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# **SCIENTIFIC PAPERS**

**SERIES “MANAGEMENT, ECONOMIC  
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## WHAT DRIVES TECHNOLOGY UTILISATION, LEARNING AND TRANSFER IN AGRICULTURE? LESSONS FROM NIGERIAN WOMEN FARMERS

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### Abstract

*This study examines the factors that drive technology utilisation, learning and transfer among women farmers in Nigeria. It assesses both modern and indigenous technologies used in farming activities. Three states were purposively selected from the six that comprise the South West geopolitical zone of the country. Structured questionnaire was administered to 180 women smallholder farmers who were randomly selected in equal proportion across the three states. Some 128 copies of questionnaire were retrieved representing a response rate of about 71%. The study reveals that majority of the women (about 67%) use indigenous technologies while only a few (17%) and 16% use modern technologies and a combination of both respectively. Family and friends are the main source of learning indigenous technologies while extension agents are the major source of modern. The study uses spearman correlation to determine the drivers of the dependent variables. Age, level of education, years of experience and learning intensity are significantly correlated with technology utilisation at 1% level of confidence while primary occupation and learning have significant correlation with technology learning at 5% and 1% confidence level respectively. The study also reveals that farmers' age, experience and availability of learning system are have significant correlation with technology transfer. The study advocates the introduction of need and gender-specific new technologies. There is the need for integration of indigenous technologies into research so that it can be attractive to the older women. Also, farmers should be integrated into the technology development process. This will help in sustaining the rising interest of younger women in adapting modern and indigenous technologies in agriculture. The study also advocates the need for deeper and broader interactions among key actors, such as, R&D institutions, extension agents, NGOs, CBOs and farmers on the effectiveness and variety of channels used in technology learning, utilisation and transfer. Appropriate public policy interventions should also be introduced to develop 'smallholder-friendly' technologies, especially among women, to curb market failures in technology adoption.*

**Key words:** learning, Nigeria, technology utilisation, technology transfer, women farmers

### INTRODUCTION

In Nigeria, agriculture has a huge potential of being the key driver of economic growth and development. However, productivity in the sector has remained low despite large deposits of natural resources and increased R&D investments. The vast arable land mass of 79 million hectares and conducive soil and weather conditions in most areas of the

country support virtually all forms of agricultural production. In 2007, approximately 70 percent of the national labour force was employed in agriculture, up from 54 percent in 1980 (NPC, 2009). In 2011, agriculture contributed the highest proportion of 40% to Nigeria's Gross Domestic Product (GDP). Prior to mid 1990s, investment in agricultural R&D was not too encouraging. However, starting from the mid

1990s, R&D investments assumed a new dimension with a gradual rise in expenditure. Recent statistics shows that Nigeria spent about 24 billion Naira (392 million USD) on agricultural R&D in 2008. This is four times higher than the 1995 spending level, and twice as much as those of the late-1970s and early 1980s (Flaherty *et al.*, 2010). The liberalisation of the university system in 1999 has also led to a quantum leap in the number of universities from 36 in 1999 to 124 in 2012, an increase of about 350%. Out of this, 3 are dedicated agriculture universities while virtually all the remaining has departments or faculties of agriculture. Also, Nigeria has about 70 research institutes with 15 in the Ministry of Agriculture. The 2007 Nigerian R&D survey shows that agriculture and food security accounted for the highest sub-sectoral R&D spending with about 20% (NACETEM, 2012). More than one-third of the growth in agricultural spending in sub-Saharan Africa is attributed to an increase in R&D spending in Nigeria. The country also accounted for the rise in regional growth in the number of researchers. It accounted for about 32% in the African regional FTE growth between 2001 and 2008 (Beintema and Stads, 2011).

Despite all these, there is rising food insecurity in Nigeria. Unemployment rate has doubled from 12% in 2006 (NBS, 2011) to 24% in 2011 (NBS, 2012). Relative poverty level has also risen from 54% in 2004 to 69% in 2010 (Onuba, 2012). One of the key reasons for these is the failure to successfully commercialise R&D outcomes as well as failure in the adoption process for the few commercialised ones especially among smallholder farmers (Lipton, 1988). A recent study in Papua New Guinea found out that low adoption of modern farming practices by smallholder farmers is the core problem in both the cocoa and coconut industries (Komolong *et al.*, 2012). In India, about 60% of the farmers, mostly smallholders, had not accessed any source of modern technology (Birner and Anderson, 2007). Smallholder agriculture, which is the predominant source of livelihoods in Nigeria, has proven to be at least as efficient as larger farms when farmers

have received similar support services and inputs. However, there is a rising belief in policy circle that for hunger, poverty and inequality to be reduced, smallholder farmers must be at the epicenter for agriculture and innovation policy development and implementation. IFPRI's global food model projections to 2015 show that a smallholder-led agricultural transformation of Africa is feasible both technically and economically. A 1-percent increase in yields can help 6 million more people raise their incomes above US\$1 per day. Smallholder-led growth strategy focusing on efficiency in food production systems through the utilisation of technological innovations could lead to huge cuts in Africa's rural poverty within a couple of decades (IFPRI, 2002).

Women constitute about 43% of agricultural labour force in developing countries, (ActionAid, 2011) and between 60 to 80% in Nigeria (World Bank, 2003 as cited in Ogunlela and Mukhtar, 2009). Issues pertaining to women need to be taken into consideration during technology development and transfer process to increase the chances of adoption (Okoye *et al.*, 2008). They have been proven to be less opened to adopting new technologies than men despite playing a major role in agriculture process (Doss, 2001). Researchers and policymakers rarely take into account gender-specific opportunities and constraints in access to technology and techniques for improving agricultural production (Odebode, 2002). The main factors that influence the adoption, utilisation and transfer of technologies among smallholder farmers is of great importance for policy, especially within a developing country like Nigeria where little attention is paid to 'smallholder-friendly' technology issues. Factors that determine these have not been fully accessed in Nigeria. The study specifically examined the utilisation of indigenous and modern technologies by women smallholder farmers. It also assesses the sources, modes and factors influencing the transfer, utilisation and learning of the technologies.

The rest of the study is structured as follows. Section 2 presents a brief review of the

research and development in agricultural sector in Nigeria. This is followed in Section 3 by a review of the extant literature on technology learning capability and transfer. The section highlights, from the literature, the key determinants of technology learning, utilisation and transfer among farmers. In Section 4, the method and theoretical framework employed by the study is detailed. The results are presented and discussed in Section 5 while Section 6 discusses the implications for policy and conclusion.

### Technology learning and capability transfer

Recent studies advocated the need to replace linear models for knowledge transfer with interactive models (Adesina and Baidu-Forson, 1995; Saka *et al.*, 2005; IFAD, 2012). The definition of technology transfer varies depending on the context (Bozeman, 2000). However, the underlining factor is the movement of technology from one entity to another (Sounder *et al.*, 1990). The process is deemed successful, if the receiver can effectively adapt, utilise and assimilate the new technology (Ramanathan, 1994). Madukwe *et al.*, (2002) described agricultural technology transfer as a mechanism of using appropriate methods to reach small scale farmers with relevant agricultural technologies in order to improve their knowledge, skill and overall attitude towards agricultural productivity. Central to the process of transfer is learning. Oyelaran-Oyeyinka (2002) described technology learning as the way in which firms acquire and build up technical knowledge and competencies. According to Figueiredo (2002), the learning processes used by companies in generating new knowledge and technologies are driven by multiple learning processes (variety), repeatability of learning processes (intensity), the way learning processes work over time (functioning) and how learning processes influence each other (interaction) (Figure 1). In agriculture, these four learning processes aid the process of technology transfer and sourcing among farmers.

For example, the variety of learning sources available to a farmer may determine the level of adoption and utilisation of such

technologies (Bozeman, 2002). A farmer who learns through oral instruction in addition to farm demonstration by extension agents will more likely adopt the technology.

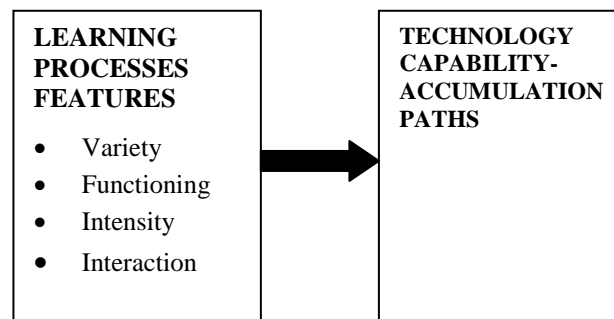


Fig.1. Technology Capability Learning Processes  
 Source: Figueiredo, 2002

The repeatability of a mode of learning over time tends to strengthen the ability to adopt, utilise and master the technologies while transforming the farmer from user to source of technologies. Ultimately, the adoption or successful use of the technologies depends on the level of engagement of the farmers in the process of learning and transfer (Doss, 2001).

## MATERIALS AND METHODS

### a) Research Design and Sampling

The southwest region of Nigeria is one of the six geo-political zones in the country. The region comprises of six states: Ekiti, Lagos, Ogun, Ondo, Osun and Oyo. It is bounded by Kwara State in the north and Kogi and Edo States in the east, Republic of Benin in the west and Atlantic Ocean in the south. The southwest zone lies within latitude 7° 01' and 8° 14'.

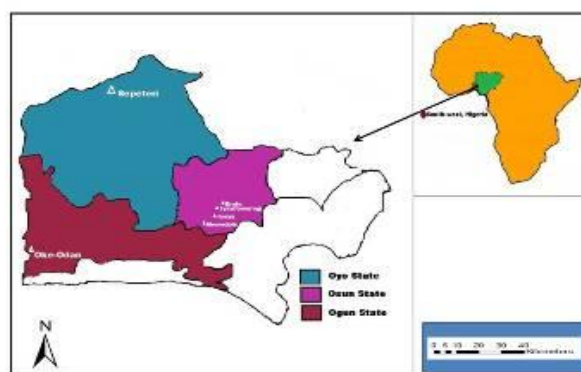


Fig. 2. Map of South West Nigeria (Study Area) and an insert map of Africa, showing Nigeria

The major tribes in this zone are the Yoruba and they are primarily sedentary farmers and traders. Figure 2 shows the map of the study area.

This study collected primary data through structured questionnaire administered to the respondents. A multistage sampling technique was used in selecting the respondents. First, three states (Oyo, Ogun and Osun) were purposively selected. These states form part of the Ogun-Osun River Basin Development Authority (RBDA), one of the eleven RBDA established to develop and manage water resources in Nigeria. The high concentration of smallholder farmers around the River Basin necessitated the selection of the states and the sample sites. Some 180 women smallholder farmers were randomly selected in equal proportion from Sepeteri, Saki East Local Government (LG) (Oyo State); Oke Odan, Yewa North LG (Ogun State); Iyanfoworogi and Erefe, Ife East LG and Isoya and Akeredolu Ife South LG (Osun State). The study covers all aspects of agricultural practices such as horticulture, food and cash crop, livestock production and crop processing. Some 128 copies of questionnaire were retrieved representing a response rate of about 71%. The data were analyzed using descriptive and inferential statistics and organized in tables for presentation.

### b) Variables and Measures

Table 1 gives a brief description of variables used in the statistical analysis.

The three dependent variables are determined from specific questions in the questionnaires. A total of seven independent variables are also included in the correlation analysis (Table 1).

### c) Conceptual Framework

The 'transfer of technology' (TOT) model was widely accepted as the preferred model in the agricultural system. It is a rigid, linear, one-way process which regards the farmers as mere users of new technologies while the knowledge institutions are credited with the ingenuity of developing new technologies.

The farmers are considered as passive actors who lack the capability to influence the process of development of technologies

(Roling, 1990). The model therefore fails in adapting research outcomes to local conditions leading to low adoption rate, especially among smallholders. Other models, however, have been developed to address this by highlighting the active roles played by users in the technology transfer and diffusion process (Ramanathan, n.d.; Biggs 1990).

Table 1. Description of Variables

Dependent Variables		
S/N	Variable Name	Definition
1.	Technology Learning Indicator	Ways in which farmers acquire and build up technical knowledge and competencies. Measured as the logarithm of length of time taken by the farmer's to master the use of a particular technology
2.	Technology Utilisation Indicator	Measured as three quantitative variables where respondents were asked to pick from indigenous, modern or a mix of the two.
3.	Technology Transfer Indicator	Measured as a binary variable where farmers were asked to indicate whether they have successfully transferred the technology to other farmers
Independent Variables		
1.	Age	Measured as 6 quantitative variables indicating the ages of the farmers in years
2.	Level of Education	Indicates the highest educational qualification of the women farmers. Options include none, primary, secondary or tertiary
3.	Years of Experience	Measured as 3 quantitative variables indicating the experience in years the farmers have been engaged in agriculture
4.	Primary Occupation	An indicator of whether or not the farmers use farming as part-time job or is their main occupation. Measured via a binary variable taking value 1 if Primary occupation is farming and 0 if otherwise)
5.	Learning Capability	Measures the strength of learning of new technologies.
6.	Availability of Learning System	A binary variable indicating whether or not the farmer has any meeting venue to share knowledge on technologies
7.	Intensity of Learning	Measured as 3 quantitative variables indicating in months the frequency of meeting to share knowledge on new technologies

An example is the two-way model which recognises that the interaction between the developer and user of technologies is crucial to successful technology generation and transfer. The user, in this case, the farmers may develop the learning capability through experience, trial and error, networking etc. They are not just passive recipient of

technologies but through the learning process adapt, assimilate, utilise and master the knowledge until they are able to improve on it and transfer it to fellow farmers and source (Nieuwenhuis, 2002). The technology source includes knowledge institutions such as universities and research institutes. This study adapts this model, however, with slight modifications (Figure 3). It assumes that the users do not just have the capability to learn and influence the process of technology transfer but also have the capability to use their indigenous knowledge and technologies to meet their needs. It also acknowledges the role of technology facilitators. These are bridging institutions that facilitate the process of interaction, learning and transfer between the source and user. They include NGOs, CBOs, media, extension agents etc. A key characteristic of this model is that the roles of the key actors are less stereotyped and therefore interchangeable (Roling, 1990).

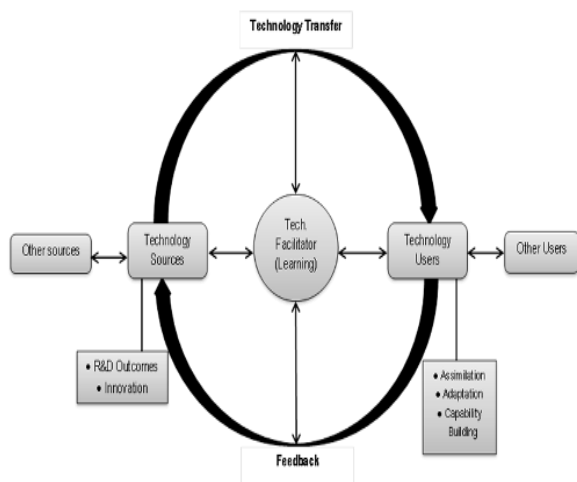


Fig. 3. Conceptual Framework for technology transfer  
 Source: Adapted from Roling, 1990

## RESULTS AND DISCUSSIONS

### a) Demographic Characteristics

Of the 128 women farmers who returned valid questionnaires, majority of them, about 36%, are in the mid-age categories between 41 to 50. The least age categories are the ones under the age of 20 with only 1 respondent (Table 2). Every three in five of the women farmers are married while those with secondary

education are in the majority with slightly less than 2 in 5 women farmers. Only about 1 in 7 of these farmers has tertiary education and thus constituting the least education category. About two-third of them practiced farming as their primary occupation while the remaining are primarily traders, artisans with a few civil servants. About half of the respondents are experienced farmers having been practicing for more than 10 years. This shows that majority of the smallholder women farmers are primarily farmers of mid-age, semi-educated and have built strong capability in farming. This finding is similar to previous studies of Nigerian smallholder women farmers. For example, Osungiri *et al.*, (2012) found out in a study of smallholder farmers in the South Eastern zone of Nigeria that the average experience and highest academic qualification of 13 years and primary school respectively.

Table 2. Demographic Characteristics of Smallholder Women Farmers

Age	%
20 and below	0.8
21-30	8.6
31-40	25.0
41-50	35.9
51-60	27.3
Above 60	2.3
<b>Marital Status</b>	
Single	6.3
Married	61.7
Widowed	27.3
Divorced	3.9
<b>Level of Education</b>	
None	17.6
Primary	32.8
Secondary	36.0
Tertiary	13.6
<b>Years of Experience</b>	
Less than 5	14.6
5 – 10	36.6
Above 10	48.8
<b>Primary Occupation</b>	
Farming	66.4
Non-Farming	33.6

In the same zone, another study of smallholder women farmers reported an average age of 51, 11 years education and 10

years farming experience (Dimelu *et al.*, 2009). These confirmed earlier studies that smallholder farming is not attractive to young, single and highly educated women (Osugiri *et al.*, 2012).

Table 3. Agricultural Practice by Women Farmers

Agricultural Practice	%*
Food Crop Production	32.8
Cash Crop Production	13.3
Horticultural Crop Production	11.7
Livestock Production	29.7
Livestock and Crop Production	10.9
Crop Processing	9.4

\* Multiple Response Analysis

Majority of the respondents are engaged in food crop production followed by livestock production. Crop processing attracted the least respondents (Table 3).

### b) System of Technology Learning and Utilisation

Women farmers utilised indigenous technologies more than modern technologies (Table 4). About two-third of the farmers use indigenous technologies in their farming practices while about 1 in 6 utilised modern technologies.

Table 4. Technology Utilisation by Women Farmers

Technology Type	%
Indigenous technology	66.7
Modern technology	17.1
Both	16.3

Family and parents constitute the main source of knowledge used in indigenous technologies while the media through programmes and television and radio constitute the least (Table 5). The knowledge sources through extension agents are not an important source of knowledge for learning indigenous technologies among the smallholder farmers. However, though majority of the farmers utilised indigenous technologies, extension agents play a key role in knowledge source. This is followed by other farmers. This is not surprising as many farmers tend to adopt the modern technologies after initial success with fellow farmers.

Indigenous technologies are learnt mainly through oral instruction mainly from parents

and family members and fellow farmers. Learning by doing through trial and error constitutes another major channel (Table 6).

Table 5. Sources of Learning of Indigenous and Modern Technologies

Indigenous Technologies	%*
Parents and Family Members	79.0
Other Farmers	51.0
Extension Agents	17.0
Agricultural programmes on TV, Radio etc.	5.0
Modern Technologies	
Extension Agents	58.3
Other Farmers	50.0
Agricultural programmes on TV, Radio etc.	47.2
Universities/Research Institutes	30.9

\* Multiple Response Analysis

The introduction of technologies like telephone has not imparted on the knowledge accumulation process of the farmers. Despite the high penetration in mobile phone telephone in Nigeria in the last 10 years, most farmers though use phone in their day-to-day activities have not found it useful for knowledge sharing.

Table 6. Modes of Learning of Indigenous and Modern Technologies

Indigenous Technologies	%*
Oral Instruction	66.7
Learning by Doing	55.6
Learning by Observation	52.5
Phone Discussion	1.0
Modern Technologies	
Learning by Doing	63.2
Oral Instruction	60.5
Learning by Observation	52.6
Farm Visitation	44.7
Seminar and Workshop	42.1
Phone Discussion	15.8

\* Multiple Response Analysis

Majority of the farmers prefer market and their associations as avenue for knowledge sharing and learning (Table 7). This enhances interaction with different actors crucial to the learning and transfer of new technologies.

### b) Drivers of Technology Learning and Utilisation



The drivers of technology learning and utilisation are shown in Table 8. As reviewed in the literature, a key component of technology use is learning.

Table 7. System for Technology Transfer among Women Farmers

Avenue for Knowledge Sharing*	%
Market	53.8
Farmers Association	44.2
On the Farm	27.9
Others	2.9
Frequency of Meeting	
Once a month	61.3
Once in three months	33.3
Once in six months	2.2
Once a year	3.2

\* Multiple Response Analysis

We argue based on our results that technology utilisation is accompanied by learning. This argument is confirmed with the figures from Table 8 showing a positive correlation between these two variables ( $r = 0.168$ ;  $p < 0.01$ ). Table 8 reveals that more variables are significantly correlated with technology utilisation than learning. Specifically, four variables have significant correlation with technology utilisation while two variables are significantly correlated with technology learning. Age, level of education, years of experience and intensity of learning are significantly correlated with technology utilisation at 1% level of confidence while primary occupation and intensity of learning have significant correlation with technology learning at 5% and 1% level of confidence respectively.

A close examination of Table 8 reveals that while age and years of experience are negatively correlated with technology utilisation, level of education and intensity of learning are positive. This shows that as women farmers become older and more experienced, they tend to use indigenous technologies more than modern ones. It also reveals that educated women farmers use modern technologies more than indigenous ones.

Also, the more frequently the farmers are exposed to training, both formally and

informally, the higher the level of utilisation of modern technologies.

Years of experience of women farmers has a significant negative correlation with technology learning at 5% confidence level, whereas, intensity of learning is positively correlated at 1% confidence level. This shows that women farmers tend to master new technologies if they have the opportunities of frequent knowledge sharing and training sessions.

Table 8. Drivers of Technology Utilisation and Learning

S/ N	Variables	Correlation Coefficient*	
		Technology Utilisation Indicator	Technology Learning Indicator
<b>Dependent</b>			
1	Technology Learning Indicator	1	0.164
2	Technology Utilisation Indicator	0.164	1
<b>Independent</b>			
1	Age	-0.276**	-0.083
2	Level of Education	0.489**	0.179
3	Years of Experience	-0.315**	-0.048
4	Primary Occupation	0.039	-0.188*
5	Transfer Capability	0.036	0.091
6	Availability of Learning System	0.104	-0.014
7	Intensity of Learning	0.367**	0.339**

Also, those with farming as their primary and main source of income master new technologies within a shorter length of time than those who take farming as secondary activities. These are farmers who are primarily traders, artisans, and even in some cases, civil servants.

The fact that learning intensity is strongly and positively correlated with both technology learning and utilisation shows its important. However, fora such as association meetings, farm, market etc. which allow interaction

among the actors enhance learning and subsequently utilisation of new technologies (Roling, 1990). The market is important because it allows farmers to interact directly with different actors such as customers and other farmers. The farmers' association meeting allows extension agents, successful farmers, CBOs and NGOs to have the opportunity to directly share information about new technologies. It also enhances feedback and builds farmers capacity to assimilate, utilise and master new technologies. However, learning intensity and variety of sources for learning are believed to be more important to the process of learning and utilisation. A one-off training or knowledge sharing platform may not be adequate in the learning process. Table 7 reveals that two-thirds of the farmers meet once a month to share and discuss new technologies. The intensity of learning provided by repeatability and frequency as well as variety of learning sharing platforms enhance the process of learning and utilising new technologies (Bozeman, 2000).

#### b) Drivers of Technology Transfer

To transform from being the user to source of technologies, a farmer has to learn, use and assimilate new knowledge. Table 9 reveals that age, years of experience and the availability of platforms for learning are significantly correlated with technology transfer. While farmers' age and experience are negatively correlated at 1% and 5% confidence level respectively, availability of learning system is positively correlated at 1% confidence level.

We can infer from these that it is more difficult to transfer new technologies to older women farmers than the younger ones. We regroup age classifications into two: youth and elderly. All farmers below the age of 40 are classified as youth while those from 40 are regarded as elderly. Our findings reveal that there is a high dependence on indigenous technologies for farming activities among older women. However, there is a rising interest in the utilisation of new technologies among younger women (Table 10).

The resistance in using new technologies among older women may be attributed to old age and inability of new technologies to meet their needs (Gul Unal, 2008; Kaimowitz, *etal.*, 1990). Furthermore, Table 9 reveals that the availability of learning system enhances transfer of new technologies.

Table 9. Drivers of Technology Transfer

S/N	Variables	Correlation Coefficient*
<b>Dependent</b>		
1	Technology Transfer Indicator	
<b>Independent</b>		
1	Age	-0.178*
2	Level of Education	0.098
3	Years of Experience	-0.427**
4	Primary Occupation	0.130
5	Availability of Learning System	0.414**
6	Intensity of Learning	0.083
7	Learning Capability	0.058

\* indicates significance at 5% level and \*\* 1% level of confidence

Table 10. Technology Utilisation Disaggregated by Age and Years of Experience

Age Group	Technology Utilisation (%)		
	Indigenous	Modern	Mix
Youth	48.8	34.9	16.3
Elderly	76.3	7.5	16.3
<b>Years of experience</b>			
Less than 5	55.6	16.7	27.8
5 – 10	46.3	34.1	19.5
Above 10	83.1	5.1	11.1

This shows that more women will adopt and transfer new technologies if there are effective mechanisms for sharing knowledge and learning.

## CONCLUSIONS

The study of smallholder women farmers has implications for policy since majority of Nigerian farmers are smallholders with women constituting between 60 to 80%. The findings from this study, though with a relatively small sample, can provide useful conclusions with implications for policy in developing country context. It can also serve as a model for a broader study.

The study reveals that the key drivers of technology utilisation are age, level of education, years of experience and learning intensity. This implies that indigenous technologies should be integrated into research so that it can be attractive to the older women. Also, the introduction of new technologies should be need and gender-specific. Farmers should be involved as key actors in the research and development process. This will help in sustaining the rising interest of younger women in adapting modern and indigenous technologies in agriculture. The variety and intensity of learning sources have been shown to be crucial factors enhancing learning and utilisation of new technologies. Hence, there is the need for deeper and broader interactions among key actors, such as, R&D institutions, extension agents, NGOs, CBOs and farmers on the effectiveness and variety of channels of knowledge sharing used in technology learning, utilisation and transfer. Appropriate public policy interventions should also be introduced to develop 'smallholder-friendly' technologies, especially among women, to curb market failures in technology adoption.

## ACKNOWLEDGMENTS

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## A MANAGEMENT MODEL FOR SUSTAINABLE DEVELOPMENT OF THE TOURIST DESTINATION

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### *Abstract*

*In recent years, Bulgaria is about to market successfully one of the few competitive advantages that the country has as a tourist destination – the diverse and authentic nature. It is an indisputable fact that tourism in its diversity is closely linked to the choice of destination. Sustainable destination management is critical for tourism development, particularly by having effective spatial planning and land use control and through investment decisions on infrastructure and services. The aim of this paper is to propose a management model of a tourist destination in the context of the ideas and policies for sustainable development. The thesis that is justified is that sustainable tourism destination is the result of a proper use of an appropriate governance model. The development and implementation of specific management model make the destination of an all year-round tourism in its different varieties (recreational, sports, etc.), bearing economic, social and environmental benefits to society.*

**Key words:** *management model, sustainable development, tourist destination*

### INTRODUCTION

The management of the tourist destination in context of tourism management can be done by the basic management functions – planning, organizing, coordinating and control, each of them has specific technological and motivating characteristics, which are needed for achieving the system goals.

The management's impact on tourist destination is realized by different means-economics, social, legal, technical. It is connected with activities such as forecasting, planning, control and regulating the tourism processes. Using proper management model for sustainable development of the tourist destinations is very important key stone for Bulgarian tourism.

### MATERIALS AND METHODS

Because of the complicated socio-economic nature of the tourism at all and the aim of the paper in particular, the research uses interdisciplinary scientific approach. It is realized by using theoretical conceptions, concepts and methods inherent for the general theory of tourism, the management of tourism, the economics and marketing of tourism.

In view of the interpretation of the collected research data and formulating of the grounded conclusions, in the paper are used general

scientific methods like induction ( modelling of management system of the tourist destination), deduction (projection of conceptual model for management of the tourist destination for sustainable development) .

### RESULTS AND DISCUSSIONS

Considering the general theoretic management conception , we conceptualize the mechanism of the management of the tourist destination (Figure 1).

The process of management of the tourist destination must be tightly integrated with the interests of the wider social community, the ecological and economical strategies for developing the destination's territory. In some areas these interests should implement even wider initiatives for planning. For example, when managing and planning the tourist destination ,the perception of environmental management systems appears to be very useful in many cases. The management of the tourist destination needs to be supported, realized and valued according to specific criteria and indicators. For this purpose, we accept the 5 criteria, proposed by World Tourism Organization, for selection of indicators, that can be used in tourism destination's management(UNWTO, 2007).

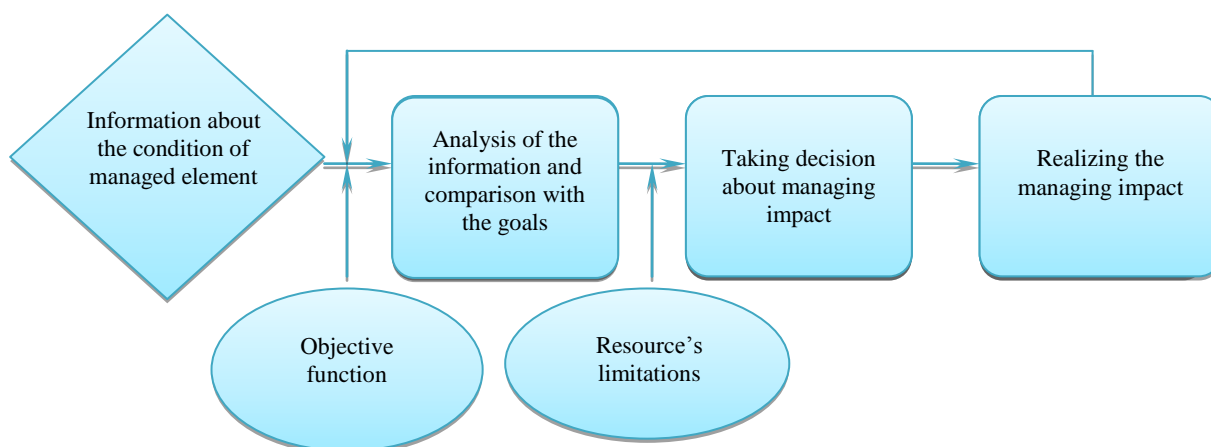


Figure1. Mechanism of tourist destination management

- Potentiality for receiving and analyzing of the needed information
- True and reliable information
- Clear and easy understanding by the users
- Comparability in time and by regions.

According to the considered documents, the four fundamentals, that we base the sustainable development on, are (Marinov et. al, 2009):

First, the ecological sustainability – the development should be compatible with the processes, which support the ecological balance, the biodiversity and bio-resources.

Second, the economical sustainability and the continuity between the generations – the development should be economically effective and should have equality and continuity between the generations.

Third, the social sustainability – the development should contribute for increasing the standard of living and supporting the harmony in society.

Forth, the cultural sustainability – the development should be compatible with the culture and values of the people, influenced by it.

There is not standard or recipe for achieving tourism sustainable development. Usually the developing of action plan and strategy for sustainable tourism is very useful measure, which guarantees efficiency and coordinated actions of different subjects. This is the best approach with the participation of all stake holder groups, interested in the local sustainable development. The strategy of sustainable tourism needs to be developed in three following steps.

First - analysis of the status quo. Complete generalization is needed and analysis of the existing information, and knowledge as precondition for the strategy.

Second – formulating strategy for development. The strategy for sustainable development of tourism is based on the information, collected in step one. The strategy determines the priority questions, the stake holders, the potential purposes and the set of methodologies for achieving these goals.

Third – Making an action plan. In the action plan are pointed the steps, needed for the implementation of the strategy and for the decision of a range of practical questions (which organizations, what activities will they take, in what time frame, with what means and what resources).

The sustainable tourism development demands such management of all resources, that leads to satisfaction of the economic, social and esthetical needs and which at the same time supports the cultural entirety, the significant ecological processes, the biodiversity and the supporting life systems (WTO, 2007).

Based on the principles of the sustainability, we can conclude that for the development of sustainable tourism within a territory are needed large, targeted and long actions, in at least 5 directions: First, compliance of the tourist development with the potential of the relevant territory. The quantitative values of the indicator carrying capacity are needed to be found (Figure 2).

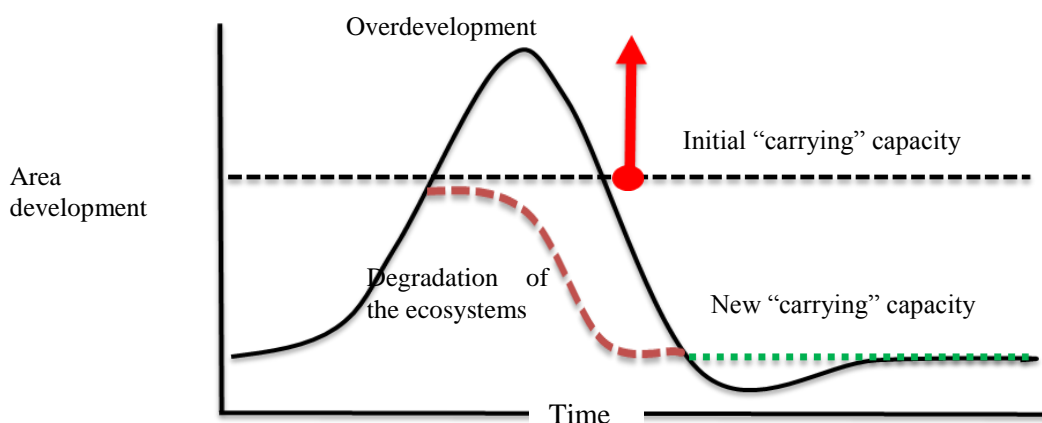


Figure 2. Carrying capacity

Second – providing equal rights and obligations of all the participants in the tourism development: business, non-government organizations, state and local public authorities, tourists and local community.

Third – active participation of the local community in the service processes. In this way, the local community takes part in the development of the tourism and stimulates with its behaviour this development, if the impacts are positive.

Forth – achieving consensus between the members of the community according to the benefits, losses and taken decisions.

Fifth – conduction of active policy for promotion of the conception for sustainable development of tourism and formation of positive attitude of the stake holders.

The analysis of the development of many tourist destinations shows that uncontrolled development of tourism leads to un sustainability turns it into environmental threat. The deforestation, erosion, landslides, pollution of the water, extinction of animal and plant's species are concrete examples for this.

The negative effects of the tourism makes long-term goals necessary. They should be compliant with the sustainable development, with the making of strategies based on the conception for the resource capacity of the concrete tourist destinations. The strategy specifies model for management of the tourist destination for sustainable development. In the strategy are considered the planning, organizing and control of the tourist destination for sustainable development. The major components in the model for management of the tourist destination for sustainable development are shown in Figure 3.

Presented in the logical order according to their meaning, the elements of the model and their interpretation are:

External environment of the tourist destination. It includes factors, which impacts can not be controlled and managed by the destination. The factors of the external environment have world, regional, national and local influence and create opportunities or threats for the tourist destination.

Internal environment of the tourist destination. It includes system elements, which impacts can be controlled and managed by the subjects of the destination. These elements are:

- Resources of the tourist destination. Their availability or lack, and their quality characteristics largely determine the potential and the specificity of the destination.

- Infrastructure and superstructure. They are materially-technical base, needed for receiving, staying and service of the tourists in the tourist destination.

They are created and developed on the base of the tourist resources in the relevant territory and together they form the physical, material part of the tourist product, where they play important role for its attractiveness.

- Public sector – It presents the state institutions on national and local level and the municipal authorities. In our model, the public sector is presented mainly by the local authorities. The public sector is responsible mainly for the regulation and control the usage of the public goods for the needs of tourism.

