading and pricing were made available to those who implement CDW projects.

Several limitations of this study require further investigation. These include 1) sensitivity analysis with respect to the pasture, crop, animal, cost, and pricing parameter estimates used to derive the results; 2) more detailed parameterization or interpolation of the effects of water and soil salinity on yields, to parameterize a full non-linear optimization model; and 3) quantify the social benefits resulting from this project using both market and non-market valuation techniques.

Figure 1: Value Chain(s) for Representative Sheep Farm ¹



¹The value chain figure is drawn for the scenario corresponding to applied water quality of 3000mg/l and soil salinity of 25t/ha and the cropping pattern with 50% halophyte and 50% alfalfa, as shown in Tables 1 and 4.

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THE PRINCIPLES OF SUSTAINABLE DEVELOPMENT AND THEIR INFLUENCE OVER THE ROMANIAN ECOTOURISM

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Abstract

Tourism can exacerbate some environmental problems and increase degradation of the environment. Sustainable tourism, a tourism industry that applies principles of sustainable development can on the contrary assist in maintaining ecosystems and biodiversity. In this regard, ecotourism, a form of sustainable tourism based on the observation of natural areas is an interesting niche. Romania has strong major natural to position in advantage in this market.

Key words: development, ecotourism, environment, sustainability

INTRODUCTION

Tourism can exacerbate some environmental problems and increase degradation of the environment. Sustainable tourism, a tourism industry that applies principles of sustainable development can on the contrary assist in maintaining ecosystems and biodiversity. In this regard, ecotourism, a form of sustainable tourism based on the observation of natural areas is an interesting niche.

Globalization, by the development of transport and the abolition of distances between countries has fostered a spectacular growth of tourism since the end the Second World War. In this context, the tourism industry has become an important tool for Regional economic development, encouraging local investments and increasing employment. This paper presents the sustainable tourism, particularly ecotourism, and focuses on its deployment in Romania. The definition concepts of sustainable tourism and ecotourism are above of the link analysis between tourism and the environment, and the impact of climate changes.

MATERIALS AND METHODS

According to the Brundtland Report, World Commission on Environment and Development, (1987) "Sustainable development is a development that meets the

needs of present without compromising the ability of future generations to meet their own". The International Union for the Environment Conservation adds that economic, environmental and social aspects should be taken into consideration for making development harmonious and balanced.

At the United Nations Conference on Environment and Development (Rio, 1992), has settled Agenda 21, an action plan to implement the principles of sustainable development. Then, the action plan on Sustainable Development, World Summit (Johannesburg, 2002) was involved in the evolution of the concept of sustainable development. With influences from sciences and policy making, the Sustainable development includes now environment protection, social equity, quality of life, cultural diversity and dynamic economy that provides for all jobs and prosperity (Tourism Sustainability Group, 2007). Overall, it revolves around the three "Pillars" of economic, environmental and social viability.

To be effective, sustainable development must be implemented in all areas of activity. Regarding the tourism industry, the development of sustainable tourism, focuses on finding the right balance between it's environmental, economical and socio-cultural components, with the perspective of a long term viability (UNEP, 2006). It applies to all

destinations and all types of tourism, both in mass tourism and various specialized segments. Sustainable tourism must use optimal environmental resources, preserve ecological processes and contribute to the environment conservation and natural biodiversity. It must longer meet the socio-cultural authenticity of host communities, in addition to preserve their cultural heritage and their values. It finally must ensure sustainable economic activities for long term, and that the benefits are distributed fairly, and contribute to the fight against poverty.

The development of sustainable tourism requires the participation of all parties, relevant stakeholders, as well as strong political will, to ensure broad participation and a wide consensus.

In order to ensure the tourism sustainability, it requires constant impact monitoring, by setting up the preventive and corrective measures. In order to do that, it is necessary to apply systematically targets and sustainability criteria for existing and future infrastructure and services, (ITF-STD, 2009). Finally, in addition to providing interesting experiences to tourists, sustainable tourism should raise awareness about sustainable development issues and make them discover best practices, according to the WTO. [1]

The tourism depends on a large scale of the quality of the environment in which it unfolds. Climate, which determines a part of the attraction community, is an important resource for the sector. The scenic beauty, the integrity of nature and plant species diversity and animal also attract visitors. In addition, the tourism industry has impact over the natural environment and frame, as well as over the well-being of host populations. If the tourism development is poorly planned and managed, it can affect the quality of the environment and, thus ruining the attraction of resources witch supports it. A too large number of visitors can cause significant pressures over the ecosystems and can cause environmental degradation. Some activities enjoyed by tourists, such as snowmobile tours, produce pollution. In fact, energy consumption of the tourism industry for

transport to destination, travel during the stay, significant contributes to air pollution and emissions of greenhouse gases. Together, transport to places of destination generates approximately 980 tonnes of CO², 52% caused by air travel, 43% by cars and 5% by other means transport (bus, train and boat). The total CO² emissions related to tourism increased steadily over the past 50 years and now represent 5% of all carbon dioxide emissions of human origin. Since tourism should further progress in the coming years, this industry will develop coherent strategies to curb growth of greenhouse gases emissions. However, if subject of a thoughtful and balanced management, tourism can become a driving force behind the conservation efforts, participating in awareness and providing source of income for activities for the protection of the environment. In fact, tourism can bring contribution to the sustainable development. On the one hand, it is a sector actively participating in dynamic of the local economy. On the other hand, since moves to the consumer producer and product, tourism creates a special relationship between visitors, professionals, the environment and local communities.

By discovering new places, tourism generates multiple interactions and raises awareness of the environmental problems factors and differences between nations and cultures. Attitudes and commitment to the sustainable development can find modified.

The ecotourism is a sustainable form of tourism, small-scaled, which is based around watching activities in natural areas. Ecotourism contributes the protection of the environment and well-being of local population (The International Ecotourism Society, 1990). Originally associated with tourist activities with very low impacts on the physical environment and culture, the term ecotourism was then expanded to include conservation and sustainable development of a community. It is therefore a useful tool in development of strategies for sustainable tourism.

Ecotourism can be seen as a collaborative effort between concerned local communities, tourism stakeholders and protecting the

resource, allowing State to preserve natural environment and to serve in supporting the Regional Development.

Ecotourism is a particular object helping to minimize the impact of the human over the environment, promoting awareness about environmental respect and cultures, generating income for the conservation and local communities, through discovery activities of nature and landscapes. It is one of the sectors with the fastest growing, and a substantial contribution to the protection of threatened natural areas and providing the opportunity for local communities to participate in their development.

RESULTS AND DISCUSSIONS

Romania, which has a numerous natural resources and an exceptional biodiversity, it is considered to be a pioneer in ecotourism. For several years, measures have been implemented to preserve habitats and ecosystems in the country. There are 42 natural protected areas, 3 biosphere reservations, and 3 scientific reservations scattered all over the country. The Danube Delta Biosphere Reservation is one of the most important natural protected areas in entire Europe, and why not in the World, due to its exceptional richness in biodiversity and culture. In the World, Costa Rica is the first ecotourism destination of North Americans and Europeans. The New Zealand is also a leader in the world of ecotourism. Several operators and specialized service providers to offer friendly environment activities and visits in the Aboriginal communities.

In 2005, the World Heritage Centre of the United Nations for Education, Science and Culture (UNESCO) has undertaken an assessment of impacts of climate change on World Heritage (UNESCO, 2009). It seems that the changes introduced in World Heritage sites affect several industry segments of global tourism, including tourism and ecotourism environment. The Heritage Tourism Programme World also aims to provide support for sustainable development of sites. It proposes that States parties to the 1972 Convention policies, tools and

approaches to address the problems of tourism “green” management.

To adapt to climate changes in the tourism industry based on the nature, oversight to assess the scientific ecosystem changes must be implemented (WTO and UNEP, 2008). Appropriate safeguards will be taken, focusing on species and habitats most vulnerable impacts of climate change and which are most important for tourism. Protected areas must grow and be revised regularly. Migration corridors must be created to allow endangered species to find new habitats.

Since the late 1990s, several discussions on sustainable tourism have taken place in various international forums. Thus, in 1999, the seventh session of United Nations Sustainable Development Commission invited governments to develop policies and strategies for Sustainable tourism based on Agenda 21. That same year, the United World Tourism Organization (UNWTO) was erecting Global Code of Ethics for Tourism, incorporating the principles of tourism sustainable development. This code was approved by the General Assembly of United Nations in 2001. Under International Year of Ecotourism (2002), The Quebec Declaration was adopted at the World Summit of Ecotourism. This statement outlines recommendations from participants for governments, tourism professionals and other stakeholders on measures to be taken to promote the development of ecotourism.

The ecotourism should continue to contribute to strengthening the viability of the tourism industry in general, by increasing economic and social benefits for host communities, actively participating in the protection of natural resources and the cultural integrity of communities and raising awareness of travellers to the preservation of natural and cultural heritage.

The Quebec Declaration was adopted by more than a thousand people from 132 countries and from the public, private and non-governmental sectors, at the World Ecotourism Summit, held in Quebec City in May 2002. Tourisme Québec and the Canadian Tourism Commission were the

guests of this event organized under the aegis of the United Nations Environment Programme (UNEP) and the World Tourism Organization (UNWTO). The Declaration proposes a preliminary program and a series of recommendations for the development of ecotourism in the context of sustainable development.[2]

Also in 2002, the Plan of Action of the World Summit on Sustainable Development in Johannesburg deals with the promotion of sustainable tourism as a strategy for the protection and management of natural resources. In 2003, the Conference of the Parties to the Convention on Biological Diversity, which includes 193 governments, endorsed the implementation of a ten-step process for policy development, planning, development and management of tourism. In addition, the WTO organized the First International Conference on Climate Change and Tourism in Djerba, Tunisia. The Djerba Declaration (2003) calls on governments to develop policies for sustainable management of water resources and wetland conservation, promoting the use by tour operators of renewable energy sources and to encourage consumer associations, tourism businesses and the media to educate consumers about the impact of their behaviour and choices.

In 2009, in order to support the process of Marrakech, it was created the International Workgroup on Tourism Sustainable Development (ITF-STD). This Group, which aims to develop tools to support the implementation sustainable tourism and encourage the dissemination of good practice, is controlled by France. Following the presentation of the recommendations of the ITF-STD during preparatory workshops for the 18th session of the UN Commission for Sustainable Development in May 2010, the United Nations announced Global Partnership for Sustainable Tourism, partnership, which will be conducted initially by the French government and will be supported by UNEP. It will be comprised of member governments, industry associations, environmental and social organizations, and UN agencies. It will also build on existing regional and global

networks, including those of the Council of sustainable tourism and finance and investment in sustainable tourism.

CONCLUSIONS

The tourism sector is a privileged field of application of the principles of sustainable development. When managed properly, this industry can result in a positive impact on the economic, environmental and social. Ecotourism, a form of sustainable tourism is a particularly promising niche. Global demand for this type of experience is growing remarkably and should continue to increase over the coming years.

Romania has the resources needed to become an important ecotourism supplier. It is a highly competitive industry, more and more investment by innovative and proactive players who rely on their network protected areas and national parks, including New Zealand, Costa Rica, United States, Canada and Australia.

In order not to miss the opportunity of ecotourism, more efforts should be made. Having established an ambitious sustainable development policy, the challenge for the Government of Romania is to make concrete commitments. This step will be accomplished through the design of a real long-term national vision, in which all land use decisions and economic development are analyzed according to the principles of sustainable development, considering the views of all stakeholders. Promote the development of sustainable tourism, including ecotourism, will contribute to achieving the goals established by the principles of Sustainable Development.

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QUALITY MANAGEMENT OF BAKERY PRODUCTS: A CASE STUDY IN SC "DOBRE AND SONS" S.R.L. CONSTANTA- ROMANIA

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Abstract

The paper aimed to present the benefits of implementing HACCP (Hazard Analysis and Critical Control Points) to company S.C. "DOBRE AND SONS" S.R.L. Constanta, Romania. The data have been provided by the above mentioned manufacturer. The objectives of S.C. "DOBRE AND SONS" S.R.L. are protecting the health of the consumers of the products and their satisfaction regarding the consumption of products that are nutritional, tasty, fresh, free from microbiological, chemical and physical hazard, as well as possessing stable properties during the validity for consumption. In this respect, there has been implemented and maintained an integrated management system of food quality and safety according to SR EN ISO 9001:2008, SR EN ISO 22000:2005 and according to IFS standard, version 5/2007, which consists of determining the potential biological, chemical and physical hazards that might affect the safety of bread and bakery products, or the health of the consumer. HACCP team is analyzing hazard using one of the recommended techniques: brainstorming or the cause - effect diagram. In conclusion, the company S.C. "DOBRE AND SONS" S.R.L. Constanta, Romania provides awareness and employee involvement at all levels in achieving the appointed objectives.

Key words: quality management, bakery products, Constanta, Romania

INTRODUCTION

Considering that the company slogan is "A good taste is never forgotten", it aimed that the products obtained in the organization would reach the approved and required quality level, would be safe in terms of health and hygiene and in accordance with national regulations. Top management has ensured that the principles stated in the organizations policy are translated into specific measurable goals for each department of the organization and that the responsibilities and timelines for achieving these objectives are defined and communicated to the employees involved in each department [1].

MATERIALS AND METHODS

To ensure the implementation of HACCP, critical control points (CCP) and points of attention (PA) have been identified using the methods: brainstorming and cause – effect diagram. It is substantial that Critical Control Points (CCP) and Control Points (CP) (or

Points of Attention, PA) are not to be confused. The difference between them lies in the answer to the question: "If the phase steps out of control, is it possible that this would endanger the health or life of the consumer?" If the answer is YES then one talks about CCP, and if the answer is NO, one talks about PA. Manufacturing technologies of bakery products and specialties may vary in terms of the risk of hazard and points (steps, operations) which are critical control points. This may be due to differences in terms of: location of the section, machinery and equipment, raw material selection, materials and ingredients. Research on determining PA and CCP has established itself as a must as some fresh bakery products were not consistent in organoleptic and sanitary terms.

RESULTS AND DISCUSSIONS

CCP determination is a complex process that applies to all types of biological, physical and chemical risks by analyzes and debates held in the HACCP team. The various manufacturing

technologies of the same food product may differ in terms of risks of hazard and points / stages / operations that form CCP.


Depending on the severity and frequency of the analysed risk, the risk class is determined (1, 2, 3 or 4) resulting from the intersection of these two elements, using the table as outlined below.




Table 1. The severity and frequency of the risks

Severity	Frequency (in the final product; at intake)		
High	3	4	4
Medium	2	3	4
Low	1	2	3
	Low	Medium	High

The assessment of risk of danger is to analyze the probability (frequency) of each identified hazard manifestation and their severity (severity), on food consumption, considering that control measures (or preventive ones) have not reached their goal. Such an assessment provides a quantitative ordering of hazards, followed by the application of HACCP decision tree to identify critical control points of significant risks, which typically come in grades 3 and 4. Stages of flow diagrams identified as critical control points are addressed in the HACCP plan for each product. Implementation of HACCP involves inserting a system of documents and records to confirm all data and information related to the safety of the manufactured products, to reflect the severity of the risks, the methods used for their supervision and measurements obtained in the CCP [2].

Table 2. Flow chart - white bread

STAGE	PROCESS	DESCRIPTION
1. 	Quantitative and qualitative reception of raw and auxiliary materials: flour, yeast, water, salt, etc.	Raw materials are received in quantity and quality by the Commission of reception, checking the accompanying documents (invoice, data sheets, physico-chemical and microbiological analysis bulletins), checking compliance with Product Description. Storage Card is drawn and then operated in the accounting software.
3.	Storage of raw and auxiliary materials: flour, yeast, water, salt, etc.	Raw materials are stored on pallets in the food commodities area of the raw materials warehouse, located within the production unit. Material use in production will respect the principle of FIFO (first in, first out). Temperature and humidity in storage will be monitored in the Register of temperature / humidity storage by the

STAGE	PROCESS	DESCRIPTION
		working time manager, 3 times a day.
4. 	Sifting flour	It is mandatory that flour be sprinkled by passing it through a sieve with 7-8 metal mesh / cm or magnet sifter. This control screening removes any possible impurities, ensuring the purity of flour. Vibrating sifter is used.
5.	Emulsification of the yeast	Before use, compressed yeast is dissolved in warm water, forming suspension in order to achieve a uniform distribution of bacterial cells in the semi-finished mass which undergoes fermentation, and thus, a uniform raising of the dough, or bread. For making yeast <i>the simple mechanical agitator</i> is used.
6. 	Iodized salt dissolution	The saturated salt solution is prepared, which was filtered before use. Salt preparation is done using solvents as agitator, or using a continuous dissolving installation. The amount of salt is determined from the production recipe
7.	Tempering water	Process water must be heated to a certain temperature, usually ranging between 25 ° -35 ° C, depending on the necessary temperature for dough, flour temperature and working season.
8. 	Raw and auxiliary materials dosage	Is done by dosing water in the quantities specified in the recipes for making the product
9.	Kneading	Previously prepared and dosed ingredients are introduced into the mixer in the following order: water, flour, salt, yeast. - Kneading is performed by the working time manager. - Kneading of the ingredients is performed with the mixer for 15-20 min
10.	Ferment	Fermentation is done in order to obtain well loosed dough, resulting in a well-bred product. Temperature at which the fermentation is performed is 30-32 ° C for dough. The duration of fermentation is longer for leaven 120-150 min. and 20-30 min for dough.
11.	Dividing dough	- The piece of dough is weighed and divided into portions corresponding to the nominal mass of the product. - Weight-checking takes place piece by piece by using the scale at partition -The division is made in the manufacturing of bread, with uninterrupted machines or by hand.
12.	Pre-shaping / mechanical shaping	The dough is divided into two pieces, and each piece is round shaped. The shaping operation allows the achievement of both aesthetic form of the product and a uniform core structure by eliminating large gaps formed during fermentation.
13.	Pre-yeasting	This operation is achieved by keeping in standby, in appropriate microclimate conditions, pieces of dough after dividing and preshaping. Pre-yeasting duration is of 5-8 min. in a conditioned atmosphere, with temperature around 30 ° C and relative humidity of 75%.
14.		Final yeasting must be conducted in a warm and humid environment, with

STAGE	PROCESS	DESCRIPTION
	Final yeasting	temperatures of 35-40 ° C and relative humidity of 75-80%. The final acidity of the piece of dough 3-3.5 degrees.
15.	Baking	Baking takes place in the oven with temperature monitoring, time is set according to weight: 15 min and the oven temperature is 280 ° - 29 ° C; Baking stage is a critical control point and temperature and baking time are being monitored, data is recorded in the Temperature Register. Removing the products is done by hand, the product must have a beautiful look, with the typical colour of a well baked product.
16.	Cooling	Cooling occurs at a temperature of 18-20 ° C. There must be sufficient ventilation and relative air humidity of 65-70%.
17.	Crate washing and drying	Crates are washed, dried and properly sanitizes without residual detergent or other debris left on them.
18.	Packing	Packing is carried on in adequate hygienic conditions and washed packaging (crates) are used, dried and sanitized.
19.	Storage	In the finished product warehouse, on rack, for 1-2 h
20.	Delivery (and transport)	Are done following the principle of FIFO, with means of transport that are suitable in terms of health and hygiene

Technological flow must follow the path of raw materials from their point of entry into the production unit, throughout the manufacturing process, the route of the semi-finished products, of residual waste, of by-products up to the final product. On these routes will be identified the microbiological, chemical and physical hazardous risks to the safety of the bakery products. Identifying the critical control points lead to the additional safety measures, as follows:

- An additional mesh sieve and magnet sifter have been installed at the outlet of flour in the mixer bowl to retain physical impurities;
- The duration of dissolving of salt in water has been increased and the number of filters through which saline solution passes has also been increased;
- Scales were replaced with more efficient ones;
- Baking temperature is monitored at shorter intervals;
- For a better cooling of bread the technological line has been changed by passing the cooling belt - which was located above the oven - in its sequel, in a better-ventilated space.