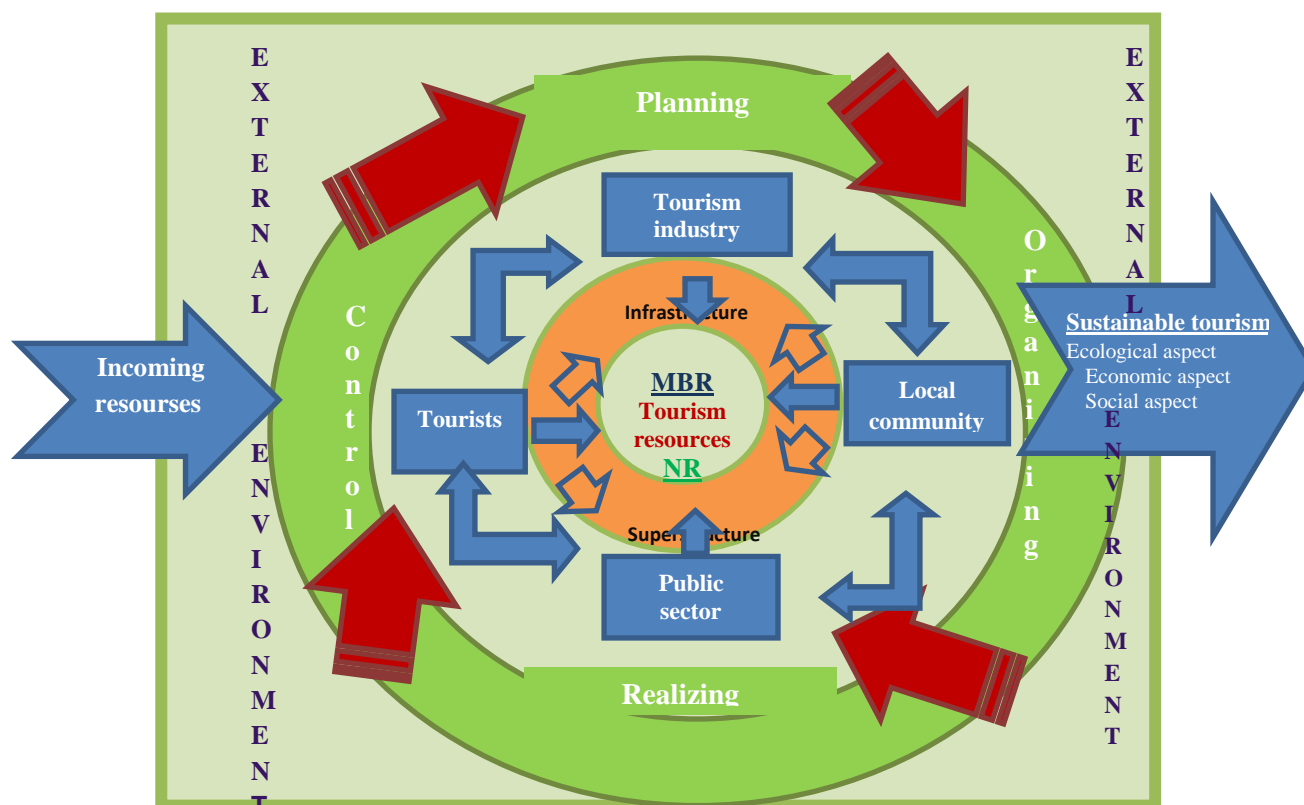


Fig.3. Management model for sustainable destination development

•Tourist industry – it is presented by all enterprises, which produce and offer services and goods for the tourists. The tourist products, offered by different tourist profit or non-profit organizations are relevant to the diverse tourist needs. Following the principles of the sustainable destination development, the tourist companies show, among with the management and exploitation function, also its social function. This way they create opportunities for preserving and saving the natural and cultural heritage in the destination, as well as they create additional added value of their product.

•Local community – All representatives of the community in the tourist area in particular, and more globally the people, living at the administrative area, in which the destination takes part. Very often, the destination area takes part of two or more administrative units (municipalities).

•Tourists – Forth stake holder about the destination’s development. In our model for management of the sustainable development of the destination are considered the following basic characteristics of the tourist’s demands: the volume of tourist’s arrivals, the structure of tourist’s nationality groups, age, income and etc., ratio quality-price expectations, the level of satisfaction from the experience in the destination.

Management process – we define the management process in the tourist destination for sustainable development as : continuous process including “planning, organizing, realizing and control of the tourist destination as sustainable system for creating, supporting and developing of mutual relationship between the subjects of the tourist destination and its visitors”.



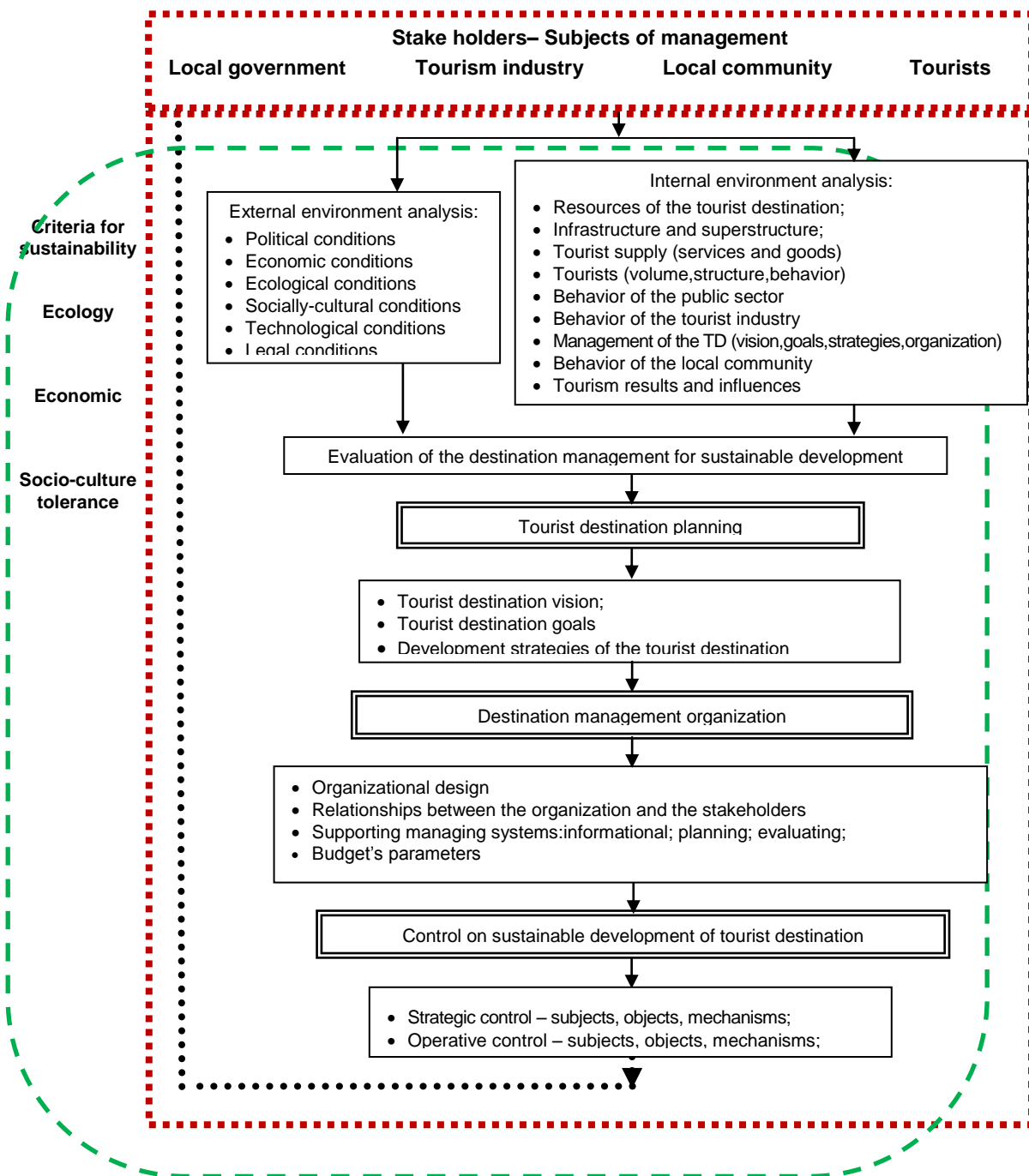


Figure 4. Management process of the tourist destination for sustainable development

Outcomes- the consequences of the tourist destination in the face of its interested subjects – representatives of the public and private sector, local community and the tourists.

The consequences have economical, ecological, cultural, social and psychological character.

The interrelationships between the stakeholders, based on the interests, profits, rights and responsibilities, are polyvalent. The polyvalent relationships are based on the differences between the subjects by legal status; ownership upon the production factors; organization form; purposes and engagement in the tourist process at the tourist destination and receiving benefits from the tourism.

The conclusion is that the institutions from the public and private sector, engaged with the tourism, in the role of subjects of management of the tourist destination, should seek after solidarity, coordination and one direction of its efforts. The success of the management for sustainable development of the destination, the support and the increase of the competitiveness depends on the level of performance of these tasks.

The synthesized model of the tourist destination, we propose in the paper, draws the frame of the process and the basic direction for effective management for sustainable development (Figure 4).

## CONCLUSIONS

The development of the tourist destination demands organization of all these processes and activities, which results in sustainable development of the destination. This supposes synchronization of the efforts of all stakeholders on their way of sustainable development.

The management of the destination manifests as integration of many organizations and interests, working for achieving common goals.

The process of management should ensure sustainable development of the tourist destination. This is possible only when it functions and develops in harmony with the

environment in economic, social and ecological aspect.

The model for management of the tourist destination should be based on the sustainable development of tourism, i.e. the model should correspond in long-term plan with the profitability of the tourist activity, according to the carrying capacity of the tourist resources, with the social acceptability of tourism for the local community, and with friendly-nature tourist activity.

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## TRENDS AND ACTUAL ISSUES CONCERNING SUSTAINABLE REGIONAL DEVELOPMENT IN ROMANIA, STUDY CASE: THE NORTH EAST REGION OF DEVELOPMENT

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### Abstract

*The European Union Regions of Development are characterized by substantial social, economic, and territorial disparities. There also recorded large economic disparities between rural and urban areas. The Romanian rural areas includes: 2860 communes, 12,956 villages, representing around 90% of the Romanian territory and 45 % of its population. It has the main agricultural and forestry resources and over 9.6 million inhabitants. Of these, 506 communes and 2414 villages are located in the 6 counties of The North East Region of Development, one of the poorest regions of development within European Union. This paper is focused on the regional development issues in the rural areas of this region and is aimed to evaluate the resources that haven't been enough capitalized in this region and to indentify solutions to improve the socio- economic situation in the next years, through a balanced development strategy.*

**Key words:** North East Region, regional development, sustainable

### INTRODUCTION

Each region has its own characteristics and specific economic trends of development. The notion of region has evolved as a unit of innovation, economic growth and an appropriate scale to resolve the challenges of sustainable development [1]. Imbalances between Romanian regions are a major issue which affect the national development. According to definition from the report 'Our Common Future' [2], "Sustainable development is development that meets the needs of the present generation without compromising the ability of future generation to meet their own needs". As Chai Ning and Dong Hoon [3] said, in order to meet continuous human needs, sustainable development has become the theme of today's world in different fields, and some renewable resources as tourism, should be continuously developed and utilized to contribute to the sustainable development. In the view of Berke PR [4] the sustainable development can be reached by a balance among the three 'E's: environment, economy and equity.

### MATERIALS AND METHODS

The paper is based on Sustainable Development Indicators used to monitor The European Union Sustainable Development Strategy, in relation with socio-economic development, sustainable production, demographic changes and social inclusion. The data are provided by Eurostat, National Institute of Statistic Romania and have been statistically processed and interpreted.

### RESULTS AND DISCUSSIONS

First we analyzed the demographic changes. In 2012 the population of North East Region of Development represented 17.3% of national population. The population of the North East region was concentrated most in the rural areas, representing 56 % of total population. From 1990 to 2012 the total population of the region decreased by 2.2 %, from 3.78 millions to 3.7 millions. In the rural areas in 1990 were 2.19 millions inhabitants, representing almost 58 % of total population.

So we can affirm that population decrease in North East Region was below national decrease which was by 8 % per total and by 12 % in rural areas.

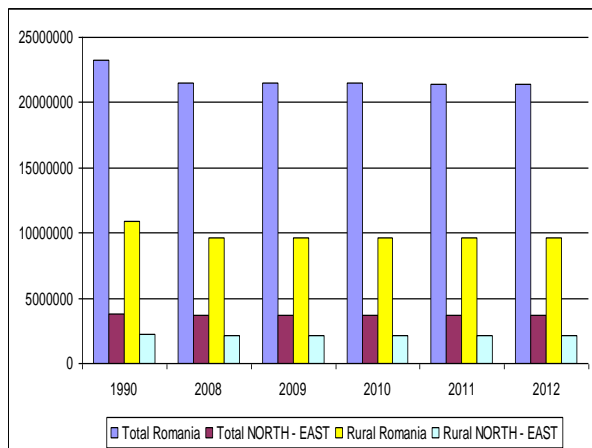


Fig.1. Demographic changes between 1990 and 2012 in The North East Region of Development, comparative with Romania, Data source: NIS Romania, 2013

The indicator economically active population shows a decrease between 2005 and 2010 in the North East Region comparative with national level, from 18.1 % to 17.9 %, but in absolute terms there is an increase of region level, which means that if this trend will continue in the next years, there will be no shortage of labour supply for the production of economic in the region.

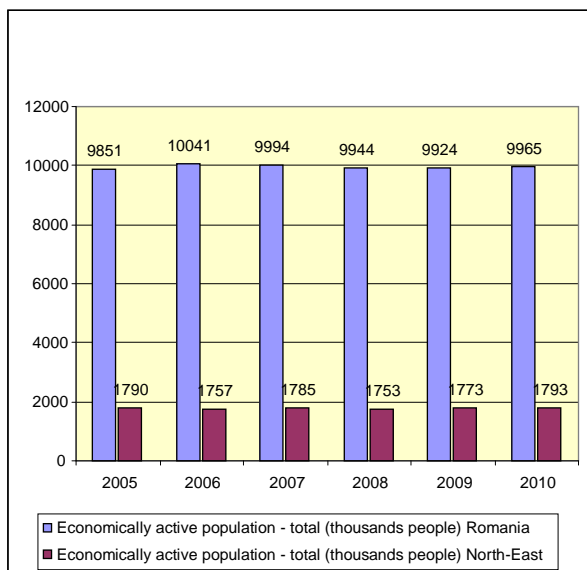


Fig.2. Economically active population trends in the North East Region comparative with Romania between 2005 and 2012, Data source: NIS Romania, 2013

The evolution of economically active population by working age in the North East Region of Development, comparative with Romania indicates the same ratio of 17.5 % in 2005 and 2012 that can be associated with stability.

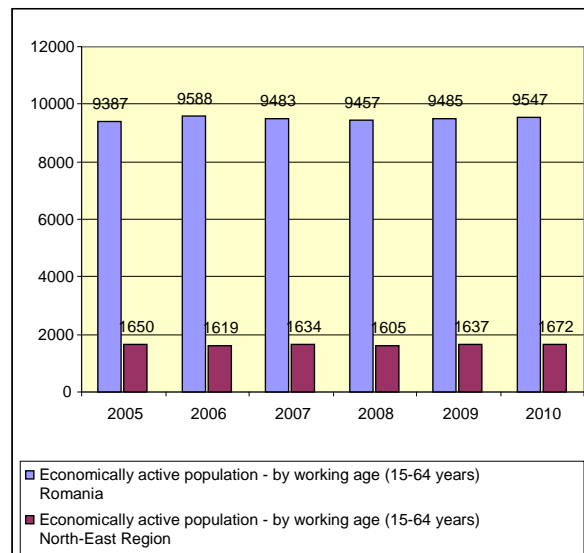


Fig.3. Evolution of economically active population by working age in The North East Region of Development, comparative with Romania (15-64 years) between 2005 and 2012 (thousands people) Data source: NIS Romania, 2013

The indicator employment rate recorded in 2010 the highest level of employment in the North East Region of Development, between 2005 and 2012.

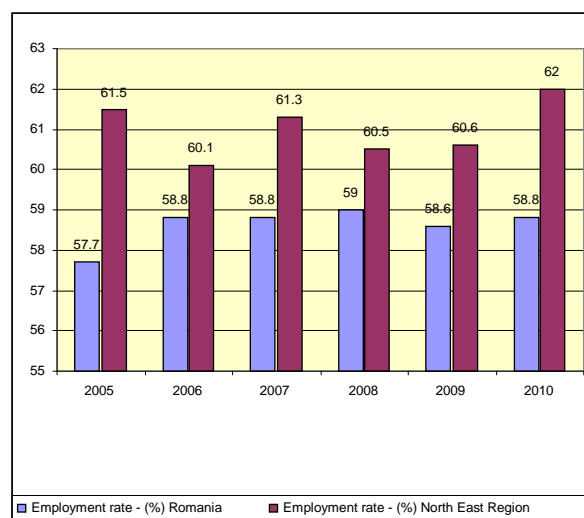


Fig.4. Employment rate evolution in the North East Region comparative with Romania between 2005 and 2012 (%), Data source: NIS Romania, 2013

The level of average monthly nominal gross earning indicates why the North East Region of Development is considered one of the poorest regions of development in Romania. The population wages are situated well below national average.

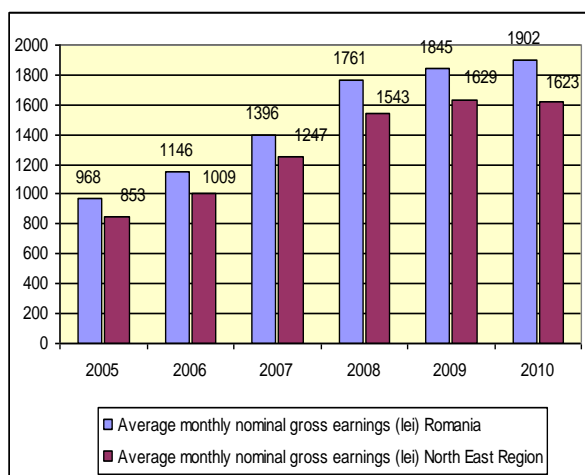


Fig.5. Average monthly nominal gross earning level in the North East Region comparative with Romania between 2005 and 2012 (lei)  
 Data source: NIS Romania, 2013

In 2009 the GDP per inhabitant reached the highest period between 2005 and 2012 in the North East Region Development but the average GDP per inhabitant in this period represented only 63 % from national GDP per inhabitant. This represents another indicator that revealed barriers to the region development.

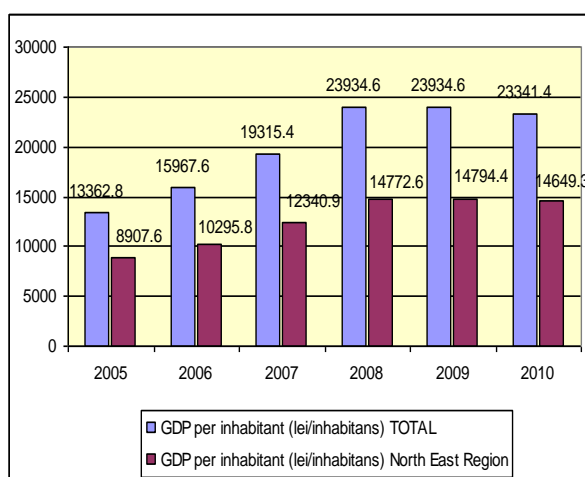


Fig.6. GDP level in the North East Region comparative with Romania between 2005 and 2012 (lei)  
 Data source: NIS Romania, 2013

The SMEs sector is a key indicator of a region stage of development. The SMEs have the most

significant role for economic growth, employment and social integration. In the North East region of development the role of SMEs in research and development is difficult to quantify, less than 0.4 % representing R&D expenditure.

Per total, at region level the number of active entrepreneurs in the North East Region didn't reach more than 11.1 % from national total number. In 2008 was recorded the highest number of active entrepreneurs but the largest share from total at the national level was achieved in 2005.

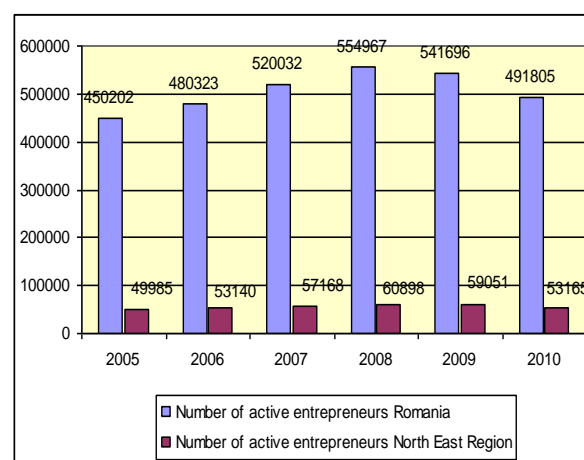


Fig.7. Number of active entrepreneurs in the North East Region comparative with Romania between 2005 and 2012, Data source: NIS Romania, 2013

The agriculture is one of the most important fields of activity of the North East Region. In the rural areas lives more than half of the region population. The non agricultural activities in the rural areas are insignificant, so the population incomes are directly depending on agricultural results.

## CONCLUSIONS

In the North East Region of Development, the sustainable development targets challenged social and economical issues but the economic growth in a safety environment and peaceful social climate is rather linked with the future than present. The indicators of sustainable development showed large disparities between national and region level, in terms of GDP per inhabitant and average monthly nominal gross earning. But the

region was well situated comparative with national level in terms of employment rate and trend of economically active population. The number of entrepreneurs decreased in the last years in the context of global economic crises, and the SMEs sector didn't produced the expected economic growth. The R&D activities are bellow national and EU targets and aims related with this "engine" sector of the economy and the turnover from innovation is negligible.

## AKNOWLEDGEMENTS

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## ENOTOURISM: A NICHE TENDENCY WITHIN THE TOURISM MARKET

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### Abstract

*This paper is aimed at establishing the required actions to be taken so as to improve perception on Romanian wine and vine tourism. In the Romanian wine and vine field, the main changes over the last ten years have been the modernization of wineries by maintaining the valuable local grape varieties and replanting soil with resistant and productive varieties, introducing new technologies in wine production processes and local producers' relocation on the market. Besides all these, technical and material facilities were developed by rehabilitating, modernizing and opening of numerous wine cellars, constructing modern accommodation units within or close to vine areas and implementing marketing programmes aimed at promoting vine areas. The tendencies of hospitality industry corroborated with the change of interest and the perceptions of the tourism products consumers make us reach the following conclusion: enotourism has to be adapted to the innovative market spirit, an efficacious brand strategy has to be defined for the final goal of attracting as many consumers as possible. Enotourism is that form of tourism which offers great local development opportunities to vineyards areas. To conclude, the study will describe the market features and tendencies, based on a large range of resources and it will present ideas connected to the tourism management and economic policies that may positively or negatively influence this field.*

**Key words:** consumer profile, enotourism, promotion, viticulture & viniculture, Wine Road

### INTRODUCTION

Being a dynamic phenomenon, tourism constantly undergoes changes due to various factors of social, cultural, economic, political nature, as well as natural and technological ones. The implemented changes have led to an increased interest in new types of tourism, of which Oenotourism has a particular place.

However, this is not a new concept; the first reference to wine tourism is found under the shape of a "Wine Road" ("Weinstraße") carried out in Germany in 1935 when, as a result of poor crops, Josef Bürckel had the idea to connect by a single road the villages of viticulturists in the Rhineland-Palatinate region in order to stimulate the sales of wine. All the local roads existing along this route were renamed by including "Weinstraße" in their names, and the local municipalities used the extension "an der Weinstraße" in the names of their localities.

Thus, enotourism is a relatively new form of tourism. Its history varies from region to

region. In the Napa Valley region from the USA this form of tourism was launched only in 1975, after some concerted marketing efforts. In other regions, such as Catalonia in Spain, enotourism marketing started in the mid 2000s, with a focus on how such a tourism type can be an alternative to beach and sun, which are basic features that Spain is well-known for as a tourist destination.

In France, the first studies intended to get quality information on the wine tourism routes, local products and actors, as well as the elaboration of marketing and advertising budgets started only in 2000.

Italy is one of the main wine producers in the world, and at the same time, it is one of the main world tourist destinations. Thus, in most cases, enotourism is combined with traditional forms of tourism. The Italian enotourism products are named "Strade dei vini e dei sapori – The wine and taste roads" and it is in 1970 that they started being promoted.

## MATERIALS AND METHODS

Based on the research results published in the recent years, the paper presents an comprehensive image of enotourism at global, European and Romania level. Important remarks are made regarding the map of viticultural regions of importance for enotourims, the EU Policy on Enotourism, the European Charter of Enotourims, wine capitals, European networks of wine cities, the pillars of the EU enotourism, global tourism industry in figures and Romania's situation.

## RESULTS AND DISCUSSIONS

### Policy Governance-European Strategy in Oenotourim

The policy of the European Union is to promote co-operation between the regional authorities and other public authorities throughout its entire territory and of the neighbouring countries that aim at becoming member states of the Union. This approach allows common projects to be implemented and co-operation networks to be developed.

#### A.CERV/AREV

The transfer of functions and competencies to the European power, hitherto assumed by the national authorities in matters of agriculture, environment, international trade and fiscality, justifies the development of dialogue between Europe and the regions.

This dialogue between regions and Brussels involves a preparing work implying a confrontation of the standpoints meant to highlight common interests. Because of the diversity of the wine-producing countries which have different cultural and economic models, a "European parliament for vine and wine" had to be established.

In 1988, the European Wine Regions Conference (CERV) was created in Bourgsur-Gironde/Aquitaine in order to make possible a concerted examination of the European policy on viticulture & viniculture and to create the appropriate framework for all opinions to be heard, both of the regional executive bodies and of the representatives of the wine-producing and naming areas. This political and professional forum, as a structure

allowing joint proposals and agreements, makes it possible to clarify conflicting positions, to limit disagreements and gradually reach the common denominator.

In 1994, in order to increase its efficiency, the European Wine Regions Conference (CERV) adopted in Marsala/Sicily a new statute and became the [Assembly of European Wine-producing Regions \(AREV\)](#), which is the present depository of the entire association, organizational and moral assets of the former CERV.

Thus, AREV has become a European and international spokesman as regards wine industry, intervening with all the institutions and authorities directly or indirectly in charge of European or world policy on viticulture & viniculture and getting involved in all the wine-related fields.

AREV collaborates with the following European institutions and authorities:

- European Commission (Directorates for Agriculture, Internal Market, Trade, Economic Affairs/Eurostat, Environment, Regional Policy, Management Committee for Wine)
  - European Parliament (Wine Intergroup, Committee on Agriculture)
  - Council of the European Union (Commission on Environment and Agriculture, Congress of Local and Regional Authorities)
  - Committee of the Regions (Commission on Agriculture)
  - Assembly of European Regions (AER)
  - International Organization of Vine and Wine (OIV)
  - World Trade Organization (WTO)
  - Food and Agriculture Organization (FAO)
- AREV has been actively involved in the following fields of viticulture & viniculture:
- Common Market Organization for Wine (CMO)
  - Viticulture of adhering countries
  - Viticulture in difficult areas, being directly connected to the Centre for Research, Environmental Sustainability and Advancement of Mountain Viticulture (CERVIM)
  - Fiscality / Excises



- Protection of the European geographical names
- Harmonization of labels
- Organic viticulture
- Genetically modified organisms
- Informatization of accompanying commercial documents
- Wine tourism, European wine roads
- Wine and health
- International Academy of Wine Tasters



<b>Bulgaria</b>	<b>Georgia</b>	<b>Italia</b>	<b>Portugalia</b>	Castilla-La Mancha
	Kakheti	Campania	Açores	Castilla y León
<b>Cehia</b>	Racha-Lechkhumi	Emilia-Romagna	Alentejo	Catalunya
		Friuli-Venezia-Giulia	Madeira	Euskadi
<b>Croatia</b>	<b>Germania</b>	Liguria	Norte	Extremadura
Istria	Baden-Württemberg	Lombardia		Galicia
	/Bayern	Piemonte	<b>Romania</b>	La Rioja
<b>Franta</b>	Hessen	Puglia	Alba	Madrid
Alsace	Rheinland-Pfalz	Sicilia	Arad	Murcia
Aquitaine	Autriche	Südtirol	Constanta	Navarra
Champagne-Ardenne	Burgenland	Toscana	Iasi	Valenciana
Franche-Comté	Niederösterreich	Trentino	Prabova	
Languedoc-Roussillon	Steiermark	Umbria	Vrancea	<b>Ucraina</b>
Midi-Pyrénées		Val d'Aoste		Odesa
Pays de la Loire	<b>Grecia</b>	Veneto		
Poitou-Charentes	Kentriki Makedonia		<b>Slovenia</b>	<b>Ungaria</b>
Provence-Alpes-Côte d'Azur	Peloponnisos	<b>Luxembourg</b>		Bacs-Kiskun
Rhône-Alpes			<b>Spania</b>	Baranya
			Andalucia	Borsod-Abaúj-Zemplen
			Aragon	Tolna

Fig.1.Map of the regions or country members of the AREV

### **B.European Network of Wine Cities-RECEVIN**

The VINTUR programme was implemented in the viticulture & viniculture field, within the INTERREG IIIC programme, being coordinated by the “European Network of Wine Cities – RECEVIN”. The RECEVIN is intended to defend with one voice the interests of the local administrations from the entire Europe in matters related to the economic policies on wine industry. This network provides a common platform for exchanging expertise, contact information and for partnership.

Nine European countries are members of RECEVIN (Germany, Austria, Slovenia, Spain, France, Greece, Hungary, Italy,

Portugal), that resulting in the strength of nearly 800 cities across Europe.

The VINTUR project was meant to promote the exchange of knowledge and technology, and to develop actions to increase the quality of the enotourism products. The vine and wine tourism product consists in integrating the interests, the present and potential resources and the services from a grape-growing area into a whole concept.

In this respect, RECEVIN developed far-reaching projects aiming at recognizing the vine and wine tourism in Europe. They are the following:

- *The European Charter on Oenotourism* – a consensual document defining the wine tourism concept at European level and establishing the participation and co-operation strategies for various agents with a view to their development and self-regulation.

- *The European Enotourism Handbook* – establishes the Quality Management System for wine tourism at European level, and defines the method of starting, developing and the recognition of the European Roads of Wine.

- *The European Day of Enotourism* - an initiative that positions this type of tourism as a unique and yet multiple reality in all the member states of the network. The goal of the “Enotourism Day” is to promote the vine and wine tourism worldwide, and at the same time in all the European countries, and to unify the European wine routes’ quality standards. This day is held on the second Sunday of November each year. In the 2012 edition, over 60 wine routes and cities from Spain, Italy and Portugal participated in this event, more than in the former editions.

- *The European City of Wine* – a competition initiated as a part of the advocacy and dissemination of enotourism in Europe. The first edition of the competition was in 2012.

The competition of the European City of Wine takes place, on a rotating basis, in different countries, members of the RECEVIN network. Following the selection, the 2012 edition took place in Portugal, in 2013, it will take place in cities of Italy, in

2014, in cities of Spain and in 2015, in cities of France.



Fig.2. RECEVIN member countries map

This context is a good opportunity for the European wine cities to present the wealth, diversity and their own wine culture, providing a better understanding of the landscape, economy, gastronomy and local heritage.

After a methodical assessment, in accordance with the requirements of the competition, the winning city from Portugal was PALMELA.

As a result of implementing the VINTUR project, two documents were elaborated, representing the basis of enotourism development in Europe.

#### ***The European Charter on Enotourism***

This Charter defines the concept of wine tourism at the European level and establishes a common strategy for all the wine tourism regions in Europe, based on defining goals and commitments of all the involved areas. The report has a wide vision of the sector, emphasizing the concept of “wine-growing culture”, an idea that comprises both the wine-growing aspects of a territory and the tourism in it. This vision offers the opportunity to use wine as a tool to promote the local tourism (niche tourism).

This global approach implies a significant number of participants, from the public and private sectors to the ordinary inhabitants of the wine tourism destinations. We should mention here that some parties described this document as a proposal approaching only the absolute minimum and that it was not exacting enough. Like any other strategic document it comprises certain predetermined values: sustainability of the enterprise economic activities and promoting local development; the need for co-operation among various parties; a collective vision; promoting restoration of buildings instead of new constructions; utilizing local human resources, and improving quality of life of the local residents. The document also mentions the necessity to manage the tourist flows, anticipating some corrective measures, such as utilizing means of public transport, bicycles and walking.

The adherence to the Charter takes the elaborate form of a report that can be seen as a strategic plan for a wine tourism destination. The report includes a diagnosis of the situation, the involvement of its members, common strategic goals, allocation of necessary resources, an action programme and assessment of results.

78 organizations have signed the Charter so far, out of which 64.1% are organizations from Italy and Spain.

#### ***The European Enotourism Handbook***

The same European project developed “*The European Enotourism Handbook*” that establishes the Quality Management System of the European Enotourism, being a first step to implementing the future project entitled “The European Wine Route”. This document, which was inspired by the *European Charter on Oenotourism*, encourages new ideas and points out the necessity to promote wine culture throughout all stages of the tourist programme (before, during and after ending the tour) and in all the aspects related to the value chain. It also emphasizes the *authenticity*, which is an important complementary resource for the enotourism experience and one of the key values of the winemakers (wine cellars), which are many

times oriented to producing handcrafted wines for a demanding and customized market, unlike the mass production model.

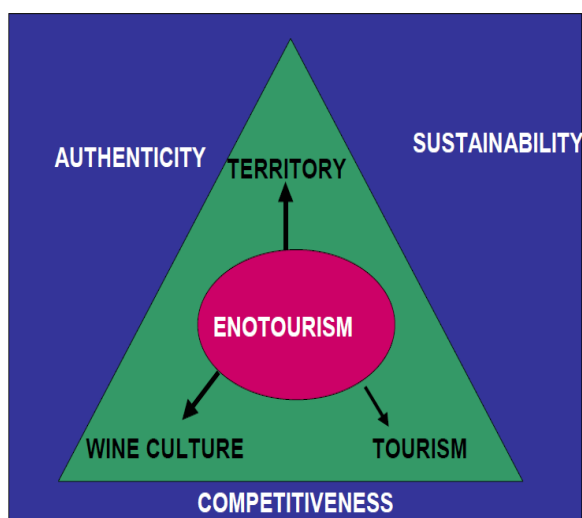


Fig.3. The pillars of the European enotourism

The specific requirements have been laid down for the public sector (local or regional administrations), and for the private one as well, according to what is wished to be offered to a traditional or a wine tourist, i.e.: accommodation, restaurants, shops, travel offices, travel agencies, tour operators, wine cellars, museums, wine shops, wine tasting services and courses.

Each destination has to set up an administrative body in order to supervise and check the adherence process, and to draw up a three-year strategic action plan.

In addition to the logical criteria (Documents of Origin -DO, the promotion itself, the existence of an administrative body, a brand and a logo, proper signage) there are also specific requirements for the destination to have a minimum of six wine factories, that can be visited at least 12 hours per week, two days per week, with 5 complementary services (of which two have to be a restaurant and accommodation premises) and the destination has to promote a fair and reasonable price policy.

Although the wine tourism products offered meet the overall requirements, they are separately analyzed for each subsector. For example, knowledge of a foreign language is considered of high importance for the persons

working in tourism agencies and for the tourism agents as well, to the same degree as it is important for the employees of a restaurant to understand and to know the local wines.

The wine shops, particularly the wine cellars, must have special places for wine tasting endowed with adequate glassware, a shopping area, provide guided tours and meet other specific requirements (toilettes, souvenir shops, etc).

The additional requirements for certification of excellence must also be met, the specific goal being to improve the administration (greater dedication and capacity to make decisions), to increase the number of services and products provided in every destination, to create and to implement control systems (creating enotourism sustainability indicators), and to develop tools for assessing the profile of the demand.

In order to reach this last goal, the administrative body shall create an information collection system and shall generate a profile of the wine services consumer, information that can be subsequently disseminated and analyzed in the entire market.

The members of the business community have also to commit themselves to provide the required information in order to carry out such analyses.

### ***C. The Great Wine Capitals – GWC***

The Great Wine Capitals is a network of nine cities located in both the northern and the southern hemispheres, sharing a common economic and cultural philosophy. What attaches them to one another is the wine industry, strongly represented in their regions. This is the only network comprising regions both from the old and the new world of wine.

The Network was created to encourage the exchange of travels, education and good practices in the economic field between internationally renowned centres: Spain (Bilbao, Rioja), France (Bordeaux), South Africa (Cape Town), New Zealand (Christchurch, South Island), Italy (Florence), Germany (Mainz, Rheinhessen), Argentina

(Mendoza), Portugal (Porto), USA (San Francisco, Napa Valley).

Since 1999, when it was created, the Network has introduced a prestigious annual prize competition entitled "Best of Wine Tourism" Awards.

This international competition was created to reward the wine-making companies from each member city that distinguished themselves by excellence in wine tourism art and culture, the development of a sustainable wine tourism, as well as in providing quality experiences to the public.

Since the launch of the awards, more than 309 properties out of 2099 candidates received prizes, which attests how rigorously are the candidatures assessed.

The organization also created a business network offering ample programmes of information and training seminars, forums and tastings.

The Great Wine Capitals presents an annual report following the carrying out of research studies entitled "International Research Grant". Grant is intended to promote excellence in research and innovation in the wine industry and encourages researching of new and interesting subjects for the network (wine tourism, wine marketing, sustainability).

The programme also supports programmes for the students of the universities from the cities members of GWC.

This network also supports the organization of numerous expert symposiums on investments in the viticulture and viniculture sector, and initiatives in the relevant educational branches. These events are many times held on the occasion of the annual general meetings or of conferences where crucial problems affecting the large world of wine are debated.

Trips of technical or commercial nature are organized for the members of the network.

The know-how exchange is an essential part of the network; thus, each city can benefit from the strong points of its network neighbors.