The review of the system is a periodical, well documented evaluation of activities included in HACCP plan in order to change it when necessary (i.e. when there are changes in raw materials, the manufacturing recipes, the production conditions, the conditions of storage or distribution, new scientific information about contaminants, changes in product use, the inefficiency of the system established on the checking route).

CONCLUSIONS

1. HACCP approach to food safety assurance shifts the attention from finished product testing to the control of the process and raw materials.
2. The study revealed that the production of bakery products is subject to a variety of risk factors during the technological flow.
3. HACCP monitoring system is an effective framework for determining risk factors in the production of bread.
4. Implementation of HACCP system provides benefits to society and consumers as a preventive method of quality assurance.
5. Implementation of HACCP system helps reduce scraps and customer complaints and allows to extend the validity of the products.
6. By improving product quality, customer and employees confidence in the company are increased, as well as in its ability to achieve only quality products, consistently representing a way to withstand the increasing competition.
7. Implementation of HACCP system helps to improve company image and credibility on international markets and to potential investors.
8. Key elements of the manufacturing process must be continually monitored and controlled, enabling implementation of corrective measures on time.
9. Benefits are besides food safety of the manufactured products, a better use of resources and a faster response to problems arose in production.
10. For an effective implementation of HACCP program, staff training and consumer awareness regarding HACCP principles and applications are essential.

11. Compliance with legislative requirements of Romania, EU and the world regarding food safety.

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ASSESSMENT OF THE E 920 ADDITIVE (L - CYSTEINE) IN RELATION TO SOME PROBLEMS OF MODERN FOOD INDUSTRY

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Abstract

This paper aims to assess the current state of knowledge about the use of L - cysteine in food industry, regarding certain cultural, legal, technological, toxicological, and other aspects that influence the attitude of the consumers towards food. Use of L - cysteine and its derivatives in bakery allows the optimizing of the technological characteristics of flours and their higher recovery, by using products with high added value. Use the E 920 additive in human food is subject to the cultural and religious controversy, due to the generalized process of obtaining this additive from animal products (keratin). Our study shows that these controversies will be overcome when industrial fermentative technologies of L - cysteine production will be generalized in the market. There exist no data on the potential toxicity of L - cysteine in the usual doses which are used in the baking industry. The only threat to the status of E 920 as a safe additive is the excitotoxic potential, suggested in several recent studies. Also, there exists a potential for extending the use of L - cysteine in the food industry in order to reduce the contamination degree with certain chemicals having carcinogen potential, such as acrylamide and mycotoxins.

Key words: bread, controversy, L - cysteine, safe food

INTRODUCTION

A brochure entitled "25 Amazing Facts about food" was published in 2011, under the signatures of Mike Adams and David Guiterrez and the copyright of Truth Publishing Inc. This brochure makes several statements about some additives used in food industry; that have enjoyed significant notoriety in the Romanian online environment. Thus, the authors make the following statements about one of the additives used in the baking industry: *While some L-cysteine is directly synthesized in laboratories, most of it is extracted from a cheap and abundant natural protein source: human hair. The hair is dissolved in acid and L-cysteine is isolated through a chemical process. Other sources of L-cysteine include chicken feathers, duck feathers, cow horns and petroleum byproducts [1].*

This paper aims to assess the current state of knowledge about the use of this amino acid in nutrition, regarding the most important aspects which influence the market, namely:

cultural, legal, technological, toxicological, etc.

MATERIALS AND METHODS

In order to assess the main aspects of using L - cysteine aminoacid, there have been extensively studied a series of bibliographic databases including the European Commission's legislative, public opinion experts EFSA scientific articles in the fields of food technology, biochemistry, toxicology, nutrition, medical science market research, and opinions of Jewish religious texts scholars.

RESULTS AND DISCUSSIONS

Cysteine has been isolated in 1810 by Wollaston from kidney stones. It is found in variable proportions in different plant and animal proteins (0.8% in zein, 2.3% in wheat gliadin, 12.5% in insulin, 1.1% in muscle proteins, etc.).

L-cysteine and its derivatives are widely used in baking, in quantities up to 90 ppm. Effects of cysteine addition to flour are obvious in the increasing of the fluid properties of dough: it decreases its ability of accumulating energy, toughness and resistance to extension, and increases its adhesiveness and extensibility [2].

Flours which require the addition of reducing agents generally give products with small volume, dense core, undeveloped porosity and poor flavor [16].

There is an intense controversy in the Western world on the use of L-cysteine in bakery. It is not based on the potential adverse effects to human health, but on the assumption that its origin is opposed to the vegan food philosophy and the Muslim Sharia requirements. Mosaic worship expressed through an analysis made by a rabbi, an interesting opinion on the use of L - cysteine in diet.

L-cysteine was considered "kosher" provided that it does not come from human cadavers or have previously been the subject of a religious sacrifice [17].

Some properties of foods rich in cysteine were known and used since talmudic times. Gemara (one of the books of Talmud) relates that Rav Abbah (175-247) using a recipe based on chicken macerate for medicinal purposes and, in the Middle Ages, Rambam (1135-1204) prescribed to Prince Al- Afdal from the court of Saladin a similar recipe for asthma treatment (treatment of this disease is also in use today, using derivatives of cysteine) [17].

Despite this, many Hebrew internet sites consider food containing L - cysteine as "non-kosher".

L-cysteine is not the only food additive in this situation. Similar controversies concern the gelatin, rennet used in the cheese industry, bone powder used to whiten sugar sporadically, frosting agents such as shellac and beeswax, and red colors of **cochineal**.

L-cysteine global market is estimated at 5000 tons per year and is supplied as a result of a mixture of different production technologies, which include keratin hydrolysis, chemical synthesis and fermentation (Fig. 1) [6, 13].

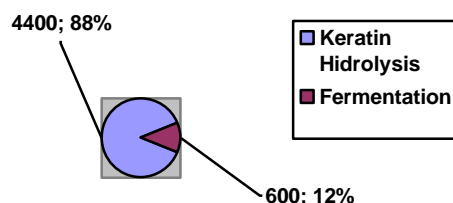


Fig. 1 Global market of L - cysteine (tonnes)

Although for most amino acids there have been developed biosynthetic technologies, the major route for obtaining L cysteine, L - Leucine, L - histidine and L - tyrosine remained the extraction from protein hydrolysates. As for cysteine, it is used the extraction from hydrolyzed keratin, obtained from human hair or feathers of animals [22].

Among the biosynthesis technologies used on an industrial scale we emphasize the biosynthesis technology used by Ajinomoto Co., Inc., Japan, which involves the asymmetric hydrolysis **DL - 2 - amino-Δ² - thiazolin - 4-carboxylic acid** to L - cysteine, using enzymes secreted by bacteria of the genus *Pseudomonas*. Also, Wacker Chemie (2001) implemented an industrial method for obtaining L - cysteine via a mutant *E. coli*, using glucose as the main carbon source [14]. Market value of L - cysteine is estimated at 55 million dollars, with a growth rate of 4% per year [14]. Approximately 30% of the worldwide produced L - cysteine is used to obtain its pharmacotherapeutic derivatives (N-acetylcysteine and S-carboximetilcysteine, both having mucolytic action).

In addition to the use of L - cysteine as flour treatment agent in bakery industry, is it also used extensively in food animal production industry. Its role in animal feed isto enrich the beef flavor of these products. A lower but constant consumption is recorded in the cosmetic industry, as a basic preparate in anti-aging creams.

Of all the L - cysteine produced worldwide, in 2004, only 12% was obtained by fermentation processes. Annual growth rate for the market share of microbial L-cysteine was estimated at 10%.

The conventional process of cysteine

obtaining involves the acid hydrolysis ($\text{HCl} > 20\%$) of keratin at high temperatures (100°C for 6 hours). The process has certain environmental implications, which are difficult to manage. In order to obtain one kilogram of cysteine, there are required 27 kilograms of hydrochloric acid; this involves the use of big water resources. Comparitively, the biosynthesis method applied by Wacker Chemie requires only 1 kilogram of hydrochloric acid to obtain one kilogram of L - cysteine. Despite this, L - cysteine obtained by fermentation is more expensive than the conventional one and is preferred primarily by pharmaceutical and cosmetic industries. This industries are able to transfer these costs to products with higher added value than food industry.

One of the factors that determine the interest of the pharmaceutical industry for microbial L - cysteine is the fear, deeply rooted in the psychology of consumers, on the risks involved in the consumption of certain products of animal origin, having the capacity of transmitting prion diseases such as Creutzfeldt - Jakob disease (spongiform encephalopathy).

The European Commission experts have analyzed this issue in 2000, at the request of some producers' organizations in the cosmetics industry. They asked for the changing of the Directive 76/768/EEC which prohibited the use of cells, tissues or products of human origin in the manufacture of cosmetics sold in the Common Market, so that the amino acids obtained by acid hydrolysis of keratin can still be used.

The experts' conclusion was that amino acids obtained by hydrolysis of keratin can be considered safe for human consumption, as long as they are not contaminated with other substances with high risk of transmission of human spongiform encephalopathies (TSEs). The conclusion was based on the following assumptions, which can be extrapolated to food: prions associated with TSE have never been identified in hair; the obtaining process involves a series of inactivation conditions that reduce the number of infectious units at a lower level even than the level already agreed by the EU legislation regarding manufacturing

of food gelatine; severe hydrolysis conditions in combination with mandatory tests, regarding the lack of peptides in L - cysteine based preparates, can guarantee the exclusion of transmissible prion protein from them [26]. The European Commission experts were called to respond later (2006) to questions about the safety of adding this amino acid to biscuits for young children (3 to 12 months). Although this amino acid has been approved for use in treating flour, the assessments considering it toxicologically acceptable, it was not mentioned in the list of food additives accepted in the food formulation for babies and toddlers. Biscuits for children should have a controlled content of carbohydrates and fat. But this fact leads to increased fragility of biscuits, inducing additional risk of suffocation. Use of L - cysteine or its hydrochloride derivative product enables optimization of textural characteristics of crunchy products and reduces the mentioned risk.

The usual dose of L - cysteine is max. 1 g / kg flour. Extrapolated to the average quantities of biscuits consumed daily by a toddler, the amount of cysteine intake is the equivalent to 6 mg / day. This amount represents only 2% of the total cysteine provided to a child by his entire daily diet (296 mg).

Consequently, the group of experts concluded that the use of L - cysteine in baby products present no risk to their safety and that is not in contradiction with previous recommendations of the European Commission.

Recommendation stated that the addition of amino acids in the diet of children should be performed only in order to improve its nutritional value [25].

Previous explanation can be applied for exposure adults to this amino acid after the consumption of bakery products. Accurate assessment of the amounts of L - cysteine or its derivatives, provided by the mill - bakery food chain is quite difficult. On one hand, L - cysteine is added to the mill, and on the other hand, improvers used in bakeries contain also varyous amounts of L - cysteine. We suspect a linear correlation between the value of this consumption and the quality of Romanian crops, in which the addition of L-cysteine per

kilogram of flour is unlikely to exceed an average of 0.05 to 0.1 grams. Quantities of L - cysteine may be much higher for biscuits which have dough rheological characteristics adjusted to the required values for the manufacturing processes, by treatments with proteases and reducing agents. The average daily consumption of bread per capita was estimated by Econtext.ro for 2010 to 0.26 kg [19]. If we assume that the average specific consumption is 0.75 kg of flour per kilogram of finished product, then the amount of L - cysteine corresponding to this consumption is 9.75 to 19.5 milligrams. Namely, the amount of L-cysteine is 25 - 50 times lower than the usual daily amount of L-cysteine or its derivatives used for therapeutic purposes, for treating various diseases (fig 2).

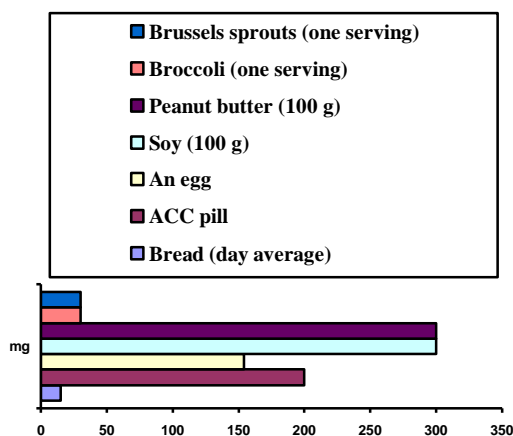


Fig. 2 Daily doses of L - cysteine associated with several components of the diet or medication

New directions for the use of L-cysteine in the food industry.

In recent year there have been patented several methods which use L - cysteine or thiol compounds for reducing the acrylamide content in foods. Acrylamide is a potential carcinogenic substance that is formed when starchy foods are baked, boiled or roasted.

Flukiger and Salih suggested in 2009 a method for treating food to be cooked with an alkaline solution of cysteine or glutathione. Thiol compounds in alkaline solution react with acrylamide, through the carbon double bonds in its molecule, forming a new nontoxic compound [11]. *Barry et al.* suggested previously a similar method, involving food contact before the heat treatment with a

solution composed from calcium chloride and L - cysteine [3].

Other studies have shown similar effects of inhibition of the acrylamide formation in aqueous systems and *in vivo*, when certain embryos were exposed to high concentrations of acrylamide [8, 18, 7].

Since thiol compounds are potent nucleophiles, they have a strong affinity for the unsaturated electrophilic centers of different dietary toxicants in food, such as aflatoxins, sesquiterpenes, lactones (elephantropin and parthenin), urethane, carbonyl compounds, quinones and even , halogenated compounds [6]. *Boyacıoğlu et al.* published in 1993 a study showing that in particular L - cysteine has a moderate decrease in DON content of whole wheat bread. Along with sodium bisulphite ammonium phosphate, treatment with L - cysteine ensured a reduction of DON content between 38 and 46% [5]. A cysteine derivative, namely N-acetylcysteine at a dose of 800 mg / kg of forage, was able to reduce the toxic effects of aflatoxin B, when added to chickens diet [21].

Cysteine and glutathione are part of the substances able to stop the formation of nitrosamines produced endogenously in the stomach and digestive tract, such as: N-nitrosodimethylamine, N-nitroso-N-nitrosopiperidin and N-nitrosopyrrolidine [20].

Toxic effects of L - cysteine in the body.

Potential toxic effects of L-cysteine have been tested on rats since the '70s. The results published in the *Journal of the Science of Food and Agriculture*, showed that despite feeding rats with bread made from flour treated with doses of 10 to 100 times higher than usual doses, there have not been identified histopathological changes or injury in the body to fifth generation [12].

However, some studies have shown that L - cysteine may have negative effects on the animal organism when it is administrated in very high doses. *Dilger et al.* introduced feed treated with 30 g / kg L-cysteine in chickens' diet and identified certain changes in their health status, as well as metabolic acidosis and increased oxidative stress in the body [9].

In a previous study, they investigated the effects of supplementing the diet with extreme amounts of sulfur amino acids in several species. They found that excess L - cysteine in doses of 7.5 times higher than dietary recommendations may result after five days of dosing in increased mortality by 50%. In all variants of administration (2.5 - 10 times more than the dietary recommendations), taking L - cysteine suppressed the growth of chickens.

In young mice or pigs receiving similar doses of L - cysteine, were not identified significant changes in mortality, but growth has been drastically suppressed. For none of the three analyzed species there have not been related similar symptoms to cystine excess in food [10].

In the literature there are cited a series of L-cysteine interferences with the therapeutic medication, administered in case of illness. Thus, L - cysteine potentiates the activity of the drugs used to lower blood pressure. It also can cause suppression of immunity, thereby increasing susceptibility to certain diseases [27].

There have been reported situations where L - cysteine inactivated the insulin given to diabetics. However, it is considered that L - cysteine potentiates the toxicity of sodium monoglutamate, for the Chinese restaurants disease sufferers [28]. For the patients suffering from cystinuria, the administration of L- cysteine has a negative effect.

Several views include L - cysteine in excitotoxins category. These are substances that have physiological functions of neurotransmitters (usually amino acids or derivatives thereof), and can supraactivate specific receptors in the nerve cell when they have high concentrations. The process consists of an excessive stimulation of nerve cells, which can result in their destruction. The best known substance with excitotoxic effect is sodium monoglutamate.

In 1990 *Olney et al.* found that systemic administration of L-cysteine to immature mice correlates with destruction of nerve cells in the cerebral cortex, hippocampus, thalamus and striatum. The author's opinion is that neurotoxicity of L - cysteine is also mediated

by glutamate receptors (subtype N-Methyl-D-aspartate) and its magnitude increases in the presence of bicarbonate ions at physiological concentrations [15].

The chemical reactivity of the thiol group of L - cysteine can induce toxicity by autooxidation, through formation of reactive oxygen species [23].

Many doubts about the toxic potential of L - cysteine are induced by associating the high level of of homocysteine in the body with some neurodegenerative and cardiovascular diseases. Homocysteine is involved in many transsulfuration reactions (such as cysteine synthesis in the body), remethylation (in the synthesis of methionine), transmethylation of DNA, proteins and lipids, biosynthesis of certain neurotransmitters or hormones. Homocysteine oxidizes many analogues of L - glutamate (L -homocysteinsulfonic acid, homocysteic acid) and L - aspartate (L-cisteinsulfonic acid, cisteic acid) that exert excitotoxic effects even greater than the excitotoxic effect of homocysteine [4]. Homocysteine enhances LDL autooxidation lipoprotein particles, thus initiating thrombosis or atheroma plaque buildup.

CONCLUSIONS

1. Use of L - cysteine and its derivatives in bakery allows the optimizing of the technological potential of flours and their superior use, by products with high added value. Controversies surrounding the use of additives in food are primarily cultural and religious controversies and are likely to be exceeded when the fermentative technologies for producing L - cysteine will generalize in the market.
2. There is potential to extend the use of L - cysteine in the food industry, to reduce contamination with potentially carcinogenic number of substances such as acrylamide and mycotoxins.
3. There are no data on the potential toxicity of L - cysteine on the usual doses which are used in the baking industry. In medicine, L - cysteine and its derivatives are used in multiple therapies of body detoxification.

4. The excitotoxic potential of L - cysteine is the biggest threat to the "sure additive " status of L - cysteine. Although the mechanisms of glutamate receptors present on nerve cells are not well understood, the number of studies that gather evidence in favor of excitotoxic potential of L - cysteine is growing. However, it is not yet clear to what extent the quantities of L - cysteine added to food during processing, can interfere in these mechanisms.

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- [28]***<http://www.ndhealthfacts.org/index.php?title=L-Cysteine>

THE IMPORTANCE OF COLOR IN THE MAJOR ROMANIAN BRANDS MARKETING

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Abstract

The approach of our study is to identify the most important elements which characterize the use of color in the successful Romanian brands marketing, starting from the main media of the marketing messages, such as: website, advertising posters used in campaigns in the past three years and package of the main product. In the background of Romanian brands' sites, the predominant color is white, followed at a great distance by various shades of green, blue and red. The best positions in the top 50 are associated to the websites that use blue background in construction, followed by the red and yellow. The most common background colors for posters were blue, white, red and green, and the color associated with the best positions in the top 50 for the studied brands was red. The most colors used for the background of the main product package were white, green, blue, yellow and red. The color red was associated with the best top positions. For alcoholic beverages brands, the most common color was yellow, which is mainly used in the design of the main product package (beer and wine brands).

Key words: brands, colour, marketing, Romania

INTRODUCTION

Color plays an important role in the relevant communication related to brand identity. Optimizing colors for building the marketing message can make the difference between success and failure, whether it is done unconsciously, or if it is based on scientific research that meets the requirements of experimental methodology.

The purpose of our investigation was to identify the elements that characterize color use in the marketing of Romanian successful brands. We started from the media marketing messages, such as: website, advertising posters used in campaigns in the past three years and mainly product package.

MATERIALS AND METHODS

The starting point was the analysis made by Unlock Market Research in September 2010,

resulted in a ranking of the most powerful Romanian brands (Table 1).

There have been selected the most powerful Romanian brands, which have been subjected to statistical processing. There have been removed "single marks" that were not accompanied in this top by equivalent brands, to which can be compared (Dacia, Arctic, Petrom, Savana, Dero, Mobexpert, Rotelecom, Frutti Fresh and Cristim).

There were also removed the marks associated to mass media, based on the grounds that their position in the top of successful brands is due primarily to the quality of the broadcasts' content, color being a less relevant descriptor in their marketing (8 brands).

Table 1. Top 50 - most powerful Romanian brands (Unlock Market Research, September 2010) [3]

Place	Brand	Place	Brand	Place	Brand
1	Borsec	18	Cristim	35	Biborțeni
2	Dacia	19	Napolact	36	Radio 21
3	PRO TV	20	Rom-telecom	37	Zuzu
4	Dorna	21	La Dorna	38	Prima TV
5	Poiana	22	Rom	39	CEC
6	Timișoreana	23	Bucegi	40	Petrom
7	Izvorul minunilor	24	Frutti Fresh	41	Kandia
8	Cotnari	25	Pate Bucegi	42	Poiana Negri
9	Ursus	26	Arctic	43	Perla Harghitei
10	BCR	27	Farmec	44	Covalact
11	Murfatlar	28	TVR 1	45	Mobexpert
12	Bergenbier	29	Radio ZU	46	Savana
13	KISS FM	30	Libertatea	47	Primola
14	BRD	31	Ciucăș	48	Laura
15	Antena 1	32	Ciuc	49	Magura
16	Pate Sibiu	33	Gerovital	50	Elmiplant

As for the last 33 brands, we examined the way color is used in the background of sites, posters from the advertising campaigns in the last three years, and package. The visible part of the packages (the side accessible to consumer's shelf perception), the advertisements in the media and the catches of companies' websites were processed using specialized software developed by the National Institutes of Health (USA) for medical image analysis: ImageJ. The program has been widely used in scientific research in physics, control of products' and materials' quality etc. In order to achieve our objectives, we used the options of the program that assesses the way colors of an image are built, starting from the three primary colors, Red, Green and Blue.

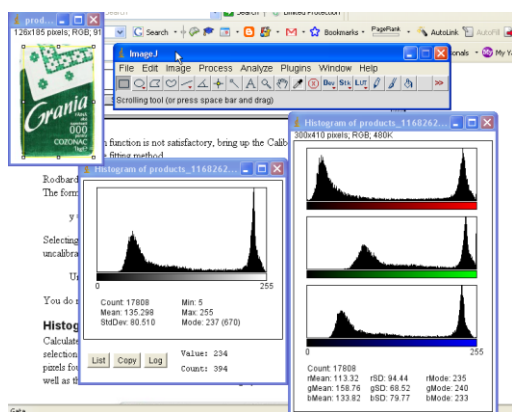


Fig. 1 Image analysis, performed with ImageJ software for the Grania flour (sponge cake flour)

Basically, the program performed for each image, or for selections from it, a specific histogram for each color. The possible values for each primary color (0 to 255) are listed on the abscissa, and the number of corresponding pixels is on represented on the ordinate. So, the program calculates the average amounts of red, green and blue, and associated standard deviations (Figure 1).

Another investigated indicator was the brightness of backgrounds, websites, posters and packages, used in marketing of those brands. Brightness was evaluated based on the average RGB parameters, using the methodology of James Brausch [1]. RGB index value is between 0 and 255, which marks the transition from discrete absolute black to white. Average of 192 means the barrier separating the dark area of a color from the bright colors (Figure 2).



Fig. 2 Brightness depending on RGB parameters average values

The results were interpreted statistically (analysis of variance and regression) using StatSoft, Inc.. (2007). STATISTICA (data analysis software system), version 8.0.

RESULTS AND DISCUSSIONS

There was no correlation between the top position and brightness of wallpapers sites, posters or primary product packages. Linear correlation coefficients were low and statistically insignificant. In Figure 3 we notice that the brightest communication elements used in marketing of trademarks are their sites, followed by main product package background. Average posters brightness was 154.667, value lying in the dark field. Brightness of sites had the lowest coefficient of variation (37.362%).

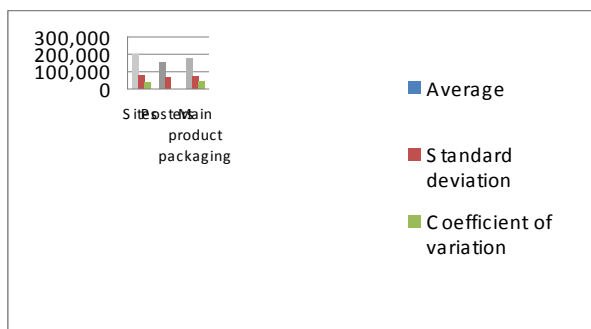


Fig. 3 Average brightness of the background of sites, posters and packages in successful brands

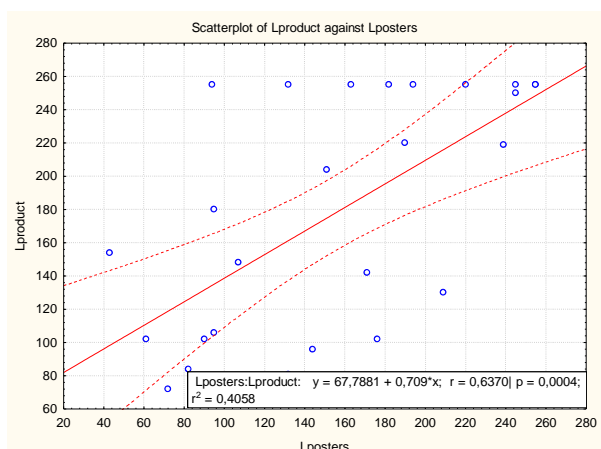
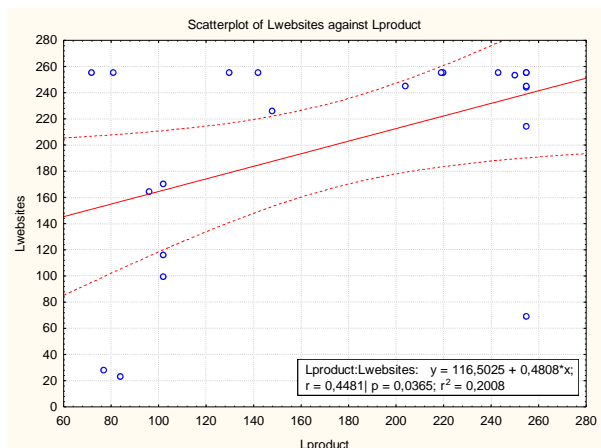
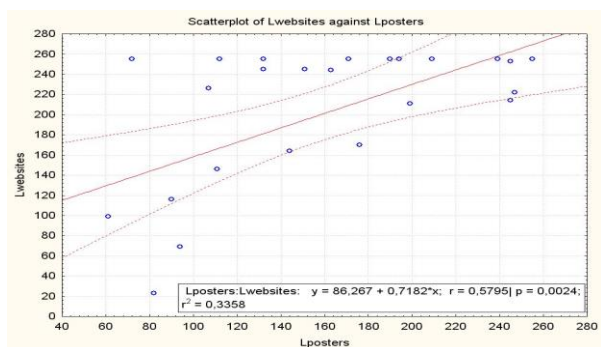


Fig. 4 Regressions: background brightness for site-posters (above), for sites-packages (middle), for packages-posters (below), in analyzed brands

It seems that in global marketing strategy brightness is used consistently, smoothly. Thus, site brightness of backgrounds is significantly positive correlated with brightness of backgrounds packages ($r = 0.450^*$), and distinctly positive significant with background brightness of posters ($r = 0.580$) (Figure 4).

Table 2. Main colors and variability parameters

Websites background					
Color	No. brands	X*	S _x *	CV* (%)	X ₂ *
White	13	24.1	15.1	62.7	790.2
Green	3	28.3	23.1	81.6	1.159
Blue	3	12.3	7.9	64.4	211.0
Beige	1	11.0	-	-	-
Red	3	20.3	12.1	59.3	510.0
Yellow	2	22.0	14.1	64.3	584.0
Gray	1	21	-	-	-
Bright background	18	20.9	15.5	74.0	665.5
Dark background	8	24.6	10.8	43.8	708.1
Posters background					
Color	No. brands	X	S _x	CV (%)	X ₂
Blue	8	17.25	17.25	100.0	577.0
Gray	2	26.0	13.4	51.7	741.0
Red	5	14.6	7.9	54.1	263.0
White	6	32.7	16.4	50.1	1290.0
Yellow	3	20.0	7.0	35.0	432.7
Green	4	32.7	16.5	50.3	1276.0
Purple	2	30.0	4.2	14.1	909.0
Brown	1	19	-	-	-
Bright background	10	21.0	15.4	73.6	647.0
Dark background	21	25.0	14.9	59.5	845.4
Main product package background					
Color	No. brands	X	S _x	CV (%)	X ₂
Blue	4	24.2	24.1	99.4	1023.7
Green	5	28.8	14.5	50.4	998.0
White	10	31.1	15.1	48.5	1172.3
Red	3	13.0	8.5	65.7	217.7
Orange	1	-	-	-	-
Brown	1	-	-	-	-
Yellow	4	17.0	8.5	50.0	334.7
Purple	1	-	-	-	-
Bright background	14	28.0	17.0	60.5	1058.1
Dark background	15	24.0	15.1	62.9	801.3

*X – average (arithmetic mean), S_x – standard deviation, CV – coefficient of variation, X₂ – mean square

As for the background light posters, for the pairs posters – packages, it has been established a highly significant positive correlation ($r = 0.640^{***}$).

Table 2 shows the backgrounds' colors of websites, posters and packages of the main product from Romanian successful brands, and variability parameters (mean places, mean square, standard deviation and coefficient of variation).

Figure 5 shows that in the sites of Romanian brands, background predominant color is white, followed by further of shades of green, blue and red. This makes, about 70% of the sites, have a bright background.

White background in construction of sites is likely used for contrast, to highlight the secondary colors. White is not the bearer of a specific message, related to the marketing of a certain product. Color significance of health, purity and hygiene is not so strong as the ability to associate with other colors and reinforce their message. A proof is, that despite the frequency with which it is used, white is not a color descriptor for the top brands. White is only the fourth color, after blue, red, and yellow (its mean square is lower than the mean square of these colors). White presents several ergonomic advantages related to work on computer, being less tiring than intense colors, which is an argument that can not be neglected in the construction of sites.

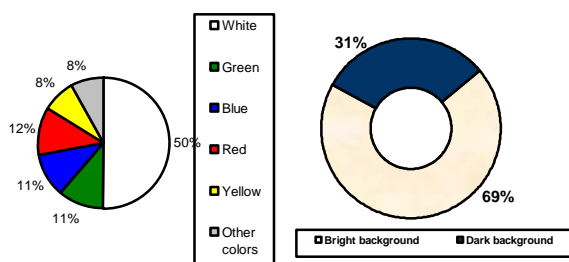


Fig. 5 Main colors and brightness of backgrounds in the sites of Romanian successful brands

As for posters, the most frequent background color was blue, followed by white, red and green. However, it is preferred a dark background, though it does not take the best places in the top (Figure 6).

Blue is one of the most common color used in marketing communication in the world.

Blue is the favorite in the corporate world because it suggests stability and experience. It is also recommended when there are dilemmas on the color required in a marketing construction.

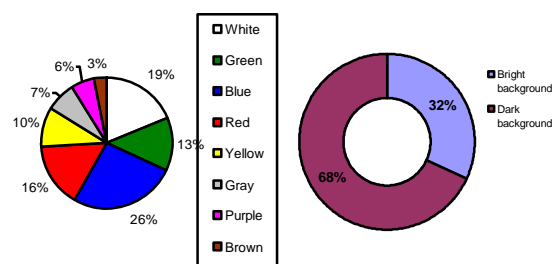


Fig. 6 Main colors and background brightness of the posters of Romanian successful brands.

However, for the posters' background of brands studied by us, the color associated with the best position in top 50 was red (mean square $X_p = 263,000$), followed by yellow ($X_p = 432,667$), blue ($X_p = 577,000$), gray ($X_p = 741,000$) and purple ($X_p = 909,000$).

As for the background of main product packages, the most commonly used color is white. This is explained largely due to the prevalence in top of the food industry brands (especially dairy) and drinks (mineral water). High frequency of white color also determines a stable balance of the ratio bright backgrounds / dark backgrounds, in construction of packages design (Figure 7).

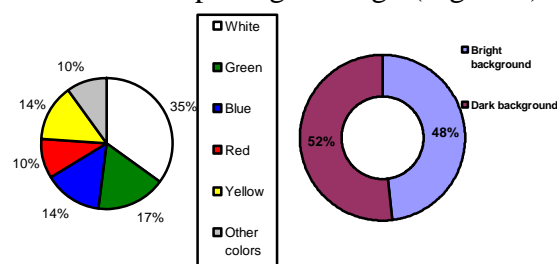


Fig. 7 Main colors of background and brightness of main product package for Romanian successful brands

The second most common color is green, followed by blue, yellow and red. The red color was associated with the best top positions ($X_p = 217,667$), followed by yellow ($X_p = 263,000$), green ($X_p = 998,000$) and blue ($X_p = 263,000$).

It should be noted that the best top positions were those of the products whose design had a dark background ($X_p = 801,333$), than those with a design based on a light background ($X_p = 1058.142$).

The following figures show the color and brightness frequency in the background of websites, posters and main product packages for Romanian successful brands, on reference fields. So, for alcoholic beverages' brands, the most common color is yellow. It is used mainly in the design of main product packages (brands of beer and wine).

Next in order: green, white and red. Green is mainly used for posters' background and packages background, white is used for the background of website, and red for the posters' background.

For brands of the alcoholic beverages category, there are generally preferred dark backgrounds, especially for the background of main products' packages and for posters (Figure 8).

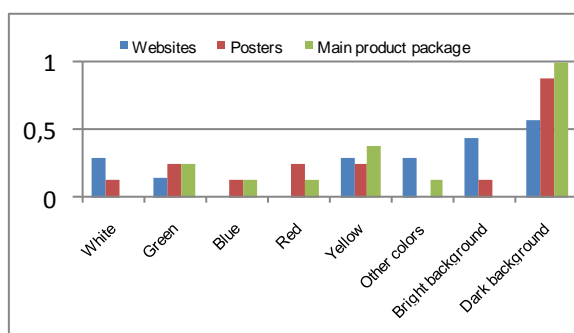


Fig. 8 Frequency of color and brightness in the background of sites, posters and packages, for the brands in the alcoholic beverages field

As for the brands in the field of soft drinks, predominant color is white, used primarily in the construction of the site and the posters, rather than in the background of the main product (Figure 9). White is followed by green and blue, used mostly in packages backgrounds.

Combination white - green - blue is specific for the field of mineral water brands. Characteristic for this field is also the prevalence of bright backgrounds against dark backgrounds, and the lack of red and yellow colors.

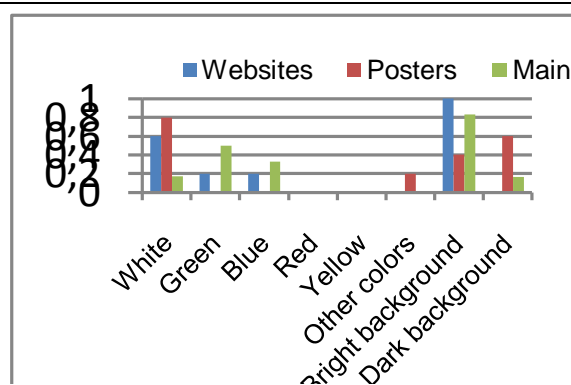


Fig. 9 Frequency of color and brightness in the background of sites, posters and main product packaging, for the brands in the nonalcoholic beverages field

White background dominates (about 50%) in building the brands in the food industry, followed by blue, red and yellow. Green is lacking, probably due to its association in the collective unconscious, with the alteration produced by microorganisms. White is mainly used in the construction of the packages background and web sites, less in the background posters (Figure 10).

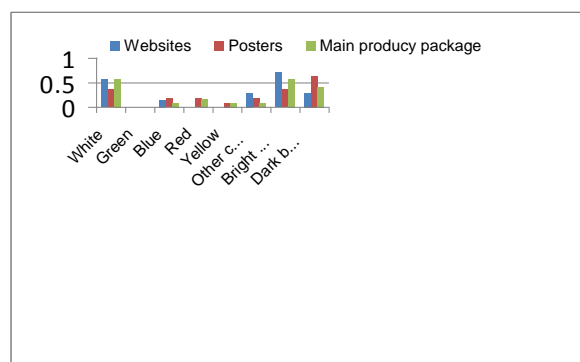


Fig. 10 Frequency of color and brightness in the background of sites, posters and main product package, for the brands in the food industry field

In figure 10 we can notice that bright backgrounds are more common than the dark ones, especially in packages and websites. Dark backgrounds prevail on posters.

Regarding banking brands, we notice a balance between white, green, blue and red. White is the predominant color in the construction of sites' background, while white, green, blue and red are used proportionally in posters' background (Figure 11).

Yellow color in Romanian brands, lacks in the

background of sites and posters, in the banking sector.

Regarding the brightness of backgrounds, it appears that bright backgrounds are predominant in sites, while in posters, light and dark backgrounds are used equally.

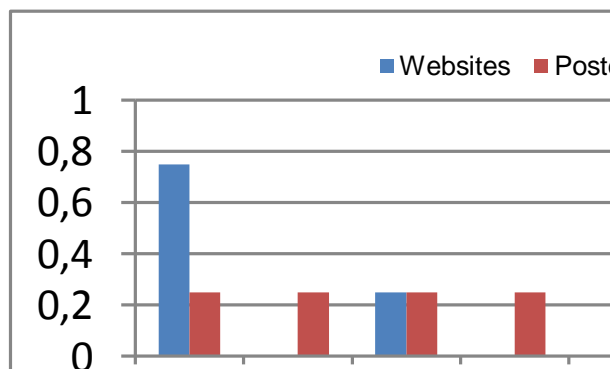


Fig. 11 Frequency of color and brightness in the background of sites and posters, for the brands in the banking field

As regarding the care products field, predominant colors are white, green and red (Figure 11). The message of this triplet includes: sanitation, cleanliness, care (white) natural origin (green) and energy (red).

Purple color, included in the chart below under "other colors", is very important for this study. The analyzed brands addresses women and purple color strongly intensifies sensuality and female sexuality. White color is mainly used in building packages background, which is an important problem for cosmetics. Green and purple are preferred in building posters' background, while balanced mixture of white, green and red are preferred in building sites' background.

Blue and yellow colors are completely missing in the background of posters, websites and packages' care products. Lack of yellow in care products brands may be explained by the inadequacy of this color with the message to be transmitted, namely: energy, freshness, beauty and youth.

Yellow color is associated with skin aging and nature aging in general. Yellow is inappropriate for a brand that promotes anti-aging products. In addition, yellow suggests grease and "old wives" remedies, altering the technological sophistication element that a cosmetic product should have. Finally, yellow

is generally used to mark certain parapharmaceutical products, such as skin treatment creams based on arnica, calendula or sunscreen creams.

Lack of blue is less understandable, since blue is a color that suggests freshness and energy. One hypothesis could be related to the necessity of Romanian brands to detach from the international brands that dominate the market and use intense blue (Nivea, Oriflame, Avon etc.).

Regarding the brightness of websites' and posters' backgrounds, dark backgrounds are preferred. Bright backgrounds (which are directly related to white, predominant here) are preferred for packing main products.

Our observations and conclusions can be the basis for further more extensive research, which will also include other strategies to address this issue. Considering the color ability to speak directly to the subconscious, the application of methodological elements specific to psychometrics is absolutely necessary.