The Great Wine Capitals developed a tourism network, in order to facilitate inter-regional

travels, if the travel agencies from each city develop wine-related programmes and routes. There are destination specialists in every city, who are able to meet all the requirements for the travel to and from the "Great Wine Capitals".

In this way, all those visiting these cities gain experience and, at the same time, help the cities to make known to the whole world the extraordinary cultural, heritage and geographic resources.

The wine tourism destination Dealu Mare, in the Prahova County, has a poor presence within the European associations for viticulture & viniculture tourism.

Together with the counties of Arad, Alba, Constanța, Iași and Vrancea, they are members of the AREV.

The last international event that took place in Romania, in Alba Iulia, was the International Council of the AREV, in the year 2007. Romania is not a member of the RECEVIN European Network.

#### ***D.Key figures of global wine tourism industry-Consumer profile***

In the year 2011 when the VINEXPO exhibition took place in Bordeaux, "The Great Wine Capitals" presented a report on "The key figures of global wine tourism". This is a very ambitious title, which actually raises great expectations.

"The Great Wine Capitals" launched in 2009 a study on enotourism of various producers, wine cellars, other operators involved in tourism activities in the nine regions of the network. They were contacted by telephone, email or Internet, and they were required to answer to an interview made up of open and closed questions. The participants in the study were 454 producers divided as follows: 102 from Cape Town, 102 from Bordeaux, 68 from Florence, 53 from Mendoza, 43 from Mainz-Rheinhessen, 34 from Bilbao-Rioja, 27 from Porto and 25 from San Francisco-Napa Valley.

As regards the profile of the tourists, it has been found that enotourism is a form of tourism essentially of proximity, since 25% are local visitors, 40% of the visitors are from

the same country, while 35% are foreign tourists.

At a global level, most of the tourists come from the European Union, the United States and Great Britain.

In the European Union, the most tourists come from the Netherlands, Germany and Belgium.

Two-thirds of the tourists are men, while one-third are women.

As regards the age of the visitors, 45% of them are aged between 36 and 55. Persons aged over 56 are also enotourism lovers.

They represent 30% of the total consumers. The remaining 25% represent persons aged between 18 and 35.

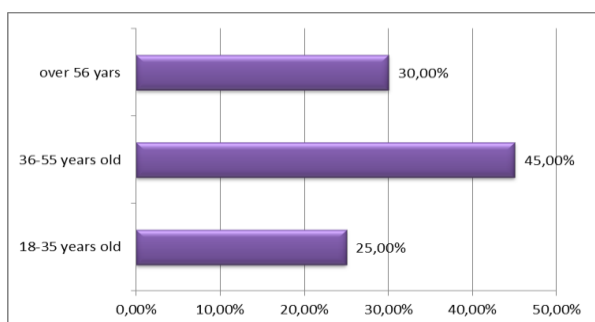


Fig.4. Age of visitors

59% of the producers state that they receive more than 2500 visitors annually.

They also confirm that the activity of enotourism is closely linked to vacations, 70% of the visitors traveling in the summer. Autumn, which is a very important season to wine growers, is preferred only by 15.3 % of the tourists, to the surprise of the researchers.

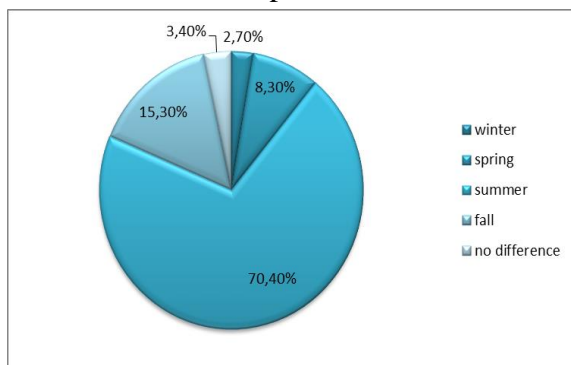


Fig.5. The highest number of visitor by seasons

The expenses per visitor oscillate between 30 and 200 US \$, depending on the region.

In Italy, in Florence more precisely, the average expense per visitor is the highest, namely about 200 US\$. In Napa Valley, 188 US \$ are spent on the average.

In opposition, the lowest amount of money is spent in Bilbao Rioja, Mainz and Cape Town, an average of 30, 40 and 41 US \$, respectively.

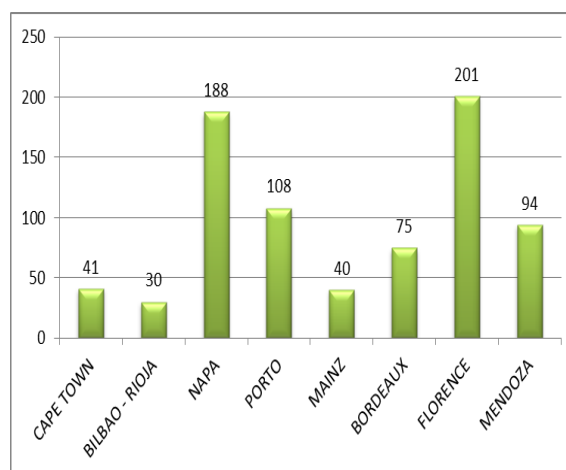


Fig.6. The estimate average expenses of each visitor (in US\$)

As regards the services provided to the tourists, the answer of the wine growers was the following: wine tasting represent 83%, guided tours 75% of the cases, visiting of bodegas and wine cellars 40%, providing accommodation services (hotels, chalets, cottages, etc) 29%, providing sport activities under various forms 20%, providing cultural activities 20%, organizing temporary exhibitions within the wine-making premises 17%, providing therapies based on the benefits of wine and viticulture 4%.

As regards the communication with the customers, the results seem to vary depending on the geographical area, two positions standing out: the “new world” area (America, South Africa, New Zealand) that mostly uses the socialization networks, the Internet and communication by e-mail; and the European area, where the traditional methods are preferred to communicate with the customers: tourism offices, wine fairs, booklets, tour-operators, etc.

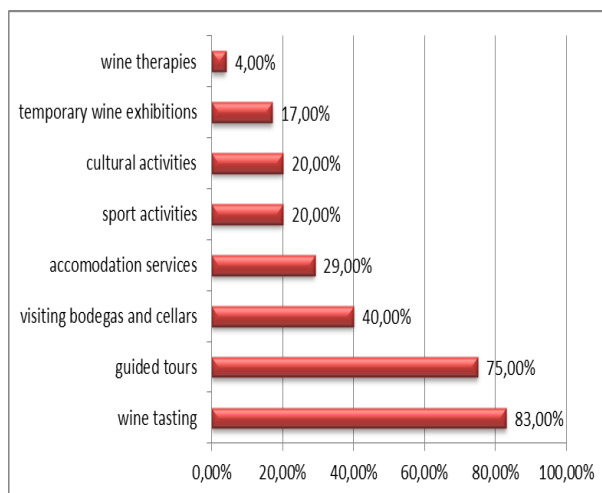


Fig.7. Service provided to the tourists

Analyzing the viability of wine tourism, the following conclusions can be drawn from this study: 78% of the wine producers' income is directly linked to the sale of their products, while the remaining 22% comes from various sources, including the wine tourism.

If their own tourism activities (except for the direct wine sales) are taken into consideration, the incomes can be divided as follows: incomes from accommodation 37%, incomes from restaurants 24%, incomes obtained from various tourist services, such as visiting wine cellars or vineyards, 20%, incomes from sales of goods and gadgets 9% , other incomes 10%.

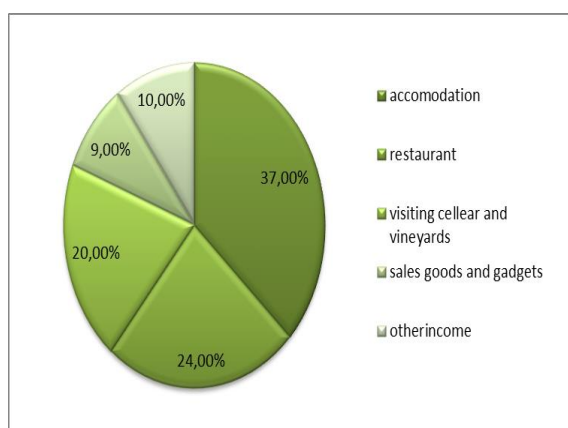


Fig.8. Incomes from tourist activity

For 74% of the owners, the wine tourism has contributed to the increase of wine sales for the last five years. The Argentineans are more enthusiastic in declaring the benefits of the

wine tourism related to the sales level (98% of them declare so). The Europeans are much more reserved and sometimes even disappointed.

When the wine-makers were asked what were the main benefits brought by enotourism, they answered: image improvement (69%), income increase (62%), a better positioning of the wine farm in the tourism market (54%), increase in the number of visitors (53%), increase in the number of workers (36%), social responsibility (24%).

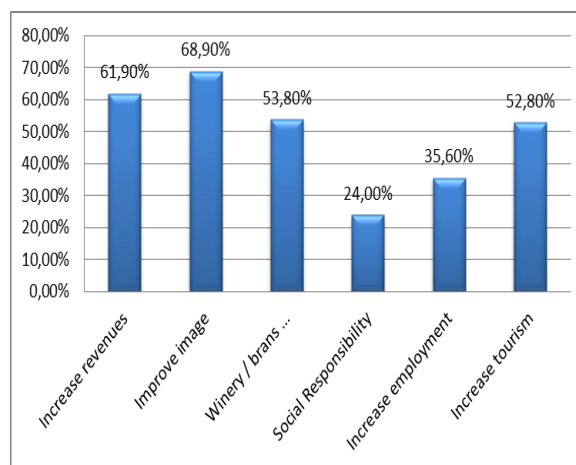


Fig.9. The most important benefits that wine tourism brings to winery and community

When the respondents were asked about the viability of the wine tourism, 68% of them declared that this tourism activity is financially viable.

The most enthusiastic answers came from Napa Valley, where 100% of the respondents considered that this form of tourism is a viable one.

In general, the participants from Spain and Germany declared that they were confident in enotourism.

The Americans consider the direct sales to the tourists as an opportunity to increase the profit margin.

The Europeans' optimism is particularly focused on improving infrastructure and services, training the personnel and establishing strategic partnerships that will certainly generate an increase in this activity.

## CONCLUSIONS

In general, the Romanian market cannot differ considerably from what happens on a global level in this industry.

There are some adjustments related to the particularities of this part of the world, but the Romanian enotourism is a local one. 80% of its tourists are Romanians. Bucharest and the large cities such as Braşov, Timișoara, Cluj, Iași, represent the main source of tourists.

As regards the foreign tourists, they come especially from the European Union, from countries as Germany, Italy, France, Belgium, the Netherlands, and from Asian countries as well (Japan and China).

As for the access, they use the means of road transport: cars and tourist means of transport (coaches and minibuses).

As regards the age of the tourists for Romania, the figures are similar to the European ones.

An increase is seen in the number of visiting women. In the future, women can become a strategic segment with an increasing potential, particularly of the premium segment.

Pioneering initiatives are arising, with women specific programmes. Over the last years, wine consumption has increased in women, this leading to creating fruitier wine assortments, with low alcohol content.

As for the accommodation, it is the 3-star rated accommodation establishments that are extensively used in Romania. Over the last years, there have been demands for 4-star rated hotel rooms, too.

Tourist farms and holiday dwellings are also used. The sums of money spent by tourists are difficult to quantify. In general, an average consumption of 60-80 Euros per person is estimated. This amount represents the expenses for accommodation, meal and visits to wine-cellars.

The trip average duration is of 2.6 days, what means in general the week-ends or the long-week-end trips.

The most attractive seasons are summer, the time of holidays, and autumn when grape harvest begins.

In Romania, the wine tourism is generally made in groups formed by friends, workmates or family. The group size is usually of 3 to 5 persons. In the case of foreign tourists, groups are usually larger, of 20 persons on the average.

The most frequent activities are closely linked to the culinary and wine culture in the region: visiting wine cellars, tasting of wines and tasting of local cuisine dishes.

Other complementary activities, such as vineyard tours or visiting specific museums play a much less important role and are, in the same time, activities that are rarely provided.

The most visited vineyards are those located in the Curvature Sub-Carpathians (the Dealu Mare vineyard) because of their proximity to Bucharest and to the main tourist routes in Romania; the Murfatlar vineyard, due to being located close to the Black Sea Coast; the Cotnari vineyard, due to the old wine cellars dating back to the reign of Prince Stefan cel Mare (Stephen the Great), in the 15th century; the wine cellars and the castle of Jidvei, thanks to the good name of the white wines made here.

As the distance between the residence of the tourists and the tourist destinations is small, in general visits are multiple, which means that the great majority of visitors repeat their visits.

As a rule, tourists make online reservations or by phone, directly at the destination place.

The travel agencies do not play a significant role; they usually step in only when group visits are organized.

The recommendations made by the family or friends are some of the most frequent sources of information.

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## THE COMPETITIVENESS OF HIGH VALUE ADDED AGRICULTURE AND MAJOR FACTORS OF ITS INCREASING: THE CASE OF THE REPUBLIC OF MOLDOVA

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### Abstract

*The key-factors of competitiveness of high value added agriculture of the Republic of Moldova and their great importance in increasing the national wealth of the country are analyzed in this paper. The wealth of a country in terms of competitiveness represents the level in which the country, in conditions of the market economy, produces goods and services to satisfy the global market requirements, thus increasing the real income of the citizens of the country. In this context, factors which have an indispensable contribution in increasing the competitiveness of the high value agriculture are: exports, Foreign Direct Investments, innovations, the role of the state institutions, the business climate and others. By the fact how the state contributes by its agricultural policies to attract FDI, to increase exports, to apply innovations and high technologies in the process of obtaining high value agricultural products depends the competitiveness of the agricultural sector of the country.*

**Key words:** *agricultural policies, agricultural sector, competitiveness, exports, FDI, key-factors, high technologies*

### INTRODUCTION

Competitiveness of a country can be defined as the ability of the country to create welfare (AIGINGER, 2006). Other authors affirm that competitiveness is the capacity to sell goods and services at the right moment of time, place and in a favourable way for foreign buyers, at prices which are equal or smaller than those offered by other potential suppliers, earning at least the opportunity cost of the used resources (SHARPLES, MILHAM, 1990).

The vagueness of the term, the theories behind it or the lack of any theoretical background induces researchers all over the world to continue researches in the field of competitiveness.

The competitiveness of the agricultural sector of Moldova depends on many factors, among them we could mention: exports, productivity of agricultural crops, quality of products, FDI attracted in agriculture, state policy in agriculture etc.

There are many countries producing and exporting agricultural products to the International market.

The products differ from one country to another.

Only countries offering products that correspond to the requirements of the consumers are competitive on the international agricultural market.

The consumers, nowadays, are more cautious on health and nutrition; As a result, the world has changed its attention towards high value agricultural products with high quality and acceptable prices.

The most high value export products which play an important role in increasing the national welfare of Moldova are the horticultural products: fruits and vegetables. The significant question to be addressed is how to increase the competitiveness of fruits and vegetables produced in Moldova to ensure a stable marketplace and to satisfy the customers' requirements on quality and price.

In general, Moldova has very good conditions to grow high value added agricultural commodities. The total area of plantations of fruits in 2011 was 119 thousand hectares. In addition potatoes, vegetables, and melons and gourd are cultivated on 72.6 thousand hectares. Among the most important fruits are

apples, covering approximately 65 thousands hectares, 40 thousands hectares of plums and cherries. The annual production of fruits, nuts and berries in 2012 diminished with about 2 thousand tones in comparison with the previous years and constituted 376 thousand tones.

A similar trend is registered for the annual production of vegetables: due to unfavourable weather conditions it diminished by 28% and reached only 231 thousand tones.

There is a big competitiveness on the International Market of fruits and vegetables from the neighbour countries, as well as there are many problems regarding the marketplace of high value added agricultural products of Moldova.

In this context, the paper presents an analysis of the major factors influencing the competitiveness of high value agriculture of Moldova and especially the production of fruits and vegetables.

## MATERIALS AND METHODS

The research has been conducted on the basis of the official statistics collected from the National Bureau of Statistics, the National Bank of Moldova, and the Minister of Agriculture and the Food Industry of Moldova.

The following indicators which characterise the production of high value added agricultural products of Moldova have been investigated: the global agriculture indices, the global agriculture production of fruits and vegetables, the exports/imports of fruits and vegetables, the GDP of Moldova and others.

## RESULTS AND DISCUSSIONS

The agricultural sector of Moldova in 2012 registered a decreasing of the total agricultural production in comparison with 2011 with 22,4 % (figure 1). The decreasing of the global agricultural production was determined by the accentuated decrease of the vegetal production – with 32,6%, as well as by the decrease of the livestock production with 1,1%. A significant negative impact on

vegetal production has played the harvest reduction of grain crops and leguminous crops with 51.1% (up to 1 mil.204 thousand tones). Thus, the wheat harvest decreased with 37.8% (up to 494 thousand tones), the maize harvest decreased with 61% (up to 571 thousand tones), the potatoes harvest decreased with 48.1% (up to 182 thousand tones), the vegetable harvest decreased with 36.7% (up to 231 thousand tones), the sunflower harvest decreased with 30.9% (up to 295 thousand tones), the harvest of grapes decreased with 15.3% (up to 505 thousand tones). Average production per hectare of maize decreased 2.7 times, of soya, potatoes, and sunflower decreased 1.6 times, of barley decreased 1.5 times, of vegetables decreased by 1.4 times. Approximately 32% of global agricultural output returns to corporate farms, 17% - peasant farms, while 51% - to rural households.

This difficult situation in agriculture was caused by the drought from the summer 2012. A similar situation was registered in 2007 (Figure 1).

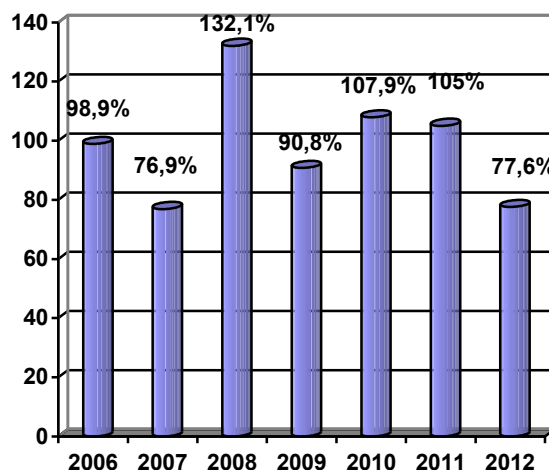


Figure 1. The indices of the agricultural production in the Republic of Moldova during the period 2006-2012 (the previous year =100%)

The drought was caused by high temperatures in June and July which were with 3,7-5,7°C higher than the annual averages, and the precipitations were only 15-60 % from the annual average. The number of days with high temperature in 2012 (more than 30°C) constituted 39-62 days, compared to 8-27 by norm. Unfavourable situation regarding the

climate conditions in 2012, caused the diminution of vegetal production, especially of high value agricultural products.

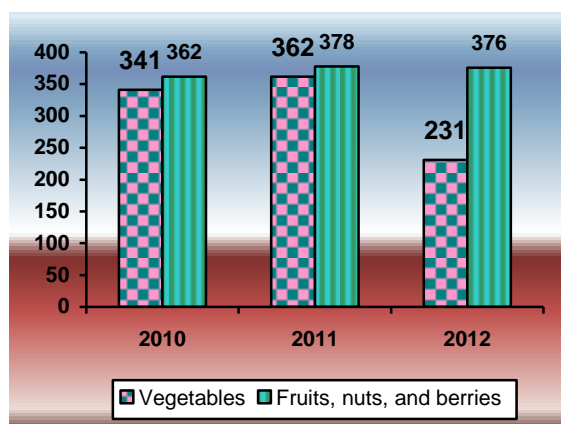


Figure 2. The dynamics of production of vegetables and fruits, nuts and berries during 2010-2012 (thousand tonnes)

The dynamics of the production of vegetables and fruits, nuts and berries during 2010-2012 (BNS, 2012), reveals that the production of vegetables in 2012 constituted 231 thousand tonnes, a diminishing by 36% compared to 2011, when this indicator was 362 thousand tonnes. The production of fruits, nuts and berries has been not affected seriously by drought, being by 1% less than in the previous year (Figure 2).

As it has been already mentioned, one of the factors which influence the production of vegetables, fruits, nuts and berries are the weather conditions. But if we want to develop competitive high value agricultural products we must analyze all the factors which influence the developing of this field.

Exports are an important factor determining the competitiveness of the economy of one country. It is very important to determine the national economy sectors where the state has comparative advantages in comparison with the neighbour countries. This will give the possibility to the country to export those goods where were registered comparative advantage and to import the goods which are more expensive to produce in the country than to import.

There were made many studies to determine the comparative advantage of a country. One of the methods to determine comparative advantage is the LAFAY (1992) index giving

the possibility to analyse the comparative advantage of a country in the export of goods, comparing the trade balance of the analyzed good (group of goods) with the general level of trade balance (STRATAN et al., 2011).

$$LF_i = \left( \frac{X_i - M_i}{X_i + M_i} - \frac{\sum_{i=1}^n X_i - M_i}{\sum_{i=1}^n X_i + M_i} \right) * \frac{X_i + M_i}{\sum_{i=1}^n X_i + M_i} * 100, i = 1, \dots, n \quad (1)$$

Where:

LF<sub>i</sub> – the index of specialisation;

X<sub>i</sub> – the export of good I;

M<sub>i</sub> – the import of good i.

The index gives the possibility to analyze the influence of the groups of goods to normalize the trade balance. If there is registered a positive value of this index, this means that the country has a comparative advantage for the analysed group of goods, otherwise the country will have a disadvantage.

Analyzing the comparative advantage of the exported goods from Republic of Moldova during 2009-2011 (based on the Lafay index) we can mention that the biggest comparative advantage was registered for clothing and accessories, which in 2011 constituted 2,51, which represents a diminution in comparison with 2010 with 0,48, and with 0,99 compared to 2009.

If to mention agricultural products, the biggest comparative advantage was registered for vegetables and fruits. In 2011 the Lafay index for fruits and vegetables was 2,34, which is less with 0.4 compared to 2010, when the biggest Lafay index from the analyzed period has been registered. According to the information presented in the table 1, Republic of Moldova has a comparative advantage for drinks - 1,66; oilseeds and oil fruits - 1,8; cereals and products based on cereals - 0,56; fixed vegetable fats and oils refined or fractioned - 0,77; furniture - 0,57.

Although the Republic of Moldova has a comparative advantage for vegetables and fruits, there are problems regarding the development of this sector and the competitiveness of these products on the local and International Market.

There is a necessity of market diversification, but yet, were not registered too big successes

in this area. The state by its agricultural policies must contribute to finding solutions regarding the problems of marketplace of high value added agricultural products.

Table 1. The comparative advantage analyses of the exported goods from Republic of Moldova during 2009-2011 (based on the Lafay index)

Goods	Years			Deviations of 2011 with	
	2009	2010	2011	2009	2010
Clothing and accessories	3,5	2,99	2,51	-0,99	-0,48
<b>Vegetables and fruits</b>	<b>2,6</b>	<b>2,74</b>	<b>2,34</b>	<b>-0,26</b>	<b>-0,4</b>
Drinks	2,5	2,36	1,66	-0,84	-0,7
Oilseeds and oil fruits	1,1	1,19	1,80	+0,7	+0,61
Cereals and products based on cereals	0,9	0,84	0,56	-0,34	-0,28
Fixed vegetable fats and oils refined or fractioned	0,8	0,66	0,77	-0,03	+0,11
Furniture	0,2	0,27	0,57	+0,37	+0,3
Mineral fuels, lubricants	-4,3	-4,15	-4,6	X	X
Chemical products	-1,8	-1,65	-1,52	X	X
Machines and transport equipments	-1,3	-1,53	-1,43	X	X

One of the factors influencing in a negative way the competitiveness of the local production of vegetables and fruits is the import of fruits from other countries. In 2010 in Moldova were imported from other countries the following agricultural products:

- Bananas – the main supplier is Ecuador (82 % of volume), Costa-Rica (7%), Panama (6%), Columbia (5%);
- Tangerines and clementines imported from Turkey (59%), Greece (27%) and Argentina (6%);
- Oranges – delivered from Turkey (43%), Greece (21%), Egypt (17%) and South Africa (10%);
- Lemons – delivered from Turkey (78%) and Argentina (17%);
- Grapefruits – Turkey (72%), China (12%), South Africa (12%);
- Kiwi imported from Greece (94 %).

Analyzing the volume of imported fruits (Greece, Turkey, Ecuador) on the local market of Moldova we can notice that this factor will not increase the local demand of fruits but it will contribute at the decreasing of the capacity of selling of the local products (Figure 3).

Traditionally, apples are the most exported agricultural products from Moldova. Russia is the biggest market for Moldovan apples. In

2010 the exports to Russia represented 93% of total exports. Belarus is another big market, where were exported 3-5 % of total exports.

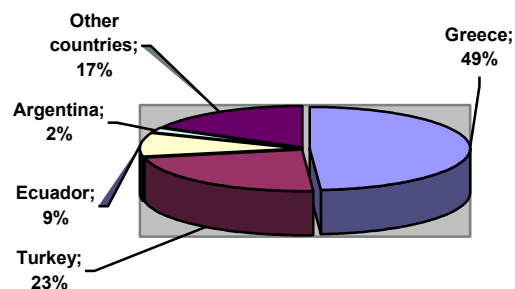


Figure 3. The main exporters of fruits to Moldova (2010)

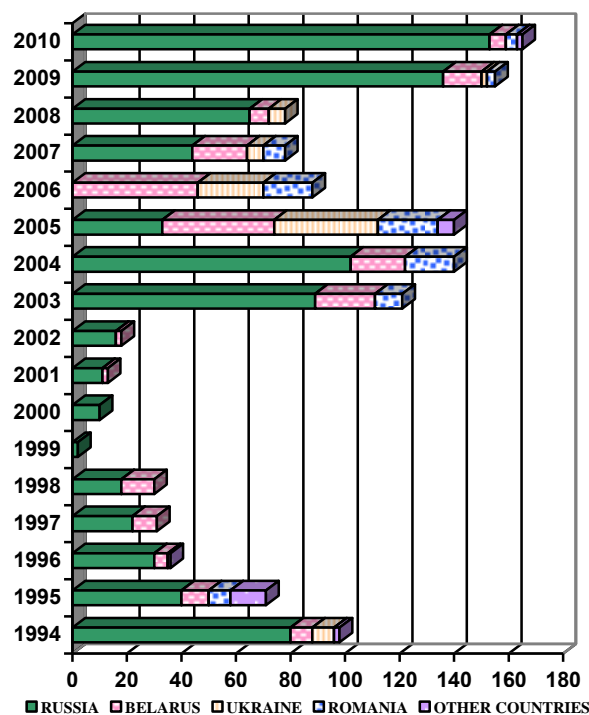


Figure 4. The structure of the Moldovan fresh apple exports (thousand tones)

An increasing of the exports of apples was registered in Romania during 2003-2006, reaching up to 20%.

However, once Romania joined the EU in 2007 and adopted EU custom tariffs, the Moldovan exports registered a sharp decrease. (LEAHU et al, 2011).

So far, Moldova was the biggest fruit exporter in Russia (Figure 4), but once this country joined WTO in 2012, the Moldovan producers of fruits (especially of apples) registered

difficulties at the export of fruits in this country. According to the producers of apples, export to Russia decreased in 2012 with 30%, in comparison with 2011. The biggest competitor of Moldova on the Russian Market is Poland. The supply of apples on the Russian market from Poland increased by 2,6 times, reaching 128 thousand tones, which gave the possibility to Poland to become a leader on the market, in comparison with the same period of the last year when Poland was situated on the third place.

The biggest problem for local producers of fruits from Moldova is the differences of price and quality. The agricultural products from Moldova will be competitive on the International Market when they will reach high level of quality and good prices.

Analyzing the situation of vegetables produced in Moldova we can state that these are not competitive on the export markets and faces a big competitiveness on the local market out of the season. The most imported product in 2010 was the potatoes from Romania and Poland. Also such products like: tomatoes, carrots, onions and are imported every year.

The biggest import countries in Moldova for the listed vegetables are:

- Tomatoes – imported from Turkey (83%), Syria (12%), Spain (2%);
- Carrots- Poland (70%), Belarus (12%), Turkey (12%);
- Cucumbers – Turkey (82%), Syria (7%), Romania (5%);
- Onion – Poland (28%), Egypt (25%); Netherlands (15%), Turkey (12%);
- Garlic – China (99%);
- Pepper – Turkey (57%), Netherlands (15%) (Cipriciuc et al., 2011).

Moldova imports a big quantity of vegetables from other countries especially in the period out of season. In Moldova the harvest season of vegetables is from June till October. The biggest problems for agricultural producers are the high costs at heating the greenhouses, Also a big problem for the local producers is the difficult conditions of storing the production. There must be created conditions to storage the potatoes, carrots, onion, etc.

If the local producers want to develop high value agriculture they must understand the requirements of the modern customers and to improve the local production of vegetables and fruits, the quality of products, the packaging of fruits and vegetables to satisfy the clients requirements with high value added products all the year round.

To satisfy the mentioned above conditions in developing high value added agriculture there is necessary to apply Foreign Direct Investments, which is an important factor at increasing the competitiveness of the state (GARRELLI, 2008).

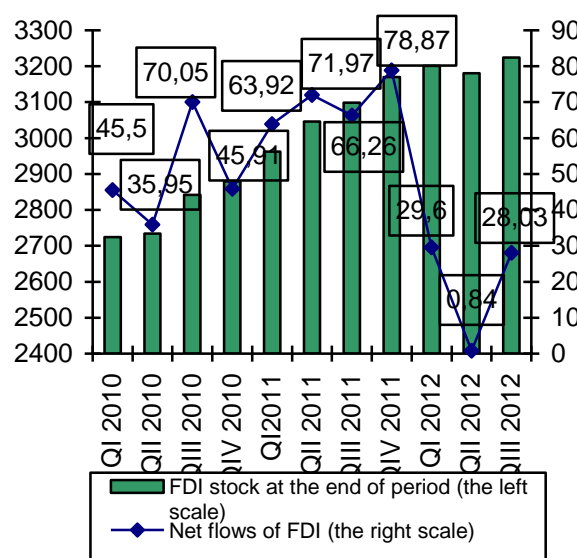


Figure 5. The dynamics of FDI in economy of the Republic of Moldova during 2010-2012 (mil. USD)

The dynamics of FDI in economy of Republic of Moldova during 2010-2012 (Figure 5) reveals that the FDI stock during the analyzed period increased from 2724.58 mln. USD in the first quarter of 2010 to 3224.53 mln. USD in the third quarter of 2012. The dynamics of the net flows of FDI in the economy of Moldova is very irregular. The highest flow of net FDI was registered in the fourth quarter of 2011, when the FDI flow constituted 78,87 mln. USD, which is more than in the fourth quarter of 2010 with 32.96 mln. USD. In 2012 a decreasing of net flow of FDI in the economy of Moldova was registered, which constituted in the first quarter 29,6 mln. USD, which is less than in the first quarter of 2011 with 34.32 mln USD. Also we can mention

that in the second quarter of 2012 was registered the lowest net FDI flow from the analysed period which constituted 0.84 mln. USD, which is less than in the same period of the previous year with 71,13 mln. USD. In the third quarter of 2012 a small increase of net FDI was registered which constituted 28.03 mln. USD, but the net flows of FDI in the economy of Republic of Moldova remain still low. The state must take measures to increase the FDI flows in the Republic of Moldova, because this is an essential factor of economic growth of the state and also of the increasing the competitiveness of the branches of the national economy (BNM, 2012).

Table 2. The structure of FDI by sectors of national economy of Moldova during 2006-2012

Years National economy sectors	2006	2009	2012	Deviations of 2012 with	
				2006	2009
Financial activities	10.7%	25.1%	28.7%	+18.0%	+3.6%
Processing industry	24.2%	22.6%	21.4%	-2.8%	-1.2%
Wholesale	25.1%	20.5%	16.9%	-8.2%	-3.6%
Real Estate	9.5%	8.8%	11.4%	+1.9%	+2.6%
Transports, communications	11%	4.8%	5.4%	-5.6%	+0.6%
Heating, energy, gas, water	16.4%	12.6%	9.6%	-6.8%	-3.0%
Hotels, restaurants	1.2%	2.1%	1.9%	+0.7%	-0.2%
<b>Agriculture</b>	<b>1%</b>	<b>1.1%</b>	<b>1.3%</b>	<b>+0.3%</b>	<b>+0.2%</b>
Others	0.9%	2.4%	3.4%	+2.5%	+1.0%
TOTAL	100%	100%	100%	X	X

Analyzing the structure of FDI by sectors of national economy of Moldova during 2006-2012 (table 2), we can mention that financial sector is the most attractive sector for foreign investors, the rate of FDI in 2012 was 28,7%, which represents an increasing with 3.6% in comparison with 2009. Other important sectors for FDI are: processing industry – 21.4%; wholesale – 16,9 %; real estate transactions – 11.4 %; and others. In agrarian sector the rate of FDI in 2012 constituted only 1,3%, which is insignificant for developing a high value added agriculture. Applying FDI in development of high value agriculture will contribute to modernization of the park of machinery and tractors, will contribute to increase the productivity of agricultural

products, to achieve quality indices and to be competitive on the International Market.

## CONCLUSIONS

The Republic of Moldova has comparative advantage in growing fruits and vegetables as high value added products, but it faces problems in this area. Among the problems are the import of fruits and vegetables from other countries, the quality of exported products, the lack of high technologies in producing high value added products, the problem of finding a stable marketplace and others. Analyzing the situation of vegetables produced in Moldova we can state that these are not competitive on the export markets and faces a big competitiveness on the local market out of the season because the local producers are specialized to produce only in open field and there are a few of the producers which produce all the year around in greenhouses. Another big problem for the local producers is difficult conditions of storing the production. There must be created conditions to storage high value products all the year round. The decreasing of FDI in the economy of the Republic of Moldova, especially the small flow of FDI in agriculture influences the competitiveness of this sector and this is why we do not have technological advantage in the agrarian sector.

On the one hand, to develop high value added agriculture requires from the local producers to focus on increasing the quality of products, to supply products well packed, and at good prices but on the other hand, the state by its agricultural policies must contribute at opening new markets for agricultural products, elaboration of new policies for attracting FDI, creating conditions for a sustainable development of high value added agriculture.

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## AGRI-FOOD TRADE - A PATH TO AGRICULTURAL DEVELOPMENT OF MOLDOVA

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### **Abstract**

*In this study we try to assess the progress in the development of the agricultural sector of Moldova. As indicator of the successful/unsuccessful development of the agri-food sector may serve the foreign trade activity. Thus, in the given research is analyzed the changes in the agri-food trade structure during 2007-2011, the competitiveness of the agricultural sector and the pattern trade flows. For this aim was computed Gruber-Lloyd index for evaluating the intra-industrial trade in this period, and RTA index for inter industrial trade. As well, some policy measures necessary for further integration will be discussed.*

**Key words:** agricultural sector, agri-food trade, GL index, RTA index, Republic of Moldova

### **INTRODUCTION**

For Moldova, the transition to a market economy led to various changes in the ownership relations, the development of the market infrastructure, investments process and others. During 2009, Moldova registered 7,7% decrease in its GDP, 24% decrease in exports, and 43% decrease in FDI as a result of the global financial crisis.

Strong differences in the level of development in the countries with former planned economy are observed after over twenty years of transition towards market economy. This is related to the level of economic and social development, as well as to the level of integration of these countries in the world markets. Many researchers appreciate the level of integration of these countries in the world economy (Bergschmidt, Hartmann 1998, Levkovich, Hockmann 2007). In these works are established the level of competitiveness of one or another branch or country. Nevertheless, it is not given the answer in which measure these results should be related to the amount of utilized branches (countries) advantages of labour division, or how much these results are determined by the successfulness (unsuccessfulness) of the transition process (Levkovich, Hockmann 2007).

The aim of this research is to appreciate the progress of the transition process of the agri-food sector in the context of the Moldova's trade with agro-food products and to review which economic and politic measures that contributes to the economic integration of the country in the world economy should be undertaken. As the object of the analysis is the foreign trade, we will try to determine if it is enough the specialization in the area of international trade as a result of the "unstable" trade policy of Moldova and its partners (unfavourable trade policy of its partners) or if the reason is the too indecisive transition reforms.

### **MATERIALS AND METHODS**

This research will analyze some indicators of inter and intra industry trade. For the appreciation of the country's comparative advantage (or a particular sector) Bela Balassa (Balassa 1965) elaborated the method that reveals the "Revealed Comparative advantages" (RCA). This method is based on the assumption that the implicit comparative advantages find their reflection directly in the trade flows. According to Balassa, comparative advantages are manifested in relatively high shares of a particular product/sector in the structure of exports. In

the same time the relative limitations are reflected through low shares of a product/sector.

The RCA index or Balassa index is an indicator that characterizes the ratio of a commodity  $i$  in the total amount of country's exports and the share of this commodity in the total amount of world's exports. This index is based on observed trade patterns. This index is defined as:

$$B = (X_{ij}/X_{it}) / (X_{nj}/X_{nt}), \quad (1)$$

Where:  $X$  – export;  $i$  – a country;  $j$  – a commodity;  $t$  – a set of commodities;  $n$  – a set of countries.

If  $B > 1$ , then a comparative advantage is revealed. The standard deviation of this index across products can be used as measure of the comparative importance of inter-industry specialization or intra-industry trade.

An alternative specialization of revealed comparative advantage was developed by Vollrath (Vollrath 1991) and was called Relative Trade Advantage (RTA). The RTA index is calculated as the difference between relative export advantage (RXA) or Balassa index and relative import advantage (RMA):

$$RTA = RXA - RMA \quad (2)$$

Where,  $RXA = B = (X_{ij}/X_{it}) / (X_{nj}/X_{nt})$ ;

$RMA = (M_{ij}/M_{it}) / (M_{nj}/M_{nt})$ ;

$M$  – import.

The positive value of RTA indicates comparative trade advantages, while negative value indicates comparative trade disadvantages. When RTA is greater than zero, then a comparative advantage is revealed, which means that a sector of the country is relatively more competitive in terms of trade.

For assessing the intra industry trade was developed some indicators, from which the most used is the Grubel-Lloyd index (GL) (Grubel, Lloyd 1975). According to it, intra industry trade is determined as the trade between countries, where the costs of exports of particular sector is corresponding to the costs of imports of same sector. The GL index determines the share of intra industry trade in the total amount of exports of a particular sector. For computing this index is needed to

sum particular trade flows. The index is changing in values from 0 to 100.

$$GL_i = \frac{[(X_i + M_i) - |X_i - M_i|]}{X_i + M_i} \times 100\%, \quad (3)$$

Where,  $GL_i$  – index of intra industry trade;

$X_i$  – value of export in industry  $i$ ;

$M_i$  – value of import in industry  $i$ ;

$X_i + M_i$  – total value of trade;

$|X_i - M_i|$  – trade balance of industry  $i$ .

The closer the GL value is to 100, the more important is intra industrial trade, and the closer is GL value to 0 the more important is inter-industry trade. In order to establish an average level of intra-industry trade, Grubel and Lloyd proposed the weighted index to arrive at an overall measure of intra industry trade.

The traditional measure of intra industry trade is used and the Grubel Lloyd index is calculated as:

$$GL_i = 1 - \frac{|X_i - M_i|}{(X_i + M_i)} \quad (4)$$

Where,  $X_i$  is the export in a certain line of goods and  $M_i$  is the import in the same commodity group.

The value of  $GL_i$  index can vary between 0 and 1. The higher the value of this index, then the higher is the level of intra industrial trade.

For the appreciation of agri food trade indicators were used data from National Bureau of Statistics and COMTRADE according to the harmonized sections of commodities HS 2002, for the years 2007-2011. In the given research were analyzed 24 groups of commodities from the agri-food sector. From these, groups 01-15 are agricultural production, groups 16-24 – foodstuffs. As well, is analyzed the agri-food trade by groups of countries: EU27, CIS, others.

## RESULTS AND DISCUSSIONS

A central place in the country's economy belongs to the agri-food sector. It represents 30% of GDP, 37% of exports and 40% of population is employed in this sector; but only 2,5% of total FDI.

Economic transformations from the beginning of the 90s lead to negative processes in country's agro-industrial complex that caused

changes in the proportions between agriculture and industry, as well as the decrease of the amount of agricultural production.

Table 1. Agri-food sector in the national economy

	2007	2008	2009	2010	2011
Share of agricultural sector in GDP, %	10.0	8.8	8.5	12	12.2
Share of population employed in the agricultural sector, %	32.7	31	28.2	27.5	27.5
Gross Agricultural Output (GAO), mio lei	9432.5	12460.3	11259.5	12146.7	12757.8
Agri food exports, mio US dollars	456750	525430	537680	640302	733522
Agri food imports, mio US dollars	424759	595483	488720	555169	652717
Share of agri food exports in the total amount of exports, %	34.08	33.02	41.9	41.5	33.08
Share of agri food imports in the total amount of imports, %	11.5	12.05	14.9	14.4	12.5

Source: based on data from National Bureau of Statistics

Another negative consequence is related to the proportions of distribution between the sector of crop production and livestock.

Table 2. Gross Agricultural Output, mio lei

	2007	2008	2009	2010	2011
Crop production	7491	10600	7861	13616	15751
Livestock	4509	5519	4987	5786	6347
Gross Agricultural output	1282.5	16503	13300	19873	22619

Source: based on data from National Bureau of Statistics

As a result of bankruptcy most livestock complexes were closed and the share of livestock sector is currently low comparing to its level at the beginning of 90s.

In the agricultural output largest share belongs to crop production (about 70%) namely, cereals (27%), potatoes and vegetables (19%), fruits and technical crops (14%), and grape (about 30%). The largest share in country's exports belongs to foodstuffs, alcoholic drinks, and tobacco (about 45%), followed by vegetal products as sunflower seeds, walnuts, fruits and cereal crops (about 40%), animal and vegetal fats and oil (8%) and livestock (2%).

Agri-food exports of Moldova are dominated by the high share of a number of commodities (commodity groups) and mainly: the highest share belongs to edible fruits and nuts – about 20% in 2011. Second place is for oil seeds and oleaginous fruits with a share of 19%, and after are placed beverages, spirits and vinegar – about 17%. A smaller share have the commodity group of animal or vegetable fats and oils and preparations of vegetables, fruit, nuts or other parts of plants, with a share of 8% and 7%. The amount of crop production in Moldova is influenced by weather conditions. Thus crop production is leader of country's structure of exports, which leads to a certain instability in the amount of cash payments and as result an unstable balance of payments.

As well, should be mentioned that in 2011 from the total amount of Moldavian agri-food exports about 80% were agricultural products (01-15 HS commodity group). In the same time, the share of food processing industry products is only 20%, which indicates an unused potential for increasing the competitiveness of Moldavian agri-food sector.

If in country's agri-food exports the largest share (other 50%) belongs to 3 main groups of commodities (beverages, oil seeds, edible fruits), then Moldova's agri-food imports are more diversified (Fig. 2).

During 2007-2011 the structure of agri-food imports did not changed significantly.

Exception was for imports of sugar which increased by 3 times, edible fruits and edible vegetables increased by 2 times, preparations of cereals (with 94%), fats and oils (56%) and tobacco (40%).

A major condition for a country's economic development and constant growth is the existence of a favourable policy framework. Unfortunately, this condition was not really characteristic for the case of Moldova.

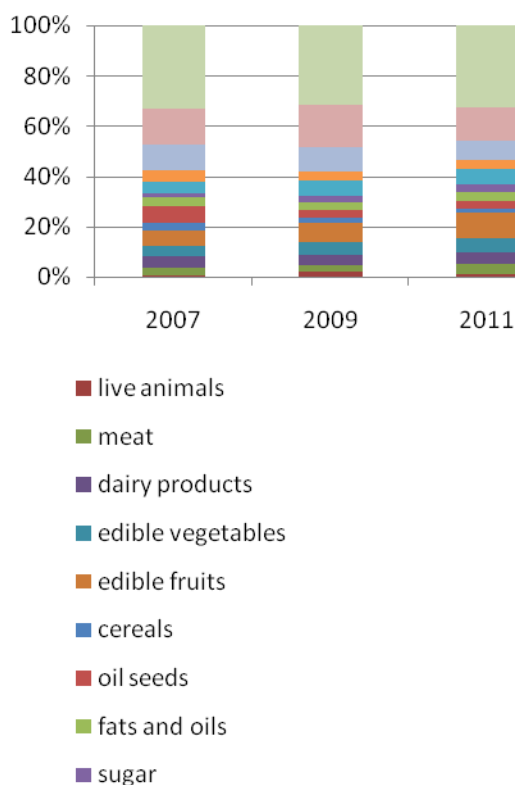


Fig. 1. Moldova's imports structure of agri food products for selected years 2007-2011

Nevertheless, a certain improvement in the implementation of some economic policies, and particularly agricultural and trade policy was noticed. One important step was the redirection of Moldavian exports towards EU countries.

An important step for Moldova's trade liberalization and its trade policy was joining the WTO in 2001. Another important movement in the Moldovan trade policy was accession at the Stability Pact for South-East Europe which offered some additional opportunities for its exports.

Another way of trade stimulation/intensification between Moldova and EU is the Free Trade Agreement representing an efficient instrument for reaching its strategic objectives of future integration. Because of the importance of trade and investments for

the economic progress, a free trade zone will offer considerable economic earnings, with the condition to be introduced in an adequate economic framework by each company or individual are free to value the available business opportunities. The key elements of a Free Trade Agreement are the dynamic effects which results from the changes in the economic growth because of the impact of big foreign investments. For countries in transition these investments are particularly important, mainly for the CIS countries where were invested only a small amount of direct investments. Therefore, in the opinion of many authors, Free Trade Agreement will create favourable conditions for the investments as well as will intensify the trade relations with the European partners (Bartosova 2008).

A deep and comprehensive free trade agreement supposes not only the elimination of tariffs on bilateral trade in goods, but also provides regulations in various selected areas (competition policy, state aid etc.) for market integration. The implementation of such a free trade agreement will cause major changes for Moldova. Some Moldavian export products are exempt from EU import tariffs and quotas, but in the same time there are charged high import tariffs for agricultural imports in the country. Most trade barriers are now non tariff measures such as trade-related transaction costs, different national regulations that increase the cost of market entry and others. An eventual FTA should reduce such non-traditional trade barriers (Perju et.al 2010).

From 1<sup>st</sup> of January 2006, Moldova is already beneficiating from the General System of Preferences (GSP+) granted by the EU. As well, in 2008 Moldova obtained a larger access to the EU market through Autonomous Trade Preferences (ATP), achieving free trade advantage for some important products for country's economy as alcoholic drinks, a number of agricultural products, sugar and others.

The geographic structure of agri-food trade is presented in the following two charts.

From 2008 about half of Moldavian exports were to EU countries and almost all the other half to CIS countries.

Concerning the agricultural exports, mostly food and live animals, beverages and tobacco have a smaller share in EU than in CIS countries.

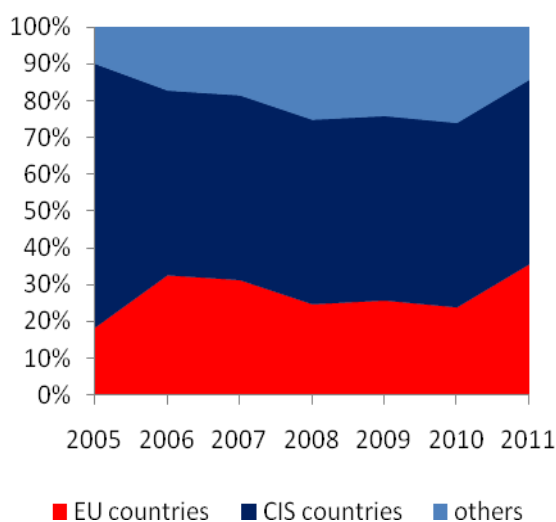


Fig.2. Moldova's agri-food exports by main trading partners, 2005-2011

This might be explained through Moldova's incapacity of facing the demanding sanitary standards (particularly in the case of meat and dairy products) imposed by EU. Romania had a large share in country's meat exports before joining the EU family. Concerning wine and other alcoholic products, the European market is highly competitive, which impose difficulties in terms of price and quality for Moldavian products entering on this market.

In general, the Moldova's agri-food trade in 2005-2011 had significantly increased. The agri-food exports to EU increased twice in this period, and in 2011 it was 274363 mio US dollars. Nevertheless, should be mentioned that a share of 58% from agri-food exports is for food processing industry, and 58% for agricultural products.

As well, is increasing the share of other countries, as Moldova's trade partners. Their share increased in the geographical structure of agri-food exports by three times in 2011 comparing to 2005 (Fig. 3). The share of these countries in imports is about 24% in the total agri-food imports of Moldova.

The amount of agri-food imports of Moldova as well increased in the analyzed period (in its total amount as well as for each commodity group), about two times. In the same time the geographical structure of agri-food imports did almost not changed.

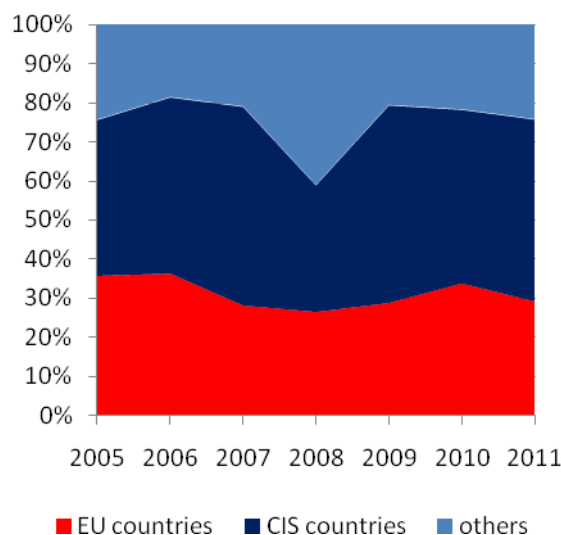


Fig. 3. Moldova's agri-food imports by main trading partners, 2005-2011

Thus, agri-food imports from EU countries increased twice in 2011 comparing to 2005, from CIS and other countries almost by three times.

The analysis of agri-food trade flows structure of Moldova demonstrates the need of products and regional diversification, fact which will increase the stability of exports earnings and will decrease the dependence of local producers and exporters from the policy of partner countries.

For agricultural producers a FTA would open opportunities in new large markets with high purchasing power and prices stability. In the same time, they will face with high competition in terms of supply prices and quality, as well as products promotion policies. A positive impact from a FTA would be an increase in FDI in the agricultural sector, modernization of agriculture and food processing industry.

The expansion of free trade facilities on exported products as alcoholic drinks, sugar, cereals, and animal products will increase, on long term, the share of trade to EU countries.

Nowadays, a large share of exports to EU is not entirely used. For promoting country's exports more important are the products with comparative advantage, especially in high value. These are wines and strong alcoholic beverages, fruits, vegetables, nuts, cereals and technical crops and agricultural ecologic products.

Nevertheless, Moldova's exports to EU and other developed countries face difficulties in terms of quality and food security, as well as low competitiveness. Concerning low competitiveness it includes the following: production factors (except land), economic potential and behaviour of producers, competitive market, demand factors (quality and variety of demanded products, quality standards), the connection with food processing industry (quality and price of inputs). Nowadays, local prices are much lower than those international, which affect the profitability in the agricultural sector. As result, income in the agricultural sector is lower than in other sectors, causing lower productivity and quality of products, not competitive on foreign markets (Perju et al 2010).

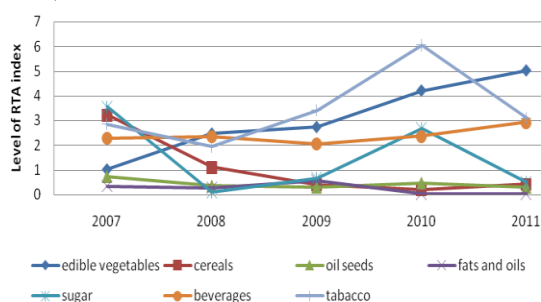


Fig. 4. The dynamics of RTA index on different groups of commodities, 2007-2011

If analyzing the level of revealed trade advantages index on commodity groups in the years 2007-2011 is possible to distinguish groups with products that have positive index value, products with diminishing value and products with unstable RTA values (in some years high value and others decreasing and again increasing). The given results are presented in Fig.5 for selected commodity groups.

The results revealed that in 2011, from the 24 agri-food products (commodity groups)

analyzed, 10 had positive values of RTA index, fact which demonstrates the relative trade advantages of Moldova on these commodities groups.

The higher levels of RTA index from agricultural products are noticed for dairy products (5.52) and for edible vegetables and certain roots and tubers (5.02). From food processing products highest values are for tobacco (3.09) and beverages (2.93).

A characteristic of revealed trade advantages for Moldavian agri-food products is the decrease of RTA values for some commodity groups (12,15,17,19) as: sugar from 3.5 in 2007 to 0.5 in 2011, fats and oils from 0.33 to 0.022, oil seeds from 0.7 to 0.3. Reasons for this decrease are many: old equipment and technologies, low efficiency of production, low products quality etc.

The level of intra industrial trade varies depending on commodity group or country partner. In general, the share of intra industrial trade varies from year to year and has not a clear tendency. In average the level of intra industrial trade is about 80%, which is indicating about a foreign trade with comparative advantages.

Both agricultural products and foodstuffs have high intensivity of intra industrial trade. For agricultural products is observed a slow decrease in the analyzed period from 99% to 72%. For foodstuffs the values of GL index is high and unstable but slowly increasing to 95% in 2011.

The increasing values of GL index (as for groups 02, 07, 17, 19, 20) is related to the high increase in imports of these products and decrease in exports. Such changes are good for consumers, because they obtain a higher variety of products. From the point of view of producers such an increase in the intra industrial trade is not related to an increase of earnings for them.

For the groups 4, 10, 12, 22 the values of the index is indicating to the utilization of advantages or receiving extra earnings of intra industrial specialization, due to concentration of production, decrease of production costs and increase of production efficiency.

Table 3. The level of intra industrial trade for different groups of agri-food products, percents 2007-2011

Commodity groups	2007	2008	2009	2010	2011
01 – Live animals	94.83	15.52	37.52	75.91	82.53
02 – Meat and edible meat offal	46.28	7.43	20.26	54.12	82.28
04 – Dairy products	50.21	54.85	37.15	34.25	40.41
07 – Edible vegetables and certain roots and tubers	24.78	25.40	28.04	45.03	78.46
08 – Edible fruits and nuts	47.16	51.39	48.59	51.42	53.59
10 – Cereals	95.34	61.76	24.91	24.07	24.59
12 – Oil seeds and oleaginous fruits	78.25	44.66	38.24	45.48	19.81
15 – Animal or vegetable fats and oils	44.93	49.85	48.09	57.69	48.87
Total agricultural production 01-15	99.20	99.14	81.76	81.04	72.28
17 – Sugars and sugar confectionery	47.41	97.03	58.42	60.27	86.61
19 – Preparations of cereals, flour, starch or milk, pastry cooks products	32.22	31.33	37.22	35.35	43.34
20 – Preparations of vegetables, fruit, nuts or other parts of plants	41.56	73.91	57.06	60.60	53.51
22- Beverages, spirits and vinegar	52.14	55.63	46.18	40.28	43.42
24 – Tobacco and manufactured tobacco substitutes	37.71	39.28	30.17	45.79	47.23
Total foodstuffs 16-24	92.88	94.85	98.04	99.09	95.91
Total agri-food products	95.93	96.85	92.12	89.55	85.69

Source: authors calculations based on COMTRADE data

In the market from the diversification of production consumers are benefitting.

## CONCLUSIONS

The level of RTA index is indicating to the competitiveness of some commodities groups on international markets as: from agricultural products are noticed for dairy products (5.52) and for edible vegetables and certain roots and tubers (5.02). From food processing products highest values are for tobacco (3.09) and beverages (2.93).

In general, agricultural products in the structure of agri-food exports have a share of 65%, and food stuffs – about 35%.

Nowadays, the comparative advantages of Moldova are not fully used. This is explained by decreasing values of RTA index for some commodities groups (12, 15, 17, 19). Prices and trade liberalization, low state support is just some of the reason for this situation. Another important fact is the lack of long term funding that is affecting not only particular sub sectors but the agri-food sector as a whole.

One important step in the development of the agricultural sector of Moldova is the reform of the whole agro-industrial complex. The changeable and not continuous agricultural trade policies are those that determine the position of the country on international markets of agri-food products.

At microeconomic level, an important direction for increasing the competitiveness of agri-food products will be by increasing the efficiency of production, modernization of food processing industry, increasing the quality of production. As well, the investment climate, state support programs, liberalization of trade and political stability will create favourable conditions for the activity of agricultural producers and food processing firms on international market.

For agricultural producers a FTA would open opportunities in new large markets with high purchasing power and prices stability. In the same time, they will face with high competition in terms of supply prices and quality, as well as products promotion policies. A positive impact from a FTA would be an increase in FDI in the agricultural sector, modernization of agriculture and food processing industry.

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## RURAL AREA – AN UNTAPPED OPPORTUNITY FOR ENTREPRENEURSHIP DEVELOPMENT ?

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### Abstract

Romanian rural area faces a violent lack of entrepreneurship initiatives, which can generate negative economic and social phenomena, with medium and long-term effects, such as: the decreased living standards of people in rural areas, the migration of young people from rural areas, which generates psychosocial problems among children who have to stay with their grandparents, the sharp decrease of interest for agriculture and, thus, the decrease of GDP ratio from agricultural activities, the lack of education among rural people etc. Under these circumstances, the paper tries, through documentation, analysis and processing statistical data, to quantify the development level of entrepreneurship in rural areas in Romania, compared with developed EU countries (such as: Germany, Great Britain, France etc.), in order to reveal the gaps in this sector. To increase the relevance of the analysis, the paper also analyzes the possible causes that can stimulate or repress the expression of entrepreneurship and its implementation in Romanian and European rural areas, such as: different levels of fiscal pressure, the existence, effectiveness and efficiency of programs implementation for stimulating and supporting entrepreneurship in general and in rural areas, in particular, the different business culture etc. These results generated from the research will finally create a set of premises for adopting international best practices and develop pragmatic solutions and programs to increase entrepreneurship, which can leads to new business initiatives in the Romanian rural area. In conclusion, for a quality of life growth and a decrease of negative social and economic phenomena with medium and long-term impact, it is necessary an increase of the living standards, done by increasing the opportunities for entrepreneurship in agriculture and rural areas. Specifically, there are needed investments in the development of human resources in rural areas and in supporting its entrepreneurial efforts and activities in order to generate profitable activities that can ensure motivating financial and social rewards for medium and long terms.

**Key words:** entrepreneurship, fiscal pressure, rural development, agri-food sector

### INTRODUCTION

The Romanian rural areas face a series of economic and social problems mainly generated by the drastically migration of the active population, due to lack of opportunities and profitable economic activities, which generate negative effects on medium and long term. The purpose of this research is to snapshot the current situation of the development level of entrepreneurship in Romania, compared with developed countries in the EU and, on this basis, to highlight opportunities for future development of entrepreneurial initiatives in rural areas. Through its subject, the paper makes an important contribution to the scientific knowledge on the degree of entrepreneurship development in rural areas and by generating

the premises for stimulating entrepreneurial initiatives in rural areas.

### MATERIALS AND METHODS

The research study called for a series of established research methods; among them: data analysis and survey questionnaire. Statistical data analysis was used to reveal the gaps between Romania and the EU developed countries, but also to analyze the tax burden in Romania and the EU. The statistical data on which the analysis was conducted were taken from official sources, such as Eurostat statistics, National Council of SME's (CNIPMMR) statistics and data gathered from The National Institute of Statistics. The questionnaire survey was conducted in Baleni village, from Dâmbovița County, on a sample of 384 people, with a margin of error of  $\pm 5\%$ .

## RESULTS AND DISCUSSIONS

1. The analysis of entrepreneurship gap between Romania and the EU

The gaps of entrepreneurship manifestation between Romania and the EU Member States are identified in a suggestive manner by analyzing the number of enterprises per 1000 inhabitants. Table no. 1 shows the number of SMEs per 1000 inhabitants in Romania and in the EU in 2011.

Table 1. Number of SMEs/1000 inhabitants 2011

Indicator	Total	
	ROM	UE
No. SMEs	452.171	20.796.192
SMEs/1000 inh.	21.11	41.39

Source: INS, Eurostat, Own calculation

From the table data analysis it can be seen the existence of significant differences in terms of the manifestation of entrepreneurship in Romania and the EU, expressed in the number of SMEs per 1000 inhabitants. It is thus seen that in 2011, in Romania the number of SMEs per 1,000 inhabitants is 21.11, 96% lower than the number registered in the EU 27, 41.39.

The causes of this phenomenon, which has a negative economic and social impact, especially on medium and long term, are multiple and diverse, ranging from lack of entrepreneurial culture, inadequate implementation of incentive programs for entrepreneurship development, inadequate fiscal policies applied, (with impact on tax burden) etc. Next, there are considered and analyzed some of these causes, in order to counter them and to identify and promote opportunities for the development of entrepreneurship in rural areas in Romania.

### 1.1 Comparative analysis of fiscal pressure

In order to identify the starting points in determining the tax burden gap between our country as a full member of the European Union from January 2007 and the rest of the Community, we considered necessary to develop a comparative analysis of tax systems practiced in the European Community and setting of a comparison between Romania and

EU-27 averages in the evolution of the main tax revenue, the tax burden and the effects of fiscal policies practiced on entrepreneurship development.

Table 2 presents the evolution of tax revenues in the European Union, from 2008 to 2012.

Table 2. Fiscal revenues in UE (%GDP)

	2008	2009	2010	2011	2012
<b>Directs</b>	12.3	11.5	11.2	12.6	13.0
<b>Social contributions</b>	10.7	11.1	10.9	12.9	12.9
<b>Indirects</b>	13.6	13.3	13.5	13.1	13.5
<b>Total fiscal pressure</b>	36.6	35.9	35.6	38.6	39.4

Source: EC – Report „Taxation trends in UE 2012”; Comisia Europeana – „Statistical Annex of European Economy”, Spring 2012

As a methodological framework, our approach was based on the average values determined by simple arithmetic average values of registered or predicted tax revenue in the 27 Member States of the European Union. Direct taxes are not containing social security contributions. Indicators are represented by shares in GDP of fiscal policy variables analyzed.

The average values recorded for the period 2008 - 2012 for the three fiscal taxes are: for direct taxes 12.08%, 11.70% for social security contributions and 13.4% for indirect taxes.

We see a clear delimitation of these three categories, which have relatively linear trends and are almost parallel. Thus, indirect taxes are clustered around the average value of 13.5%, overall being down almost insignificant, from 13.6% in 2008 to 13.1% in 2011 and a slight increase projection for 2012 up to the level of 13.5% of GDP. Direct taxes are clustered around the average value of 12%, overall having a fluctuating trend during the period 2008 to 2012 and registering a growth projection. The level of social contributions are grouped around the average value of 11.7%, with an overall upward trend in 2008-2012, mentioning that the estimate of revenue from social contributions for 2012 maintained at the same level indicator in 2011 (12.9%).

We conclude that the evolution and trends for

the EU 27 is increased to indirect taxes and lower direct taxes and social security contributions mandatory. The three categories of elements are relatively close to an additional of 2-3% for indirect taxes. It can be appreciated that in the EU, the relatively low tax burden and the trend of decreasing direct taxation is a measure for stimulating entrepreneurship initiatives.

Table 3 presents the evolution of tax revenue and the level of the tax burden in Romania from 2008 to 2012.

Table 3. Fical revenues in Romania (%GDP)

	2008	2009	2010	2011	2012
<b>Directs</b>	6.7	6.5	6.2	5.8	6.0
<b>Social contributions</b>	9.3	9.4	8.8	8.8	8.8
<b>Indirects</b>	12.0	11.0	12.3	12.6	12.7
<b>Total fiscal pressure</b>	28	26.9	27.3	27.2	27.5

Source: EC – Report „Taxation trends in UE 2012”; Comisia Europeana – „Statistical Annex of European Economy”, Spring 2012

The current macroeconomic situation of Romania is characterized by a high current account deficit, a tight labor market with high unemployment and inflation rates, above the EU-27, also amplified by frequent and unjustified changes from the central administration. Under these circumstances, we consider it appropriate to analyze the evolution of tax revenues in our country during 2008 - 2012, to study its influence on the development of entrepreneurial initiatives. The average values recorded for the period 2008-2012 for the three tax categories are: 6.24% for direct taxes, 9.02% for social security contributions and 12.12% for indirect taxes. The evolution of these tax categories for our country is much different than the EU27 average and is characterized by a greater magnitude of changes much more frequently than in other countries. Thus, Romania, mandatory social contributions have become the second category tax as a share of GDP. Average for

each category is well below the EU states. Direct taxes decrease was from 6.7% in 2008 to 5.8% in 2011, meaning a reduction of almost one percentage point. Indirect taxes increased from 12% to 12.7% in 2012 (year in which was registered the highest value of this indicator).

The level of global tax burden in Romania was 27.2% in 2011, about eleven percentage points lower than the EU-27 (38.6%). In 2011, Romania was ranked the second smallest in terms of tax burden among EU countries, ahead only Bulgaria (26.7%). In 2011, Romania was ranked third in the EU in the share of indirect taxes in total tax revenues. Indirect taxes were in 2011, 46.3% of total tax revenue compared to EU-27 average of 33.9%, while the share of social contributions accounted for 32.3% (compared to EU-27 33.4%) and direct taxes only 21.3% (compared to the EU-27 32.6%). During the crisis, the tax rate decreased by two percentage points, mainly due to an accelerated decline in VAT revenues. In 2009, short-term economic outlook for Romania were negative, characterized by a large drop in GDP (6.6 percentage points), compared to 2008. However, growth rates of duty in 2009 and the growth of VAT rate in 2010, has provided higher revenues from indirect taxes, which offset the continuing decline in tax revenue from direct taxes and social contributions.

If we try to find a correlation between fiscal policy practiced and lack or weak expression of entrepreneurship in our country, maybe we should refer to repeated legislative changes (both reported in the modification of VAT and excise duties, the introduction of flat tax and health contributions - in our country, only in 2008 there have been three changes in health benefit structure, which also continued in 2009-2011, not only in terms of rates but also in terms of tax base), errors of law application, excessive bureaucracy and the large fiscal and para-fiscal obligations that SMEs have to bear.

This reality is amplified by the fact that most taxpayers feel the aggression of the Romanian legal system as taxation in Romania.

Although is comparable with other member states, it can not be assessed without taking into account that the economic performance of SMEs in Romania is much lower than in other EU developed countries. Also, in our country there are a large number of taxes, special taxes and mandatory contributions that emphasize the perception of a higher tax burden.

It is, therefore, highlighting one of the major causes of poor manifestation of entrepreneurship in our country: the lack of adequate fiscal policies to stimulate entrepreneurial initiatives in urban and especially in rural areas.

#### 1.2 Programs for stimulating entrepreneurship in rural areas

In recent years, the EU has been supporting entrepreneurship, becoming untenable to formulate policies for economic development without taking into account the improvement of the business environment by removing barriers or direct actions for supporting entrepreneurship.

At EU level, the stimulating of entrepreneurship is further promoted by the launch and implementation of EU policies dedicated to this purpose, such as: Europe 2020, the Small Business Act for Europe, Action Plan for the development of entrepreneurship in the EU, with 2020 horizon.

Although supporting the development of small and medium enterprises (SMEs) is a priority at EU level and at national level, since this category of operators is more dynamic and flexible to market changes, most programs for stimulating entrepreneurship in rural areas in Romania have a strong bureaucratic character and are not well applied, so their results are weak.

The main programs which are currently trying to stimulate entrepreneurship in rural areas are: The program for stimulating the creation and development of micro-enterprises by young entrepreneurs, The START Programme, and the Measure 3.1.2 of National Program for Rural Development (PNDR).

#### **The program for stimulating the creation**

**and development of micro enterprises by young entrepreneurs** is a program run by the Government through the Agency of Implementation of programs and projects for SMEs (AIPPIMM).

The objective of this program is to stimulate the creation of new micro-enterprises, to growth the potential to access funding and to develop entrepreneurial skills of young people for their involvement in private economic structures.

The program aims to:

- develop entrepreneurial skills based on knowledge and on the optimal management of resources in order to adapt quickly to the changes caused by globalization of markets;
- stimulating and supporting start-ups and development of new companies (start-ups) by facilitating their access to finance;
- facilitate youth access to funding sources.

Initiated in 2011, the program awarded so far about 2000 funding for newly established microfirms to little as needed for revitalization and stimulate the SME sector.

**THE START Programme** is also a program run by the Government through the Agency of Implementation of programs and projects for SMEs (AIPPIMM).

The program objective is to stimulate start-ups, small and medium enterprises, improve economic performance of existing ones, increasing the potential to access funding and develop business skills of entrepreneurs for their involvement in private economic structures.

The Measure 312 from PNDR's overall objective is sustainable development of rural economy by encouraging non-agricultural activities in order to increase the number of jobs and additional income in rural areas. The low rate of absorption of European funds on this measure is caused by strong bureaucratic character.

It appears so, another reason for the lack manifestation of entrepreneurship in rural areas: the inefficiency and ineffectiveness of programs to stimulate entrepreneurship.

#### 2. Actual situation of entrepreneurship in rural areas

Next on the study, a survey questionnaire was conducted on a sample of 384 people from the village Baleni in Dâmbovița County, to emphasizing entrepreneurship level of these people.

Through six questions were assessed personality characteristics of each respondent, such as: availability to accept risk, creative and innovative spirit, level of aspiration, confidence, sense of initiative and perseverance and the ability see opportunities. The evaluation of responses for determining entrepreneurship was performed as follows:

- Most “a” answers – highly developed entrepreneurial spirit;
- Most “b” answers – developed entrepreneurial spirit;
- Most “c” answers – weak developed entrepreneurial spirit;
- Most “d” answers – undeveloped entrepreneurial spirit.

The answers centralization is given in the below table and figure.

Tabel 4. Entrepreneurial spirit evaluation in rural areas

Q/A	A	B	C	D
1	64	89	148	83
2	71	92	115	106
3	94	121	75	94
4	101	78	98	107
5	79	87	104	193
6	48	99	141	96
<b>Total</b>	<b>457</b>	<b>566</b>	<b>681</b>	<b>679</b>

Sorce: Own data collection

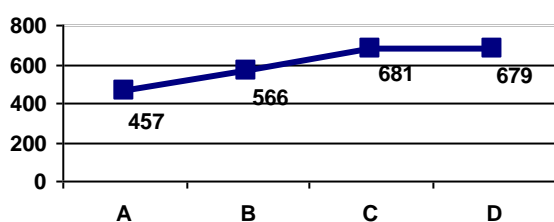


Fig. 1. Entrepreneurial spirit in rural areas

From the analysis of data from the table and figure above it can be seen that, according to the answers given by respondents, the entrepreneurship spirit level is weak (most answers are c) and in some cases it can be seen the lack of entrepreneurship (high percentage of d answers).

Among respondents who have obtained the highest number of responses “a” or “b” (which means a developed or highly developed entrepreneurial skills), mostly are aged between 18 and 35 years, secondary education or higher, most are students or work in technical and economic fields and have monthly household income per capita between 2000 and 6000 lei. Analyzing through gender, the most “a” or “b” answers were given by male respondents.

The study also aimed at showing the respondents' opinion on the causes of weaker entrepreneurship development in rural areas.

By analyzing data obtained from field completion of the questionnaires, it can be observed that, according to respondents the greatest difficulties of entrepreneurship manifestation in rural areas are: the political instability (76.3% of total) economic and financial crisis (74.7% of total), low level of knowledge in entrepreneurship (63.8% of the total) and lack of financial resources for investment (56.5% of total). At the opposite in terms of respondents' perception are: the lack of market information (35.4% of the total) and lack of free time (36.7% of total).

**The lack of market information**, although in general is a major difficulty for any entrepreneur and a prerequisite for entry into the crisis or even bankruptcy of the business, wasn't framed by respondents among the most important manifestation difficulties of entrepreneurship in rural areas ( holding only 35.4% of total). Nevertheless, we consider it appropriate to stimulate rural entrepreneurship by adopting measures to facilitate access to market information by introducing and / or modernization of the internet in these areas and special programs for access to market information.

**The difficulty of selling products or services** is also a major obstacle in the normal course of business of any type, because without sales company is unable to cover costs and isn't profitable. The difficulty of selling products and / or services in the market is a major obstacle to rural entrepreneurship, according to 52.3% of respondents. The difficult access to market of

rural entrepreneurs, both in terms of food products and other goods and / or services determine most rural residents not to consider starting their own economic activities. **Economic and financial crisis** is one of the major difficulties of entrepreneurship manifestation in rural areas in view of respondents (74.7% of total) as its negative impact was felt in all sectors since 2009, the most affected being the construction sector (where there have been reductions in gross value added by 39.5 percentage points), agriculture (GVA reductions of 35.0 percentage points) and services (with reductions of gross value added by 11.6 percentage points). Under these circumstances, is need to launch and implement measures to reduce the negative effects of the crisis and to stimulate the growth of food and service sector in order to initiate and develop new business in rural areas.