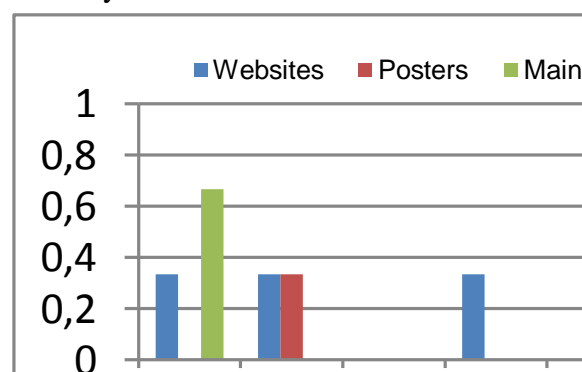


Fig. 12 Frequency of color and brightness in the background of sites, posters and main product packages, for the brands in the care products field

It is very likely that they would reveal some new information, which are beyond our competence in behavior psychology or regarding the mechanisms of subconscious functioning.

CONCLUSIONS

1. In terms of global marketing strategy of studied brands, brightness of backgrounds is used in a coherent, homogeneous way, brightness values for all pairs formed

between: websites, posters, main product packages being correlated;

2. In the background of Romanian brands' sites, the predominant color is white, followed at a great distance by various shades of green, blue and red;

3. The best positions in the top 50 are associated to the websites that use blue background in construction, followed by the red and yellow;

4. Regarding the posters, the most common color in the background was blue, followed by white, red and green, and the color associated with the best positions in the top 50 for the studied brands was red;

5. Regarding the background of the main product package, the most common used color is white, followed by green, blue, yellow and red. The color red was associated with the best top positions;

6. Regarding the brands which represent products of the alcoholic beverages field, the most common color is yellow, which is mainly used in the design of the main product package (brands of beer and wine);

7. Combination white - green - blue is specific to the soft drinks field represented by several brands of mineral water;

8. White color dominates in building the background of brands in the food industry, followed by blue, red and yellow;

9. Regarding brands in the banking field, we notice a balance between white and green, blue and red;

10. Regarding the care products' field, the predominant colors are in order: white, green and red; the message given by this triplet includes: sanitation, cleanliness, care (white) natural origin (green) and energy (red); a special role has the purple color, widely used in the background of posters;

11. The absence of certain colors in the construction of marketing messages seem to be due, from case to case, to the need of separating brands of: other products, marks, even natural phenomena, associated with colors considered unpleasant (suggesting: skin aging, microbial spoilage).

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THE PIONEERS OF THE GREEN REVOLUTION AS FORERUNNERS OF TODAY'S ECOLOGICAL AND BIOTECHNOLOGICAL REVOLUTIONS

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Abstract

This paper presents the milestones of the Green Revolution, outlining its role in the development of today's sustainable and biotechnological agriculture. In order to do this we used the material found in papers and books on the research in agriculture from the 1940s to the late 1980s. Current sustainable agriculture and biotechnological advancement, including the creation of genetically modified organisms could never have been possible without the Green Revolution. Reducing the height of the stalk allowed the production of high-yielding cultivars that now are used and modified with genetic engineering methods in the context of a sustainable agriculture.

Key words: *biotechnology, ecology, green revolution*

INTRODUCTION

The Green Revolution refers to a series of research, development, and technology transfer initiatives, occurring between the 1940s and the late 1970s, that increased agriculture production around the world, beginning most markedly in the late 1960s. It forms a part of the 'neo-colonial' system of agriculture wherein agriculture was viewed as more of a commercial sector than a subsistence one.[1]

The initiatives, led by the American agronomist **Norman Borlaug** (1914–2009) – fig. 1, the "Father of the Green Revolution" credited with saving over a billion people from starvation, involved the development of high-yielding varieties of cereal grains, expansion of irrigation infrastructure, modernization of management techniques, distribution of hybridized seeds, synthetic fertilizers, and pesticides to farmers.

Apparently, there is a contradiction between an intensive agriculture intended to feed millions of people, like the one proposed by the Green Revolution, and an extensive agriculture imposed by the principle of sustainable development. But there is not.

Paradoxically, genetic engineering provides the means to increase production without spoiling soil or polluting it with chemicals.

That is why we think that now is the time for a Second Green revolution, a "Really Green" Revolution, which needs to be both quantitative and qualitative, providing plenty of healthy food for the world's increasing population, while preserving their environment. As Borlaug put it, you can't build a peaceful world on empty stomachs.

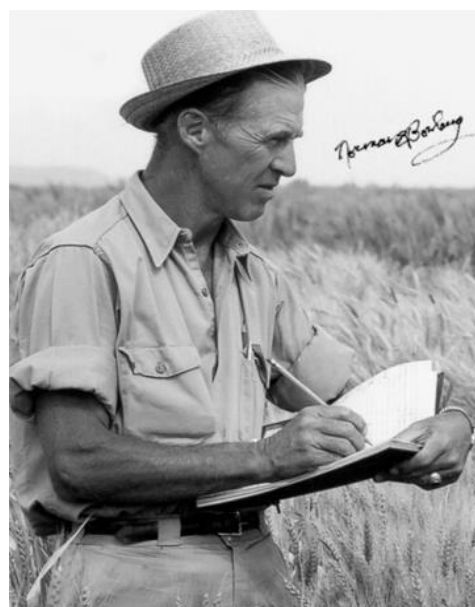


Photo 1. **Norman Borlaug** (picture in the public domain)

MATERIALS AND METHODS

This paper presents the milestones of the Green Revolution, outlining its role in the development of today's sustainable and biotechnological agriculture. In order to do this we used the material found in papers and books on the research in agriculture from the 1940s to the late 1980s.

RESULTS AND DISCUSSIONS

The Green Revolution in common wheat

Cecil Salmon (1885–1975), an American biologist working in post-World War II Japan, collected 16 varieties of wheat, including one called “Norin 10”, which was very short, thus less likely to suffer wind damage. Salmon sent it to the American agronomist **Orville Vogel** (1907–1991) – fig. 2 in Washington in 1949. Vogel began crossing Norin 10 with other wheats to make new short-strawed varieties. Vogel led the team that developed Gaines, the first of several new varieties that produced 25 percent higher yields than the varieties they replaced. Vogel shared his germplasm with Norman Borlaug, who later received the 1970 Nobel Peace Prize for his role in the “green revolution.” Borlaug publicly acknowledged Vogel’s contributions to his research.[2]



Photo 2. **Orville Vogel** (picture in the public domain)

Dwarfing is an important agronomic quality for wheat; dwarf plants produce thick stems. The cultivars Borlaug worked with had tall, thin stalks.

Taller wheat grasses better compete for sunlight, but tend to collapse under the weight of the extra grain—a trait called lodging—from the rapid growth spurts induced by nitrogen fertilizer Borlaug used in the poor soil. To prevent this, he bred wheat to favor shorter, stronger stalks that could better support larger seed heads. In 1953, he acquired a Japanese dwarf variety of wheat called Norin 10 developed by Orville Vogel, that had been crossed with a high-yielding American cultivar called Brevor 14.[20] Norin 10/Brevor is semi-dwarf (one-half to two-thirds the height of standard varieties) and produces more stalks and thus more heads of grain per plant. Also, larger amounts of assimilate were partitioned into the actual grains, further increasing the yield. Borlaug crossbred the semi-dwarf Norin 10/Brevor cultivar with his disease-resistant cultivars to produce wheat varieties that were adapted to tropical and sub-tropical climates.[2]

Borlaug's new semi-dwarf, disease-resistant varieties, called Pitic 62 and Penjamo 62, changed the potential yield of spring wheat dramatically. By 1963, 95% of Mexico's wheat crops used the semi-dwarf varieties developed by Borlaug. That year, the harvest was six times larger than in 1944, the year Borlaug arrived in Mexico. Mexico had become fully self-sufficient in wheat production, and a net exporter of wheat.[2] Four other high yield varieties were also released, in 1964: Lerma Rojo 64, Siete Cerros, Sonora 64, and Super X.

The Green Revolution in Durum wheat

Proving the possibility of obtaining high yield cultivars from parents with low productivity (through heterosis), [3] between 1967 and 1989, the Romanian agronomist **Zoe Tapu** (1934–2013) – Fig. 3, working at the National Agricultural Research and Development Institute at Fundulea, developed a research program for improving winter durum wheat, in order to obtain cultivars with fall resistance and high yield, using height-reduction genes from summer durum developed at the

International Maize and Wheat Improvement Center (CIMMYT) in Mexico[4][5][6].



Photo 3. **Zoe Tapu** (picture in the public domain)

In order to achieve that, she used dwarf plants from CIMMYT, which survived to a mild winter, back-crossing them with Romanian durum wheat varieties. Repeated selection for cold resistance of semi-dwarf variants led to the creation of the first semi-dwarf winter durum wheat varieties, Topaz (1977) and Rodur (1984).[7] This original type of wheat set the ground for further progress in durum wheat breeding in many countries.

CONCLUSIONS

Current sustainable agriculture and biotechnological advancements, including the creation of genetically modified organisms could never have been possible without the Green Revolution. Reducing the height of the stalk and increasing pest resistance allowed the production of high-yielding cultivars that now are used and modified with genetic engineering methods in the context of a sustainable agriculture.

Along with United States agricultural scientists as Borlaug, Vogel, and Salmon, Romania had an important contribution to the

Green Revolution through Zoe Tapu, who extended it to durum wheat, with its high nutritive value in the form of pasta and good quality bread.

High-yielding varieties of durum wheat developed also using genetic modification technologies can thus be a solution of feeding millions, in the context of a sustainable agriculture.

How is the time for a Second Green revolution, a “Really Green” Revolution, which needs to be both quantitative and qualitative, providing plenty of healthy food for the world's increasing population, while preserving their environment.

Studying the methods and work of the personalities of the past can only be to the benefit of a new agriculture designed for future generations.

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METHODOLOGY ELABORATION OF INTEGRAL APPRECIATION OF ECONOMIC EFFICIENCY OF WINE GROWING SECTOR'S PRODUCTION IN THE REPUBLIC OF MOLDOVA

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Abstract

This paper presents an analysis to estimate the economic efficiency of grapes and wine production obtained from processing the grapes in agricultural enterprises. There was determined the system of partial indicators of economic efficiency of grapes and wine in the dynamics of the years 2005-2011. Along with the traditional indicators the author has developed a methodology for calculating of the synthetic (integral) indicator of efficiency which can take into consideration the basic indicators of grape production and the results of their processing.

Key words: economic efficiency, integral appreciation, system of indicators, wine sector

INTRODUCTION

As a scientific term, the term “efficiency” is of Latin origin and it means result. Although most researchers are mentioning in their work researches the evolution of the term “efficiency”, they affirmed that researches in this area began to be made in the last century, evidences that were met in some indirect references of researchers W. Petty and A. Smith. Adam Smith addresses the issue of efficiency in terms of maximizing the results without referring to minimize consumption. One of economists with important contributions in the definition of economic efficiency was undoubtedly the Italian researcher Wilfred Pareto, whose findings were identified with the equilibrium conditions of a market economy with perfect competition.

Research conducted permitted to state that the essence of efficiency of agricultural production is the formation of a complex of requirements and conditions necessary to ensure extended reproduction in the competitive economy, enabling industry to meet society's needs not only food, but also to develop in harmony under the conditions of functioning some links and economic, organizational, legal, social, moral relations, and not lately, in terms of ensuring a

sustainable agriculture. Increasing useful effects should be the aim of all economic activities, but with the condition to maintain ecological balance. Organization extended reproduction depends on the level of economic efficiency as profit creates prerequisites and conditions for expanded reproduction processes.

MATERIALS AND METHODS

In the research the author utilized data of the Statistic Annuary, specialized formularies of agricultural enterprises.

On researching the issues addressed in this work were: method of comparison, economic indices, stochastic frontier (SFA) and enveloping (DEA).

RESULTS AND DISCUSSIONS

Currently addressing the problematic economic efficiency is based on econometric techniques, which is based on the method of least squares. In the context of measuring efficiency, the regression models with a new random variable - i.e. "inefficiency". Thus, there can be made different assumptions about the distribution of inefficiency, resulting efficiency scores for both point estimates and estimates by confidence intervals. It is about

the *efficient frontier*. The latest research studies in the research domain of efficiency production refer to stochastic frontier method, which is a method to estimate the production frontier and, therefore, a method of measuring the efficiency of production.

We tend to mention that the results obtained from producing the farm products are reported to every type (factor) of resource separately. But it is remarkably noticed the fact that when obtaining the results, then there are participating a totality of resources (agricultural land, productive fixed resources with agricultural destination), material consumptions, labor work, etc.), as well as market's conditions (demand, offer, competition, etc.)

Changing business conditions in the agricultural enterprises with diverse legal forms of ownership and of organization requires a new and complex attitude of analytical research. Its results should determine not only changes in the dynamic, the connections between phenomena, but also to serve as a basis for making good decisions in planning and forecasting future production development. The existent practice of comparative analysis production efficiency is represented by very different indicators, which often characterize various aspects of the production process and does not reflect the full extent conditions of the operation objectives, the link between production results and means of obtaining them.

For efficiency characteristic of any production sector is used a system of indicators expressing special factors influencing the final results of production. These indicators reflect the level of use of agricultural land, means of production; indicate the consumption materials, labour etc.

Production efficiency effect is characterized by results that always exceed production consumption.

A high economic efficiency (Table 1) was achieved in 2005 and 2011, when grape productivity and high levels recorded in the period when the correlation between the sales price and the cost of finished products sold was the largest. Every 1 lei is an average profit of 31.02 and 36.53 liquid cash.

Table 1 – Dynamics of economic efficiency of grape production in agricultural enterprises in the Republic of Moldova

Years	Productivity of bearing vine plantations, q/ha	Unit cost of finite sold production, lei	Selling average price of 1 q of grape, lei	Calculated (lei) per: 1 q of sold product	Efficiency level, %
2005	31,5	238,95	314,37	74,44	31,02
2006	25,1	234,76	272,0	37,27	15,88
2007	30,8	219,93	268,38	48,45	22,03
2008	37,1	224,50	246,04	21,54	9,60
2009	41,1	1717,19	181,41	10,22	5,97
2010	20,9	313,98	340,95	26,96	8,59
2011	42,6	237,17	323,81	86,64	35,53
	35,5	236,5	273,0	363	15,5

Source: author's calculations on the basis of specialized blanks of agricultural enterprises given period of time

Vine plantation productivity is the main indicator which characterizes economic efficiency in viticulture, which increase, in the conditions of intensification and difficult financing, remains a problem for agricultural enterprises. Increase or decrease of productivity of plantations and the change of their quality determines the efficiency of production of grapes. But only on the basis of the partial indicators is not possible to assess the integral economic efficiency.

These indicators reflect the partial economic efficiency, because some of them only refer to a certain category of resource.

We believe that in order to determine the integral economic efficiency of production is necessary to calculate, along with traditional indicators, a synthetic (integral) indicator of efficiency, such as multi-criteria weighted average calculated from each agricultural enterprise of the total set based on main indicators that are characterizing the efficiency.

For each combination of resources to achieve maximum results, but data results may actually coincides with this maximum level or may be lower. Undertaking achieve maximum results in relation to a unit of resources is taken as a yardstick with which to compare all companies studied by the use of resources. Efficient firms form "efficient production frontier." Therefore, the efficiency is calculated by estimating the distance between the enterprises studied the efficiency frontier.

The proposed methodology is based on the principles of the method, which is called analysis - envelope (eng. Data Envelopment Analysis, DEA).

On the basis of comparing partial indicators of efficiency of using resources are obtained enveloped data.

These enveloped data make the frontier of production possibilities, which is maximal possibility of results by different combinations of resources.

Method of analysis - envelope belongs Farrell [p.253-281], according to which efficiency is determined as the ratio of agricultural enterprises in productivity maximum productivity.

Maximum efficiency is often called "advanced practice", (eng. best practice), which is always at the frontier of the production possibilities, and, therefore, the change of efficiency means changing the distance from the border. When selecting features it is necessary to meet the requirements of qualitative homogeneity of the non-existence of contradictions between them. This condition can be considered fulfilled if the lot is changing characteristics usually in one direction and strength of their bond is high.

At product level is proposed to compute the average multi-criteria according to the following mathematical relationship that results from the methodology developed:

$$\bar{C}_i = \frac{\frac{p_i}{p_{opt}} + \frac{Cp_{opt}}{Cp_i} + \frac{Pm.v_i}{Pm.v_{opt}} + \frac{Pq_i}{Pq_{opt}} + \frac{Nr_i}{Nr_{opt}} + \sum_{n=1}^n \left(\frac{x_{i_n}}{x_{opt}} \right) + \frac{x_{opt}}{x_i}}{n}$$

where:

\bar{C}_i - multicriterial average coefficient of economic efficiency for i units;

p_i and p_{opt} - productivity of culture culturii per 1 ha, (q) for i units per unit with optimal frontier level (sample)²;

Cp_i and Cp_{opt} unit cost of production, (lei) per i units and unit with optimal frontier level;

$Pm.v_i$ and $Pm.v_{opt}$ - selling average price of 1 q, (lei) per i units and unit with optimal frontier level;

Pq_i and Pq_{opt} -calculated profit for q of product, (lei) per i units and unit with optimal frontier level;

Nr_i and Nr_{opt} - level of efficiency (%), for i units and unit with optimal frontier level;

x_{i_n} - significance of characteristic x_n (for maximized characteristics) for i units;

x_i - significance of characteristic (for minimized characteristics) for i units.

x_{opt} - significance of characteristic for optimal frontier level (sample) - x_n ;

i - number of multitude researched;

n - number of characteristic.

We tend to mention that a part of obtained production in agricultural enterprises is not sold on distribution channels, but is processed.

Table 2. Dynamics of economic efficiency of grape wine obtained from processing it in the agricultural enterprises of the Republic of Moldova

Year	Production volume, dal	Unit cost of 1 dal, lei	Selling price of 1 dal, lei	Profit in calculation per 1 dal, lei	Level of rentability, %
2005	1051316	70,2	89,75	19,54	27,84
2006	216173	17,59	31,17	13,59	77,25
2007	75697	122,07	116,54	-5,52	-4,52
2008	67125	101,75	101,08	-0,67	-0,66
2009	116328	47,92	64,09	16,17	33,75
2010	91682	50,57	70,55	19,98	39,52
2011	176719	23,07	43,11	20,04	86,88

Source: author's calculations on the basis of blanks specialized of agricultural enterprises of the given period

Data of Table 2 demonstrate that the obtained results from processing grapes in 2007 - 2008 were registered with losses, and in 2007 și 2011, the vine efficiency level reached the level of 77,2% - 86,8%.

We consider a necessity to expose our opinion and to complete the methodology proposed taking into consideration and the results obtained from selling own products, including also four indicators:

c'_{p_i} and $c'_{p_{opt}}$ - unit cost of sold finite production, lei for i units and for unit level with optimal frontier;

$p'_{m.v_i}$ and $p'_{m.v_{opt}}$ - selling price of 1 sold unit (ton, decaliters etc.), lei for i units and for unit level of optimal frontier;

² As a basis of comparison, depending on the scope of research, can be taken too the data on average level of multitude, on progressive average, etc.

Pq'_i and Pq'_{opt} – calculated profit of one unit of product sold, (lei) for i units and for unit level of optimal frontier;

Nr'_i and Nr'_{opt} – productivity efficiency level (%), for i units and for unit și pentru level of optimal frontier;

Then, in the enterprises that process their own production the determinance of economic efficiency of different types of products, with taking the consideration the results obtained from the industrial processing, we suggest to be made the following relation:

$$\bar{C}_i = \frac{\sum_{n=1}^n \left(\frac{x_{i_n}}{x_{opt}} + \frac{x'_{i_n}}{x'_{opt}} \right) + \frac{x_{opt}}{x_i} + \frac{x'_{opt}}{x'_i}}{n}$$

where:

x'_{i_n} - significance of characteristic x'_{i_n} (for maximized characteristics) for i units;

x'_i – significance of characteristic (for minimized characteristics) pentru i unități.

x'_{opt} significance of characteristic for optimal frontier level (sample) – x'_n ;

i – units number of researched multitude;

n – number of characteristic.