**Lower purchasing power of the rural residents** was an answer given by 46.3% of all respondents for the weak manifestation of entrepreneurship in rural areas. In order to increase the purchasing power of rural residents is first necessary the food sector recovery (which from the most people ensure their existence) and secondly the rural development, through diversification of activities.

**The existence of an inadequate infrastructure** for starting and developing a business is another obstacle raised by a relatively high proportion of respondents (50.5%) for expression of entrepreneurship in rural areas. Lack or poor quality of paved roads, which are hampering access to raw material suppliers and to customers in urban areas, the lack of modern networks and high speed internet connections that would streamline the activities, lack of utilities that are necessary for a normal economic activity (eg: energy power without voltage fluctuations) are barriers to entrepreneurship manifestation and realization at the same level as in urban areas where these facilities exist. **Lack of free time** is an obstacle to rural entrepreneurship development raised by a

relatively small percentage of respondents, 36.7% (particularly people employed, aged 26-45 years, who have less free time). Although entrepreneurial business need extra time, especially during the launch and growth period, according to interviewees there are many other important elements that restrict entrepreneurship in rural areas, such as: **lack of financial funds for investment**. 56.5% of the respondents consider that lack of funds for investment is an impediment to entrepreneurship development. In these circumstances, we consider necessary to reintroduce mutual credit system, whereby all actors operating in rural areas (both in food production and other areas) to attract savings and invest jointly in order to increase performance of agricultural or non-agricultural activities performed. This system of cooperatives credit should be organized according to modern principles, but which meet the current requirements of rural entrepreneurs, as the currently lending system which operates by banks is prohibitive and very large burden for the small entrepreneurs in rural areas, no matter of the size or nature of business.

Mutual agricultural credit system should be promoted to provide support in the following ways:

- Support marketing associations and producer groups in modern mutual credit cooperatives;
- Promoting access to mutual savings banks systems and rural credit guarantee funds for agricultural and non-agricultural activities.

**Low level of knowledge in entrepreneurship** is considered by 63.8% of respondents an obstacle to the manifestation of entrepreneurship in rural areas. In these circumstances it is necessary to facilitate access of rural training programs in entrepreneurship, through which to acquire knowledge and skills in the field and discuss opportunities identified with professionals and experts in entrepreneurship, to guide them until the business grows.

Another impediment to entrepreneurship in rural event is the **unstable political environment**, reason given by 76.3% (the highest rate). It can be seen, therefore, that

frequent changes in the central administration have a negative impact on the citizens and discourages the initiatives to launch economic activities on their own.

The study also regarded the respondents' point of views on the priority measures necessary to be taken in order to stimulate entrepreneurship in rural areas. The most important are presented below.

According to respondents, the most important measures that should be adopted to stimulate entrepreneurship in rural areas are: reducing bureaucracy (51.8%), modernization and infrastructure development (36.9) and running training programs in entrepreneurship in rural areas (32.3%).

Reducing bureaucracy and simplifying financial and accounting operations is a premise for stimulating entrepreneurship and streamline the operational activities of firms, especially in rural areas where the level of knowledge on financial accounting and taxation is lower.

The modernization and development of infrastructure is also a priority condition for the development of enterprises in rural areas so that they can enjoy the same modern conditions of market and information access as in urban areas.

Conducting training programs in entrepreneurship in rural areas is appropriate for the development of new SMEs in rural areas, especially nowadays, when the information and knowledge are essential factors of entrepreneurial success, according to the knowledge based economy.

## CONCLUSIONS

The research study revealed the differences between Romania and other European Union countries on the manifestation of entrepreneurship, but also the causes of these gaps (lack of entrepreneurial culture, lack of coherent programs to support entrepreneurship, inadequate fiscal policy etc).

To build a strong economy, Romania should strengthen entrepreneurship and to create conditions for the development of innovative

practices that lead to the creation and development of SMEs, which represent an important factor for economic growth and social development. Achieving this objective is vital to ensure economic sustainability and support the overall progress of society. Although at present the premises for entrepreneurship development in rural areas in Romania are not very favorable, we consider that there are many opportunities that can be exploited to stimulate entrepreneurship on medium and long term. These include:

1. Opportunity to exploit human resources (cheap and medium qualified labor force in rural areas) which are currently social assisted or performing activities abroad our country;
2. Existence of untapped natural resources that can be successfully exploited by reactivation of Romanian traditional industries in the agri-food processing, textile and leather industry, and those related to wood processing and furniture in rural areas;
3. Accessing European funds for the development of small and medium-sized farms and develop alternative activities in rural areas, which will create new jobs;
4. The orientation to new market areas with high demand on intra-Community market, such as the eco-food products.
5. The promotion and development of organic farming systems, through priority allocation of European funds for agriculture and rural development and the gradual reduction of the allocation of funds to large farms of industrial type that can be self-sustaining. In this way, there will be a significant support in action of recovery small and medium-sized farms which need financial funds attracted for development.

To reduce these gaps, and to exploit the opportunities of stimulating entrepreneurship in general and in rural areas, in particular, Romania must invest also in promoting and expanding entrepreneurial culture to create a new generation of entrepreneurs with innovative ideas, who will generate economic performance, in order to to provide the opportunity of entrepreneurship asserting to a broader segment of society.

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## STUDY ON GRAIN MARKET IN THE WORLD

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### Abstract

*In the global economy, the market occupies a representative place because the grain is grown on a large area and it is important both to ensure food security and safety, but also for animal feed. In order to accomplish this study we have used certain indicators, of which the most representative are: acreage, production obtained, yield per hectare, food consumption, imports, exports and last but not least the price. World market of cereals has increased in the past decade due to increased consumption of cereals, especially in less developed countries economically. World grain market evolution in the analyzed period was disrupted on one side by the global economic crisis and on the other side by bad weather changes that occur on a global scale and have had a negative impact on acreage, production achieved, prices etc. According to forecasts the global market for cereals is expected to increase trade with cereals, while diminishing stocks.*

**Key words:** cereals total production acreage, world market, imports, exports, prices

### INTRODUCTION

Cereals are important because they hold a significant place in human nutrition, provide the fodder for livestock and last but not least is a raw material for many industries value [2]. According to expert studies cereals are high in dextrose, showing the energy value of all plant products, supplying about 65% of your daily calories and 45% of protein [3]. Cereals are grown on large surface worldwide. According to data from FAO, the world's arable land, estimated at 1.4 to 1.6 billion hectares, over half is occupied by cereals.

In 1992, U.S. Department of Agriculture created the food pyramid (Fig. 1), whose main purpose was to represent the share held by each food group in all foods eaten in a single day. According to this model, the grain is positioned at the bottom, with bread and pasta [1]. According to data provided by the UN, for every inhabitant of the planet are produced on average 152 kilograms of grain per year, which is 0.5 kg / day [14]. But although cereal production is practically sufficient globally, approximately 870 million people are malnourished. The main problem for now but

for the next period is represented by global food security, given that population grows exponentially in certain regions of the globe, while resources diminish significantly.

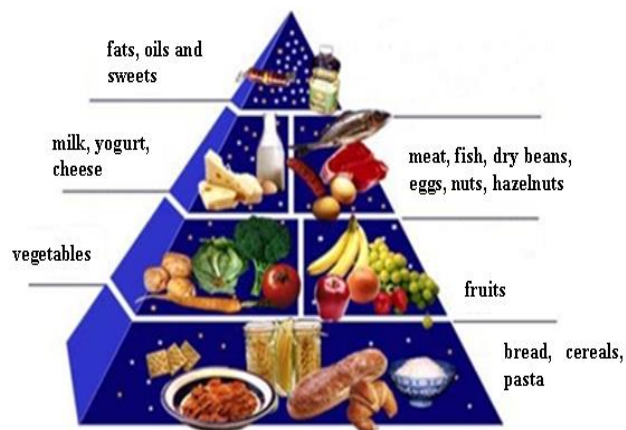


Fig. 1. Food Pyramid  
Source: at the U.S. Department of Agriculture

### MATERIALS AND METHODS

In order to accomplish this study, it was consulted literature and were used statistics provided by the U.S. Department of Agriculture, Food and Agricultural Policy Research Institute, Eurostat and FAOSTAT. The paper presented and analyzed a number of global indicators, such as acreage, total

cereal production, the average yield per hectare of grain consumption, net exports and FOB prices. This research study has materialized world grain market for the period 2007-2011.

## RESULTS AND DISCUSSIONS

Worldwide, grain market is an important segment of the food industry, providing a considerable part of the population needs food [5]. The most widely cultivated cereal in the world are wheat and corn, but do not ignore the importance of other cereal crops. The main crops cultivated areas had a fluctuating trend from one period to another [4]. This evolution is shown in Table 1 and Figure 2, where it can be seen that wheat acreage in 2011 recorded an increase of 2.6% compared to 2007 - the year considered. For the period analyzed, the lowest wheat acreage was 218,610.22 thousand hectares, in 2007, and most of 226,898.95 thousand hectares was recorded in 2009 [7].

Table 1. The surface evolution of the main cereal crops worldwide in 2007-2011 (thousand hectares)

Crops	2007	2009	2011	2011/2007 (%)
Wheat	218.610,22	226.898,95	224.353,08	102,6
Barley	57.486,34	55.646,69	52.501,41	91,3
Corn	161.842,17	157.568	165.236,98	102,09
Sorghum	42.863,54	40.613,74	43.938,62	102,5

Source: own calculation on the basis of data from following data bases: FAPRI, EUROSTAT, USDA, FAOSTAT (2007-2011) [8], [9], [10], [12]

Like observation for 2025 is forecast an area of 224,679.66 thousand hectares cultivated with wheat, which is basically an area almost equal to that recorded in 2011. For maize is an increase of 2.09% in 2011 compared to 2007. The lower corn acreage was recorded in 2009, being 157,568 hectares thousand and largest cultivated area was recorded in 2011, 165,236.98 thousand hectares. Surface projected for 2025 is 165,931.11 thousand hectares planted to corn.

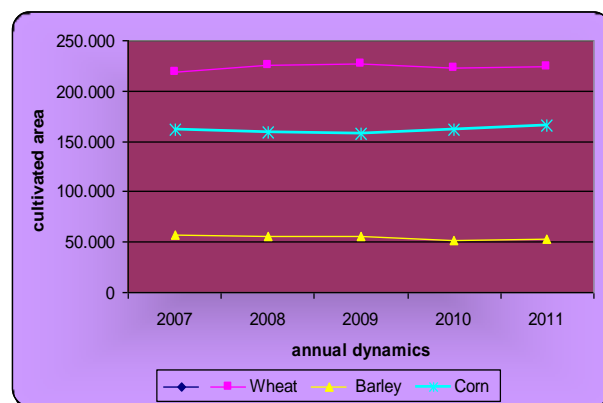


Fig. 2. Dynamics of surface evolution (thousand hectares)

Sorghum crop has registered an upward trend in 2011 compared to 2007, by 2.5%. Regarding this culture are predicted an increase in cultivated area, from Thousand 43,938.62 hectares in 2011, to 44,113.98 thousand hectares in 2025. Of the four species of crops analyzed, the barley acreage declined by 8.7% in 2011 compared to 2007. However, it provides an increase in area planted with barley in 2025, compared to 2011, but this increase does not equate acreage in 2007. Evolution of total grain production worldwide is presented in Table 2 and in Figure 3 are presented the dynamics of grain production worldwide, for the period 2007-2011. According to data from the Food and Agricultural Policy Research Institute, world production for major cereal crops registered an upward trend in 2011 compared to 2007.

Table 2. The evolution of grain production worldwide in 2007-2011 (thousand tons)

Crops	2007	2009	2011	2011/2007 (%)
Wheat	613.814,14	685.059,31	671.521,43	109,4
Barley	133.462,85	150.099,17	136.754,31	102,4
Sorghum	66.874,61	59.535,81	67.495,13	100,9
Corn	801.573,89	821.105,68	864.376,44	107,8

Source: own calculation on the basis of data from following data bases: FAPRI, EUROSTAT, USDA, FAOSTAT (2007-2011) [8], [9], [10], [12]

The largest increase was recorded in wheat by 9.4% compared to the reference year and the smallest increase was observed for sorghum production, value of 0.9%.

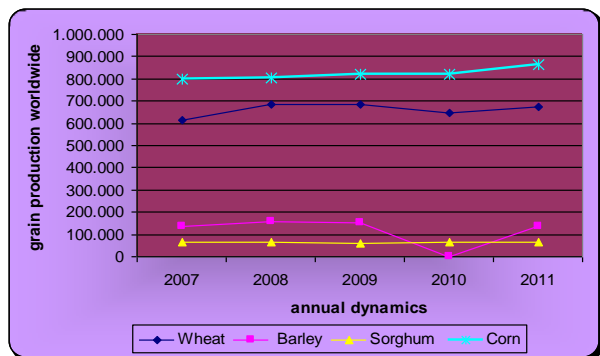


Fig. 3. Dynamics of grain production worldwide (thousand tons)

Estimates for 2025 indicate an increase of grain production for the main categories, namely:

- Wheat:** production will increase from 671,521.43 thousand tons (corresponding to 2011) to 740,901.88 thousand tons;
- Corn:** it will grow from 864,376.44 thousand tons (corresponding to 2011) to 1041015.55 thousand tons;
- Sorghum:** will see an increase from 67,495.13 thousand tons (corresponding to 2011) to 79,123.45 Thousand tons;
- Barley:** growth will be provided at 136,754.31 thousand tons (corresponding to 2011) to 165,542.01 thousand tons.

According to studies, the main factors that will underpin production growth are represented by favorable weather conditions and the efficient use of inputs.

In Table 3 are presented average yields for major cereals, recorded worldwide and in Figure 4 are presented the dynamics of the average production.

Analyzing the results, shows an increase in average yields per hectare in 2011 compared with 2007 crops of wheat, corn and barley. Regarding the sorghum crop is recorded a decrease of 1.3%. production per hectare achieved.

Table 3. The average production per hectare for major cereal crops in 2007-2011 (tons per hectare)

Crops	2007	2008	2009	2010	2011	2011/2007 (%)
Wheat	2,81	3,04	3,02	2,9	2,99	106,4
Barley	2,32	2,78	2,7	2,42	2,6	112,0
Sorghum	1,56	1,53	1,47	1,58	1,54	98,7
Corn	4,95	5,05	5,21	5,11	5,23	105,6

Source: own calculation on the basis of data from following data bases: FAPRI, EUROSTAT, USDA, FAOSTAT (2007-2011) [8], [9], [10], [12]

For barley crop has registered the highest average production per hectare increased by 12% in 2011 compared to 2007.

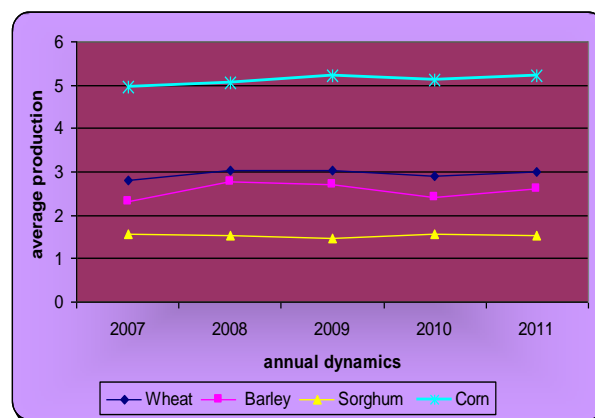


Fig. 4. Dynamics of the average production (tons per hectare)

According to data provided by FAPRI and USDA for 2025 is forecast following average yields for crops analyzed:

- Wheat:** 3.03 tons per hectare, compared with 2.99 tons per hectare (2011);
- Corn:** 6.27 tons per hectare, compared with 5.23 tons per hectare (2011);
- Barley:** 3.03 tons per hectare, compared to 2.6 tons per hectare (2011);
- Sorghum:** 1.79 tons per hectare, compared with 1.54 tons per hectare (2011).

For all crops is estimated to average yield increase will be due to the application of modern production technologies.

Total consumption of grain for the world is presented in Table 4. Reveals a differentiated evolution of global grain consumption for the period. Thus, wheat consumption is an increase of 8.4% in season 2011/2012 season to the 2008/2009 and for cultivation of corn this increase is 12.08%. These increases are due to the change of food consumption pattern of the population and world population growth, and reducing revenues during the economic crisis. In this situation, people turned to food with affordable prices. Were recorded decreases in consumption of barley (-5.6%) in 2011/2012 versus 2008/2009 season, and in terms of the consumption of sorghum decreased by 12.6% in season 2011/2012 season against reference.

Table 4. The evolution of total grain consumption worldwide in 2007-2011 (thousand tons)

Crops	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012	2011/2012 / 2008/2009 (%)
Wheat	643.500	653.858	655.107	698.033	108,4
Barley	143.932	144.743	135.856	135.944	94,4
Corn	784.504	825.527	850.313	879.338	112,08
Sorghum	64.262	56.650	60.812	56.185	87,4

Source: own calculation on the basis of data from following data bases: FAPRI, EUROSTAT, USDA, FAOSTAT (2007-2011) [8], [9], [10], [12]

Were recorded decreases in consumption of barley (-5.6%) in 2011/2012 versus 2008/2009 season, and in terms of the consumption of sorghum decreased by 12.6% in season 2011/2012 season against reference. For the period analyzed in this study, we can see a constant ascending trend in grain production used for human consumption (approximately 2kg/cap capita - from 152.3 kg / capita in 2007 to 154.1 kg / capita in 2011). Interestingly, the growth rate of production of cereals used for human consumption was however not correlated with the growth rate of human population density. We can explain this by the fact that consumer behavior is inextricably linked to disposable income, on the one hand, and systemic relationship between needs, consumer traditions, the usefulness of economic assets, education and psychological profile of the consumer, on the other. Basically, the market economy emphasizes the role as promoter of consumer demand economic goods and its main outlet [6].

Grain trade occupies an important place in the global market and its evolution is presented in Table 5.

In the period under review there were significant changes to the structure and size of the grain trade.

From Table 5 result that there is a positive development of net exports of wheat and barley, and maize and sorghum to register a downward trend. Wheat exports increased by 21.9% and barley rose by 2.9% in 2011 compared to 2007.

Table 5. The evolution of world trade in cereals in 2007-2011 (thousand tons) – Net export

Crops	2007	2009	2011	2011/2007 (%)
Wheat	83.907,77	102.015,87	102.351,19	121,9
Barley	15.371,07	17.997,58	15.819,08	102,9
Corn	92.984,97	82.420,97	84.066,34	90,4
Sorghum	9.376,34	6.099,86	6.391,85	68,1

Source: own calculation on the basis of data from following data bases: FAPRI, EUROSTAT, USDA, FAOSTAT (2007-2011) [8], [9], [10], [12]

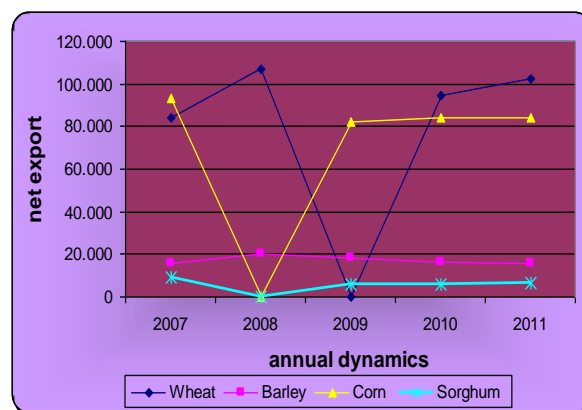


Fig. 5. Dynamics of world trade in cereals (thousand tons)

Global grain trade rebounded after the decline of 1999-2002. Estimates for 2025 indicate an increase in exports for all cereals analyzed from 2011. Currently, U.S. is the largest grain exporter in the world, managed to cover half of the total consumption of corn, about one fifth of the total consumption of wheat and nearly one third of the soy consumption (culture was not analyzed in this study).

Due to the size of U.S. grain exports negative changes are noted when world market cereal production is in decline. Most affected are the prices on the world market, in case the U.S. grain production drops due to bad weather conditions. In terms of world trade in cereals for season 2012/2013 is expected to decrease by 6% to 296 million tons [12].

Cereal prices registered as international market and the major scholarships in 2007-2011 varied depending on the category of cereals (table 6). Thus, for the barley was an increase of 2.3% in 2011 compared to 2007. The highest price was recorded in 2007, when

it reached 340.02 U.S. dollars/tonne [10]. For 2025 is estimated to decrease the price to \$ 198.49/tonne. In the case of wheat, sorghum and maize prices have registered a downward trend in 2011 compared with 2007 (fig. 6).

Table 6. The evolution of prices for major cereals, registered in the international market (\$/tonne)

Crops	2007	2008	2009	2010	2011	2011/2007 (%)
Wheat	340,02	292	213	239,4	270,44	79,5
Barley	200,11	160,14	142,75	165,62	204,75	102,3
Sorghum	216,27	158,29	170,64	215,83	191,87	88,7
Corn	217,71	172,3	162,98	205,9	183,17	85,1

Source: own calculation on the basis of data from following data bases: FAPRI, EUROSTAT, USDA, FAOSTAT (2007-2011) [8], [9], [10], [12]

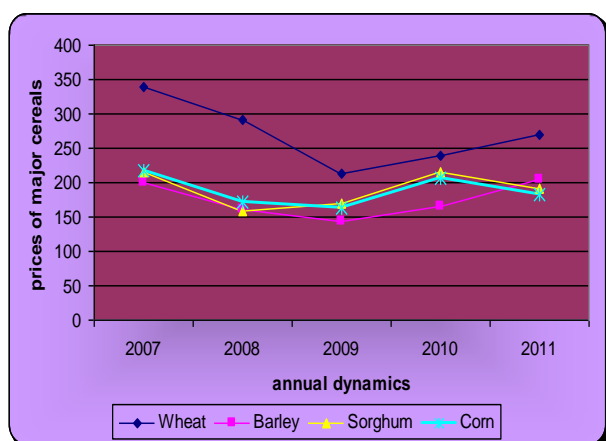


Fig. 6. Dynamics of of prices in 2007-2011 (\$/tonne)

This situation is due to the reduction in global stocks, adverse weather conditions resulting in reduced production of grain.

The most significant reduction was found in wheat prices, with 20.5% in 2011 compared to 2007. According to estimates, the price of wheat is going to be reduced in 2025, from \$ 260.37 / tonne, compared with a price of \$ 270.44 / tonne recorded in 2011. Lower price for wheat is based on the decrease in global demand for grain crop. For maize and sorghum is expected to grow by 4.4% and 29.6% in 2025 compared to 2011.

## CONCLUSIONS

Global grain supply came to meet world consumption growth, mainly due to human consumption growth (excess of approx. 250-

300 million tons). Study global grain market in 2007-2011 identified several specific issues, such as:

- main areas planted with grain crops have changed from year to year, depending on the species and market evolution; is expected to increase grain acreage in 2025 compared with 2011;

- world grain production has registered an upward trend in 2011 compared to 2007, this favorable trend is mainly correlated with productivity growth, achieving agricultural works best when the application in production activity of new scientific discovery etc.

- the average production per hectare in 2011 compared to 2007 crops of wheat, corn and barley registered a positive evolution, culture sorghum production recorded a decrease in realized per hectare, up 1.3%;

- the total consumption of cereals recorded a different cereal crops, such as: increases for wheat and corn, respectively reductions for barley and sorghum crops;

- wheat and barley exports registered an upward trend compared to corn and sorghum exports recorded a downward trend;
- positive trend of net exports of wheat and barley, respectively negative evolution for maize and sorghum;

- grain prices on the international market fluctuated depending on the category of cereals, climatic conditions, the evolution of the global crisis, the stock levels, the demand for human consumption and for livestock consumption, but not least, the wheat market and the evolution of U.S.

Grain market will occupy a central place in the global economy as it contributes directly to food security of the world population, given that, on the one hand there is an rapid population growth in some regions of the world, on the other hand diminish the available resources and their price increases.

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## QUANTITATIVE STUDY OF THE WORLD MARKET OF MEAT

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### **Abstract**

*This study presents the evolution of global market of meat in 2007-2011 and has been possible because the authors used an important set of indicators, namely: livestock, achieved production, imports, exports, trade balance, price etc. The data used in this work was provided by the following institutions accredited for collecting and processing statistical data: National Institute of Statistics, EUROSTAT, FAOSTAT, FAPRI and USDA. The analysis global market of meat is primarily a quantitative analysis. In the period which is analysed, the demand, the production, the imports, the exports and the prices have evolved differently, especially meat categories, so all these indicators have influenced global market of meat. In mainly, the meat consumption is influenced by the pattern of food consumption and price level. In the future, expect a increase prices, which is based on increasing production costs. Therefore, first it is necessary to adopt measures to support the farmers.*

**Key words:** consumption, export, import, market, meat, price, production

### **INTRODUCTION**

Meat is a staple food for the population, as it is a rich source of protein, vitamins and important nutrients [1]. Although there are a number of technologies livestock and meat in recent years have revealed a number of problems in the livestock sector. [3] This is due to several factors, such as increased fuel and fertilizer prices, significant costs resulting from compliance with regulations concerning livestock and meat processing, increased competitive pressure that increased grain prices, which implicitly causes significant changes in selling prices for different categories of meat etc. According to data from FAO, world population will increase by 30% by 2050, which would represent an increase in demand for meat by up to 70-80% [4]. This increase in population density will not occur uniformly, meaning that it will record significant growth in developing countries. This will result in consumer demand for cheaper food, because the purchasing power in these regions of the world is low. While some of the population will opt for cheaper meat, another part will opt for meat quality. In this context, competitiveness - except costs - will be closely linked to the quality of products produced and sold [2].

### **MATERIALS AND METHODS**

To achieve this research were used statistics provided by recognized institutions and approved the collection and storage of statistical data, such as the Food and Agricultural Policy Research Institute, U.S. Department of Agriculture, FAOSTAT and Eurostat . International Market Analysis meat was based on a series of indicators that were presented in the introduction, such as livestock and poultry meat production, average consumption, prices, etc.. For the present study were mostly used common statistical methods, which have contributed to a more realistic picture of the world meat market.

### **RESULTS AND DISCUSSIONS**

Livestock and poultry for slaughter is an important indicator meat market, because their numbers directly influences the production of different types of meat. Actual evolution of these Hoteles plan is presented in Table 1. Livestock and poultry recorded a differentiated during the analyzed period. Cattle, sheep and turkeys were rated on a downward trend in 2011 compared with 2007, as follows: for cattle has been a fall of 1.7%

for sheep there was a more pronounced reduction of 9, 2%, and for the flocks of turkeys decrease was only 3.6%.

Table 1. Evolution of livestock and poultry slaughtered worldwide (million head)

Specification	2007	2008	2010	2011	2011/ 2007 (%)
Cattle	298	300	303	293	98,3
Swine	1.260	1.314	1.379	1.382	109,6
Sheep	533	535	514	484	90,8
Goats	392	403	424	410	104,4
Poultry	54.533	57.071	60.195	61.761	113,2
Turkeys	680	692	645	656	96,4

Source: own calculation on the basis of data from FAPRI, EUROSTAT, USDA, FAOSTAT (2007-2011) [7], [8], [9], [10]

Sheep, goats and poultry were positive developments in 2007 compared with 2011, as follows: pig growth was 9.6%, herds of goats increased by 4.4% and flocks recorded the most significant increase of 13.2%. Upward trend was mainly due to increased demand for these types of meat in certain regions of the world. It predicts a large increase in the number of cattle in Asia, Latin America, the Caribbean and some countries in Oceania. For pig growth is expected in Asia and Japan. South America is expected to increase in the number of pigs, mainly due to price increases for beef. In the European Union predicts swine herd reduction will take effect as new environmental regulations [2].

Table 2 presents the evolution of meat production in the period 2007-2011. Using the comparative method (2011 compared with 2007), we can see that the market to the beef and sheep has been characterized by a production items, depending on the species, down 1.2% for beef, i.e. a decrease of 6.8% for sheep. Decrease in beef production must relate to cattle, while reducing production in sheep is due to decreased number of sheep for slaughter and the reorientation of dairy sector. Along with the above mentioned factors can also specify other common factors leading to reduced production of meat, such as increased costs, especially those related to production, rising energy prices, rising prices for feed and particularly the protein components of food[1].

Table 2. Evolution of meat production worldwide (thousand tones)

Specification	2007	2008	2010	2011	2011/ 2007
Total meat	273.908	282.855	296.107	297.221	108,5
Cattle meat	63.247	63.374	64.275	62.543	98,8
Pig meat	99.890	104.163	109.370	110.011	110,1
Sheep meat	8.485	8.408	8.241	7.911	93,2
Goat meat	4.777	4.958	5.217	5.114	107,0
Poultry meat	88.105	92.551	99.050	101.738	115,4
Turkey meat	5.384	5.677	5.385	5.473	101,6

Source: own calculation on the basis of data from FAPRI, EUROSTAT, USDA, FAOSTAT (2007-2011) [7], [8], [9], [10]

According to studies conducted in the last decade by U.S. analysts, meat production significantly increased, ie by 26% in Asia, 28% in Africa, South America and 32% [5]. Beef demand was quite high, especially at EU level, and was supported by production in Latin America (2011) [8]. World market meat as the main producers were noted, especially in 2011, Asia (17 million tons) and South America (15 million tons). Regarding sheepmeat production is expected to increase, explained by experts aimed at increasing efficiency through improved breeds of sheep meat in order creasterii weight on housing [9]. In order to assess the quantitative production of meat carcasses focus on weight (table 3). When carcass weight is reported live weight at slaughter yield can be determined. This is a specific quantitative indicator meat production, which presents a great commercial importance.

Table 3. Yield on carcass weight for the main categories of animals and birds worldwide

Specifications	UM	2007	2009	2010	2011
Cattle meat	Hg/An	2.118	2.113	2.117	2.134
Pig meat	Hg/An	793	791	793	796
Sheep meat	Hg/An	159	162	160	163
Goat meat	Hg/An	122	118	123	125
Poultry meat	0.1Gr/An	16.156	16.120	16.455	16.473
Turkey meat	0.1Gr/An	79.086	80.808	83.468	83.340

Source: own calculation on the basis of data from FAPRI, EUROSTAT, USDA, FAOSTAT (2007-2011) [7], [8], [9], [10]

Special emphasis is placed on correct aprecirea as productive capacity. Farmers aimed at obtaining superior race of animals, which carry significant daily gains with lower consumption while watching consumers purchase meat quality. The main world producers of meat are interested in obtaining high quality productions that by capitalizing



on higher prices to producers bring significant revenues, so necessary for the continuation and development activity, given that there is increased pressure on the international market of meat.

Another representative of the international market of meat is given the size of imports and exports various types of meat. Depending on their size can cause balance and degree of satisfaction of consumer needs. Table 4 contains a brief overview of trade with the world.

Table 4. The evolution of global meat trade (thousand tons)

Specifications	Flux	2007	2008	2009	2010*	2011*
Total meat	Export	36204	38891	39069	-	-
	Import	34519	36546	36109	-	-
Cattle meat	Export	10370	10333	10428	5.052	5.545
	Import	9231	8929	8967	-	-
Pig meat	Export	12032	13408	13229	4.780	5.202
	Import	12084	13522	13156	-	-
Sheep and goat meat	Export	1042	1066	1075	-	-
	Import	965	1002	914	-	-
Poultry meat	Export	12135	13403	13673	7608	8137
	Import	11158	12044	11945	-	-

Source: own calculation on the basis of data from FAPRI, EUROSTAT, USDA, FAOSTAT (2007-2011) [7], [8], [9], [10]

\*Total Net Exports = Total net exports are the sum of all positive net exports and negative net imports [fapri]

- missing data

In terms of global trade in beef and poultry can see a continuous development and growth estimates of global meat exports, about 19% until 2021 compared with 2009-2010. This increase is attributable mainly to North America and South America as two large regions will accumulate about 70% of export growth, thus increasing its market share in world meat trade. U.S. beef exports are expected to increase substantially due to lower import tariffs on relations with South Korea. Beef trade in the next period will register an average annual growth of 1.8% [9]. Pork trade will record a stagnant trend in the near future, but there are certain changes in industry structure. It provides faster growth of exports of North American pork compared to other regions. Regarding Brazil is estimated as a reduction in exports is expected to increase demand and restrictions on imports of sanitary-veterinary nature [4]. China fulfills a dual role as producer and net consumer of pork because it produces and consumes half

of the total pork consumed worldwide. For this country are not provided major changes in terms of consumption and production. In the European Union, in the near future are not expected export growth regarding pork. Regarding the evolution of sheep trade is expected to increase the quantity exported. This increase in exports is based on the increasing demand for imports from different countries[2].

Another important indicator for the analysis of the meat market is the average annual meat consumption per capita. The evolution of this indicator is presented in table 5, from which one can observe an increase in the consumption of pork and poultry, a decrease in bovine meat consumption and consumption in constant limits of goats and sheep.

Table5. Evolution of average annual meat consumption worldwide (Kg per capita consumption)

Specificare	2007	2008	2009	2009/2007
Bovine Meat	9,8	9,6	9,6	97,9
Pigmeat	15,2	15,7	15,8	103,9
Poultry Meat	13,1	13,6	13,6	103,8
Sheep & Goat Meat	1,9	1,9	1,9	100

Source: own calculation on the basis of data from FAPRI, EUROSTAT, USDA, FAOSTAT (2007-2011) [7], [8], [9], [10]

According to data provided by Wordwatch Institute, global meat consumption in 2011 recorded a decrease. This drop in consumption is not significant, but warned specialtrilor industry. Meat consumption dropped in 2011, reaching 42.3 kg/capita compared to 42.5 kg/capita in 2010 [10]. These decreases were based on several factors, of which the most important are: reduced production due to drought in the U.S., China, Russia and Africa, the existence of manifest disease in animals, which have jeopardized the health of consumers, namely rising prices. Meat consumption it was not uniform in all countries. According to statistical data analysis, but in 2011 there were major differences in terms of consumption, so for developing countries meat consumption was an average of 32.3 kg/capita, while countries developed this consumption was 78.9 kg/capita [5]. In terms of meat consumption, in 2011 it was

found that consumer preferences have turned to pork, followed by poultry. It should be recalled that, according to expert studies regarding consumer preferences of the population, there was an upward trend in the consumption of poultry meat over other types of meat.

Table 6 presents the evolution of the international market price for different categories of meat. One can easily see price increases in 2011 compared to 2007, for all the studied meat, as follows: 12.3% for beef and veal, 18.1% for pork, 14.2% for poultry.

Table 6. Evolution of prices in the international market by type of meat (US Dollars per Metric Ton)

Crops	2007	2008	2009	2010	2011	2011/ 2007 (%)
Wheat	340,02	292	213	239,4	270,44	79,5
Barley	200,11	160,14	142,75	165,62	204,75	102,3
Sorghum	216,27	158,29	170,64	215,83	191,87	88,7
Corn	217,71	172,3	162,98	205,9	183,17	85,1

Source: own calculation on the basis of data from FAPRI, EUROSTAT, USDA, FAOSTAT (2007-2011) [7], [8], [9], [10]

Currently, high prices of meat market is explained by the fact that, globally, there is a tendency to increased demand, especially from less developed countries. Do not forget that the high level of prices is influenced by increasing production costs, which is manifested by a long period of time. In real terms, the price of meat in 2011 was kept to last 15-20 years. Price for sheep remains at a high level because there is a decrease global supply of this type of meat. It predicts an increase in the number of sheep, which would represent a decrease in price for this type of meat.

## CONCLUSIONS

In 2007-2011, global meat market was characterized by the following:

- livestock and poultry recorded a differentiated during the period. Downsizing was due to several factors, such as the occurrence of diseases that have reduced herd of cattle severe drought in certain periods,
- increased feed prices and birds, restrictions on certain region of the world regarding imports and exports;

- it forecasts an upward movement of cattle in Asia, Latin America, the Caribbean and some countries in Oceania;
- done meat production worldwide recorded a substantial annual growth rate over the past ten years;
- traditional meat producers are interested in getting a high quality productions that by trading at higher prices to producers bring significant revenues;
- in terms of world trade in meat has not had a uniform evolution period; beef and poultry can see an upward trend, with an estimated increase in world exports of around 19% by the year 2021 compared to the period 2009-2010, for pork short term there will be a trend stagnant, the sheep is expected to increase the quantity exported, it will increase demand on the world market;
- it predicts an upward trend in the consumption of poultry meat over other types of meat;
- world meat market is an important market for the global economy, but it will be under pressure from producers in developing countries. In terms of competitiveness, it will be determined, on the one hand, the price level and on the other hand the quality of meat and meat products.

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## ANALYSIS OF THE AGRI-FOOD SECTOR OF THE REPUBLIC OF MOLDOVA IN THE EQUATION MODEL OF GROWTH AND DEVELOPMENT OF THE FOREIGN ECONOMIC RELATIONS

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### Abstract

*Republic of Moldova is a country with favorable conditions for agricultural development. In no other country in the world the chernozems (black soils) occupy up to 80% of the agricultural land. However the performance of the agricultural sector of the Republic of Moldova records a low level compared to other countries. The lack of competitiveness is reflected by low productivity, low economic growth, the fact that agriculture and food industry fail to keep pace with the increasing demand for food, determined by rapid overall economic growth and inability to cope with foreign competition, especially the one from European Union. In order to renovate the agricultural sector and enhance the competitiveness of its products it is necessary to pay special attention to the production of organic agricultural products which recently recorded an increasing demand both nationally and internationally.*

**Key words:** *agricultural sector, agri-food products, barter, economic relations, inputs, international standards, international trade, organic products, quality.*

### INTRODUCTION

Currently, both on the national and international level, agricultural development gets a new look. If until now the increasing volume of agricultural production was due to a combination of fertilizers and new highly productive plant varieties, then, at present, this agricultural system does not work so well because the soil is increasingly impoverished while chemical fertilizers and pesticides are harmful to human health. Most countries have tried to promote agricultural development by funding research activities, providing services and other types of support to stimulate production through subsidies. As a result of these activities the volume of agricultural production increased, which generally contributed to society development. Therefore, the promotion of organic products trading will help to increase the efficiency of agricultural sector. For the Republic of Moldova, organically produced agricultural products and

their commercialization is a real chance of penetrating targeted international markets that are oversaturated with products from conventional farming and lack organic products. The purpose of our research is to assess the promotion of agricultural products trading in order to increase the efficiency of the agricultural sector.

### MATERIALS AND METHODS

In this paper, analysis of the agri-food sector of the Republic of Moldova in the equation model of growth and development of the foreign economic relations, the method of analysis, induction, deduction and synthesis that allowed researching the essence of the topic and drawing some conclusions that we believed would be of interest for economics. The end result is to develop economic and mathematical methods to quantify the growth and development of agri-food sector, which are scientifically based on the main aspects of

perspective and efficiency of foreign trade in the Republic of Moldova.

## RESULTS AND DISCUSSIONS

At present, agriculture remains the major sector of country's economy due to its moderate climate, fertile soils and rich labour resources. However, Moldova's agriculture is characterized by increased economic and social consumption. It should be noted that even the reforms undertaken in order to enhance the efficiency of this sector didn't reach their goal. Thus, the newly formed enterprises use outdated models of management, work, remuneration, technological and sale system of agricultural production. Also, there is no fair competition on the market of agricultural products because of legislative, technical, economic and informational barriers. Both large and small enterprises from this sector are highly leveraged while rural demonetization obstructs the development of agricultural sector. [1]

In order to increase the efficiency of agricultural sector and enhance the competitiveness of agri-food products it is necessary to pay special attention to the production of organic agricultural products which recently recorded an increasing demand both nationally and internationally. Through organic agriculture it is

implemented the agricultural production management system that promotes the use of renewable natural resources and recycling. Further we'll present the structure of economic agents by farm categories producing organic agricultural production in the Republic of Moldova. (Fig. 1.)

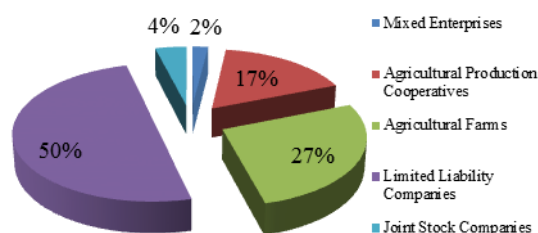


Fig. 1. Structure of the economic agents by farm categories

Source: elaborated by author based on data of the Ministry of Agriculture and Food Industry of the Republic of Moldova, 2012

In our opinion, the reduced share of agriculture could be explained by the fact that processing enterprises purchase agricultural production at low prices that do not cover the consumption incurred by farmers, while the latter are obliged to pay exaggerated prices for fertilizers, agricultural machinery, equipment and so on.

Table 1. Evolutionary aspects of the global plant production in all farm categories of the Republic of Moldova

Years	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Global agricultural production at current prices, million lei	8646	9474	10354	11819	12688	13734	12825	16503	13300	19873	22619	20263
Including:												
Global plant production at current prices, million lei	5727	6298	7086	7900	8449	9079	7941	10600	7861	13616	15751	11346
Global animal production at current prices, million lei	2655	2870	2937	3524	3851	4278	4509	5519	4987	5786	6347	8417
Services at current prices, million lei	264	306	331	395	388	377	375	384	452	471	521	500
Absolute deviation of the global plant production, +,- thousand lei	-	571	788	814	549	630	-1138	2659	-2739	5755	2135	-4405
Index of plant production growth (reduction) at current prices, %	102	110	113	111	107	107	87	133	74	173	116	72
The share of plant production in global agricultural production, %	66,24	66,48	68,44	66,84	66,59	66,11	61,92	64,23	59,11	68,52	69,64	55,99
The share of animal production in global agricultural production, %	30,71	30,29	28,37	29,82	30,35	31,15	35,16	33,44	37,50	29,11	28,06	41,54
The share of services in global agricultural production, %	3,05	3,23	3,20	3,34	3,06	2,75	2,92	2,33	3,40	2,37	2,30	2,47

Source: author's calculations based on data of the National Bureau of Statistics of the Republic of Moldova, 2012. <http://www.statistica.md/pageview.php?l=ro&idc=263&id=2193>

Taking into consideration Moldova's goals to diversify international economic relations, increase exports, attract foreign investment, increase GDP per capita in rural areas, enhance environmental and social protection, win customer confidence, ensure food safety and traceability of agricultural products, we can mention that they fall in with the purposes of organic agri-food products sector development.

From the point of view of farm structures, Moldova's agriculture is uneven and unstable in terms of forming new production structures designed to meet market demands and use efficiently the human and natural resources in rural areas.

We can assess the volume of agricultural activity in terms of value using the global agricultural production at comparable or

current prices, which is an important synthetic indicator that should be analyzed. (Table 1)

Analyzing the data in the table above, we noticed a minimization of 2356 million lei of the global agricultural production in 2012 compared to the previous year and 11617 million lei compared to the year 2001. As a result, there is a minimization of 4405 million lei of the plant production in 2012 compared to 2011 and 5619 million lei compared to the year 2001, and respectively there is a minimization of 2070 million lei of the animal production in 2012 compared to 2011 and 5772 million lei compared to 2001. The same minimization could be noticed in the case of services: in 2012 there is a reduction of 21 million lei compared to 2011 and 236 million lei compared to 2001. An evolutionary aspect of the agricultural production in the Republic of Moldova is shown in figure 2.

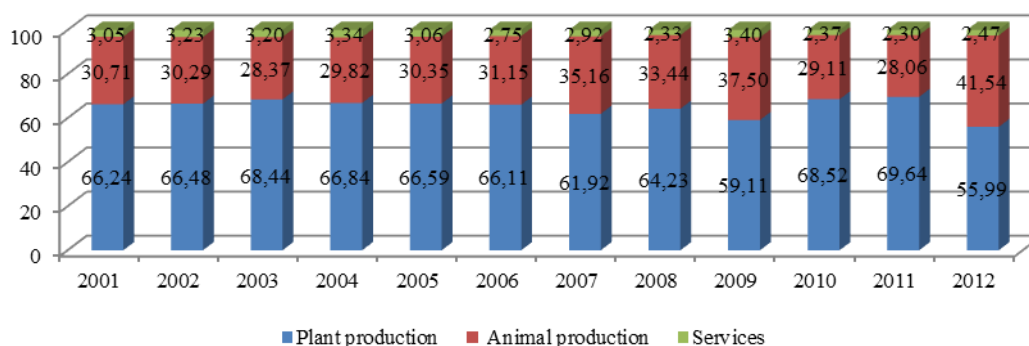


Fig. 2. Structure of agricultural production in the Republic of Moldova in the period 2001-2012

Source: elaborated by author based on data of the National Bureau of Statistics of the Republic of Moldova, 2012  
<http://www.statistica.md/pageview.php?l=ro&idc=315>

Analyzing the evolution structure of global plant production in all farm categories in the Republic of Moldova at current prices, we remarked a considerable upward trend except for the years 2007, 2009 and 2012. Also there is an impressive growth in 2008, 2010 and 2011, recording the indices of 1,33; 1,73; 1,16 for the plant production increase at current prices.

Also, we observed a reduction of 13.65% in relative value and 4405 million lei in absolute value of plant production at current prices in 2012 compared to 2011. An essential increase of 2659 million lei or 33.48% of the plant production was recorded in 2008 compared to 2007. At the same time it should be noted that

there is a slow increase of 2070 million lei or approximately 32.61% of the animal production at current prices in 2012 compared to 2011. Also we have to mention that in most analyzed periods there is a fluctuation in plant production at current prices and the influence on these important fluctuations is caused by drought. The highest reduction rate of the global production took place in 2008 compared to 2007 by 28.68% where global plant production at current prices increased by 2659 million lei or 33.48%. Also, another decrease of the global production occurred in 2009 compared to 2008 by 19.40% where global plant production at current prices decreased by 2739 million lei or 25.83% and

the third reduction of 10.42% took place in 2012 compared to 2011, where global plant production at current prices decreased by 4405 million lei in absolute value or 27.97%. Consequently, it was also noted the reduction of plant production share in the global agricultural production in 2007, 2009 and 2012.

However, the comparisons of plant production volume at current prices do not reflect real changes in volume because it does not take into account the inflation.

In order to neutralize the influence of the price factor it was calculated the index of production change at current prices. To find

out the average annual increase (decrease) of plant production at current prices ( $K_m$ ) we'll use the following formula:

$$K_m = \sqrt[n-1]{k_1 \times k_2 \dots k_n}$$

where:

$k_1, k_2 \dots k$  – increase (decrease) index compared to the previous year;

$n$  – number of dynamic range.

Following the calculations based on data in the table above, we obtained the average annual increase (decrease) rate of 1,065.

$$K_m = \sqrt[12]{1,02 \times 1,10 \times 1,13 \times 1,11 \times 1,07 \times 1,07 \times 0,87 \times 1,33 \times 0,74 \times 1,73 \times 1,16 \times 0,72} = 1.065$$

The obtained result proves the fact that in the period 2001-2012 global plant production recorded essential modifications in each year, but comparing the year 2012 to 2001 and to 2005 it was of 18,5% and 1,6% respectively.

The modification of plant production's evolutionary aspect also represents a specific

feature of the global agricultural production as a whole. Analyzing the indices of global agricultural production by farm categories as presented in figure 3 we observed that, in 2012, global agricultural production at current prices in all farms decreased by 27.4% compared to the previous year.

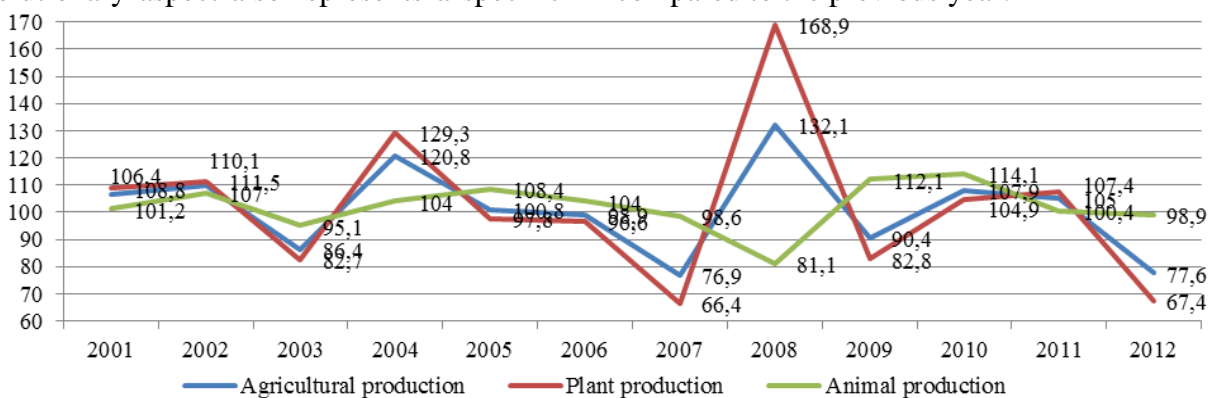


Fig. 3. Dynamics of indices of the agricultural production volume by farm categories, % (the previous year 100%)  
 Source: elaborated by author based on data of the National Bureau of Statistics of the Republic of Moldova, 2012, <http://www.statistica.md/pageview.php?l=ro&idc=263&id=2193>

The reduction of global agricultural production in 2007, 2009 and 2012 was caused by long-term drought and consequently crop yields fell by 2-3 times. The decrease of global agricultural production in the agricultural farms has also occurred as a result of reduction of field crops areas by

4.6% in 2003, 1.0% in 2005, 4.6% in 2006, 3.6% in 2007, 3, 5% in 2008, 5,9% in 2009, 6,1% in 2010, 6,9% in 2011% compared to the year 2001. A more detailed explanation is presented in Table 2.

Table 2. Dynamics of crop sown areas by farm categories

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Sown areas - total</b>	<b>1555,1</b>	<b>1573,8</b>	<b>1484,0</b>	<b>1567,5</b>	<b>1540,3</b>	<b>1483,4</b>	<b>1499,2</b>	<b>1500,3</b>	<b>1464,1</b>	<b>1460,3</b>	<b>1447,2</b>
Structure, %	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
Cereal crops and leguminous grain crops	1076,5	1071,5	896,6	1077,1	1034,7	917,6	655,4	1005,8	353,2	328,2	301,8
Structure, %	69,2	68,1	60,4	68,7	67,2	61,9	43,7	67,0	24,1	22,5	20,9
Technical crops	301,0	331,0	417,1	344,7	358,0	400,7	368,2	342,1	365,4	388,3	412,4
Structure, %	19,4	21,0	28,1	22,0	23,2	27,0	24,6	22,8	25,0	26,6	28,5
Vegetables and Cucurbitaceous crops	114,2	107,7	89,9	79,1	79,8	87,6	81,5	81,2	76,4	77,1	72,6
Structure, %	7,3	6,8	6,1	5,0	5,2	5,9	5,4	5,4	5,2	5,3	5,0
Forage crops	63,4	63,6	80,4	66,6	67,8	77,5	94,1	71,2	70,7	75,3	68,2
Structure, %	4,1	4,0	5,4	4,2	4,4	5,2	6,3	4,7	4,8	5,2	4,7

<http://www.statistica.md/pageview.php?l=ro&idc=263&id=2193>

Analyzing the structure of agricultural production by farm categories in 2012, we observed an increase of 0,2% of the global agricultural production in the country; the agricultural farms recorded a decrease of 0,5% while family farms recorded an increase of 0,3% compared to the previous year. (Figure 4.)

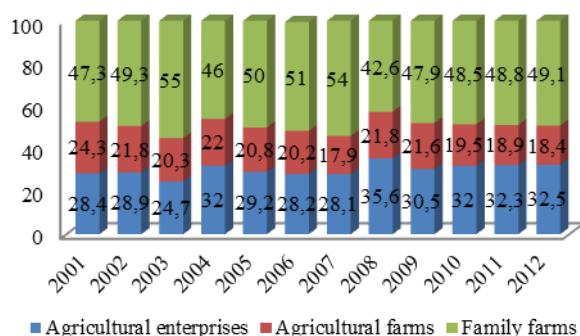


Fig. 4. Structure of agricultural production of the R. Moldova by farm categories (in percentage compared to total production volume)  
 Source: Elaborated by author based on data of the National Bureau of Statistics of the Republic of Moldova, 2012,  
<http://www.statistica.md/pageview.php?l=ro&idc=263&id=2193>

It should be noted that the growth rate of global agricultural production in 2012 compared to 2001 is by 1,34 times higher, compared to 2005 is of 59.6% and compared to the previous year it is of 10,42% respectively. A negative growth rate does not mean that the state or enterprise is less effective, especially if there are some isolated events (drought). The trend of production increase should be evaluated during several years.

The obtained results prove the possibility to achieve maximum allowable production potential by the agricultural farms.

In the table below we'll analyze the production of main plant products in the agricultural farms of the Republic of Moldova.

Table 3. Production dynamics of the main plant products in all categories of agricultural farms of Moldova, thousand tons

Indices	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Cereal crops and leguminous grain crops – total	2628	2587	1613	2993,7	2837,9	2290,2	901,9	3169,5	2176,5	2421,3	2498,2	1204
including:												
wheat	1181	1113	100,6	861	1056,7	691,4	406,5	1286,3	736,7	744,2	794,8	494
barley	230,9	220,5	57	268,3	212	200,1	115,2	353,1	261,4	208,4	194	129,3
- corn for grains	1118	1194	1414	1794,5	1492	1322,2	362,7	1478,6	1141,1	1419,8	1468,3	571
- leguminous grain crops	77,6	48	29,6	50,1	64,5	67,5	14,1	37,1	27,8	35,8	31,8	21,2
Sunflower	254,5	317,5	390	335,2	331,1	379,9	155,5	371,9	284,2	382,3	427,4	295
Soybean	9,5	12,6	19,4	40,2	65,6	79,8	39,8	58,1	49,2	110,6	78,7	49
Sugar beet	1085	1129	656,8	911,3	991,2	1177,3	612,3	960,7	337,4	837,6	588,6	584
Tobacco	16,1	11,8	6,9	7,9	6,7	4,8	3,6	3,9	4,4	7,6	5,4	2,8
Potatoes	384,8	325,2	302,8	317,7	378,2	376,9	199,4	271	260,9	279,6	350,8	182
Vegetables	448,1	396,5	360,8	315,2	389,3	475,2	221,8	376,3	307,9	341,2	361,5	231
Cucurbitaceous crops	38,3	28,4	71,6	56,9	48,3	92	41	69,9	101,9	103,4	84,1	61,83

Source: <http://www.statistica.md/pageview.php?l=ro&idc=315>

Analyzing the period 2001-2012, we can say that the production of main plant products in the Republic of Moldova was inconstant. Studying the impact of different production types on the physical volume rate of agricultural production in 2012 compared to 2011, we found that the most negative impact was caused by significant decreases in production: cereal crops and leguminous grain crops production by 1294,2 thousand tons, potatoes – by 168,8 thousand tons, vegetables - by 130,5 thousand tons, sunflower seeds - by 132,4 thousand tons, cucurbitaceous crops - by 22,27 thousand tons, which resulted in the reduction of global plant production in relative values, corresponding to 51.81%, 48.12%, 36.10%, 37.74% and 26.48%.

The decrease of plant production in 2012 compared to the previous year was due to lower average yield of all agricultural crops as a consequence of the exceptionally bad weather conditions of the last year. Thus, the average yield per a hectare of corn decreased by 2,6 times, wheat – by 1.6 times, soybean, potato, sunflower - by 1,7 times, barley – by 1.5 times, vegetables – by 1.6 times, cucurbitaceous crops - by 1.4 times and leguminous crops – by 1.5 times.

During the devastating drought of 2012, over 90% of the country's territory and 80% of the rural population depending on agriculture was affected by low yields.

In order to develop the prospects of trade with leguminous crops it is necessary to analyze the dynamics of its production in the Republic

of Moldova (Table 4.) using the following indicators [2]:

1. Absolute gain ( $S_a$ ):

- *fixed*:  $S_{ab} = N_i - N_1$ ;
- *mobile*:  $S_{al} = N_i - N_{i-1}$ ;

2. Rate of growth:

- *fixed*:  $R_{cb} = \frac{N_i}{N_1} \times 100\%$ ;
- *mobile*:  $R_{cl} = \frac{N_i}{N_{i-1}} \times 100\%$ ;

3. Rate of gain:

- *fixed*:  $R_{sb} = \frac{S_a}{N_1} \times 100\%$ ;
- *mobile*:  $R_{sl} = \frac{S_a}{N_{i-1}} \times 100\%$ ;

4. Absolute value of 1% of absolute gain compared to relative gain rate:

$$V_a = \frac{N_{i-1}}{100}$$

5. Absolute average gain:

$$\bar{S}_a = \frac{\sum S_{al}}{n}$$

where:

- $S_{ab}$  – absolute fixed gain;
- $S_{al}$  – absolute mobile gain;
- $R_{cb}$  – fixed growth rate;
- $R_{cl}$  – mobile growth rate;
- $R_{sb}$  – fixed gain rate;
- $R_{sl}$  – mobile gain rate;
- $V_a$  – absolute value of 1% of the absolute gain compared to relative gain rate;
- $N_i$  – current level;
- $N_1$  – first level;
- $N_{i-1}$  – previous level;
- $n$  – number of levels of dynamic range.

Table 4. Dynamics of leguminous grain crops production in the Republic of Moldova

Years	Production of leguminous grain crops, thousand tons	Absolute gain, million lei		Rate of growth, %		Rate of gain, %		Absolute importance of 1% gain, million lei
		fixed	mobile	fixed	mobile	fixed	mobile	
2001	77,6	-	-	-	-	-	-	-
2002	48	-29,60	-29,60	61,86	61,86	-38,14	-38,14	0,78
2003	29,6	-48,00	-18,40	38,14	61,67	-61,86	-38,33	0,48
2004	50,1	-27,50	20,50	64,56	169,26	-35,44	69,26	0,30
2005	64,5	-13,10	14,40	83,12	128,74	-16,88	28,74	0,50
2006	67,5	-10,10	3,00	86,98	104,65	-13,02	4,65	0,65
2007	14,1	-63,50	-53,40	18,17	20,89	-81,83	-79,11	0,68
2008	37,1	-40,50	23,00	47,81	263,12	-52,19	163,12	0,14
2009	27,8	-49,80	-9,30	35,82	74,93	-64,18	-25,07	0,37
2010	35,8	-41,80	8,00	46,13	128,78	-53,87	28,78	0,28
2011	31,8	-45,80	-4,00	40,98	88,83	-59,02	-11,17	0,36
2012	21,2	-56,40	-10,60	27,32	66,67	-72,68	-33,33	0,32

Source: author's calculations based on data of the National Bureau of Statistics of the Republic of Moldova, 2012.  
<http://www.statistica.md/pageview.php?l=ro&idc=315>



According to the obtained results we calculated the absolute average gain of the leguminous crops production in the period 2001-2012, which constitutes 4,70 thousand tons and which is considered a negative one.

$$\bar{s}_a = \frac{(-56,4)}{12} = -4,70$$

Dynamic changes, which represent a characteristic feature of the transition phase to market economy, and new requirements for enterprises imposed by the scientific-technical revolution determined a considerable increase in quality. Humanity has reached a stage when products quality has a strong influence on life conditions. Nowadays, personal security and health are closely dependent on the quality of products. Being analyzed in connection with the objective process of amplification and diversification of international economic exchanges, the quality is also an essential prerequisite for competitiveness and therefore for the participation of any country and any economic unit in the world economic circuit. The factors influencing the quality of agricultural products compared to other sectors of national economy are directly or indirectly determined by natural conditions especially those connected to the soil and climate.

The great variety of factors influencing the choice of production system in phytotechny is also determined by the fact that plant production is placed in different areas or natural economic micro-regions characterized by specific conditions.

Environmental factors vary in space and time. *The first* aspect influences the choice of system and *the second* concerns its functioning within acceptable limits and generally raises the issue of maintaining its balance. The achievement of second aspect requires, in case of disruptive conditions, to allocate different factors having counteractive effects, i.e. to make investments or additional expenses that will influence the costs of production and ultimately the financial results.

The chosen production system should emphasize, through crops structure and other components, the importance of environmental factors, aiming at increasing the productivity of various crops according to their needs, and by correcting their negative influence in order to avoid great variations from one period to another, otherwise it is possible to obtain a deviation of offer over the demand. [3]

Further we'll analyze actual and smoothed data of the leguminous grain crops productivity (table 5.).

Table 5. Actual and smoothed data of the leguminous grain crops productivity in the Republic of Moldova

Years	Productivity of leguminous grain crops q/ha (N)	Conventional time marking, (t)	t <sup>2</sup>	N*t	Smoothed volume of productivity per 1 ha of leguminous grain crops, q/ha $\bar{N} = a_0 + a_1t$
2002	8,4	-5	25	-42	10,4
2003	6,4	-4	16	-25,6	10,5
2004	13,6	-3	9	-40,8	10,5
2005	15,7	-2	4	-31,4	10,6
2006	16,3	-1	1	-16,3	10,6
2007	4	0	0	0	10,7
2008	13,6	1	1	13,6	10,7
2009	8,8	2	4	17,6	10,8
2010	10,7	3	9	32,1	10,8
2011	11,6	4	16	46,4	10,9
2012	8,2	5	25	41	10,9
	$\sum N = 117,3$	$\sum t = 0$	$\sum t^2 = 110$	$\sum Nt = -5,4$	$\sum \bar{N} = 117,3$

Source: author's calculations based on data of the National Bureau of Statistics of the Republic of Moldova, 2012.  
<http://www.statistica.md/pageview.php?l=ro&idc=315>

The calculation of smoothed volume of productivity per 1 ha of leguminous grain crops we'll be done according to the following formula:

$$\bar{N} = a_0 + a_1 t$$

where:

The parameter  $a_0$  of equation is:

$$117,3 : 11 = 10,7$$

The parameter  $a_1$  of equation is:

$$-5,4 : 110 = 0,05$$

Actual and smoothed data obtained according to calculations are presented in the following graph.

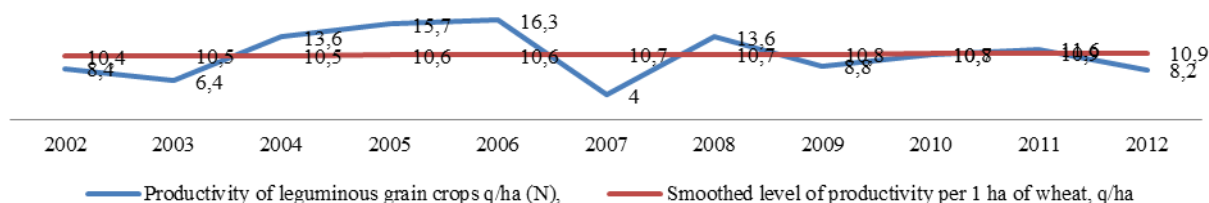


Fig. 5. Dynamics of actual and smoothed data of leguminous grain crops production in the Republic of Moldova  
 Source: elaborated by author

Using the process of extrapolating, in 2013, the productivity of leguminous grain crops will constitute:

$$\bar{N} = 10,7 + 0,05 \times 6 = 11 \text{ q/ha}$$

In 2014, it will constitute:

$$\bar{N} = 10,7 + 0,05 \times 7 = 11,05 \text{ q/ha}$$

In 2015, it will constitute:

$$\bar{N} = 10,7 + 0,05 \times 8 = 11,1 \text{ q/ha};$$

In 2016, it will constitute:

$$\bar{N} = 10,7 + 0,05 \times 9 = 11,15 \text{ q/ha};$$

In 2017, it will constitute:

$$\bar{N} = 10,7 + 0,05 \times 10 = 11,2 \text{ q/ha};$$

The parameters of re-estimated indices are very optimistic according to performed straight line forecasts. In the following years the index of smoothed level is growing as it has a positive assessment.

Achieving a strong growth of leguminous grain crops productivity would allow a decrease of Moldova's vulnerability and the commercialization of these crops in different countries. Rural space degrades economically, socially and culturally. In this context, for the Republic of Moldova, agri-food products diversification and the process of exchanging leguminous grain crops at constant rate with the economic partners exporting oil resources (for example:

$1 \text{ kg of leguminous grain crops} \equiv \alpha \text{ liters of oil, } \alpha - \text{constant}$

) represent some of the possibilities to get out of the economic crisis.

## CONCLUSIONS

Captivating into consideration the development of Moldova's agricultural sector and in order to increase the competitiveness of grain legumes, as well as to export them, one should:

At present, agriculture remains the major sector of country's economy due to its moderate climate, fertile soils and rich labour resources.

to diversify and create a system to produce, process and sell organic products designed to meet the needs of both national and international markets;

the diversification of the end product structure is one of the strategic issues of the country with commercial partnerships and different economic policies. Moldova can ensure financial stability only through diversification, thus, it will be able to withstand "attacks" from foreign economic partners, to value the potential of rural production.

During the devastating drought of 2012, over 90% of the country's territory and 80% of the rural population depending on agriculture was affected by low yields.

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## ACCOUNTING AND TAX TREATMENT OF THE RE-EVALUATION OF THE TANGIBLE ASSETS

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### Abstract

*The methods of patrimonial evaluation are recognised on a large scale by the specialists in the Continental Europe, while the specialists in the North America almost ignore them, they consider as a realistic economic value the one that results from the update of the forecast cash-flows. The Romanian financial school does not mention at present a basic orientation related to the continental or American opinion. In general, it can be found out that the attitude of the Romanian authors, specialised in the accounting domain, is for the patrimonial methods, and those in financial professional domain, is for the financial and stock methods. According to the International Standards for business evaluation, the "asset based approach is the way to estimate the value of a business and /or the participations to it, using methods based on the market value of the individual assets of the business, decreasing its debts". The entities can proceed to the re-evaluation of the tangible assets that exist at the end of the financial exercise, so that they are presented to their true value in accounting, reflecting the results of this re-evaluation in the financial reports made for that exercise. In this context, the present paper proposes the analysis of the **accounting and tax treatment** foreseen by the accounting regulations, according to the European directives, and to the procedures of evaluation and re-evaluation of the tangible assets.*

**Key words:** *accounting value, accounting treatment, fiscal treatment, immobilisation, re-evaluation*

### INTRODUCTION

The main idea of the patrimonial methods of evaluation is that the enterprise value is equal to the patrimony value it owns. The methods mean an identification of the assets to evaluate and they do not aim the potential result associated to the future activity. The start point for this estimation is the patrimony value reflected in the financial situations. According to this definition, the patrimony, equivalent to the **net accounting asset**, aims exclusively the elements reflected in the balance sheet, either they participate or not in the exploitation process. There are two possibilities to calculate the patrimony value thus defined: either by decrease of the debts values in the total assets, or by summing the elements that represent the own capital and thus due to the shareholders (Manăţe D, 2010). **The net corrected asset** (ANC) aims to eliminate the limits of the net accounting asset and to provide a more accurate dimension to the enterprise value about the economic reality. In order to determine the net corrected

active it is needed the critical analysis of each element of calculation, depending on the concrete reality and of its value on the evaluation. In the evaluation practice for the calculation of the net corrected asset the assets expression is made depending on their use value. Due to the lack of a rigorous definition the *use value* will be considered as being „the sum that a cautious and authorised enterprise manager, would accept to pay in order to obtain the wanted immobilised asset, taking into account the use that its possession has for the achievement of the enterprise objectives” (Tournier J.C., Tournier J.B.,2010)

### MATERIALS AND METHODS

The basic treatment foresees that the corporal immobilisations are present in the balance sheet at **cost**, adjusted with **the value of the cumulated amortisations and of any cumulated losses in depreciation**. The alternative treatment foresees that after the initial recognition, a corporal immobilisation is present in the balance sheet at the **re-**

**evaluated value**, based on the just value in the moment of the re-evaluation, less the cumulated amortisation and losses in depreciation. IAS 29 foresees, besides the two treatments, the evaluation by methods that take into account the inflation, respectively re-treating the historical cost to inflation. The assets that are re-evaluated on the date of the balance sheet or that are evaluated on the current cost, on the date of the balance sheet are not re-treated.

**The lands evaluation** that are in the enterprise property of is recommended to be made by real estate evaluators, familiarized with the methods of land evaluation ( Stan S, 2000) respectively: the direct market comparison, the allocation method, the extraction, the parcelling, the residual method, the capitalization of the gross rent. *The direct comparison* is method recommended for the evaluation of the free lands, without constructions. The method implies the analysis of the sale prices and of the characteristics of the land sales in the period immediately after the evaluation moment, in order to compare and adjust these prices to reach to a market value for the land subject to evaluation. *The allocation method* is recommended by the practice of the evaluation of the built lands. The principle on which the method is based is the determination of the share of the land value in the total value of a property. *The extraction* is an evaluation method, derived from the allocation method, which consist of the deduction from the sale price of a property of the construction value, calculated on the net replacing cost, and the resulted value is the land value. *The parcelling method* takes into account the best use, from building point of view, of each land parcel resulted after the division of a larger land surface. *The residual method* takes into account the contribution of the two types of invested capital, buildings and land, to obtain and distribute the net profit of the entire business, resulted following an investment made on the land subject to evaluation.

*The method of gross rent capitalization* is used for the evaluation of the rented lands,

allowing the capitalization of the rent collected by the rented land owner to a user. The agricultural lands are evaluated using *the comparison method*, the same as in case of non agricultural lands, or *method of net rent capitalization*. The second method reflects what David Ricardo mentions (Tournier J.C., Tournier J.B.,2010) that „the price of the agricultural land is the capitalized rent at the present interest rate”. The corrections made at the level of the balance sheet and account of profit and losses are, in fact, *interventions on the accounting value*, in order to transpose this specific information in „the day values”. From methodological point of view, the evaluation of an enterprise by ANC method implies passing trough a sequence of the following phases (Fiscal code Pct. 571 and pct. 715):

- check up the financial situations that contain information about the enterprise assets and debts on the evaluation date. It is preferable that the evaluation date is identified with the data on which the patrimony inventory is made;
- check up the compliance between the on the staff situation of the assets and the real situation, following some inspections made by the evaluator and which are written in the evaluation report;
- make corrections to some posts of asset and passive, according to table no. 1.

Table 1. Causes of the corrections made on posts of immobilised assets

No. crt.	Posts	Cause of corrections
1.	Non corporal assets	Depreciation / appreciation during the time
2.	Land	Reflecting the market value
3.	Buildings	Depreciation, modification of replacing cost
4.	Machines, equipment, installations	Depreciation, introducing value to those not accounted, eliminating the value of those not used

The estimation of the value of the basic components of the net corrected asset supposes corrections on the accounting value of those posts that did not register significant modifications to the accounting value. The re-evaluation represents the alternative

accounting treatment allowed for the determination of the corporal immobilisations value on the date of the balance sheet. The re-evaluation of the corporal immobilisations is made on the fair value on the date of the balance sheet. The fair value is determined based on some evaluations made, as a rule, by qualified specialists in evaluation, members of a professional body in this field, recognised nationally and internationally. The fair value of the corporal immobilisations established following the re-evaluation becomes amortising value of the respective assets from the beginning of the financial exercise following the next financial one for which the re-evaluation was made. On the date of the re-evaluation, the cumulated amortisation can be treated in one of the following ways: a) it is recalculated proportionally with the change of the gross accounting value of the assets, after re-evaluation, so that the accounting value of the asset, after re-evaluation, is equal to its re-evaluated value – method based on indices; b) it is eliminated from the gross accounting value of the asset, and the net value, determined following correction with the adjustments of value, it is re-calculated on the re-evaluated value of the asset.

## RESULTS AND DISCUSSIONS

The surplus in the re-evaluation included in the re-evaluation reserve is capitalized by the direct transfer in reserves, when this surplus represents an achieved gain. The gain is considered achieved when taken out from the evidence of the asset for which the reserve in the re-evaluation was made. Nevertheless, a part of the gain can be achieved while the asset is used by the entity. In this case, the value of the transferred reserve is the difference between the amortisation calculated based on the re-evaluated accounting value and the amortisation value calculated based on the initial cost of the asset.

The re-evaluation of the corporal immobilisations at the end of the financial exercise constitutes the **alternative accounting treatment** foreseen by the accounting regulations according to the

European directives. **The basic accounting treatment consists of the presentation of the immobilisations in the balance sheet**, at the entrance value, less the cumulative adjustments of value. The application of the **alternative treatment** of evaluation supposes that, after the initial recognition of a corporal immobilisation, this is presented in the accountancy to the fair value, instead of the purchase cost/production cost or any other values before that asset. The main aspects on the re-evaluation of the corporal immobilisations, refer to: **establishing the fair value of the assets, frequency of re-evaluations, accounting registration of the re-evaluation results, treatment of amortisation related to re-evaluated amortisations, accounting treatment of surplus from re-evaluation, requirements for information presentation, aspects presented briefly as follows.**

Establishing the fair value of immobilisations is achieved according to the accounting regulations, based on some evaluations made, as a rule, by qualified professionals in evaluation, members of a professional body in this field, recognised nationally and internationally. **The fair value of the corporal immobilisations is determined, in general, starting from their market value.** The re-evaluation is applied simultaneously on the entire groups of which the asset is part, respectively on the goods of the same nature and similar use that are used by an entity, in order to avoid the selective re-evaluation and reporting in the annual financial situations of some values that are a combination of costs and values calculated on different data. The result of the re-evaluation is determined by comparing the net accounting value of the asset with the fair value, established following the re-evaluation.