CONCLUSIONS

Research results allow us to demonstrate the advantages of the proposed methodology for calculating the synthetic (integral) indicator of efficiency, along with traditional indicators used in competitive economy, which are:

- given methodology is based on complex multi-criteria complex approach of evaluation system of economic efficiency of production;
- assessment based on multi-criteria average coefficient is a method of comparison and consider the actual results of all enterprises;
- estimation is made based on public data of specialized forms of companies studied, which are used in traditional practice of assessing the economic efficiency;
- there are no restrictions on the number of indicators years, businesses etc.
- correspond to existent practices of competitive economy, where each producer aims to exceed its competitors in all positions

(indicators) that characterize the competitiveness and economic efficiency of production.

- between indicators of economic efficiency calculated in the competitive hierarchy of enterprises there is a reciprocal connection, are harmonized, have a consecutive increase (decrease) and are comparable.

- estimation the integral economic efficiency enables to identify the location of each agricultural unit on the economic efficiency level in the hierarchy studied in comparison with optimal frontier (sample).

- is kept the comparability of indicators in ensemble, because they are standardized optimal frontier level (sample).

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A COMPARATIVE STUDY ON THE PROFITABILITY OF TOURISTIC PENSIONS

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Abstract

The expansion that rural tourism has witnessed in the late XIXth century was determined by the existence of two reasons: on the one side the revival and development of the rural area, and the other side the alternative tourism form compared to traditional, classic or table tourism. It is known that regardless of the external environment in which tourist accommodation units operate, an important role belongs to the quality of the services offered and the satisfaction level of the customers. This study aimed to comparatively analyze the economic efficiency of the Confort Pension located in a rural area and the Danacris Pension from the urban area. The reason for choosing these two units was that the types of tourism they represent are significant areas of operation, namely leisure tourism ("Confort" Pension) from Suceava area and business tourism ("Danacris" Pension) from Bucharest. Based on the existing methodology in the specialized literature, specific indicators were calculated in order to highlight economic efficiency. Based on the analysis of the main financial standing indicators and the evolution of income and expenditure one may conclude that both companies were profitable.

Key words: customers, economic efficiency, pension, tourism.

INTRODUCTION

Two Pensions were studied: "Confort" and "Danacris" Pensions.

"**Confort**" Pension is located in Suceava, was established in 2000 as a rural Pension, within the category of 3 daisies, having a capacity of 8 rooms, and a 24 seats restaurant, and the average fee was of 100 lei/double room. 94% of the clients come for leisure and touristic objectives sightseeing, and only 6% of them come for business purposes [5]. Meals are ensured in 27% with products from own production. The occupancy rate of "Confort" Pension is high enough, falling between the interval 73-87% for all of the three years analysed, and average length of stay is 3.5 days.

"**Danacris**" Pension was established in September 2003, as the top Pension in Bucharest at that moment. Presently the Pension has 21 beds and a restaurant with a capacity of 36 seats. Given that it is an urban Pension, from the 3 daisies category, the average fee is higher, respectively 140 lei/double room. The Pensions' tourists are, in

proportion of 96% business tourists and Romanians are predominant, only 22% being foreign tourists. The products are ensured in proportion of 97% from the supermarket [5]. The occupancy rate varies between 61-83% and the average length of stay is 2 days at "Danacris" Pension.

MATERIALS AND METHODS

This study on the economic efficiency of a Pension from the urban environment on one side and of one from the rural environment on the other side, by the activity these develop, are based on the technical-economical processing of the existing data, by using specific analysis methods [4].

RESULTS AND DISCUSSIONS

The values of occupancy rate listed for each month of the period 2010-2012 for Confort Pension are presented in Table 1.

Table 1. Situation and evolution of the monthly occupancy rate, „Confort” Pension

Specification	2010	2011	2012	2011/ 2010	2012/ 2010	2012/ 2011
January	87	71	88	81.61	101.15	123.94
February	62	53	67	85.48	108.06	126.41
March	83	74	89	89.16	107.23	120.27
April	79	67	86	84.81	108.86	128.36
May	53	65	68	122.6	128.30	104.61
June	80	75	85	93.75	106.25	113.33
Average-sem. I	74	67	80	90.54	108.11	119.40
July	99	88	98	88.88	98.99	111.36
August	99	94	99	94.94	100	105.32
September	76	75	80	98.68	105.26	106.66
October	57	62	63	108.7	110.53	101.61
November	54	65	68	120.3	125.92	104.61
December	92	90	94	97.82	102.17	104.44
Year average	77	73	82	98.81	106.49	112.32

Correspondingly, for the “Danacris“ Pension a similar table was prepared (Table 2.), in which the values of occupancy rate were listed for each month of the past three years, followed by a calculation of this indicators’ evolution.

The comparative study shows that, unlike the “Confort” Pension, where the lowest occupation rate was over 50%, the “Danacris “ Pension drops to an occupation rate of 19% (2010) during the winter months, when there are no conferences and business meeting [1]. Subsequently, through sustained marketing campaigns, an occupation rate of over 50% was attained also for these months, although a visible difference is kept between the summer months and those with winter holidays compared to the rest of the year, when the occupation rate is much higher [2].

In Suceava we observed that the average stay is higher than in Bucharest in all 3 analysed years. The fact that the stay is in average on day longer, in case of “Confort” Pension, highlights the fact that transit tourism is almost non-existent, the leisure vacation) and weekend tourism being prevailing.

Table 2. Occupancy rate of “Danacris “ Pension

Specification	2010	2011	2012	2011/ 2010	2012/ 2010	2012/ 2011
January	19	60	64	315.7	336.8	106.6
February	41	81	85	197.5	207.3	104.9
March	57	79	85	138.9	149.1	107.5
April	43	56	83	130.2	193.0	148.2
May	80	89	96	111.2	120.0	107.8
June	65	74	93	113.8	143.0	125.6
Average-sem. I	51	73	84	143.1	164.7	115.0
July	60	87	88	145.0	146.6	101.1
August	51	75	79	147.0	154.9	105.3
September	77	96	94	124.6	122.0	97.9
October	79	92	93	116.5	117.7	101.0
November	90	95	97	105.5	107.7	102.1
December	19	60	64	315.7	336.8	106.6
Year average	41	81	85	197.5	207.3	104.9

Table 3. Comparative situation on the average stay

Year / Month	“Confort” Pension			“Danacris “ Pension		
	2010	2011	2012	2010	2011	2012
January	2.7	2.3	3.3	1.8	1.43	2.54
February	2.5	2.9	3.1	2.2	1.95	1.78
March	3.2	3.5	3.5	3.3	2.20	2.81
April	3.1	3.7	4.1	4.0	1.70	2.63
May	3.0	2.8	3.9	2.3	3.08	2.75
June	4.2	3.6	4.7	2.3	2.36	2.76
July	5.5	5.8	5.3	1.6	1.96	1.77
August	5.8	5.7	5.6	4.1	2.69	1.61
September	3.5	3.3	3.4	2.4	2.78	4.30
October	2.1	2.3	2.0	2.9	2.68	2.10
November	2.4	1.9	2.2	3.0	2.86	2.38
December	3.6	3.0	3.5	1.8	1.87	1.88
TOTAL	3.46	3.44	3.72	2.6	2.36	2.30

Table 4. Revenues situation for the two Pensions

Specification	"Confort" Pension			"Danacris" Pension		
	2010	2011	2012	2010	2011	2012
Operating revenues	285982	166010	323230	151019	243303	389130
Financial revenues	-	-	-	410	17	450
Extraordinary revenues	-	-	-	-	-	-
Total revenue	285982	166010	323230	151429	243320	389580

The operating revenues for both Pensions have significant percentages, while the financial and extraordinary revenues are inexistent for both Pensions.

From the comparative point of view, the evolution of the revenues was much more spectacular in the case of "Danacris" Pension, and figures are concluding in this respect.

Table 5. Evolution of expenses for the two companies

Name	"Confort" Pension			"Danacris" Pension		
	2011/ 2010	2012/ 2010	2012/ 2011	2011/ 2010	2012/ 2010	2012/ 2011
Operating expenses	71.2	124.7	175.2	192.9	330.9	171.5
Financial expenses	-	-	-	-	-	-
Extraordinary expenses	-	-	-	-	-	-
TOTALE EXPENSES	71.2	124.7	175.2	192.9	332.1	172.0

Total expenses had, in overall, an upward evolution during the analysed period, with small particularities: in 2011, "Confort" Pension expenses dropped compared with 2010, by a percentage of 28.8%. Reported also to 2010, the expenses of the company in Suceava increased in 2012 by 24.79 %, and for the same year, 2012, to increase by 75.27% compared to 2011;

"Danacris" Pension benefits from significant increases over the analysed years: 2011 brings about an increase of the expenses of 92.98% compared to the reference year, 2010; in 2012 there was an increase of 232.12% compared to

the same year (2010) and of 72.09% compared to 2011.

Table 6. Comparative situation on the year result

Specificat.	"Confort" Pension			"Danacris" Pension		
	2010	2011	2012	2010	2011	2012
Gross result	65 609	9 104	48 210	41 952	32 046	25 982
Net result	57 030	4 124	41 842	36 606	31 508	25 982

The main reason for which the "Arin"s Pension is higher than the one of "Danacris" Pension is related to the fact that the expenses are considerable lower in comparison to the revenues attained.

Table 7. Evolution of the Pensions' year result

Specification	"Confort" Pension			"Danacris" Pension		
	2011/ 2010	2012/ 2010	2012/ 2011	2011/ 2010	2012/ 2010	2012/ 2011
Gross result	13,87	73.48	529.5	76,39	61.93	81.08
Net result	7.23	73.37	1015	86.07	70.98	82.46

There are significant fluctuations as regards to the profits recorded by the two companies: from a profit drop of 93.77%, to increases of 915%, fact that indicates an activity that has not been constant from the financial point of view. Slightly different is the case "Danacris" Pension, where, although the profits decreased, it happened gradually and it was generated especially due to the very high expenses recorded [3].

CONCLUSIONS

Notable is the establishment of a Pension in Bucharest fact that entails a whole new approach and is problematic compared to the same process happened in the rural environment.

Only the problem of cost and finding a plot of land in Bucharest must be mentioned, compared to the utilities problem in the rural.

To the same extent there is also the problem of expenses that are much higher in Bucharest than in Vatra Dornei.

On the other hand there is an interesting social aspect of operating a Pension such as "Confort Pension". By marketing actions the efficient counteracting of finding a hotel

problem was accomplished by attaining a very satisfying occupancy of up to 96% (May 2012).

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SCENE OF INTERMEDIATE MANAGEMENT BALANCES FOR COMPANIES IN THE FIELD OF TRADE

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Abstract

The structure of profit and loss account for the three types of activities allows to release some balances of potential monetary accumulation designed to accomplish a certain payment function for production factor and funding the future activity, called intermediate management balances (IMB). To achieve this goal it is required to analyse previously the profit and loss account to highlight: the workings and the enterprise profitability as commercial margin, production of year, added value, gross operating surplus, a result of operating, current result and net result for the year. The company considered into the analysis is S. C. GENERAL AGROCOM SERVICE S.R.L., and through the used calculation are underlined strategies and policies that the enterprise management should adopt to improve the year result.

Key words: food trade, intermediate management balances, year result

INTRODUCTION

As a branch of the national economy, the trade experienced a strong development after 1990 and although at first sight, the trade appears to be a simple activity, in fact the content of its activity is particularly complex. Thus, alongside with the activity of intermediation, goods purchase, transport and storage under food safety terms, the trade contains other activities such as market research, public information, consumer education, advertising, promotion, creating the environmental background necessary for the deed of conveyance and so on [2]

The analysed company is S.C. GENERAL AGROCOM SERVICE Ltd. founded in 1994, the head office being in the Tisău village, Buzău county and its main field of activity is the food trade, mainly products that have a high utility for the final consumer.

In the company's goods portfolio one may find products which require special transportation conditions, handling, storage-husbandry, products from domestic production, but also imported ones. Goods, in

terms of heat conditions, are divided into frozen and chilled.

Frozen goods: **poultry meat** supplied from domestic producers; **poultry products** supplied from importers; **fish and frozen fish products**.

Goods which require refrigeration heat conditions: **dairy products; cold meats; preserved products** [7].

In 2010 the company has purchased a computer system much more efficient than the previously one used, namely the DataLight Enterprise product, provided by AttoSoft, which is an ERP computer system that centralizes information from all departments, from all work points, so that they are available both for management and other members of the organization which need them.

Of the seven modules present in the Data Light Enterprise computer program, the company purchased only three of them, namely DataLight BalPro, DataLight Fixed Assets and DataLight Management 3.00 [7].

MATERIALS AND METHODS

The intermediate management balances are successive stages in the formation of final result [5]. The indicators construction is done in tandem, from the most comprehensive (year production + commercial margin) and ending with the most synthetic (the net year result).

Every intermediate management balance reflects the result of financial management at the respective stage of accumulation [4].

The drawing up of the intermediate management balances panel aims:

- ✓ the assessment of increasing wealth, generated by the enterprise activity;
- ✓ the description of wealth distribution created by the enterprise between: employees and social bodies, state, shareholders, enterprise itself; [1]
- ✓ understanding the net result formation;
- ✓ studying the activity structure by means of some rates which allow to analyse its temporally evolution (by example, the rate of commercial margin, the rate of added value, the export weight and so on); [6]
- ✓ studying the operating means, using rates such as labour efficiency, the industrial equipment performance and so on;
- ✓ the profitability analysis;
- ✓ the analysis of temporally evolution by rating the percentage variation of the main intermediate management balances, identifying the causes of these variations and if necessary, the establishment of compensator measures [3].

RESULTS AND DISCUSSIONS

The Commercial Margin accomplished in the three analysed years demonstrates a surplus from the sale of goods due to a faster increase of income from the sale of goods towards the purchasing cost, making a profit of the commercial activity. In addition, the recorded growth of this indicator signifies an improvement, in financial terms of company's commercial activity, fact proven by the upward trend registered into the dynamic by the commercial margin, and this increased by

35.4% in 2011 and by 117.86% in 2012 compared to the basic year.

The nominal rate of Added Value registered an upward trend, the increase being of 34.57% in 2011 and of 130.95% in 2012 as compared with the basic year, fact that positively influence the company results.

Table 1. Calculation of Intermediate Management Balances

Specification	2010	2011	2012
Income from goods	19.534474	25.300.994	35689.861
Cost regarding goods	17418.497	22.435.251	31079.916
Commercial Margin	2.115.977	2.865.743	4.609.945
Sold production	248.904	395.029	769.325
Stocks variation	56.680	101.018	118.780
	105.913	0	0
Capitalised production	66.855	264.324	0
Year Production	266.526	760.371	888.105
Raw materials and expendable materials costs	547.021	981.654	1.532.230
Other material costs	152.266	134.306	190.300
Water and energy costs	76.703	95.427	153.476
Costs of external services	557.278	1.002.715	1.198.799
Added value	1.049.235	1.412.012	2.423.245
Income from subsidies related to the Turnover	0	0	0
Other operating income	4.860	444	22.831
Staff costs	508.848	988.803	1.406.950
Other dues and taxes costs	13.532	13.793	23.607
Compensation, donations and granted assets	19.310	37.724	15.444
Gross operating surplus	512.405	372.136	1.000.075
Redemption and provisions cost	203.937	177.810	409.344
The operating profit	308.471	194.326	540.669
Financial income	3.235	2.388	13.891
Financial costs	91.229	95.393	131.975
Financial Profit	-87.994	-93.005	-118.084
Current /gross profit	220.477	101.321	422.585
Net profit	183.402	78.507	356.413

The increase recorded by this indicator highlights the efficient employment of capital and labour force, and it is a favourable

outcome because it is the source of accumulation funds wherefrom one will pay the debts to state, banks and sundry creditors, personnel, and as much as possible one will appropriate a certain amount for self-financing.

Otherwise, in 2011, the **Gross Operating Surplus** recorded a decreasing nominal rate of 27.38% towards the previous year which influenced the potential capacity in self-financing the profit investments and paying off in dynamic, one may determine a significant growth in 2012 of 95.17% as compared with the basic year.

The current result registered in 2011 a decrease of 54.05% towards 2010, but at the same time, it recorded an upward trend in the next year, the growth being with 91.66% higher in 2012 than in 2010.

Finally, the **Net Result** follows the same tendency as the other indicators, recording a decreasing trend in 2011, the decrease of 57.2%, but also an upward trend in 2012, the growth of 94.33%, in comparison with 2010.

The profitability is the economic category that shows the company *capacity of obtaining profit*, which highlights its *performance*. The major goals of the company are both for increasing the wealth of the company members (shareholders, partners, personnel, creditors, state) and for increasing its value, in order to ensure its own development.

The profitability rates are some of the most important indicators by means of which one may appreciate the general efficiency of the company activity, because it points the results obtained by passing through all stages of the economic circuit: provision, production and sale.

Analysing the **Commercial margin rate** one may determine an upward trend of it, a higher growth being recorded in 2012, and this is due to the fact that the company practice a balanced commercial addition related to an increase of goods turnover.

At the same time, the **Net margin rate** (the net profit margin) registered a significant decrease in 2011 compared to the basic year, the decrease of this rate highlighting a decline of company's capacity in obtaining satisfactory financial results. In 2012 the net

margin rate fallback to a positive percentage value.

Table 2. Calculation of profitability rates

Specification	2010	2011	2012
Commercial margin rate -%	10.83	11.33	12.92
Net margin rate -%	0.93	0.31	0.98
Economic profitability -%	5.78	1.87	7.45
Final profitability of own capital -%	39.51	12.23	35.71
Final profitability of permanent capital -%	20.83	6.59	27.26
Income profitability -%	0.93	0.30	0.97
Costs profitability -%	0.94	0.30	0.98

The **economic profitability rate** shall record a low level in the analysed period, due to a faster growth in the carrying amount of the patrimonial asset related to an emphatic decrease of the net profit. Thus, in the first analysed year, the rate value is at 5.78%, while in 2011 it decreases to 1.87%, but in the last analysed year, it increases to a value of 7.45%.

The **financial profitability rate** reported in the own capital register almost normal values, its level being of 39.51% in 2010, and this shows that its own resources were effectively used. Otherwise, next year one may determine a decrease of this rate's percentage value up to 12.23%, due to a decrease of the net profit. The indicator percentage value recovers in 2012, reaching a level of 35.71%, due to the large increase in the amount of the net profit.

The **financial profitability rate** reported to the permanent capital follows a recessive trend in 2011 towards 2010 due to the growth of permanent capital value and of the considerable decrease of net result. In 2012 the situation recovers, the rate level reaching a 27.26% value, which is due to a faster growth in the net profit towards the increase of permanent capital.

Analysing the **income rate** one may highlight the fact that the company recorded a profit of 0.93 lei for 100 lei cashed in 2010, a profit

down to 0.30 lei for 100 lei cashed in 2011. However there is an upswing in 2012, this rate recording a value of 0.97.

The costs rate (consumed resources) lies also at a low level, registering approximately the same evolution as the income rate does.