The main aspects on the **accounting registration of the re-evaluation result and the accounting treatment of the amortisation related to the re-evaluated assets and of re-evaluation surplus**, contained in the mentioned accounting regulations, are summarised in tables 2 and 3.

The depreciation calculated for the re-evaluated corporal immobilisations is registered in accountancy starting with the financial exercise that follows after that for which the re-evaluation was made.

Table 2. Registration of re-evaluation result

Rectification	Accounting treatment
Increase of net accounting value	- as an increase of the re-evaluation reserve, registered in the account credit 105 Reserves in re-evaluation, if there was not a previous decrease recognised as expenditure related to that asset
	- as an income reflected in the account credit 7813 Incomes from adjustments for the depreciation of immobilisations), to compensate the expenditure with the previously recognised decrease at that asset
Decrease of net accounting value	- as an expenditure with the entire value of the depreciation (account 6813 Exploitation expenditure on adjustments for the immobilisations depreciation), when in the re-evaluation reserve evidenced in account 105 Re-evaluation reserves, a re-evaluation surplus is not registered
	- as a reserve decrease in re-evaluation (by account debit 105), in the limit of the creditor balance of the re-evaluation reserve, and the potential difference remained uncovered is registered as expenditure by the account debit 6813 Exploitation expenditure regarding the adjustments for the depreciation of immobilisations.

The rules on amortisation apply to asset, considering its value, determined following the re-evaluation.

Table 3 Accounting treatment of the amortisation and re-evaluation

Accounting treatment	Registration
Accounting treatment of amortisation	- re-calculated proportionally with the change of the gross accounting value of asset, so that the accounting value of asset, after re-evaluation is equal with its re-evaluated value
	- eliminated from the gross accounting value, and the net value, determined following the correction with value adjustments, is re-calculated at the re-evaluated value of the asset.
Surplus treatment from re-evaluation	- it is capitalized by direct transfer in reserves, by account credit 1065 Reserves representing the surplus achieved from re-evaluation reserves, when this surplus represents the achieved gain, respectively when taking out of the evidences the asset for which the re-evaluation reserve was made or as the asset is used by the entity.
	- No part of re-evaluation reserve can be distributed, directly or indirectly, except for the case in which the re-evaluated asset was used, situation in which the re-evaluation surplus represents the effectively achieved gain.

We consider that only the sums reflected in the account 1065 reserves representing the surplus in reserves in re-evaluation related to assets sold that can be distributed, not those registered in account 105 Reserves in re-evaluation.

In case in which the re-evaluation is made, in the explanatory notes must be presented, separately, for each element in the balance sheet of re-evaluated corporal immobilisations, following the information: value to historical cost of re-evaluated immobilisations and sums of cumulated value adjustments or the value on the date of balance sheet of the difference between the value resulted in the re-evaluation and that representing the historical cost, and, when applicable, the cumulated value of the supplementary value adjustments. At the same time, the entities must present in the explanatory notes information related to: value of re-evaluation reserve at the beginning for the financial exercise, differences in re-evaluation transferred to reserve in re-evaluation during the financial exercise, sums capitalized or transferred in another way from the re-evaluation reserve during the financial exercise, presenting the nature of any such transfer, observing the legislation in force, re-evaluation reserve value at the end of the financial exercise. This information must be presented regardless the reserve value was modified or not during the financial exercise (Pierre F., Besançon E., 2011).

## CONCLUSIONS

The re-evaluations must be made with a highly enough regularity, so that the accounting value of the corporal immobilisations is not different substantially from the value that would be determined using the fair value from the balance sheet date.

The account 105 „Reserves from re-evaluation“ is balanced in case of using immobilisation, and the balance of the account 1065 „Reserves representing the surplus achieved in re-evaluation reserves“ represents in fact the surplus in re-evaluation.

The income obtained from selling the corporal immobilisation, represents a taxable income to taxable profit calculation, and expenditure with the value remained unamortised is deductible from the calculation of the taxable profit.

The re-evaluation reserve highlighted in account 1065 „reserves representing the surplus achieved from re-evaluation reserves“, in case in which they are not used for covering the losses, distributing dividends, maintain the unit level, are not taxed.

The reality proves the fact that the enterprise is not only a center for profit production and capital accumulation, but also a center of knowledge accumulation and technical-organisational experiences accumulation, and when all these forms of accumulation develop in an balanced way, the enterprise achieves the goal for which it was created. So, the value of an enterprise can be measured depending on the size of its material patrimony, but it subsists also in the capacity to acquire, generate and distribute the intangible resources.

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## THE CHARACTERISTICS OF THE BUDGET PROCESS AT THE LEVEL OF THE LOCAL PUBLIC ADMINISTRATION IN THE RURAL SECTOR

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### **Abstract**

*The financial decentralization is an essential component part for the political, administrative and economic decentralization process, with major involvement on the economic and social system in Romania. Although the authorities of the local public administration in Romania were authorised to ensure the local communities the services provided by law and even to involve in the economic-social development of the towns and communes, in fact they have never had enough financial sources from the state budget or from the local budgets. The local budgets represent the planning and management tools of the financial activity of the territorial-administrative units. Their structure reflects the autonomy level of the local administration towards the central level and the links existing between the different territorial administrations. Also, the local budgets reflect the flows of incomes formation and the expenses of the local administrations, the method of financing the expenses on destinations and the deficits covering. The local authorities must access external aid programs, in order to be able to achieve the investigation works related to the commune infrastructure, due to the fact that the local incomes are insufficient to achieve investigations works from their own sources. In this context, the present paper proposes to highlight the characteristics of the budget process within the local public administration in the rural sector area.*

**Key words:** budget process, budget classification, local autonomy, local budget

### **INTRODUCTION**

The Local budget is a component of the defined budget system, according to the legal regulations, as a link of it, in the context of autonomy in relation to the other components (state budget, state social insurance budget, special funds budgets, budgets of the autonomous public institutions, the budget of the state treasury).

The local budgets have a specific structure within the local public administrations, limited from territorial viewpoint. Each of these is independent of each other.

According to ONU economic and functional classifications used in the reports of the international revenue, the structure of local budgets is common to the central budget (state) and to other budgets within the budget system. It is about, of course, the main categories, according to the groupings used in the budget classifications.

The definition of the local budget incomes is based on finding out and evaluating the taxable matter and the tax base is calculated

depending on the related taxes and fees, evaluation of the services provided and the incomes from these, as well as other specific elements, including data series in order to assess the correct income.

The grounding, sizing and distribution of local budget expenditure, on credit officers, on destinations, respectively on actions, activities, programs, projects, objectives, is made in accordance with the responsibilities of the local public administration authorities, with priorities established by them, for their functioning and in the interest of the respective local communities.

The grounding and approval of the local budget expenditure is made in strict correlation with the real possibilities of the local budget income collection, estimated to be achieved.

### **MATERIALS AND METHODS**

The study is part of a research approach that aims to illustrate more accurately the reality in the village world. I began this process by

creating an image as objective as possible about the quality of life of those living in these areas aiming an outline of the level of the existing rural development. In this respect, I consider necessary to corroborate the qualitative data with the quantitative data obtained by observation with quantitative data that will bring more clarity and objectiveness to the process.

The methods used were mainly quantitative – the analysis of documents and secondary analysis of quantitative data, SWOT analysis and case study. I chose these methods in order to present a more complete image of this area and to outline with concrete elements the budgetary process developed at the level of the rural communities representative for certain types of typologies – commune near an urban area, field relief, with potential in agriculture.

## RESULTS AND DISCUSSIONS

The local public administrations obtain their funding sources from taxes and duties that people and companies must pay as well as from other sources (concessions, leases, income from capital, etc.) according to the fiscal code, with the subsequent modifications (Law no. 13/06.01.2012).

*The own incomes* of the local budgets are current (tax and non-tax), from capital and with special purpose.

*The current fiscal incomes* consist of taxes and other tax incomes. The fiscal incomes refer to transfers from the net profit of the companies set by the local councils by transforming the autonomous administrations, concessions, payment transfers from public institutions. The local public administration control these incomes, involving directly in establishing, finding, tracking and collecting them by their own specialised units.

Locally, by the opportunity to establish some local taxes within certain limits and to reduce or increase all local taxes by 50% according to the law provisions, the local authorities may establish *their own fiscal policy depending on the state of the local economy*, on financing needs, the collection rate,

sensitivity tax, current tax level, logistic and organizational capacity to collect taxes, in close correlation with the local development program.

*The capital incomes* are obtained by exploiting some goods, residential sales and privatization. Their share is quite low and is more than exceptional. When sizing the incomes the legal provisions on local taxes and duties are taken into account as well as the direct involvement of the local authorities in establishing, finding, tracking and collecting them by their own specialized units, but to ensure the functionality of the territorial administrative units it is needed the allocation of different breakdown taxes in order to balance the local budgets.

*The state budget incomes* are rates and amounts deducted from certain incomes of the state budget, transfers with special destination from the state budget.

The rates and amounts deducted from the income tax: the rate distributed to the local councils from the income tax that provide relative autonomy, meaning that each local administration has this income automatically without the intervention of other national or local authorities, and the local public authorities use these sources without conditioning the destination. However, such income can not be controlled and local public authorities do not have the tools to forecast, establish and collect these sources.

*The sums deducted from VAT* have as destination covering the expenses on pre-university education, nurseries, local and county centers of agricultural consulting and related support to the child protection system and disabled people. For these amounts the local authorities lack local autonomy both in terms of determining the amount and in terms of using them.

*The transfers received from the state budget for co-financing* projects promoted within the programs developed by international organizations and financing activities and services from special funds does not affect the operational budgets of the local public administrations as generally they aim achieving investment objectives, services with

medium and long term impact on local communities.

Financing some activities and services from special funds managed by different ministries.

**Expenditure** is foreseen in local budgets in accordance with the budget classification, and materialize the ways of financing the specific actions performed locally. Of course, some expenses are not included at this level, they are only of local importance.

The local public authorities can commit internal loans without the Government guarantee provided that they inform previously the Ministry of Finances.

The external loans will be contracted only with the approval of the authorisation commission of these loans, constituted by representatives of local public administration authorities, of Government of Romania National Bank, its component being approved by the Government. *The contracted loans of the local public authorities for the achievement of public investment of local interest*

The financing of the public investments of local interest can be achieved by loans from the commercial banks or from the credit institutions or by emission of value titles, both on the internal market and on the external market of capital.

The public debt contracted this way, represents a general obligation that must be reimbursed, according to the agreements concluded, from the resources made available by the territorial administrative units, except for the transfers from the state budget with special destination.

The incomes and expenses are grouped in the budget based on the budget classification approved by the Ministry of Public Finances. The incomes are structured on chapters and sub chapters, and expenses, on parts, chapters, sub-chapters, titles, articles, as well as paragraphs and lines, if applicable.

The expenses foreseen in chapters and articles have precise and limited destination.

The number of employees, permanent or temporary, and the basic salary fund approve distinctly, by annex to the budget of a public institution can not be exceeded.

The capital expenses contain at each budget chapter, in accordance with the commitment credits and durations of investment achievement.

The programs are approved as annexes to the budget.

The external non reimbursable funds and the internal and external loans are contained in annexes to the local budget and approved once with them.

**Case study.** Alexandru Odobescu commune lies on a surface of 40,28 Km and includes 1286 households. Each part of the poorly developed commune category from economic point of view, the tradition sector in the commune economy being agriculture (Table 1). Number of economic agents is of 7, a quite low number for the local economy.

Table 1. SWOT analysis at commune level

<b>Strengths:</b>	<b>Opportunities:</b>
- Gălățui lake ; -Project „Pollution control in Agriculture”; -Program SAPARD – Water supply in Gălățui village; -population from town began to migrate to village; -2 Rural development projects	-agro-tourism development; - attract investment in the area ; -Source of food products for covering the town needs; -development of commune infrastructure
<b>Weaknesses:</b>	<b>Risks:</b>
– there is an incomplete and reduced town documentary fund ; -not maintained commune roads; -rural infrastructure is inadequate; -poor material state of inhabitants; -there is not a rural management plan; -Lack of a long term local development strategy.	-some of those who were preserving the traditional techniques in constructions disappeared; -in the sector of rural development t legislation is unsatisfactory and methodological norms are absent; -Lack of staff motivation involved in development programs; -Links of partnerships insufficiently stable.

Following the analysis of execution account (budget execution account of Alexandru Odobescu Local Council) for 2011 compared to the budget on 2012 an increase of incomes result for 2012 with 8% compared to 2011, and regarding the expenses it results an

increase of 5% for 2012 compared to 2011. The current incomes increase the percent of 81% in 2012 compared to 2011, and fiscal incomes increase in percent of 88% for 2012 compared to 2011 (The incomes and expenses budget of Alexandru Odobescu Local Council).

From the analysis of this indicator, at the level of the analysed commune, considering the effective achievement of 2012, it results that the self financing level of local council expenses was of 19%, difference of 81% being covered by the distribution of some sums from the state budget and from the special funds. From this point of view, it can be concluded that the local autonomy is very reduced being dependent largely on the incomes distributed from the state budget.

We will analyse further on the achievement of the commune budget, comparing the budget provisions and the local budget achievement on 2012. In 2012, at commune level, the own incomes were collected in proportion of 78%, compared to own incomes foreseen to collect in the local budget (Table 2).

From the analysis of the budget execution on 2012, it results that the collecting level of local taxes and duties is not good enough.

Table 2. Structure of own incomes

Name of indicators	Plan 2012	Achievements 2012
Duties and taxes from the population	1.032.000	829.203
Tax for lands state property	1.000	2.790
Tax on Buildings and lands of legal entities	42.000	40.117
Other direct taxes	64.000	22.893
Indirect taxes	231.000	132.674
Transfers from the public institutions	82.000	88.037
Various taxes of which:	620.000	376.922
- recovery of judgment expenses	1.000	0
- incomes from fines	0	5.300
- funds repayment from local budget financing of the previous years	359.000	325.000
- incomes from concessions	40.000	31.367
- collecting from other sources	220.000	15.255
TOTAL CURRENT INCOMES	2.072.000	1.492.576
TOTAL OWN INCOMES	3.134.955	2.460.710

The local budget incomes of Local Council (Figures 1, 2 and 3) for 2012 are constituted in proportion of 74 % from the distributed incomes from the state budget, own ones in proportion of 21% coming practically to balance t incomes from the state budget, from the point of view of the financial autonomy of the local locality.

The current incomes are found mainly in: taxes and duties from population - 55,6%; taxes on buildings and legal entities - 2,7 %; other direct taxes -1,5%; other indirect taxes 8,9%; incomes from concessions and rents - 31,30%. We can conclude that the current incomes are based on property taxes – citizen property, economic agents property and private property of territorial administrative units.

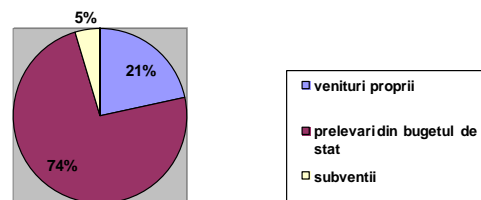


Figure 1. Structure of total incomes in 2012

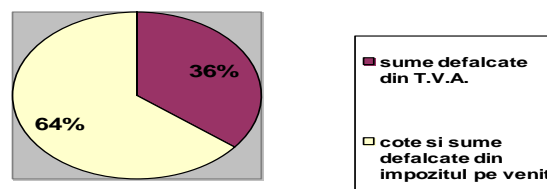


Figure 2. Structure of state budget incomes in 2012

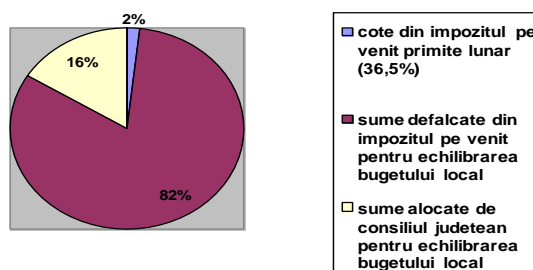


Figure 3. Structure of shares and sums from income tax

The law on public property and its juridical regime (Law no.213 of 17 November 1998) mobilised the local authority in delimiting the public domain and on this occasion t public

domain was delimited too and this made possible the application of a local policy for the capitalization of the private sector by rent and concession.

The impact of fiscal decentralisation become more favourable if it is completed with a professional and rigorous local management, with a partnership on horizontal (economic agents, citizens, county council, non governmental organisations) and on vertical (ministries, bodies and organisations at national level).

Nevertheless, the contribution of the local sources to balance the needs in the territory is not covering especially if we take into account the general economic context, the development degree of each locality, the geographical situation as well as the fact that the decentralisation of some expenses is made without covering sources.

From own incomes (current) a percent of 23% allocated to education that represents sin total budget 3,3% - over the sum allocated at the state budget level – but major problems can not be solved only the current ones. From the total budget of 2012 a percent of 10% was allocated for social assistance in amount of 98.410 lei, sum insufficient to pay the assistants for disabled persons and social support.

Due to the lack of funds and not ensuring the covering sources, the payment of the assistants for disabled persons and social support was achieved in proportion of 80%.

The legislative instability creates problems in real setting of a local budget and the most affected part of the budget is the development budget as by taking from the local budget some functional expenses without covering sources, the local authority is obliged to ensure the current functioning of the mechanism in the territory and the sources being limited, this is not made for the development in the territory by transferring the sources from this sector to functioning sector.

Until now we faced situations that various actions (expenses) were sent from national level to local level but without covering sources totally or partially.

Examples could be given: taking nursery staff to local authorities without having an established juridical status; expenses for social support payment (Law 416/2001; Law 115/2006); taking persons to accompany the disabled tat was made initially wit integral financing from the state budget, subsequently local budget being obliged to bear until 55%.

## CONCLUSIONS

The legislation in the sector, in force, creates problems in real setting of a local budget and the most affected part of the budget is the development budget by taking to the local budget some functional expenses without covering sources, the local authority is obliged to ensure the current functioning of the mechanism in the territory and the sources being limited, this is made affecting the development in the territory by transferring sources in this sector to functioning sector. Thus a series of measures are proposed: improvement of the system for local taxes and duties collection; creation of a local information program for the evidence of local taxes and duties; re-introduction of agricultural land tax, that represent an important income source; identification of not taxed properties (natural persons who achieve incomes without being authorized, constructions without authorisation); payment of global income tax in 3 distinct accounts (state budget, local and county councils), as it was foreseen initially in Law of public finances (Law 273 of 29th June 2006 on local public finances); modification of Law of real estate cadastre, in the sense that the property evaluation is made under the control of the local public administration authorities and inclusion of taxes related to this service in the structure of local budget incomes; elaboration of a simple and unitary guide for the documents of authority adopted by the local public administration authorities in fiscal sector; establishing the percent shares of income tax that will return to local communities, depending on the different level of their economic development.

The following solutions are proposed: organisation of specialisation courses for sending the regional and local development concepts; promotion of successful experiences of strategic planning being a process of adapting to the needs, the reconsideration of elaboration of regional development concept, as base of strategy elaboration is considered appropriate.

The definition of the local budget incomes is based on finding out and evaluating the taxable matter and the tax base is calculated depending on the related taxes and fees, evaluation of the services provided and the incomes from these, as well as other specific elements, including data series in order to assess the correct income.

The legislative instability creates problems in real setting of a local budget and the most affected part of the budget is the development budget as by taking from the local budget some functional expenses without covering sources, the local authority is obliged to ensure the current functioning of the mechanism in the territory and the sources being limited, this is not made for the development in the territory by transferring the sources from this sector to functioning sector.

**As a conclusion**, it is considered important the regional and local development as a contribution to the increase of local and county autonomy and at the same time it was concluded that the regional development policy is conditioned by the existence of some solid local public finances, well programmed and managed. This can be achieved by a more accentuated fiscal decentralisation and creation of some adequate implementation instruments.

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## NEW APPROACHES TO THE MANAGEMENT OF TOURISM RESOURCES. CASE STUDY THE BUZAU COUNTY

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### **Abstract**

*The paper aimed to present the new approaches to the management of tourism resources. Starting from theoretical and methodological approaches to date regarding the principles of substantiating the touristic zoning of the territory, it has been achieved the valuation of the touristic potential of the basic territorial and administrative divisions in Romania. For this purpose, the following analysis elements for defining the national territory have been established: the natural touristic potential, the cultural heritage, the general infrastructure, the specific touristic infrastructure, and the quality of the environment. Following discussions with specialists in touristic and related fields, as well as of reference to the specific legislation in force, the result was a model of categorizing the potential and infrastructure components. Starting from the component elements of touristic valences, for valuation and hierarchy purposes of the territorial and administrative divisions, we have chosen the method of the analysis families according to fundamental criteria and sub-criteria; the estimation levels have been attributed by using a moderation procedure of a 100 points total. To demonstrate these theoretical aspects, we developed case study focused on Buzau County. As a conclusion, Buzau County is rich in tourism resources potential, but their management is not efficient.*

**Key words:** Buzau county, natural potential, rural pensions, tourism resources management

### **INTRODUCTION**

In recent years, there was an overflow of the resort on the Prahova Valley. To resolve this situation, a solution would improve infrastructure in the state. We believe that this is partly a viable solution and that is the true identification of other tourist areas to absorb the thousands of Romanian and foreign tourists.

This paper aims to analyze quantitative and qualitative tourism resources of natural and anthropogenic Buzău County to see if that area may represent an alternative to the Prahova Valley. A little known, rarely promoted County Buzău hide some of the most beautiful tourist treasures of the country. Resources for tourism are numerous and very varied, should not be invented just to show them to be known and valued.

Buzau County is situated in the S – E part of Roumania and its neighbours are the counties of Brasov, Covasna, Vrancea, Braila, Ialomita and Prahova. It possesses 2, 6 % from the whole surface of the country (Neacșu, 1999).

Buzau County lies over the largest part of the hydrographical reservoir of the river having the same name, it combines harmoniously all the relief forms: mountains, in the north part, field – in the south; between the two of them there is lying the Sub Carpathian of Buzau.

The natural setting, as well as the variety of the landscape, especially in the mountains and in the hills, to which other historical elements are added, such as the ethnographical and folk richness of the place, they all offer great satisfactions to their tourists (Bran, 2007).

In the Sub Carpathians of Buzau, the Muddy Volcanoes from the Paclele Hills make up a quite unique natural element in our country.

There can be found another impressive phenomenon The Alive Fire on the Slanic Valley, near Lopatari and Rusetu, which are blue, flames coming out from the deep crack of the earth.

The houses and the households in the mountains and in the hill areas are set on foundations or cellars giving the image of simplicity and elegance, of hospitality and

open-heartedness, they offer excellent conditions for agrotourism (Honțuș, 2005).

## MATERIALS AND METHODS

Starting from the component elements of touristic valences, for valuation and hierarchy purposes of the territorial and administrative divisions, we have chosen the method of the analysis families according to fundamental criteria and sub-criteria; the estimation levels have been attributed by using a moderation procedure of a 100 points total (Antonoaie, 2002).

In order to hierarchies and delimit the touristical areas, first of all, the inventory and knowledge of all components of tourism potential, their clustering in space and then evaluating their qualitative and quantitative is necessary, in order to determine the opportunities for development, the forms of development that could be generated and the equipment necessary for management in terms of efficiency and competitiveness (Bran, 2005).

## RESULTS AND DISCUSSIONS

### 1. Qualitative and quantitative analysis of the touristical potential of the Buzău County.

Table 1. Calculation model

Basic criteria	A Natural potential	B Cultural historical potential	and C Touristical structures	D Communication means	Maximum score
Attributed value (%)	40	30	16	14	100
Sub criteria	20 heritage values 10 landscape natural conditions 10 water resources	14 historical values 9 urban values 3 ethnographical values 2 memorial values 2 museums and collections	8 structures for accommodation and food 5 spa treatment 3 entertainment	6 roads 6 railway 2 air routes	
Attributed value					

Source: The Institute Urbanproiect

**The ranking** of tourist areas is done, as we said, according to a number of criteria, aimed to the value classification of touristical resources, their way of concentration in the territory. In the literature of speciality there are numerous ways of evaluating and ranking the touristical areas, of which the following may be mentioned: the method of graphs and partial ranking.

Graphs Methods - is a system of analysis based on a series of basic criteria and sub-analysis done on more levels. Each level of assessment, which relies on a number of criteria, has received a number of points.

The elements constituting touristical heritage received 70 points out of a total of 100, the remaining 30 being granted for the touristical equipping.

By using this method, proposed and used by specialists from the Institute Urbanproiect (planning for the travel section), the main touristical areas and sub-areas may be easily highlighted.

For all the methodologies for value scoring, the following potential components are to be mentioned:



For the Buzău County the situation is as follows in the analysis:

Table 2. Calculation model for Buzau County

Basic criteria	A Natural potential	B Cultural and historical potential	C Touristical structures	D Communication means	Maximum score
Attributed value (%)	40	30	16	14	100
Sub criteria	8 heritage values 8 landscape natural conditions 5 water resources	7 historical values 7 urban values 3 ethnographical values 2 memorial values 2 museums and collections	7 structures for accommodation and food 4 spa treatment 2 entertainment	4 roads 5 railway 0 air routes	
Attributed value					62

Source: Crețu, 2012



Fig.1. Map of Buzău County

## 2. Agrotourism in The Buzău County

In the Buzău County there are twenty-nine rural pensions.

A.N.T.R.E.C. Buzău occurred because of the acute need to identify and promote the touristical potential of the rural county of Buzău, because it is obvious that, taking into account the relatively small business sector size, the efforts to promote made by the individual owners of rural pensions are insufficient and can not show a significant impact (Beciu, 2011).

### Well-known products of the Buzău County

From the ingenuity and inventiveness of the people living in Buzău, resulted the sausages of Pleșcoi, the wine of Pietroasele, the pretzels of Buzău, products that are identified with the tradition and history of the place.

**The Pietroasele area** is most famous because of all the "treasures" in the area, one of them being that one found in 1837 by four peasants who were working on stone exploitation, the so called "The Golden Brood Hen with Its Chickens", treasure, that seemed to have been made by the Dacian craftsmen, but also with pieces of Visigothic origins (Crețu, 2012).

The second "treasure" of the area is represented by the vines, from which the renowned wine of Pietroasele is obtained.

The wines of Pietroasa have participated in many competitions, where the Tămâioasa Românească wines were renowned.

From all the awards, we would like to mention "the gold medal", "diploma of honour" and the congratulations of the international jury from Montpellier, "First diploma of honour" and "the great gold medal" in Budapest.

### The Sausages of Pleșcoi

A Romanian protected trademark in the European Union, the sausages of Pleșcoi are a real delicacy that came from the culinary imagination of the Buzău people.

The „Pleșcoi” is made after a traditional recipe from the area of Buzău, from mutton with garlic and pepper, pressed, dried and smoked.

### The Pretzels of Buzău

A Romanian protected trademark in the European Union, the pretzels of Buzău are a

real delicacy that came from the culinary imagination of the Buzău people. They are prepared following a recipe well maintained over time and are still found today on the tables of the people living in the area of Buzău during the holidays. A visit in the Buzău County may also mean the meeting of the pretzels of Buzău.

## CONCLUSIONS

1. All resources found in the Buzău County are insufficiently valorified, the main obstacles in this regard could be the following:
2. An insufficient number of hostels.
3. Poor infrastructure represented by impracticable and insufficient roads, bridges that show a great deal of problems within rainy periods.
4. The County Council, the Prefecture and the City Council do not show initiative in shaping up the actions that should promote the natural and anthropical resources and the agrotourism in this county.
5. There is an acute shortage of qualified people for tourism activities and tourism.
6. Should all of these problems be solved, the agrotourism in this county could become not only a great attraction for the Romanian tourists, but also for the honest hat come from other countries.

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## METHODS AND TECHNIQUES REGARDING THE GENERAL TECHNICAL-ECONOMIC IMPROVEMENT OF THE PLANTS

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### **Abstract**

*The capacity of continuous modernisation of our agriculture, in order to obtain some high vegetal and animal productions is reflected first of all by the effects of applying some productions technologies that are as adequate as possible to the natural and technical-economic conditions in the units. In order to improve in general the production technologies of the vegetal crops it is needed to identify the crops that are to be practiced, the surfaces (differentiated on categories of fertility) that it would be good to be allocated to different cultures, the technological chains needed to obtain the various products depending on the limits imposed by the resources that exist in order to obtain a maximum profit. In this regard, the technical-economic background of the production technology and the corresponding linking to the component elements, increase the effect of their action. The present paper proposes to establish the general methods and techniques specific to the modern technologies in the plants crops.*

**Key words:** critical path method, crops, graph, indicators, technologies

### **INTRODUCTION**

At the global level, given the vastness of products, the production conditions, the used systems, the technological levels and the new resources that revolutionize the technological system, the modern science and technology are very important resources for increasing the productive potential of the agriculture. The rapid level of technology change and development of new technologies has led to the development of the engineering aspects of technology that seek to develop science-based technologies that are most effective and should be applied in practice in a creative manner.

Thus there is an ongoing development, selection and adoption of techniques and technologies to new objective conditions existing at each stage of development, so that the effort made by those working in agriculture to be optimal. Sequential optimization in process technologies agricultural production ranging from basic research to practical application, to ensure economic efficiency of the proposed technology is a long way. Basic research is performed in relatively small dimensions,

however its cost is relatively high. To reach economic performance, of course, a number of items which enables basic even experimental research must be reduced, because in practice you can enter only those technologies that have improved efficiency compared to the previous one. Without this relationship, basically a new technology can be applied in practice. Another aspect to be taken into account in sequential optimization of production technologies is the perishable nature of technology, the appearance of new resources that go. To meet increased competition and to keep up with productivity, agricultural units must shape different combinations of production factors and to build up capital so as to adapt to the needs and modernization and characteristics of agricultural process. Technological optimization at global level tend to have as priorities the use of production factors that have beneficial effects on reducing costs and does not breach environmental rules. In the general process of development of production technology basically several stages are passed their trend and rhythm are different and when a saturation stage is reached and from this stage to decline. Today a technology

obsolescence is witnessed particularly wear due to continuous change of the qualitative and quantitative resources and new discoveries or technological structural combinations in fact the need to change their structure. Science and technology, when considered as resources for optimization of technologies have practically unlimited character. Impetuous development of science and technology knowledge and widens as the rate at which this process takes place, it accelerates certainly and prefigures a new form future.

## MATERIALS AND METHODS

A method commonly used in general optimization is the method of variants. This method consists in producing many types of technologies applied to the concrete conditions of the agricultural units.

Case study was carried out collecting information from specialised literature and information processing.

## RESULTS AND DISCUSSIONS

The sequential optimizing of the production technologies must be completed by a global optimization model of all technological links. For this aim selecting from the set of variants, technically acceptable, the alternative of combining production technology ensures maximum efficiency of available resources in enterprise and market expectations.

Up to a certain point, the best technology would be assembled by putting together all the variants considered sub-optimal. This method is not the best because from the mechanical assembly of technological optimal sequences, it does not necessarily result a optimal technology. Under these conditions, the overall optimization of technologies aiming at bringing those technological elements with interaction leads to maximum economic effect in the concrete conditions of each agricultural unit. Based on the analysis of each subsystem is done in compiling several technological options that will keep possible solutions from sequential optimization. By

achieving overall optimization of vegetable crops production technologies should be identified crops to be applied, surfaces (differentiated by type of fertility) would be appropriate to allocate different cultures, effective technologies by which it is obtained different products depending on the limits of existing resources in order to achieve the main objective of business: profit and that the maximum revenue.

By a judicious technical-economic substantiation production technology and appropriate combination of constituents can be increased effect of their combined action.

Hence the necessity of combining the technology of those elements whose interaction can lead to maximum economic effects in concrete terms ag units widely deployed in the overall optimization is the method variants. This method consists in producing many types of technologies applied to the concrete conditions of agricultural units.

In this method the following steps:

- establishing alternative technologies.
- calculating, for each variant, the economic indicators specify.
- comparison of alternative technologies based on indicators calculated.
- choose the most convenient technology.

In this method, analyze the production technology involves several modalities and criteria of approach:

a) physical criteria. Involves analyzing economic indicators, expressed in physical units, indicators serve expert in assessing the influence of one or more physical inputs on results. Physical criterion is a criterion partial analysis of the results

b) criterion value (economic). It is necessary to deepen the consequences of each choice, showing how much can be produced that are valuable results and economic efficiency.

Such indicators are: total production value (PTV), additional production value (PSV), average production value (PMV), the marginal production (PMgV), total costs (TC), additional expenses incurred by factor considered variable (CV) total additional profit and labor productivity.

c) energy criterion. It considers the premise that any material or product has built into it a certain amount of power and energy consumption required to obtain. Studies in this field have led to energy analysis methodology and a set of indicators:

- total or additional energy obtained
- energy consumption, total or additional under different forms
- net energy obtained

Energetic efficiency is reflected by:

Specific-energy consumption ( $C_s$ ) which is determined as follows:

$$C_s(\%) = \frac{\text{energyconsumption}}{\text{energyfrom}} \times 100$$

- Bioconversion ratio ( $R_c$ ):

$$R_c = \frac{100}{C_s}$$

expressing the energy unit is converted by the technology per unit of energy consumed

The method has the advantage that the results are not influenced by changes in prices, although it may be supplemented by determining costs for each type of energy and environmental cost of energy unit of various factors and their share in total expenditure.

d) Ecologic criteria. It becomes mandatory and may be reflected in substance use of chemicals: herbicides, fungicides, content in nitrates, etc..

Disadvantages of method variants that limit the number of factors that can be optimized simultaneously (one or two) and analysis discontinuity factors used for the proposed levels.

In the process of optimizing the overall production technologies in agriculture, a more modern method used is based on critical method. This method, which has gained wide spread use in planning and tracking complex work in ensuring production rhythm with maximum efficiency and use of resources based on business optimization methods using decision theory using graphs.

Its advantage is the ability to choose from many possible combinations of technological routes best in terms of costs and employment in the era's best quality

parameters and limits with the use of scarce resources.

Critical path analysis is a tool commonly used in programming and follow-scale works, which allows short and medium term planning, operational planning to execution and regular updating of these projects taking account of factors: time, cost, resources and manpower.

Graph MDC method allows complex parts division action at a level to link their logic and technology that make it possible to establish interacting between components (activities).

All planning methods using graphs are based on a model representing the conventional signs are shown by some independent work that must be done to achieve this goal. Graph can be represented as focused or detailed form, but in any case it is exhibited, it must present an idea of the ways in which you can reach your goal and what are the expenses. On the occasion of the graph drawing, unclear thing appear, as well as illogical measures of in the organisation context of planned action. Using the graph, the whole complex of works can be included also at the same time, it becomes accessible to study in detail the different parts.

In addition to present the foreseen works in reaching the goal, the graph contains a series of assessments (time, cost, resources, degree of technicality of elements) for each paper. These values can be exact or approximate with a known degree of discretion. Graph, together with the findings noted on it, serves as a basis for further analysis of possible changes and to check its performance. The main parameters that are examined in this analysis, are time and cost. These two factors usually are in direct dependence with each other, the shorter the time spent for execution of works, the higher the expenses necessary for their performance will be and vice versa.

Graphical analysis allows to choose the optimal plan in terms of ensuring the execution of all works required and minimum cost. Method by stringing activities and the time required to achieve them in a certain time sequence in a graph, highlighting all of the work flow and process critical path.

When drawing the graph all the work has to be taken into account, without the execution of which is impossible to achieve the ultimate goal. It is not mandatory to start directly with developing a detailed graph. In the first step only overall links are established of various complex works, thus obtaining a network that reflects the order, and the inter-dependencies between key stages. This network presents the overall organization of the works, highlighting different nodes and allowing focus on the main points of the program.

The economic calculations based on these networks present a great approximation and therefore a new phase - detailing network was introduced. On this occasion it is obtained a more accurate assessment of the time required for carrying out more complex activities within the overall network. After detailing, some complex work with many interacting networks can be regarded as independent. Using the mathematical planning and management system based on graph theory, it is determined the time required to execute all respective works. The results of assessment for solving problems of complex works are noted on the original network and are used for the timing of work specified in the graph. Planning and management based graph allows early assessment of the effects of deviations from the original program and it allows the prevention of works interruption.

Due to the calculation process and the used algorithm, the critical path is just the simple arithmetic optimization variant that chooses one variant from several ones, the shortest one. The phases taken to optimize using critical path are:

- a) development of all graphical operations
- b) calculating the start and end times of activities
- c) control of works and updating the graph

The following example is a model of design, calculation and update the graph for scheduling activities within an agricultural seasons.

For the critical path method, it is needed to analyse in detail the operational plan of campaign work, monthly or every ten days, taking into account each activity to be

performed, determining their sequence. You also need to establish activities that can be performed simultaneously.