CONCLUSIONS

- ✓ Identifying suppliers wherewith one could make commercial contracts where to be specified the terms and conditions of goods delivery, the accounts due date as well as the given facilities;
- ✓ One may eliminate of the company's goods stock those categories of products that have a quantitatively insignificant turnover;
- ✓ The rolling rate increases for the main goods categories, respectively for the frozen ones;
- ✓ A better selection of costumers to whom one may offer facilities to purchase goods, depending on the amount and the due date, which leads to reduce the recovery term of debts;
- ✓ Identifying new costumers by the sales associates;
- ✓ The communication improvement between salesmen and the sales associates ones;
- ✓ An improved way of communication between the sales associates and central warehouse employees as well as the one with the accounting- financial department in order to identify faster the costumers with billing restrictions;
- ✓ An improved way of communication between the central warehouse management and the provision division, as well as the one between the two shifts at central warehouse level;
- ✓ Increasing the involvement of staff by training regarding the quality management and implicitly, food safety;
- ✓ A balance of the company financial structure by contracting a loan in the medium and long-term designed to be used for financing the current asset, respectively for stocks financing;
- ✓ Increasing the carrying amount of the own capitol by input, respectively the profit assimilation;

- ✓ Increasing the cash availabilities by recovering debts.

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TECHNIQUES AND SYSTEMS OF INDICATORS USED IN THE ANALYSIS OF SUSTAINABLE DEVELOPMENT OF RURAL AREAS

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Abstract

The present article exposes the summary of a research project whose purpose is measuring sustainable development in Romania at the level of rural areas. Sustainable Development (Sustainable Development in English) means better quality of life now and for future generations. According to the vision of sustainable development, progress integrates immediate and long-term objectives, local actions and global economic and environmental issues, all of which are inseparable. Such a vision of society can not be imposed only by political, society as a whole must adopt certain principles (political, economic, social, thinking). Sustainable development can be defined simply as a better quality of life for everyone, both now and for future generations. Sustainable development means: balanced and equitable economic development; high levels of employment, social cohesion and inclusion; a high level of environmental protection and responsible use of natural resources; generating a coherent political system open, transparent and accountable; effective international cooperation to promote global sustainable development (Gothenburg Strategy, 2001).

Key words: *sustainable development, sustainability, research paradigms, quantification, resources*

INTRODUCTION

The concept of sustainable development was born 30 years ago in response to the emergence of environmental and natural resource crisis, especially those related to energy [1]. Basically, the Stockholm Conference on the Human Environment in 1972 is when it is recognized that human activities contribute to environmental damage, putting endangered future of the planet [2].

A few years later, in 1983, the World Commission on Environment and Development (WCED) began work, by a resolution adopted by the UN General Assembly, which gives the best known definition of sustainable development:

"sustainable development is development which aims to meet needs of the present without compromising the ability of future generations to meet their own needs " [3].

MATERIALS AND METHODS

Monitoring the development of the phenomenon, and using indicators beyond

economic activities precedes the definition of sustainable development principles, consecrating themselves along with the definition of sustainable development strategies developed in assistance with United Nations, respectively EU. Such monitoring tools were produced by many institutions, from business or civil society formations, expert groups or research centers to local governments, national governments, organizations.

In this research project, the purpose is seeking to assess the current state of sustainable development in the rural area.

The main objectives are analyzed:

- Support agriculture and rural development;
- Long-term problems for the agriculture sector and rural adjustment;
- Implementation of the *acquis communautaire* in the field of agricultural policies.

Sustainable development should be seen as an adaptation of society and the economy at large problems facing humanity today: climate change, water crisis, drought, desertification, depletion of resources, waste, loss of

biodiversity, population growth, poverty, migration etc.

The term sustainable development began to become, however, well known only after the Conference on Environment and Development, organized by the United Nations in Rio de Janeiro in the summer of 1992, known as the "Earth Summit". It resulted in development of several conventions on climate change (reducing emissions of methane and carbon dioxide), biological diversity (conservation) and stop massive deforestation. Also then, the Agenda 21 - sustainable development support plan, was drafted. The concept of sustainable development means all forms and methods of socio-economic development, whose foundation it is primarily a balance between the socio-economic systems and the natural capital items.

Although sustainable development was initially meant to be a solution to the ecological crisis caused by intense industrial exploitation of resources and environmental degradation continues and seeks primarily in environmental preservation, now expanded concept of quality of life in its complexity and in terms economically and socially. Subject of sustainable development is now a concern for justice and equity between countries, not only between generations.

RESULTS AND DISCUSSIONS

The concept of sustainable development was initially linked to environmental issues and natural resource crisis, especially those related to power 30 years ago.

Natural resources represent all deposits of minerals and ores, arable land, forests and water available in a particular country.

Natural resources are substances that occur naturally but are considered valuable in their relatively unaltered form. A material is considered a natural resource when the primary activities associated with it are extraction and purification, as opposed to creation. Mining, oil extraction, fishing and forestry are generally considered natural-resource industries, while agriculture is not. This term was introduced to a large audience

by EF Schumacher in his book "Small Is Beautiful" in 1970.

Natural resources are usually classified as:

- renewable resources
- non-renewable resources.

Renewable resources are generally living resources (fish, forests, for example) that can recover if not over-exploited. Renewable resources can recover and can be used indefinitely if used rationally. Once renewable resources are consumed at a rate that exceeds their natural rate of recovery, they will diminish and eventually will run out. Rate that can be supported by a renewable resource is determined by the rate of recovery and the size of that resource availabilities. Renewable natural resources that are not living include soil, water, wind, tides and solar radiation.

Although sustainable development was initially meant to be a solution to the ecological crisis caused by intense industrial exploitation of resources and the continued degradation of the environment, which primarily looks preserving environmental quality, now expanded concept of quality of life in its complexity, in terms economic but also social.

Over time the concept of sustainable development got into agriculture too, as a reponse to the many shortcomings of conventional agriculture, from this perspective being a system of sustainable agriculture technologies and practices designed not only to ensure satisfactory production, but also to achieve environmental objectives. Thus, in recent decades increasingly stated that the viability of rural areas can not depend only on agriculture, but must also strengthen its role in protecting the rural environment, the production of safe and quality food to help maintain the attractiveness of rural areas for young people and for those who will be born in the future.

CONCLUSIONS

1. Sustainable development is a form of growth that meet social needs in terms of welfare in the short, medium and long term, basing it on the grounds that the development must meet the needs of the present without

jeopardizing those of future generations. Sustainable development is based on three-dimensional environment, economy and society determinant of information system, on which one can quantify and form an accurate picture of sustainable development and the interaction of access.

2. Sustainable development is a slow process of change that allows long-term use of the environment so that economic development remain possible while maintaining an acceptable level of environmental quality.

Sustainable development in the ecological conditions are:

- regeneration of natural resources and preserving their natural stock to an acceptable level;
- reducing pollution to a "minimum security"
- observance of biodiversity conservation;
- Avoiding irreversible effects of economic processes by:
 - Strategies aimed at preventing risks;
 - The orientation of technological development towards protecting the environment;
 - Orientation of institutional change and economic decisions towards protecting the environment;
 - Distribution of income fair and reasonable manner.

The essence of sustainable development of human society is given by the management, present and future of its natural resources, energy, materials and information, the objectives of economic growth and ensuring a quality increasingly better life and environment.

As the environment and its resources are shared among different users to expand their range of protection and savings collective action is needed.

Decisions on economic development be taken taking into account potential costs of pollution and damage to the environment and the amount of resources consumed and converted, the value of any improvements ead office. However, it is often difficult to determine the environmental costs, the amount of resources that can be used without affecting their regeneration and what benefits exist or will be provided as a result of certain human actions.

3. Integrated rural development program involves the application of complex socio-economic sectors in rural areas, correlated with each other, are in a continuous interdependence and mobile, so encourage sustainable development.

4. For rural areas become more attractive living spaces should be addressed following general objectives of rural development:

- reorganization planning;
- land improvement works;
- works to improve access roads;
- beautifying the landscape;
- conservation and preservation of ecological balance;
- improve comfort people.

Also development of rural communities can not be separated from the development and consolidation of farms without their evolution towards modern farms. Sustainable development policy should include three main areas:

- household development through systematization and modernization of its equipment without altering traditions;
- Strengthening farms compatible with those of the EU;
- Development of rural communities through provision of infrastructure (water, telephone etc.) And providing residents with social services.

5. Regarding the National Strategy for Sustainable Development of Romania, it aims commissioning of two types of indicators:

a. National Sustainable Development Indicators - focus on key priorities expressed by measurable targets allowing benchmarking national and international partners and the objectives of the EU Sustainable Development Strategy. This set of indicators will be based on the results of the working group Eurostat-UNECE-OCDE and it will be constantly updated.

b. Indicators of progress of National Strategy - covering the entire package depoliticized that it generates, including those which are not covered by EU strategy. In this way, all policies will be subject monitoring, aiming the empowerment of the policymakers and allowing the public opinion to assess the success of actions.

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STRATEGIES AND PROGRAMS FOR SUSTAINABLE DEVELOPMENT OF RURAL IN THE EUROPEAN UNION

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Abstract

The present article exposes the summary of a research project whose purpose is measuring sustainable development in Romania at the level rural areas. Sustainable Development (Sustainable Development in English) means better quality of life now and for future generations. According to the vision of sustainable development, progress integrates immediate and long-term objectives, local actions and global economic and environmental issues, all of which are inseparable. Such a vision of society can not be imposed only by political society as a whole must adopt certain principles (political, economic, social, thinking). Sustainable development can be defined simply as a better quality of life for everyone, both now and for future generations. Sustainable development means: balanced and equitable economic development; high levels of employment, social cohesion and inclusion; a high level of environmental protection and responsible use of natural resources; generating a coherent political system open, transparent and accountable; effective international cooperation to promote global sustainable development (Gothenburg Strategy, 2001).

Key words: quantification, research paradigms, resources sustainable development, sustainability

INTRODUCTION

Sustainable Development (Sustainable Development in English) means better quality of life now and for future generations [1]. According to the vision of sustainable development, progress integrates immediate and long-term objectives, local actions and global economic and environmental issues, all of which are inseparable. Such a vision of society can not be imposed only by political society as a whole must adopt certain principles (political, economic, social, thinking) [2].

In Europe, the rural has been studied for a long time in ethnographic or geographic [3].

MATERIALS AND METHODS

Over time, we have outlined several research paradigms:

1. traditionalist model, which considers rural or village, as the true keeper of the spirituality, specificity and originality of a culture, a society, such research seeking to

reveal the values, behaviors and symbols of traditional rural;

2. improver model, which considers rural areas as genetic form a company, but also advanced enough to be brought to urban structures. Research in this area measure generally gap between urban and rural areas in terms of income, education, comfort and productivity;

3. ecological model, which reveals specificity, features and advantages of contemporary rural way of life;

4. cronoregresiv model used generally in the monographs of villages.

Theoretically, each State member may decide and implement rural development policies completely independent. But this approach would not work well in practice. Not all EU countries could afford policy they need. Moreover, many of the issues addressed by rural development policy is not strictly limited to national territory or to a particular region (eg, pollution knows no boundaries, and fight for environmental sustainability has become a concern at European and international level). Also, rural development policy relates to a

number of other policies developed at EU level.

Therefore, the EU has a common rural development, which, in a rather large extent, is controlled by member States and regions.

This policy is partly financed by the EU central part of national and regional budgets of the Member States.

The main rules governing rural development policy for the period 2007-2013 and policy measures available to Member States and regions are covered by Regulation (EC) no. 1698/2005 of the Council.

Under this act, rural development policy for 2007-2013 focuses on three themes (known as "thematic axes"). These are:

- improving the competitiveness of agriculture and forestry;
- improving the environment and the countryside;
- improving the quality of life in rural areas and encouraging diversification of the rural economy.

For this period, place even more emphasis on the existence of a coherent strategy for rural development in the EU. This is achieved through strategic national plans should be based on the EU strategic guidelines.

It is intended that this approach will contribute to:

- identify areas where the use of EU support for rural development is greater added value for the Union;
- the link with the main EU priorities (eg, those included in the Lisbon and Gothenburg agendas);
- ensure consistency with other EU policies, particularly those relating to cohesion and environment;
- implementation of the new CAP, market-oriented and, therefore, the necessary restructuring in old and new Member States.

RESULTS AND DISCUSSIONS

Responsibility for implementing the Strategy to the European Union and its Member States, involving all parts of the EU and national institutions. It also stresses the importance of close collaboration with civil society, social partners, local communities and citizens to

achieve four key objectives of sustainable development:

- a. environment - made possible by measures to decouple economic growth from negative environmental impacts;
- b equity and cohesion - Made by fundamental rights, cultural diversity, gender equality and combating discrimination of any kind;
- c. economic prosperity - possible by fostering knowledge, innovation and competitiveness to ensure high standards of living and a abundance of and well-paid jobs;
- d. meeting the EU's international responsibilities by promoting democratic institutions in the service of peace, security and freedom, the principles and practices of sustainable development throughout the world.

The overall objective of promoting sustainable development is to have people better prepared to face current and future challenges and to act responsibly towards future generations. To this end, initiatives will be considered fundamental to all areas of learning, namely learning to know, to act, to live together and to renew themselves and society.

Sustainable development can be defined simply as a better quality of life for everyone, both now and for future generations. Sustainable development means:

- balanced and equitable economic development;
- high levels of employment, social cohesion and inclusion;
- a high level of environmental protection and responsible use of natural resources;
- generating a coherent political system open, transparent and accountable;
- effective international cooperation to promote global sustainable development (Gothenburg Strategy, 2001).

Currently the European Union are promoted three instruments for sustainable rural development: LEADER TRDI and SAPARD. LEADER + (for EU-15). The program aims to support and encourage rural economic actors in order to develop long-term. Local decision makers are invited to develop and implement original development strategies, focusing on:

- specificity and unique landscape, and tradition;
- improving the economic environment in order to create new jobs;
- improving the skills of self-organization of rural communities to promote social cohesion.

In this sense, it creates local action groups (LAGs), which will develop local development plans and will be responsible for implementation.
 TRDI (Temporary Rural Development Instrument) (for the 10 new countries mmbre EU) is a supported by EAGGF and includes key measures to standardize the policies of the 10 new EU member countries and the rest of the European space, comprising: a series of measures environmental protection, early

retirement, afforestation and providing payments for disadvantaged areas.

SAPARD (Romania and Bulgaria) or Special Accession Programme aims to assist in rural development and agriculture, with an annual budget of 520 million Euros for the period 2000-06. The main objectives of pre-accession program are:

- Support agriculture and rural development in the pre-accession;
- Long-term problems to adjust the agricultural and rural sector as a whole;
- Implementation of the *acquis communautaire* in the field of agricultural policies.

Rural development in Europe was implicitly contained in the Common Agricultural Policy (CAP) (Common Agricultural Policy).

Tabel 1.The main stages of the history of CAP development

No.	Period	Features
1	1958	Conference in Stresa
2	1932-1972	Implementation of the CAP, with the sole pillar agriculture
3	1973-1982	Prudent pricing policy period
4	1983-1991	Crisis years of the CAP
5	1992-1999	CAP reform (Mac Sharry) – New Approach
6	2000-2001	PAC long-term sustainable agriculture> Agenda 2000
7		Second pillar of the CAP priority - rural development
8	2003 Sept.	New CAP

CONCLUSIONS

1.The essence of sustainable development of human society is given by the management, present and future of its natural resources, energy, materials and information in relation to the objectives of economic growth and ensuring a quality increasingly better life and environment.

2.Possible funding sources to achieve the objectives of the National Strategy for Sustainable Development, under the National Development Plan, Operational Programmes and specific action plans approved are:

a.EU contribution through structural instruments (European Regional Development Fund, European Social Fund, the Cohesion Fund) for the "Convergence" objective and purpose "European territorial cooperation" and public national co-financing (state budget, local budgets, external loans and other public sources) and related private.

b.EU structural funds (European Agricultural Fund for Rural Development, the European Fisheries Fund) and national co-related public and private sources.

c. Funds allocated from the state budget and local budgets for development investment programs with objectives similar to those financed from Community funds mentioned above.

d.Foreign loans for investment from international financial institutions (European Investment Bank - EIB, European Bank for Reconstruction and Development - EBRD, World Bank, etc..) And other sources (sovereign wealth funds, private funds investment profile and so on) to support 95 national projects congruent with the objectives of the National Strategy for Sustainable Development and the EU Strategy.

e.Other financial instruments (encourage further foreign direct investment, more active use of the capital market, in particular by

launching initial public offerings (IPO), enlargement of bank loans by encouraging domestic savings, investment term development tools long lease of infrastructure and public utilities, promoting public-private partnerships and so on).

3. Sustainable development policy should include three main areas:

- household development through systematization and modernization of its equipment without altering traditions;
- Strengthening farms compatible with those of the EU;
- Development of rural communities through provision of infrastructure (water, telephone etc.) and providing residents with social services.

4. We may conclude that there are practically two essential ways which determine and influence the process of rural development in the European Union: report of agricultural sector versus non-agricultural sector and environmental care.

There is noticed a focus move from center starting policies to policies that appear locally. In the new approach, rural development requires first of all, information.

A particular emphasis is placed on the dissemination of knowledge, information and know-how, transfer and management of information and knowledge. Concepts such as rural extension development or agricultural extension involves communication infrastructural development, information and innovation.

Rural must be thought in terms of the future, not as a past problems solve ("rural area should not be seen as a problem but as an opportunity). Rural development policy must include agriculture in a larger socioeconomic and ecological context.

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EFFECT OF CROSSES ON TRAIT EARS OF MAIZE SUB-SPECIES CROSSES

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Abstract

To investigate the effect of crosses in maize ears, five genotypes were hybridized .one genotype of each of (Z. mays L.)Sub-species (Everta, indurate, Indentata, Saccharata and the Wight endosperm Denprofeski) were intercrossed.F1 and F2 kernels and F1 ears were investigated. The results showed that hybrid vigor or dominance was controlling ears traits. They were controlled by female nuclei indicating the effect of two nuclei of female genes on one nucleus of male pollen. .It was dominance or hybrid vigor controlling ear traits in maize

Key words: Crosses of sub-species of (Z. mays L.)

INTRODUCTION

Hybrid vigor

All [4] and [15] the first recognize this phenomenon and suggested that the last name (Heterosis) and defined as: (difference in weight, size and growth of the hybrid resulting from his parents). And means: the increase achieved in vital force, weight, size and growth in the first generation progeny (F1) compared with the best parents involved in the hybridization. Adopted [14] in his theory on the deviation of the first generation (F1) for the highest hybrid vigor parents to estimate the so the values are positive or negative .While Confirmed [10] the importance of relationship grain weight and the number of grains cob with the amount of output carbon representation processed within Confirmed individuals a single genotype. Found [3] that seed weight increases during the reproductive phase of the plant from the Florescence to physiological maturity.

Concluded [16] that the speed of growth of grain in maize is not necessarily to be in support of more owner, in other words that the category which is characterized by fast grain filling may give the holder of less than that which has a speed slower growth of the grain, on the basis of unequal of length the period of grain filling in both cases.

Either [6] has found that the hybrid vigor in maize is the bigger impact in the number of grains in the plant than in the number of cob or in the weight of grain, Because of the rapid growth of the hybrid plants and the metabolic material moves from vegetative phase to the proliferative phase faster and increase the number of grains formed and thus increasing the product of hybrid seeds, but that does not prevent of weight increase that coming from grain hybrids.

Length of cob in maize

Affect the length of the cob in the amount of holder through its effect on the possibility of increasing the number of grains, associated with cob length and its diameter of the growth factors significantly associated with the season the plant as well as the role of genetic [8] and [13]. Either [1] he was found that the hybrid vigor the is positive (10.7%) in the length of the cob to the highest proportion parents, while stressing [11] that all the crosses showed hybrid vigor positive the in the character of cob length was between (7.9% - 71.4%) However, some researchers found the hybrid vigor positive and negative in the search itself.

Cob diameters and the number of rows:

Mentioned [7] (Hatfield, et al, 1965) that the number of rows of Cob is determined by the genetic composition and growth factors, as mentioned [9] that the diameter of cob may

not give a good indication is often the product of grain due to differences in percentage proportion resulting between the weight of grain to the weight of heart cob. . Either [17] they found that the percentage of the inheritance of diameter in the strict sense of composition cob was 75% and this means it may be governed by the host gene and it may differ from time to time.

Number of grains in the row in the Cob:

Often expect to increase the number of grain product with the increase in cob length, note that this has to do with the nature and availability of growth factors during the life cycle of the plant, and concluded, [12] that the number of grains in row has a genetic influence is greater than those associated with a length of cob, That shows that the number of the class are governed by several pairs of genes, compared with fewer of them governs the length of cob. Confirmed the results [6] such a result and that per plant could give two cobs different in the number of rows.

Rate of plant growth:

Increasing or decreasing rate of plant growth depending on the nature of genotype and growth factors that is reflected on the product of dry matter per plant [2]. Measured by the rate of plant growth unit area (gm. / m² / day) or (gm. of plant / day), but the first depends on the rate of plant growth on the basis of community vegetable is the best [6], also explained that improving the rate of plant growth remains very necessary for plant breeders to increase the productivity per unit area of the total dry matter resulting from the product of the growth rate x number of days of plant growth

MATERIALS AND METHODS

Prepared a piece of land in the field of Agronomy Department at the Faculty of Agriculture / University of Baghdad for the purpose of cultivation in successive seasons, spring and autumn 2010. Were ploughed and divided the ground according to the experimental units and the way genetic material used is described later.

Spring season

We do the initialize and planted the seeds of five genotypes are:

1 – (Zm2) represents the (Zea mays L. Indentata).

2 – (Zm19) represents the (Zea mays L. Indurata).

3 - (P 8) represents the (Zea mays L. Everta).

4- Hybrid U.S. (Royal Flag) represents the (Zea mays L. saccharata). Because we don't have sugar strain in this time.

5 – Type (Denbrvski) represents the white grain.

Service operations conducted for the plants until they reach the stage of hybridization and conducted reciprocal crosses were obtained for 20 hybrids.

Notice:

We obtained only 18 hybridization of out of 20 because of the failure of two of the crosses. We have to encode genotypes that have been used (Zm2, Zm19, P8, Royal Flag, Denprofki) by the symbols (2, 19, P, S, Dp), respectively.

Autumn season

Planted the seeds of hybrids (20 hybrids) were planted as parents (5 parents) for comparison at the first and to get the grain F2 at the second.

Were harvested at maturity cob and dried with air to reach humidity standard. Recorded by the data for the study (cob length, cob diameter, the number of cob per plant, number of kernel per plant, number of rows in cob) and that was for both seasons, spring and autumn.

RESULTS AND DISCUSSIONS

Identified five traits of each of the kernel and cob for study in this research to find out the nature of their behavior and the impact of genetic father and mother, compared with two generations F1, F2.

In the (table 1) the results of genetic crosses show the difference in the characteristics cob of the genetic structures involved in the hybridization as shown in (Table 1). But in the tables (2) seem to look first to the impact of the phenomenon (heteroses) is clear in cob length in hybridization (P x 19) gave a lower percentage of parents while already reflected (19 x P) gave the highest percentage from higher value of the parents. .

Table (1) some traits of Cob for parents and their hybrids generation (F1) in maize

parents	Average of cobs length (cm)	Average of cob diameter (cm)	Average number of rows of cob	Average of Cob number in plant	Average of Grain in plant	Average of yield of per plant
Dp	20	15	14	1,8	647	193
p	21	12	16	2,4	1436	262
s	19	14	18	1,2	582	108
19	16	16	18	1,4	621	119
2	16	14	17	1,4	450	92
♀ x ♂						
D p x S	21	18	18	1	657	214
S x DP	20	17	17	1,4	650	177
D p x P	21	16	17	2	626	220
P x Dp	17	16	13	1,2	578	148
Dpx19	14	14	14	1	605	210
P x S	18	11	16	1,2	536	185
S x P	20	15	17	1,4	673	176
P x 19	16	14	16	2,5	1575	357
19 x P	20	15	19	1	712	249
P x 2	16	11	16	2	600	139
2 x P	19	14	17	1	615	175
S x 19	22	17	15	1,2	638	211
19 x S	20	16	14	1,52	505	202
S x 2	22	15	16	1,5	1008	175
2 x S	23	15	16	1,2	487	144
19 x 2	22	17	17	1	575	187
2 x 19	22	16	16	1	555	171

As for the rest of the crosses, for example (P x Dp) the result was hybrid vigor is negative (-19%) while the already reflected (Dp x P) gave the value of the highest parent, as well as the (Dp x 19) has given the hybrid vigor is

negative by (19 x Dp) gave already reflected in rate (-30%) from higher value of the parents. This refers to the existence to overcome or the hybrid vigor from the father.

Table (2) % Hybrid vigour compared to the highest power of parents in some traits of cob in maize

♀ x ♂	Cob length	Cob diameter	Rows in Cob	Cob per plant	Grains in plant	Yield in plant
Dp x S	+5	+20	H.P	_44	H.P	+10,8
S x Dp	H.P	+13	_5,5	M.P	H.P	_8
Dp x P	H.P	+6	+6	M.P	L.P	_16
P x Dp	_19	+6	_18,7	_50	_59	_43,5
Dp x 19	_30	_12,5	L.P	_44	_6	+8,8
19 x Dp	H.P	H.P	L.P	_30	+44	+41,9
P x S	_14	_21	L.P	L.P	_62	_29,3
S x P	M.P	+7	M.P	_41,6	_53	_32,8
P x 19	L.P	M.P	L.P	H.P	+10	+36,2
19 x P	H.P	M.P	+5,5	_58	_50	_4,9
P x 2	L.P	_21	L.P	_16,6	_58	_46,9
2 x P	_9,5	HP	H.P	_58	_57	_33
S x 19	+15,7	+6	_16,6	L.P	H.P	+77
19 x S	+5	H.P	_22	L.P	_18,6	+70
S x 2	+15,7	+7	_11	+7	+72	+62
2 x S	+21	+7	_11	LP	L.P	+33
19 x 2	+37,5	+6	LP	_28,5	M.P	+57
2 x 19	+37,5	H.P	_11	_28,5	M.P	+43

Cob diameter

The impact of the mother clear in this status as hybrid vigor crosses gave a negative or a positive or average between the parents because of the double dose of mother-dose compared with the father-dose.

For example, hybridization (P x S) gave the hybrid force is negative (-21%), while already reflected (S x P) gave a positive rate (7%). The Cob diameter was not reflected its impact on the number of rows, but reversed its effect on increasing the rate of weight pill note that the number of rows and number of cob per plant are the character quantity of recessive [5].

The number of cob per plant

These were not such a clear inheritance because of there are several pairs of genes responsible for the low heritability of this specifications or features. That the increase in the number of specification cobs or features in plants are undesirable if not offset by an increase in the number and weight of grain. All crosses gave negative except for a hybrid vigor (Dp x P), which gave the average value of the parent. And hybridization (P x 19) were male sterile and gave the rate (2.5 Cob / plant), with a high number of grain.

Number of rows of cob and the number of grains per plant:

1 - Number of rows in the cob

Generally gave all the hybrid vigor crosses a positive or a negative or lower the average parent or parents, except hybridization (Dp x S) and (2 x P), which gave the highest value of the parent. That it confirms that this status under the impact of secondary and multiple genes and recessive, and supports what he said [7] that the number of rows in cob is determined by the genetic composition and growth factors.

Several hybrids have given the hybrid vigor between a positive or negative (-22%) and (+24%) to the highest proportion of parents indicating a large genetic difference between the parents used in hybridization, and the adoption of the emergence of hybrid power on the probability associated with the nature of the genes (polymorphic) differentiated between hybrid strains. Was the highest hybrid vigor negative (-22%) in the

hybridization (19 x S) and that points to the need to adopt a high number of strains of the rows of cob to produce a hybrid as well as such a negative inheritance.

2-The number of grains per plant

This is one of the quantitative traits associated with the quantity of output. Gave hybridization (P x S) hybrid vigor is negative (-62%) and already reflected (S x P) (-53%), either hybridization (2 x 19) and already reflected (19 x 2) gave an average parents value, either hybridization (2 x S) gave the 487 grains to achieve the lowest value of the rate of parents (450 grain / plant), while already reflected gave the (2 x S) hybrid force is positive (+72%). Contrast the results in this status is the result of differences in the trait of cob for parents because it is of quantitative traits and do not determine definitively the impact of the father or mother, but due to the effect of gene pairs and the number of genes controlling the specifications or features length of the cob and the number of rows and number of cob per plant.

CONCLUSIONS

Based on the results of this research, the hybrid vigor or overcome is the Governing the traits, especially cob length, number of grains and grain weight.

1-The amount of grain produced by the hybrid associated with an increased cob length and number of grains and grain weight.

2- Did not show a clear impact in the number cob per plant or the number of rows in cob.

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ON DIDACTIC MANAGEMENT OF SOCIOCOGNITIVE CONFLICT

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Abstract

Development is a process that requires conflict ('disequilibrium'). The dialogue allows to co- create new meaning through mutual understanding and reciprocal communications between two or more parties. 'New meaning' can threaten 'old meaning' that is inextricably embedded in cultural discourse. Sociocognitive conflict is one product or form of the meeting of the 'incommensurable' or 'irreconcilable' aspects of diverse cultures/ interpretations of the same values. This meeting is a transformative process but the transformation is not always satisfying or mutually enriching, at least in the short term. The meeting of multiple knowledge systems may enrich perspectives, but also can impoverish perspectives and cause a retreat from dialogue into the social and cognitive security of the familiar. This paper brings in strategies and methods for positively managing sociocognitive conflict in the classroom.

Key words: *creative controversy, didactic methods, didactic strategies, sociocognitive conflict*

INTRODUCTION

First of all, within the educational context of the 21st century, it's a fact that the classroom is especially conducive to sociocognitive conflict due to cultural diversity which entails increasing exposure to different sociocultural conventions and practices. Diverse sociocultural conventions embedded in pedagogy and curriculum content meet relatively frequently with the developmentally sensitive cognitive operations of individual learners. There is much interest in the potentially facilitative effect of cultural courses on cognitive development. 'In order to provide the highest quality education for today's students, we need to understand especially the ways in which (multi)cultural courses support cognitive, and not just moral or social, development in students' (Kögler)[1].

Given the evidence that sociocognitive conflicts can facilitate or debilitate development (Tudge), the dynamics of sociocognitive conflict raise important questions in educational contexts: What are the key dynamics that affect sociocognitive conflict as a positive or negative influence on development? Should sociocognitive conflict be prescribed in educational settings? What pedagogical strategies can help manage

sociocognitive conflict to facilitate development amid increasing cultural diversification? Is cognitive development always a desirable outcome of sociocognitive conflict? How to manage in classroom a sociocognitive conflict in order to optimally activate the individual and collective consciousness for personal benefit and group development?

Butera & Darnon's research [2] found that *sociocognitive conflict is beneficial for learning to the extent that conflict is regulated in an epistemic manner*, that is, by focusing on the task or on the knowledge at hand. On the contrary, *sociocognitive conflict can result in detrimental effects whenever conflict is regulated in a relational manner*, by focusing on status and on interpersonal dominance.

A recent experiment illustrates these dynamics: university students participated in a fictitious computer-mediated interaction about a text with a bogus partner who introduced through her/his rhetoric either an epistemic conflict (a conflict that referred to the content of the text), or a relational conflict (a conflict that questioned participants' competence). Results indicated that compared to the epistemic conflict, the relational conflict enhanced threat and reduced the perceived contribution of the partner. Moreover, when the conflict was epistemic, the stronger the

perceived conflict, the more participants said they worked through the problem to understand it better and tried to integrate the two points of views, that is, the more they regulated the conflict in an epistemic way. On the contrary, after a relational conflict, the stronger the perceived conflict, the more participants said they tried to assert they were right and the other person was wrong, that is, the more they engaged in a relational regulation of the conflict. Finally, epistemic conflict elicited better learning than relational conflict [2].

Beside the impact of such researches, I personally have a direct cognitive interest and motivation in searching this topic: I teach philosophy, a provocative subject for both sides of the chair, a subject where (socio)cognitive conflict is at home. I work with students who learn environmental/ rural engineering and management. Every group is heterogeneous by various criteria: rural/urban area of student's origin, cultural background of every student, cognitive interest, learning motivation, cognitive styles, statutes and roles. I frequently encounter in class different interests, various cognitive and problem-solving styles and I feel the tension of the dialogue between students as a shaping force of the group dynamics. I'm aware that, potentially, every conflict separates or unites parties. And I also know that development outside the range of the group can be a socially/ cognitively costly process (i.g. negotiating dual cultural identities) – hence my need to deepen conflict's theme, to understand its role and purpose, to investigate its formative-educative impact. The more so as pedagogy reconfigured developing interactive methods, some of them deliberately provoking cognitive conflict.

In this paper I investigate the internal origin of the conflict (particularly of the sociocultural discord) and I try to highlight the educative benefits and limitations of the conflict and of the teaching methods that promote it because I truly believe that cultural subjects which raise questions, worries, dilemmas, paradoxes help us in our cognitive development and also in building authentic relationships with the others and with our self.

MATERIALS AND METHODS

This paper is the theoretical result of a bibliographic study on the main topic (*didactic management of sociocognitive conflict*) combined with my own teaching practical experience for nearly 20 years.

Concerning the documentary study I selected eloquent works by authors internationally / nationally appreciated in their branch.

The main methods used in paper's elaboration are: documentation by reading, analysis, synthesis, comparison, written discourse, explanation, questioning, example.

RESULTS AND DISCUSSIONS

(1) Sociocognitive conflict - proximate gender and specific difference

Resulted in disagreements and frictions within inner-self or between group members, latent or manifest verbally/ emotionally/ in actions, 'conflict (lat. *conflictus*) exists when incompatible activities meet – when an activity is blocked, interfere, harm or in a certain way make another activity less enjoyable or effective' (Schmuck & Schmuck) [6]; 'in class conflict provides opportunity to develop individual and group' [3].

Also, the failure to balance my 'outputs' / your 'outputs' – my 'inputs' / your 'inputs' (as a lack of equitability between the participants in an act of communication) determines one of the parties to be frustrating to the other and this can lead to conflict (Myers) [6].

Essentially conceived as 'a situation where seemingly incompatible elements exert force in opposition or in different directions' (Heitler), conflict can be a 'source for individual change or for the system where it evolve' (Constantin Stoica, Neculau coord.) [6].

NB: We characterize a conflict as such only when *both* parties infer uncertainties, disagreements, but are unable or unwilling to implement resolutions on their own communication field.

'*Cognitive conflict* is a psychological state involving a discrepancy between cognitive structures and experience, or between various

cognitive structures (i.e., mental representations that organize knowledge, beliefs, values, motives, and needs). This discrepancy occurs when simultaneously active, mutually incompatible representations compete for a single response. The detection of cognitive conflict is thought to trigger compensatory adjustments in executive control processes, which serve to reduce and prevent subsequent instances of similar cognitive conflict.' [7]

Cognitive conflict, inevitable fact due to the social nature of knowledge, is a part of many different psychological theories, and has been regarded both deleterious and beneficial.

For example, Freud (1901/1953) viewed distortions of rational thinking and neuroses as the result of conflict between basic drives. Similarly, early learning – theoretic investigations of conflict focused on different types of response competition that lead to negative outcomes (Miller, 1944). Many empirical investigations of the effects of cognitive conflict in human participants have shown that when conflict arises between behavioural responses in experimental tasks, performance is adversely affected in terms of speed and accuracy.

It was around 1970 that experimental studies explicitly investigating the relation between social interaction and cognitive development started to appear. Theorists such Piaget (1977) and Festinger (1957) viewed the effects of cognitive conflict as playing a beneficial role in rational thinking and intellectual development, insofar as conflict drives positive cognitive adaptation. Piaget viewed cognitive development as involving the attainment of successively higher states of equilibrium or balance. Piaget proposed that the mechanism of transition from one state of equilibrium to another was the process of equilibration. According to Piaget, this process is fueled by conflict or 'disequilibrium', either between cognitive structures and experience or between various cognitive structures. Disequilibrium then motivates an individual to resolve the conflict and attain a new state of equilibrium.

The term 'sociocognitive conflict' was popularised by Doise and Mugny in their

studies of the effect of peer group involvement on individual Piagetian operations. Defined within a structural-developmental paradigm, *sociocognitive conflict* is a source of disequilibrium. It is disequilibrium that is at once both social and cognitive. It is cognitive disequilibrium in that the cognitive system is unable to integrate simultaneously its own responses and those of others within a single coherent whole; it cannot account for others and itself at the same time. It is social disequilibrium since this is not simply cognitive disagreement; it involves relations between individuals for which this conflict poses a social problem.

Sociocognitive conflict is the result of a contradiction or mismatch between the cognitive operations an individual applies to a situation and the sociocultural conventions that contextualise the situation. Studies of sociocognitive conflict have focused on individual to peer interactions and individual to expert or authority figure interactions. (Doise & Mugny, Druyan & Levin, Perret-Clermont, Tudge) [1].

(2) *Strategies for positively managing sociocognitive conflict in the classroom*

Raoul J. Adam [1] identifies three complementary strategies for positively managing sociocognitive conflict in the classroom: experiential strategies, metacognitive strategies and integrative strategies. Collectively, these strategies aim to facilitate development in response to increasing cultural diversification.

Experiential strategies engage students with self-representations of 'the other'. These strategies by no means avoid conflict and may even serve to clarify points of conflict.

However, encounters with self-representations of the other can help to negate conflicts over misrepresentations generated in the absence of self-representation. In developmental terms, experiential strategies facilitate the development of perspective taking (Selman and Byrne). Here, managed sociocognitive conflict facilitates a move from subjective (I see you) to self-reflective (I see you seeing me) to mutual perspective taking (I see you seeing me see you) and beyond. It seems reasonable to assume on the basis of even the

loosest age-stage relationship that school-aged children and adolescents are prone to see the other, without seeing the other see them.

Accordingly, experiential strategies do not merely place culturally diverse others in proximity – that is to provoke conflict – rather, they encourage listening to the self representation of the other in order to develop more complex perspective-taking (I see you seeing yourself, I see me seeing myself). In a meta-analysis of developmental theory, Marchand writes: According to various authors (Kramer, Labouvie-Vief), the relativistic conception of knowledge develops during adolescence and young adulthood, thanks to the growing expansion of social space which confronts subjects with (1) different points of view and different values; (2) with the assumption of roles which, at times, can be difficult to reconcile; and (3) with the choice of one direction among many possible ones.

The difficult task of the teacher is to facilitate development through the sociocognitive conflict that occurs when one culture experiences another³. Experiential strategies offer genuine encounters of the other in managed environments. However, management involves recognising and offering a range of cognitive and social solutions to sociocognitive conflict and an understanding of their consequences. The desired effect of this development is to humanise the intentions of the other and to broaden the boundaries of the self [1].

Meta-cognitive strategies engage students directly with the cognitive operations needed to coordinate otherwise opposing binaries arising through cultural diversification. It is necessary for educators to actively sponsor some conceptual tools and learning experiences to help students manage rather than despair the ‘irreconcilable’ dimensions of

diverse cultures in the classroom. Meta-cognitive strategies highlight and offer alternatives to the dualistic, absolutist, and dichotomous structuring tendencies that characterise childhood and adolescent epistemologies: the issue is to ‘coordinate’ two or more ‘rivalling’ descriptions, explanations, models, theories or interpretations on a certain reality (see Reich’s model of relational and contextual reasoning - RCR). The questionable reality staying *the same*, applying formal binary (Aristotelian) logic someone would conclude that only one of the given answers/solutions is right, and proceed to determine which one. In contrast, RCR logic will confirm that an answer is correct in one context, and another answer to the same question is right in another context.

In a meeting of cultures RCR adds the cognitive tool of ‘complementarity’ to the existing tool of ‘binary dualism’ to conceptualise the meeting. It does not replace active construction but it places tools in cognitive proximity should students wish to use them to resolve the apparent conflicts [1].

Integrative strategy integrates experiential strategies and meta-cognitive strategies to facilitate development. Integrative strategies provide opportunities for collaborative problem solving through interaction between diverse cultural perspectives. Integrative strategies create situations where students actively choose from a range of cognitive tools to engage conflicts arising from diversity.

In a school context interactive strategies can take the form of debates, forums, discussion groups, scenario tasks etcetera. Such strategies bring the problems of diversity into collective consciousness (for example the wearing of the Hijab in English, French and Australian schools). Students are given and construct a language of awareness to engage the problems that diversification brings. Many decisions can at once be reasoned by the most egocentric dualistic absolutism or the most inter-subjective multi-perspective relativism. The rationale for a developmental approach to sociocognitive conflict could be that the former basis for a decision will do more long-

³ It is problematic that these cognitive developments and their desired effect can be obfuscated by the contents of culture because some cultures are structured to protect and perpetuate very simple perspective-taking. In the context of religious development Oser and Gmünder claim “Cultural development can hamper or sponsor the construction of individual stages while, simultaneously, shaping the content of the stages” [1].

term damage than the latter. Integrative strategies provide students with the opportunity to engage such conflicts arising through cultural diversification with sufficient cognitive tools [1].

(3) Teaching methods which constructively exploit sociocognitive conflict

As I mentioned before, the integrated complementary strategies already described various interactive teaching methods and technics classified, adapted and inter-correlated in educational practice by the purpose, type and content of learning: conditioning learning, social learning, using conflict learning, problem-solving, communication skills, methods based on experience (real and simulated) [5].

Correlated with the theme of the paper, I will mention some effective teaching methods for practicing social learning (through cooperation or conflict), whose practical application supports the observation that neither competition nor cooperation are essentially 'pure' (competition contains cooperation's germ in its own structure and cooperation is defined in turn by a competitive area).

Specific methods of social learning and cooperative learning are: learning with others⁴, cooperative learning, data base,

⁴ Mugni&Doise established by research on seventy-four children, aged from 5 to 7 years, that: (1) collective cognitive performances are superior to those of the individual, on condition, however, that the interaction be conflictual; the performances often acquired structural characteristics after the interaction which neither of the two subjects had been capable of in the individual pre-test; (2) when subjects of the lowest level work together with subjects of the highest level, they do not progress even though the group's performance is usually correct – the more advanced subject tends to solve the problem on his own, ignoring the suggestions of his colleague, so the latter is therefore given no opportunity to coordinate his approach with that of his partner; (3) when the less advanced subject is together with an intermediate subject, the latter, whose system is less stable comparing to an advanced subject, is perturbed by the unacceptable solution proposed by the first one, although he does not yet possess the cognitive instruments necessary to solve the problem. While looking for a satisfactory solution, the intermediate subject's explicitate their strategy and the problem they face. As a result, they progress, but so do the lowest

Socratic seminar, strengths and weaknesses technique, small groups mentoring, mosaic method, reflective teaching, paper technique, fishbowl, tutorial discussion groups, Phillips 66 reunion, nominal group technique, '£ 100 offer' technique.

Using conflict learning methods are reflected in creative controversy, controversial decision technique, debate's technique, focus group technique.

Among the *methods which aim problem-solving* there are: SWOT analysis, fishbone technique, force field analysis, errors' tree technique, Venn diagram, personal reflection, cube method, panel discussion, brainstorming, brainwriting etcetera.

Next I will present three methods to manage a (socio)cognitive conflict, following the logical order of a conflict' analysis: (1) the force field analysis, (2) debate technique, (3) creative controversy.

Force field analysis [6] – within problematic learning situations, the student needs to gain a proper and global perspective that can start in three steps: (1) the detection of the acting forces, those which have a driving role and those which slow, even can stop the conflict; (2) the group leader draws a horizontal line on flip chart and then he distributes the forces graphically: above the line he draws the dynamical forces, beneath the suppressing forces. Through arrows he marks various correlations between forces, the impact they can have on the situation; (3) this diagram forms the basis of possible combinations/action on forces and it will be used in adopting the strategy.

Debate technique [6] puts emphasis on competition, confronting two teams: affirmative team (favorable to the topic) and negative team (who have opposing arguments). The argumentation do not evolve in parallel, the teams must confront on the battlefield of ideas. There are several models of debate among this one: (1) the arrangement of students – the teacher divides the class into two teams, one favorable to the topic, the

subject who are able to take part in the search for a correct solution; (4) children who teach other children progress [4].

other in opposition to the first, then he selects two representatives from each team; (2) every speaker (from each team) speaks on turn during five minutes about the position that he defends; (3) then the topic is open to comments, questions and answers between teams; (4) one member of each team summarizes the case, the debate ends with some general conclusions involving the whole class (K.D.Moore).

Pânișoară adapted this model: three elected members from each team start the discussion in front of the whole group and after some time one or more members of the team will be replaced by fellows from their team until all participating students rotate to the discussion. This way to replace members, by rotating active students, is preferable to a simultaneous change of both teams because the latter usually diminishes student's motivation and damage the fluency of the dialogue. [6].

Creative controversy, also called 'structured controversy' or 'academic controversy', was promoted by Johnson & Johnson, Holubec. It is one of the best ways to approach strategies which positively model conflict and post-conflict acquisitions within the sociocultural subjects. This technique differs from debate, where contestants are sometimes more interested in winning arguments than to know the truth. It combines traditional techniques of debate with compromise' techniques, causing positive results for participants on three points: (1) implementation – it produces high quality judgments involving problem solving and decision making, creativity and deep involvement in solving tasks, (2) personal relationships – it leads to a more extensive and qualitative relation among students, (3) psychological health – it produces high esteem among the participants, the ability to control stress and coping with adverse positions.

There are two models of the method: on one hand is Johnson&Johnson&Holubec model, on another hand is B.Watters'. Next I summarize the first model, elaborated in 1992 and structured in seven steps: (1) instructors propose issues, (2) students are grouped in pairs to research issues in the literature, following various points of view – pros and

cons, (3) participants are divided into teams and these teams meet on contradictory positions, then teams reverse their roles, trying to support convincing opposite view, (5) instructor requires teams to abandon their lawyer roles for one position and for another and to compile a written report based on compromise; (6) each participant receives a written test based on the discussed issue and receives bonus points if all members of the team that built the compromise had answers close to the provided criteria; (7) during ten minutes, teams have to make an oral report by presenting the compromise reached by the entire group [5].

Through this equally informative-formative method students find/update information and apply it to their own existence. For instance let's see the case of the next creative controversy: '*Western Scientific modernist paradigm or postmodernist liberal paradigm – which way is up?*' [1] The teacher can give a clue or a reference like French philosopher Bruno Latour, who writes eloquently on the "War of the Worlds" (2002). Of *modernist optimism* he writes: There was always the hope that differences of opinion, even violent conflicts, could be eased or alleviated if only one focused a little more on this unifying and pacifying nature and a little less on the divergent, contradictory and subjective representations humans had of it ... modernization compelled one to mourn the passing of all one's colorful pretensions, one's motley cosmologies, of all the many ways of life with their rich rituals. 'Let us wipe our tears', the modernists liked to declare, 'let us become adults; humanity is leaving behind its myth-imbued childhood and is stepping into the harsh reality of Science, Technology, and the Market. It's a pity but that is the way it is: you can either choose to cling to your diverse cultures, but conflicts will not cease, or, alternatively, you can accept unity and the sharing of a common world.'

The *postmodern argument* against or beyond modernism and its developmental imperative raises the nature of the truth that such developmental progress is seen to reveal: 'For if nature has the immediate advantage of imparting unification, it also has the serious

drawback of being fundamentally devoid of meaning. Objective facts in their harsh reality can neither be smelled, nor tasted, nor can they provide any truly human signification. The modernists themselves were fully aware of this, and even acknowledged it with a sort of malicious joy. The great scientific discoveries, they were glad to say with a shudder, are incessantly wrenching us from our little village and hurling us into the frightening, infinite spaces of a frozen cosmos whose centre we no longer occupy.' (Latour 2002)

For Latour, the postmodern return to diversity struggles to escape the criticism that meaning is closely related to the sense that one has access to reality: 'You possess meaning, perhaps, but you no longer have reality, or else you have it merely in the symbolic, subjective, collective form of mere representations. You have the right to have a culture, but all others likewise have this right, and all cultures are valued equally ... In this combination of respect and complete indifference, we may recognize the hypocrite condescendence of cultural relativism ... No one wants to be just tolerated anymore. No one can bear to be just one culture "among others". Reality is now once again becoming the issue at stake'.

In this example the compromise begins with the observation that in a social context each individual has biological, social and cultural/spiritual needs. Genuine compromise is neither in reducing all individuals to the common denominator of *homo economicus* in a throwaway society, nor in condescending tolerance of different value orientations under the cultural relativism' umbrella. Let's all recognize that the fulfillment of ones needs asks for science, technology and market and that science, technology and market are used and interpreted from the subjective perspective of each individual according to its cardinal values which guide and model its personality. So genuine compromise does not mean toleration of difference, but the will and the capability (according to one's receptivity / personal development) to recognize, to accept and to value what we have in common and what sets us apart.

CONCLUSIONS

1. Although educators obviously differ in their perspective, the creation of culturally responsive science curriculum has powerful implications for students: a student might conceivably develop all of the common skills and understandings while working from and enhancing a traditional knowledge base; acquisition of the common ground, regardless of route, is a significant accomplishment; exploration of a topic through multiple knowledge systems can only enrich perspective and create thoughtful dialog. The meeting of these objectives requires a process that recognizes and manages the obstacles that stand in its way. Dialogue is 'the co-creation of new meaning through mutual understanding and reciprocal communications between two or more parties' (Roberts). 'New meaning' can threaten 'old meaning' that is inextricably embedded in cultural discourse. Poorly managed, the meeting of multiple knowledge systems, far from enriching perspectives, can impoverish perspectives and cause a retreat from dialogue into the social and cognitive security of the familiar [1].

2. Socio-cognitive conflict is one product or form of the meeting of the 'incommensurable' or 'irreconcilable' aspects of diverse cultures/interpretations of the same values. This meeting is a transformative process but the transformation is not always equal, or mutually enriching, at least in the short term. Sometimes even a teacher who is at once given the task of encouraging cognitive development and the task of valuing socio-cultural diversity may clash; an understanding of this clash is the first step in its management.

3. Development is a process that requires conflict and it is important to differentiate conflict management and conflict resolution (management suggests that conflict is inevitable and inextricably linked to growth; resolution suggests that conflict can be solved). Sociocognitive conflict can be useful if it is managed, devastating if it is mismanaged, and likely to be mismanaged if it is not recognized [1].

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FEASIBILITY OF INVESTMENTS FOR PLANTING AND MAINTENANCE OF APPLE ORCHARDS BY APPLYING VARIOUS TECHNOLOGIES

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Abstract

The main purpose of this paper is to determine correctly the investments required to establish apple orchards, as well as to point out the best option to ensure the quality, productivity and competitiveness of the relevant products. The feasibility of investments for planting apple orchards is considered according to the following method: preparation of investment budgets for planting and maintenance of apple orchards before fructification for three technologies of fruit cultivation (traditional, intensive and super-intensive), the budget for the apple orchard during the fructification period, and the comparison of the obtained results of calculation. The traditional orchard technology is more extensive, easier to implement, needs least investments per hectare and has lower economic effects, the intensive technology needs large investments per hectare and, therefore, allows obtaining more advantageous economic results, while the super-intensive technology is the most expensive, implies the greatest investments per hectare, and allows obtaining the best economic results. Given the above-listed findings, it may be concluded that intensive orchards allow obtaining apples of homogenous calibre and quality, have a high productivity per hectare, at lower costs, and benefit from state subsidies.

Key words: apple cultivation technologie, consumption, cost, feasibility, investments, price, profitability

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.

Under market economy conditions, agricultural entrepreneurs should analyze in detail the start-up of a business to determine correctly the implementation of business and the investment amount. The investment budget during planting and maintenance of the apple orchard before fructification should be analyzed from the following points of view:

❖ The most important aspect is whether the selected technology allows ensuring **quality, productivity and competitive price** during fruit production. Only the high quality and productivity of apples will make our business competitive and will facilitate access of our products to strategic fruit markets.

❖ An important aspect is the optimal use of production factors in the agricultural enterprise.

❖ The amount of necessary investments and return on investment in the shortest time.

These are the most important aspects which should be taken into consideration when planting apple orchards and, to ensure correct decision making, the farmer should avail of technological and economic information.

MATERIALS AND METHODS

As materials for analysis and research we considered the Statistical Yearbooks of the Republic of Moldova, the data offered by the

Ministry of Agriculture and Food Industry regarding the developments in the agricultural sector and, particularly, high value agriculture, the data collected from agricultural enterprises dealing in apple production by applying various cultivation technologies. To analyze and substantiate the feasibility of investments for planting apple orchards, these materials were considered according to the following method: preparation of investment budgets for planting and maintenance of apple orchards before fructification for three technologies of fruit cultivation (traditional, intensive and super-intensive), the budget for the apple orchard during the fructification period, comparison of the obtained results of calculation, and formulation of final conclusions on the analyzed issue – feasibility of investments. On

the basis of calculations, it was established that the intensive technology of apple cultivation was the best one for agricultural entrepreneurs, as it offered real opportunities to compete with fruits produced on regional markets in terms of price and quality.

RESULTS AND DISCUSSIONS

Below you will find an analysis of the economic information on investments for planting one hectare of apple orchard by applying the three technologies: traditional, intensive and super-intensive.

The table below shows a comparative analysis of apple cultivation technologies, which should be known by entrepreneurs in order to select the best and most efficient one to start their own business.

Table 1. Analysis of technical indicators for apple plantations cultivated through various technologies

Specification	UM	Apple cultivation technologies		
		Traditional technology	Intensive technology	Super-intensive technology
Planting scheme	m	4 X 2.5	3.5 X 1.2	3.5 X 0.75
Number of trees per hectare	trees	1,000	2,400	3,810
Average harvest that may be obtained	t/ha	25	40	60
Time for return on investment (per harvest)	year per harvest	3.49	4.72	3.95
Time for return on investment since plantation	years	8.49	8.72	6.95
Number of years upon fructification	years	5	4	3
Period of use	years	25-30	18-20	12-15

Source: Calculations made by authors

The investment budget for planting of apple orchards is a financial tool to project expenses and required financial resources for a certain period of time.

These calculations will serve as a basis for economic substantiation upon the selection of the best option of orchard plantation for entrepreneurs.



Photo 1. Traditional orchard



Photo 2. Intensive orchard



Photo 3. Super-intensive orchard

The table below shows the summarised information from the investment budgets for the establishment and maintenance of apple orchards before fructification, by applying

three types of fruit production technologies: traditional, intensive and super-intensive. To plant a hectare of traditional orchard, the farmer needs approx. MDL 111.2 thousand.

To create one hectare of intensive orchard, the investments will be 2.73 times higher (investments are provided for espaliers and drip irrigation system) in comparison with the

traditional orchard, while for one hectare of super-intensive orchard, investments will be 4.17 times higher (investments for hail protection nets are not taken into consideration).

Table 2: Total investments for planting and maintenance of apple plantations before fructification

Specification	Apple cultivation technologies					
	Traditional technology		Intensive technology		Super-intensive technology	
	MDL	%	MDL	%	MDL	%
I. Cost of production means	44,805	40.3%	175,436	57.9%	330,728	71.3%
II. Mechanized services	32,750	29.4%	54,000	17.8%	47,422	10.2%
III. Manual operations	23,550	21.2%	46,150	15.2%	43,450	9.4%
IV. Contingencies (10%)	10,111	9.1%	27,559	9.1%	42,160	9.1%
TOTAL	111,216	100.0%	303,145	100.0%	463,760	100.0%

Source: Calculations made by authors

If we compare the data in the table, we may conclude the following:

- ✚ The traditional technology is the less intensive (and more extensive), it is easier to implement by entrepreneurs, needs less investments per hectare and yields the lowest economic results from operational activity;
- ✚ The intensive technology may be implemented by farmers, but it needs large investments per hectare, and, as a result, allows obtaining more advantageous economic results from operational activity;

✚ The super-intensive technology is the most expensive for entrepreneurs, it requires the largest investments per hectare and, therefore, it allows obtaining the best economic results.

The table below shows the summarised information from budgets for the maintenance of apple orchards during fructification, by applying three types of fruit production technologies: traditional, intensive and super-intensive. [3, pag. 156-164]

Table 3: Budgets for the maintenance of apple plantations during fructification

Specifications	Apple cultivation technologies					
	Traditional technology		Intensive technology		Super-intensive technology	
	MDL	%	MDL	%	MDL	%
I. Net sales	75,000	X	120,000	X	180,000	X
II. Cost of production means	13,732	33.6%	14,760	27.3%	14,940	24.7%
III. Mechanized services	5,450	13.3%	11,850	21.9%	13,950	23.1%
IV. Manual operations	17,950	43.9%	22,600	41.8%	26,050	43.1%
V. Contingencies (10%)	3,713	9.1%	4,921	9.1%	5,494	9.1%
VI. Variable consumption - total	40,845	100.0%	54,130	100.0%	60,433	100.0%
VII. Gross profit - total	34,155	X	65,870	X	119,567	X

Source: Calculations made by authors

If we compare the data in the table, we may conclude the following: the selling price of apples is the same for all technologies, and amounts, on average, to MDL 3/kg of apples):

- ✚ The traditional technology allows obtaining a gross profit of MDL 34.155/ha, which is rather low for the application of high value agriculture;
- ✚ The intensive technology allows obtaining a gross profit of MDL 65.870/ha, which is advantageous for the application of high value agriculture;

✚ The super-intensive technology allows obtaining a gross profit of MDL 119.567/ha, which is the most advantageous result for the application of high value and sustainable agriculture.

The table below shows the economic indicators for the cultivation of apple orchards by applying the three types of fruit production technologies: traditional, intensive and super-intensive.

On the basis of economic calculations for planting an apple orchard, the specialists recommend the entrepreneurs to apply the intensive apple cultivation technology, as they allow obtaining best results with fewer risks.

Table 4: Analysis of economic indicators for the cultivation of apple orchards through various technologies

Specification	UM	Apple cultivation technologies		
		Traditional technology	Intensive technology	Super-intensive technology
Total investment amount	MDL	119,216	311,145	471,760
Income from sales that may be obtained	MDL	75,000	120,000	180,000
Direct consumption	MDL	40,845	54,130	60,433
Gross profit	MDL	34,155	65,870	119,567
Unit cost of production	MDL/kg	1.634	1.353	1.007
Average selling price	MDL/kg	3.000	3.000	3.000
Direct consumption per MDL 1 of income from sales	MDL	0.545	0.451	0.336
Profitability	%	83.6	121.7	197.8

Source: Calculations made by authors

Note: The intensive technology implies the installation of espaliers and drip irrigation system. In the Republic of Moldova, farmers cultivate apples by applying intensive technology and achieve high performance without installing espaliers and drip irrigation.

CONCLUSIONS

Why the intensive apple cultivation technology? Answers to this question are shown in the following arguments:

- ✓ Intensive and super-intensive orchards allow obtaining high quality apples (homogenous by calibre and quality);
- ✓ The intensive technology is less expensive in comparison with the super-intensive technology and is the midpoint (average) option in apple production;
- ✓ The management of intensive orchards is more efficient through the middle form of tree crowns (easier dry pruning, tree spraying, apple harvesting, etc.);
- ✓ The high productivity of apples in the intensive orchards allows having competitive unit prices for products, which is extremely important in the competition on regional markets;
- ✓ Production factors in intensive orchards are used at a high level;

- ✓ Orchards planted using the intensive method benefit from substantial subsidies;
- ✓ Purchase prices for apples from the field will be further slightly adjusted (decrease), and intensive orchards allow for higher profitability under such conditions.

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