Given the specific conditions of the unit at the beginning of the campaign, different work activities are set up in chronological order, taking into account their interdependence, as well the estimated duration of each activity.

Table 1. List of activities for the harvesting campaign of straw cereals

Activity symbol	Activity name	U.M.	Duration days
O1	Organisation of wheat harvest area	Ha	2
O2	Mechanical harvest of barley	Ha/t	7
O3	Load, unload, grain barley	T	8
O4	Barley transported to storehouses	T	8
O5	Works to reduce moisture of barley grains	T	5
O6	Pack of barley straws	Ha/t	8
O7	Load, unload barley straws pack	T	6
O8	Transported barley straws barley	T	6
O9	Soils works after barley for double crop	Ha	4
G1	Organization of wheat harvesting area	Ha	5
Activity symbol	Activity name	U.M.	Duration in days
G2	Mechanic harvesting of wheat	Ha/t	15
Activity symbol	Activity Name	U.M.	Duration in days
G3	Wheat loading, unloading	T	12
G4	Transport of grain wheat to storehouses	T	12
G5	Packing of wheat straws	T	10
G6	Loading, unloading of wheat straws packs	T	10
G7	Transport of wheat straws	T	10
G8	Packs of straws wheat	T	10
G9	Previous cleaning of wheat destined to seeds	T	4
G10	Conditioned seed wheat	T	5
G11	Ploughed, harrowing after wheat	Ha	7
P1	Preparation of germinating layer for sowing double culture of wheat	Ha	4
P2	Sowed wheat green mass double culture	Ha	2

The durations of activities in agriculture are determined by the biological limitations and the weather, which require a minimum or maximum for a given activity. The following table (Table 1) lists activities for grain harvesting campaign of grains. Each task is assigned a symbol index, necessary activities barley crop received a symbol, the symbol G



for wheat crop and fodder maize in culture  
Double symbol P.

## CONCLUSIONS

In agriculture, the occurrence of unexpected events, often causes deviations from initially established work programs, as required, in most cases, a compression of activities between optimal terms from biologic point of view and from the point of view of time state.

To compress programs usually the following are used:

- 1) Speed up critical activities by redistributing existing resources; as a result of performing work during the critical path is reduced, and the other is increased in some extent
- 2) The allocation of additional resources through cooperation purchased from other units
- 3) Detection of activities enabling total or partial overlap
- 4) Application of finer decomposition in some parts of works for further analysis of the terms and technology

Critical path method finds its practical use in design and implementation of a marketing program of an agricultural unit, as the design, development and use marketing program is a complex process which aims structuring and scheduling all activities necessary for carrying out the proposed strategies.

The list of activities includes: symbol activity, its contents, indicating directly preceding activity, duration of each activity and responsible unit for its achievement. These activities should be sorted, grouped in order to perform them logically and chronologically.

The advantages of applying the critical path method are numerous, especially in terms of the following aspects:

- 1) it allows an overview on the development work and leads to saving time required for analysis work, which on classical methods, it would require the research of numerous charts and other specific records.
- 2) It is a perfect analyzer that highlights all jobs without reserves of time to direct the attention and to allow a quick decision on the

measures to be made for the purposes of the work.

3) It highlights the delays and advancing, allowing easy adaptation to the new situation of the graph, while the graph calendar must be recovery entirely in such a situation

4) It requires factors liable to analyze in detail the technical documentation, technical processes and organizational issues related to the execution of the works.

5) It constitutes the starting basis of the work for the optimization of deadlines and costs and it imposes setting a suitable information system.

6) It leads to the most efficient scheduling of works during the time, correlated with resources.

7) It allows to analyze in various aspects (technical, organizational and economic especially) of several variants, of which, the safest option is chosen

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## THE DEVELOPMENT OF THE SCIENTIFIC RESEARCHES IN THE EUROPEAN UNION. CASE STUDY, FRANCE

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### Abstract

*The agricultural scientific research institutions constitute the vertebral tier of the world system. Either the research institutions are under the national agricultural form, or they are under the form of agricultural research councils, that act as coordination bodies of the regional or local specialized research institutions, that form the biggest part of the research capacities in each region of the world. In the present study, I chose France because it has an agricultural surface of almost 30 million hectares, that represents more than a half of the total surface of its territory. The lands situated on one side and on the other side of 45 North latitude parallel allow a large variety of production. About 61% of the agricultural surface of the country is occupied with crops, 35% pastures and 4% vineyards. The paper makes an analysis of the research in the agricultural sector, in France and it highlights its main positive particularities, that apply also in other European Union countries.*

**Key words:** agriculture, farm

### INTRODUCTION

Half of surfaces of EU Member States is used for agriculture, which contributes to the growing importance of this area for high quality crops. Due to the occupied area and the importance for human and animal food, the cereal crop is the largest in the world. According to the statistics, cereals occupy 30% of the utilized agricultural area in EU states. Certain Balkan areas are occupied 50%: south West Oltenia, Ilfov regions of Eastern Europe (Hungary, Slovakia, Poland), from North Europe (Denmark, Finland) and South (region of Italy). A smaller area is occupied in the south of Europe, in some alpine regions on the Atlantic coast of the Iberian Peninsula, in northern Sweden, Portugal, Spain and Italy, with cereal crops that are less than 10% of the utilized agricultural area. Belgium, France, the Netherlands and Ireland allocate a relatively small grain surface although manifesting a preference for pastures and fodder. I selected France, as a case study because it holds an agricultural area more than half of the total area of the territory. According to Eurostat data, the income of farmers in the EU-27 grew

by 12.3% in 2011. It is estimated that farmers' incomes increased in 21 EU countries and decreased in 6 countries. The largest increases in farm incomes in 2011 were recorded in Denmark (+54.8%) and Estonia (+48.8%), followed by Ireland (+39.1%), the Netherlands (+32.0%), France (+31.4%), Latvia (+25.5%), Belgium (+24.1%), Bulgaria (+23.0%) and Germany (+22.8%). While the largest decreases were registered in Romania and the United Kingdom (both -8.2%), Greece (-4.3%), Italy (-3.3%).

### MATERIALS AND METHODS

For the study of scientific research in the European Union, we used the specific research methods: dynamic, deductive and quantitative economic analysis, SWOT analysis, case studies, by collecting information from the literature and information processing on site.

Case study-France, we analyzed and interpreted the data collected from the Eurostat website 2012, using the comparison method.

## RESULTS AND DISCUSSIONS

Research institutions are the pillar of the entire system. Either they are in national agricultural form, research institutes or as agricultural research councils, which act as a coordinating body of specialized research institutions, regional or local make up the much of the research capacities in each region of the world. Knowing, explaining and finding viable solutions were based on agricultural scientific developments, the stage is located and the future requirements.

The way of addressing problems is integrates in the concept of Thomas Kuhn that to solve such complex and important issues will have to develop a system of values (solutions) together with the analysis of institutions through which this system is passed and enforced, to know problems in economic context. The problem of funding of scientific research in agriculture was .

Standing under the paradigm of the moment, not so dependent of the needs of this activity, and especially to methodology approach of the development periods. In practice of scientific research, a very important result we have a systematic approach for understanding the complex reality problems specific to agriculture the diversity of the elements that make scientific research and integrates the financing and generate a variety of scientific combinations. The Romanian agricultural research gains new valences in the context of European integration, European Academies Union or agricultural sciences Agriculture, Food and Nature (UEAA) whose activity began at the Bologna meeting on 13-14 November 1999, and in Florence on 20 October 2000, when 14 founding members from 13 countries (Italy, France, Germany, Netherlands, United Kingdom, Russia, Poland, Greece, Estonia, Croatia, Latvia, Slovenia and Romania) signed the Act establishing the Union, with the President elected Academician SCARAMUZZI Franco, president of the Academy dei Georgofili, Italy. At the institutional level, the European Union complete actions made by the Member States for the dissemination and exploitation

of the results of scientific research and technological development. From a financial perspective, the European Union aims to support research institutes and attract young people to scientific careers, knowing that quality of life depends vitally on the progress of science and the application of research results in the company. Half of surfaces of EU Member States is used for agriculture which contributed to the growing importance of this area for the environment and increasing interest in crop quality. In 2010, the EU-27 produced 285.2 million tons of cereals (including rice). Despite the bad weather, the EU cereal production was relatively stable between 2000 and 2010 with higher yields in 2004 and 2008. Cereal production fell from high relative value recorded in 2008, with production falling by 6.1% in 2009 and 3.6% in 2010. However, cereal production in the EU-27 remained 2.6% higher in 2010 than in 2000.

In this study, we chose France because it holds an agricultural area about 30 million hectares, which represents more than half of the total territory.

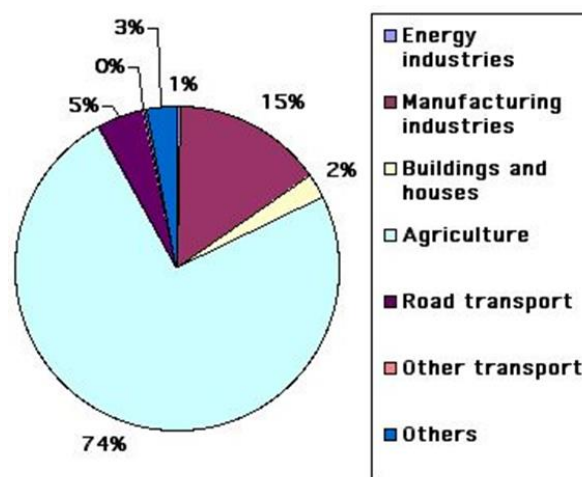


Fig. 1 Study activities in France

Located in the south-western part of the European continent. Climate is temperate oceanic in the west, where rainfall is high (about 1000 mm / m) and Mediterranean in the south, where rainfall is on average 500 mm / mp. The relief is very varied. The hydrographical network is very dense, facing the Atlantic Ocean and the Mediterranean

Sea. The land located on both sides of the 45th parallel north latitude allow a wide range of production. About 61% of the agricultural area of the country is occupied by crops and pastures 35% 4% 7% vineyards. The agriculture involves the active population although it has a low contribution to GDP (3.3%), France being on the first place in Europe and fifth in the world in production of grain. Total area - 55.17 million ha

Table 1. General Information

Indicators	Physical data	Percent data
Agricultural land	29,57 mil ha	53,75 of total country surface
Arable land	18,5 mil ha	33,64 of total country surface
Pastures	10,7 mil ha	
Forests	23,2 mil ha	
Total population	61,03 mil inhabitants	
Active agriculture population	1,14 mil	7% of total country population

Agriculture in France holds the first place in Europe, represented by cereals, industrial crops, livestock and viticulture. French agriculture is based on private ownership of land. Land owner has overall responsibility on how it is used.

Four types of farms were defined in France:

- 1) Industrial farms: their average area of 120 ha, their number and the surface are increasing (in 2009 there were 133,000 registered holdings); they could be found in cereal basins in French plains where there is poor labour force, but very modern equipment;
- 2) Family farms-their average area of 45 ha and they are declining in terms of numbers, so that in 2010 there were 200,000 family farms, from 540,000 in 1988 there were many; their surface increased from 27 ha in 1988 to 45 ha in 2010 and is found in areas close to large urban agglomerations
- 3) Organic farms-their average size -10 ha and tend to grow due to increased demand for products of this type, both for domestic use and export.
- 4) Leisure farms-farmers have other sources of income, practicing this activity just for the

pleasure of producing its own needed products

-developed in industrial areas and mountain areas.

They have modern equipment in all types of farms.

The farmer may change it, after several years of use of an agricultural machine, in a new, more efficient one, farms that sell these products, receiving for the new equipment, the used equipment used the difference in money.

Table 2. Farm structure

Farms Structure			
		Total	%
According to used surface	small <20 ha	195.100	39.72
	Medium 20-50 ha	99.000	20,15
	Large 50-100 ha	106.600	21,73
	>100 ha	90.400	18,4
Total		491.100	100,0

Type of farms with number grew slightly in 2010 are those that grow grain and oily plants (rapeseed and sunflower). From 1994 until now, the organic sector in this country has shown consistent growth. During this period, the number of organic farms increased by 457% and 490% organically cultivated land. Recent data published by Agence Bio, taken from agricultur.ro shows that currently, 3,769 new farms changed to organic. In late 2012, the share of organic farms was estimated at 3.14% of total French farms. During the past 30 years, the French agriculture experienced two heavy periods that exceeded, with the state support:

-in 1974 due to higher commodity prices

- After 1984 due to lower agricultural prices

To meet market competition in Agricultural Policy, a policy of state support farmers and .To meet market competition in Agricultural Policy, a policy of state support farmers and farm compensation premiums granted in disadvantaged areas, or less fertile areas.

Total grant allocated 9.940 million.

Table 3. Subsidies allocated

<b>Total allocated subsidy</b>	<b>9.940 million Euro</b>
<b>Contribution /citizen</b>	139 euro
<b>Subsidy /ha</b>	338 euro
<b>Average subsidy/farm</b>	18.862 euro

In France, state subsidies for agricultural insurance represents about 2.5% of the total insurance premium (40% for farms us - for the first amount corresponding to an excess of 20% or 25%). In 2011, only 15% of agricultural objectives were provided to a total of 60,000 farms.

France is one of the largest food markets in Europe.

Common Agricultural Policy is divided as follows: Direct aids (81%) Rural Development (17%). Export subsidies (2%)

From the information above you can see the features of French scientific research with applicability in other EU countries.

## CONCLUSIONS

In the new Member States of the EU post-accession economic growth stimulated the diversification by pluri-activity, namely: finding a paid job outside the farm, diversification of farm activities, starting a business in tourism or leisure on the farm or outside the farm. All these options can be applied in a survival strategy for small farms. The trend in European countries is to reduce the overall number of semi-subsistence farms as growth occurs in the rest of the economy. In the European Union, the Common Agricultural Policy points out the need of the cooperation in agriculture, setting objectives improving living in rural areas, improving agricultural sectors, increased competitiveness and diversification of activities in the rural area. There are many stakeholders involved in promoting rural development: NGOs, EU institutions and member states. The EU countries have created different networks bringing together agencies and national

institutions aimed at promoting agriculture and rural competitiveness by ensuring the implementation of the National Rural Development Plans, they aim the effective absorption of EU funds for rural development . The farmers' organizations were created in EU states, on the basis of contributions , that make available to its members consultancy in different fields: accounting, legislation, training courses, property rights etc. These powerful organizations make lobby for the rural area support. There are also non-profit organizations, think-tanks (eg RISE), which contribute to the promotion of the rural development.

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## EFFECT OF WATER AND FERTILIZATION LEVELS ON BARLEY USING DIFFERENT IRRIGATION SYSTEMS

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### Abstract

The experimental work was carried out at El-Gemmeiza Agricultural Research Station, Gharbia Governorate, Egypt during 2009/2010 winter growing season to study the effect of using sprinkler irrigation in clay soil condition and barley production. The sprinklers layouts were square and triangular. Also, two irrigation levels and two fertilizers levels were used. The results showed that the amounts of applied water were 5077, 4201 and 3068 m<sup>3</sup> ha<sup>-1</sup> for flood and sprinkler 100% ETc and 50% ETc, respectively. The highest values of coefficient of uniformity, distribution uniformity and application efficiency of low quarter were achieved by the square layout. Grain yield increased from 4.55 Mg ha<sup>-1</sup> with flood to 5.70 Mg ha<sup>-1</sup> under sprinkler irrigation with square layout at 100% ETc and 100% fertilizer. Straw yield increased from 5.36 Mg ha<sup>-1</sup> with flood to 9.65 Mg ha<sup>-1</sup> under sprinkler irrigation with square layout at 100% ETc and 100% fertilizer. Water use efficiency increased from 0.90 kg m<sup>-3</sup> with flood to 1.64 kg m<sup>-3</sup> under sprinkling method with triangular layout at 50% ETc and 100% fertilizer. Energy use efficiency increased from 13.66 kg kW<sup>-1</sup> h<sup>-1</sup> with flood to 18.20 kg kW<sup>-1</sup> h<sup>-1</sup> under sprinkler irrigation with triangular layout at 50% ETc and 100% fertilizer. In conclusion, square layout at 100% ETc with 100% fertilizer gave the best results.

**Key words:** vegetable, price volatility, commercialization, supply chain

### INTRODUCTION

Sprinkler irrigation system has been used worldwide due to its flexibility and adaptability for various soils, crops and topographical conditions. Barley rank is the fourth after wheat, maize and rice. It is consumed as a staple food for animals as well as for human consumption.

El-Adl (2001) studied the effects of irrigation intervals (daily every, two days and every three days), quantities of irrigation water (100% ETc and 120% ETc) and fertilization methods (traditional or broadcasting and fertigation) on peanut production. The results summarized that, maximum seed yield and water use efficiency was obtained with treatment of (irrigation every day with 100% ETc and traditional fertilization method). El-Gindy et al. (2001) selected sprinkler and surface drip irrigation system to irrigate maize. They used two irrigation intervals (daily and every second day), two applied water based on 100% and 80% ETc and two soil conditioners (polymer and manure) were

selected as studied treatment. They showed that the 100% ETc irrigation treatment increased grain and ear yield by 28% and 35%, respectively compared 80% ETc irrigation treatment. Kassem et al. (2002) investigated the effect of different seasonal amounts of applied water on the growth and water use efficiency of ten barley varieties under sprinkler irrigation. They showed that barley grain yield increased by increasing the seasonal amounts of the applied water. Kassem and AL-Moshileh (2005) investigated the effect of sprinkler irrigation, surface trickle and subsurface trickle irrigation with different water regimes on both potato yield and water use efficiency. They showed that the potato yield increased by decreasing the value of soil moisture depletion. Also, the field water use efficiency increased as the value of soil moisture depletion decreased. Aboamera (2010) studied response of cowpea to water deficit under semi-portable sprinkler irrigation system. He used three levels of water application deficit. The results showed that the water application was 1892.52,

1514.02 and 1135.51 m<sup>3</sup> fed<sup>-1</sup> for 100%, 80% and 60% of soil moisture content at field capacity, respectively. The highest seed yield was observed with 100% ETc, while the lowest yield was recorded with 60% of soil moisture content at field capacity. The highest water use efficiency was 0.68 kg m<sup>-3</sup> at 80% soil moisture content at field capacity. While the lowest one was 0.59 kg m<sup>-3</sup> at 100% and 60% soil moisture content at field capacity. Zabady et al. (2010) evaluated the influence of three irrigation systems on *Jatropha* production. They also, used different water management techniques. They showed that the seeds yield increased as the applied water increased. The maximum value of WUE was 0.18 kg m<sup>-3</sup> at 80% from ETc and 2 days interval for bubbler irrigation system. Meanwhile, the minimum value was 0.04 kg

m<sup>-3</sup> at 60% from ETc and 4 days interval for trickle irrigation system.

The aim of the present study was to investigate the potential utilizing sprinkler irrigation system in Delta soil conditions to irrigate barley.

## MATERIALS AND METHODS

The experimental work was carried out at El-Gemmeiza Agric. Res. Station, Gharbia Governorate, Egypt during 2009/2010 in winter growing season. The experiments were designed to select suitable irrigation parameters for producing barley crop Giza 123 variety. The mechanical analysis of the experimental soil was classified as a clay soil as shown in Table (1).

Table 1. Physical properties of soil experimental site

Depth (cm)	Particle size layout (%)			Texture	BD g cm <sup>-3</sup>	F.C (%)	P.W.P (%)	A.W (%)
	Sand	Silt	Clay					
0-15	24.00	26.30	49.70	clay	1.16	43.36	24.25	19.11
15-30	24.15	27.30	48.55	clay	1.20	39.93	21.89	18.04
30-45	24.20	28.25	47.55	clay	1.23	36.62	19.85	16.77
45-60	25.00	28.45	46.55	clay	1.25	34.85	18.97	15.88

The area of the experiment was about 1.26 hectare and situated at 31°07 longitude and 30°43 latitude. It has an elevation of about 20 m above mean sea level. The physical properties were determined according to (Black et al., 1982; Klute, 1986) as presented in Table (1).

Prior to the experimental work, soil samples were collected from different randomized locations.

These soil samples were taken at the depths of 0-15, 15-30, 30-45, 45-60 cm for the determination of some physical properties of the soil at the experimental site. Super phosphate (15.5% P<sub>2</sub>O<sub>5</sub>) was applied at the rate of 238 kg ha<sup>-1</sup> before seeding. Barley (Giza 123) was seeded by a seed-drill at the rate of 119 kg ha<sup>-1</sup> on 26<sup>th</sup> December 2009. To insure complete seed germination all treatments were irrigated by flooding for the first irrigation. In case of flood irrigation, Urea (46% Nitrogen) was applied by manual method at the rates of 238 kg ha<sup>-1</sup> in two

equal doses, the first dose was applied before the second irrigation and the second dose was applied before the third irrigation. The first irrigate was applied 1673 m<sup>3</sup> ha<sup>-1</sup> on 26/12/2009. The second irrigate was applied 1690 m<sup>3</sup> ha<sup>-1</sup> on 7/2/2010. The third irrigate was applied 1714 m<sup>3</sup> ha<sup>-1</sup> on 18/3/2010. In case of sprinkler irrigation, Urea (46% Nitrogen) was applied by manual method at the rate of 238 kg ha<sup>-1</sup> for treatments of 100% recommended fertilizer and 179 kg ha<sup>-1</sup> for treatments of 75% recommended fertilizer in twelve equal doses, frequency of fertilization were been four days before irrigation. Irrigation frequency was four days.

**Component of the sprinkler irrigation system.** Fixed sprinkler irrigation system was used which can be described as follows: A centrifugal pump was operated using a tractor P.T.O of 40 hp. The operating pressure was 150 kPa. Main pipelines were located on the ground surface which carry water from the water source (open canal) to sub main pipelines. Mainlines made from aluminium



quick couple pipe which 100 mm inside diameter and 6 m in length, 90 m long. Three valves which controlled water flow from main pipelines to sub main pipelines. Sub main pipelines located on the ground surface carry water from the main pipelines to the laterals. Sub main pipelines made from galvanized steel quick couple pipe which 89 mm inside diameter and 6 m in length, 72 m long. Lateral pipelines located on the ground surface carry water from the sub main pipelines to the sprinklers. Lateral pipelines made from galvanized steel quick couple pipe which 70 mm inside diameter and 6 m in length, 150 m long. Seventy two risers carry water from lateral pipelines to sprinklers, which was  $\frac{3}{4}$  inch in diameter and 60 cm in height. Seventy two rotating type sprinklers were used, Perrot ZB 22, have one nozzle of 5.2 mm in diameter. Sprinkler discharge rate was  $1.18 \text{ m}^3 \text{ h}^{-1}$  at 150 kPa and installed at spacing of  $12 \times 12 \text{ m}$ , wetted diameter was 24 m, overlapping was 100%. Precipitation equal  $8.2 \text{ mm h}^{-1}$  and the plant height was 80 cm.

**Experimental design.** The field experiment included two sprinklers layouts (square and triangular), two irrigation levels (100% and 50% ETc) and two fertilization levels (100% and 75% recommended level). To control the amount of irrigation to be 50% and 100% ETc, an automatic valve was used to connect the riser with the lateral line. The different treatments may be classified as follows:

S1 = square layout at 100% ETc with 100% fertilizer

S2 = square layout at 100% ETc with 75% fertilizer

S3 = square layout at 50% ETc with 100% fertilizer

S4 = square layout at 50% ETc with 75% fertilizer

T1 = triangular layout at 100% ETc with 100% fertilizer

T2 = triangular layout at 100% ETc with 75% fertilizer

T3 = triangular layout at 50% ETc with 100% fertilizer.

T4 = triangular layout at 50% ETc with 75% fertilizer

C = flood irrigation.

**The applied water under flood irrigation.**

Discharge rate of water in flood irrigation was calculated using a 4 inch plastic spile according to Michael (1978) as follows:

$$Q = 0.61 \times 10^{-3} \times A \times (2gH)^{1/2} \quad [1]$$

where:

Q = discharge rate in  $\text{L s}^{-1}$ ,

H = water head above the center of spile in cm,

A = orifice cross-section area of the spile in  $\text{cm}^2$  and

g = gravitational acceleration ( $981 \text{ cm s}^{-2}$ ).

**The applied water under sprinkler irrigation**

Flow rate of sprinkler was measured at operating pressure by connecting a flexible hose to the sprinkler nozzle and collecting a known volume of water in a container over a specified period (1min), the flow rate was calculated using the following equation (Melvyn, 1983).

$$Q = V/T \quad [2]$$

where:

Q = the flow rate of sprinkler in  $\text{m}^3 \text{ h}^{-1}$ ,

V = the collecting water volume in  $\text{m}^3$  and

T = time of collecting water in h.

**Distribution uniformity.** The distribution uniformity, coefficient of uniformity and application efficiency of low quarter were calculated using the water quantity which recorded from 16 catch cans. The catch cans were placed in a uniform pattern in the wetted area on each side of an operating lateral between each four sprinklers, cans were placed a 3 at 3 m distance between each other every two laterals. The test duration time was forty minutes. The distribution uniformity (DU) was calculated according to Heermann et al. (1990) as follows:

$$DU = [Z_{iq}/Z_{av}] \times 100 \quad [3]$$

where:

DU = the distribution uniformity in %,

$Z_{iq}$  = the average of catch cans depth in the low quarter of the field in mm and

$ZZ_{av}$  = the average of catch cans depth in the entire field in mm.

### Coefficient of uniformity

The coefficient of uniformity (CU) was calculated according to Christiansen (1942) as follows:

$$CU = [1 - (\sum |x_i - x| / n x)] \times 100 \quad [4]$$

Where:

CU = the Christiansen's coefficient of uniformity in %,

$x_i$  = the individual collector amount in mm,

$x$  = the average of collector's amount in mm and

$\Sigma$  = the summation of  $n$  values and  $n$  is the number of measuring collectors.

### Application Efficiency of low quarter

The application efficiency of low quarter (AELQ) was calculated using Merriam and Keller (1978) as follows:

$$AELQ = [Z_{r,iq}/D] \times 100 \quad [5]$$

Where:

AELQ = the application efficiency of low quarter in %,

$Z_{r,iq}$  = the average low quarter depth of collected water in mm and

$D$  = the average depth of water applied in mm.

### Water use efficiency

The water use efficiency (WUE) was determined according to Begg and Turner (1976) as follows:

$$WUE = Y/Q \quad [6]$$

Where:

WUE = water use efficiency in  $kg\ m^{-3}$ ,

$Y$  = grain yield in  $kg\ ha^{-1}$  and

$Q$  = applied water in  $m^3\ ha^{-1}$ .

### Energy use efficiency

The energy use efficiency (EUE) was determined according to as follows:

$$EUE = Y/E_r \quad [7]$$

Where:

EUE = energy use efficiency in  $kg\ kW^{-1}\ h^{-1}$ ,

$Y$  = grain yield in  $kg\ ha^{-1}$  and

$E_r$  = applied water in  $kW\ h\ ha^{-1}$ .

## RESULTS AND DISCUSSIONS

### The amount of applied water

The amounts of applied water for flood irrigation and sprinkling levels (100% ETc

and 50% ETc) are depicted in Figure (1). The amounts of applied water were 5077, 4201 and 3068  $m^3\ ha^{-1}$  for flood irrigation and sprinkling levels (100% ETc and 50% ETc), respectively. These results showed that the maximum applied water of 5077  $m^3\ ha^{-1}$  was recorded with flood irrigation, while the minimum applied water of 3068  $m^3\ ha^{-1}$  was recorded with 50% ETc of sprinkling method. It is interesting to mention that the water savings were 17% and 40% for 100% and 50% ETc, respectively in comparison with the control treatment.

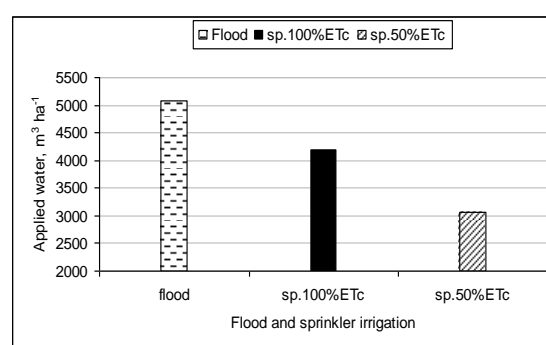


Figure 1. The amount of applied water under different irrigation regimes

**Energy consumption.** The results in Figure (2) indicate that, the values of energy consumption were 412, 333 and 276  $kW\ h\ ha^{-1}$  for sp.100% ETc, flood irrigation and sp.50% ETc, respectively. These results showed that the maximum value of the energy consumption was 412  $kW\ h\ ha^{-1}$  using sp. 100% ETc. While, the minimum value of the energy consumption was 276  $kW\ h\ ha^{-1}$  using sp. 50% ETc.

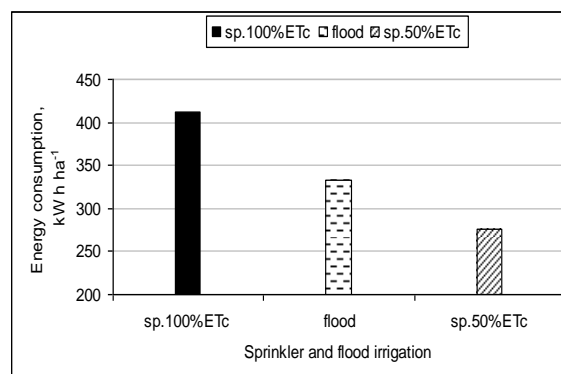


Figure 2. Energy consumption under different irrigation regimes

### Effect of sprinklers layouts on coefficient of uniformity, distribution uniformity and application efficiency of low quarter

The results in (Table 2) indicated that, the values of coefficient of uniformity were 78.28 and 78.22% for square and triangular layouts, respectively. The values of distribution uniformity were 77.24 and 73.47% for square and triangular layouts, respectively. The values of application efficiency of low quarter were 73.15 and 70.53% for square and triangular layouts, respectively. The results explained that, the highest values of coefficient of uniformity, distribution uniformity and application efficiency of low quarter were achieved by square layout. While the lowest ones were achieved by triangular layout.

Table 2. Effect of sprinklers layouts on coefficient of uniformity, distribution uniformity and application efficiency of low quarter

Sprinklers Layouts	Coefficient of uniformity, (%)	Distribution uniformity, (%)	Application efficiency of low quarter, (%)
Square	78.28	77.24	73.15
Triangular	78.22	73.47	70.53

Effect of watering and fertilizer levels on biomass, grain yield and straw yield under both square and triangular layouts.

The results in (Figure 3) showed the effect of watering and fertilizer levels on biomass, grain yield and straw yield under square layout. The highest value of biomass ( $15.35 \text{ Mg ha}^{-1}$ ) was obtained by treatment S1. While, the lowest value of biomass ( $12.14 \text{ Mg ha}^{-1}$ ) was obtained by treatment S4. The value of biomass ( $9.91 \text{ Mg ha}^{-1}$ ) was obtained by flood irrigation. The maximum value of grain yield ( $5.70 \text{ Mg ha}^{-1}$ ) was obtained by treatment S1. While, the minimum value of grain yield ( $4.82 \text{ Mg ha}^{-1}$ ) was obtained by treatment S4. The value of grain yield ( $4.55 \text{ Mg ha}^{-1}$ ) was obtained by flood irrigation. The highest value of straw yield ( $9.65 \text{ Mg ha}^{-1}$ ) was obtained by treatment S1. While, the lowest value of straw yield ( $7.33 \text{ Mg ha}^{-1}$ ) was obtained by treatment S4. The value of straw yield was ( $5.36 \text{ Mg ha}^{-1}$ ) was obtained by flood irrigation.

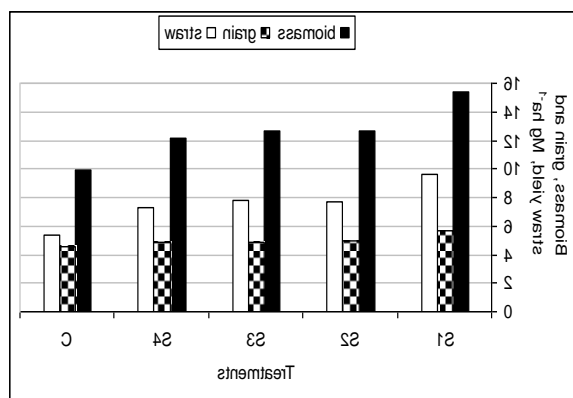


Figure 3. Effect of watering and fertilizer levels on biomass, grain yield and straw yield under square layout

The results in (Figure 4) showed the effect of watering and fertilizer levels on biomass, grain yield and straw yield under triangular layout. The highest value of biomass ( $13.08 \text{ Mg ha}^{-1}$ ) was obtained by treatment T1. While, the lowest value of biomass ( $10.82 \text{ Mg ha}^{-1}$ ) was obtained by treatment T4. The value of biomass ( $9.91 \text{ Mg ha}^{-1}$ ) was obtained by flood irrigation. The maximum value of grain yield ( $5.03 \text{ Mg ha}^{-1}$ ) was obtained by treatments T1 and T3. While, the minimum value of grain yield ( $4.79 \text{ Mg ha}^{-1}$ ) was obtained by treatment T4. The value of grain yield ( $4.55 \text{ Mg ha}^{-1}$ ) was obtained by flood irrigation. The highest value of straw yield ( $8.05 \text{ Mg ha}^{-1}$ ) was obtained by treatment T1. While, the lowest value of straw yield ( $6.04 \text{ Mg ha}^{-1}$ ) was obtained T4. The value of straw yield ( $5.36 \text{ Mg ha}^{-1}$ ) was obtained by flood irrigation.

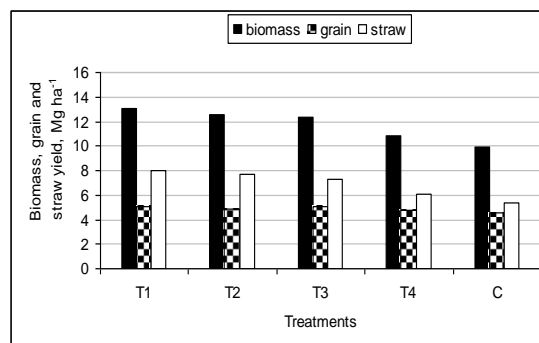


Figure 4. Effect of watering and fertilizer levels on biomass, grain yield and straw yield under triangular layout

### Effect of watering and fertilizer levels on water use efficiency under both square and triangular layouts

Figure (5) illustrate that, in case of square layout, the highest value of WUE ( $1.58 \text{ kg m}^{-3}$ ) was obtained by treatment S3. While, the lowest value ( $1.18 \text{ kg m}^{-3}$ ) was obtained by treatment S2. In case of triangular layout, the highest value of WUE ( $1.64 \text{ kg m}^{-3}$ ) was obtained by treatment T3. While, the lowest value ( $1.16 \text{ kg m}^{-3}$ ) was obtained by treatment T2. The value of WUE ( $0.90 \text{ kg m}^{-3}$ ) was obtained by flood irrigation. The figure obviously demonstrates that flood irrigation produced the minimum value of WUE.

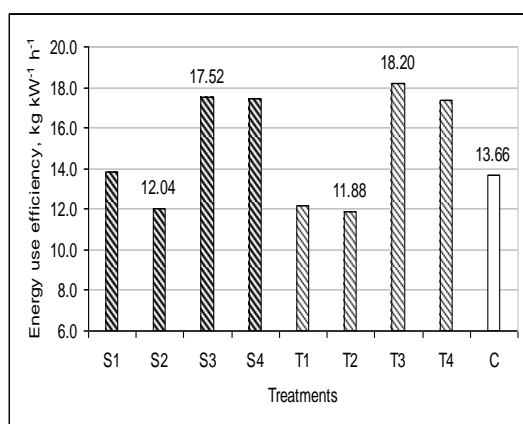


Figure 5. Effect of watering and fertilizer levels on water use efficiency (square and triangular layouts)

### Effect of watering and fertilizer levels on energy use efficiency under both square and triangular layouts

Figure (6) illustrate that, in case of square layout, the highest value of EUE ( $17.52 \text{ kg kW}^{-1} \text{h}^{-1}$ ) was obtained by treatment S3. While, the lowest value ( $12.04 \text{ kg kW}^{-1} \text{h}^{-1}$ ) was obtained by treatment S2. In case of triangular layout, the highest value of EUE ( $18.20 \text{ kg kW}^{-1} \text{h}^{-1}$ ) was obtained by treatment T3. While, the lowest value ( $11.88 \text{ kg kW}^{-1} \text{h}^{-1}$ ) was obtained by treatment T2. The value of EUE ( $13.66 \text{ kg kW}^{-1} \text{h}^{-1}$ ) was obtained by flood irrigation.

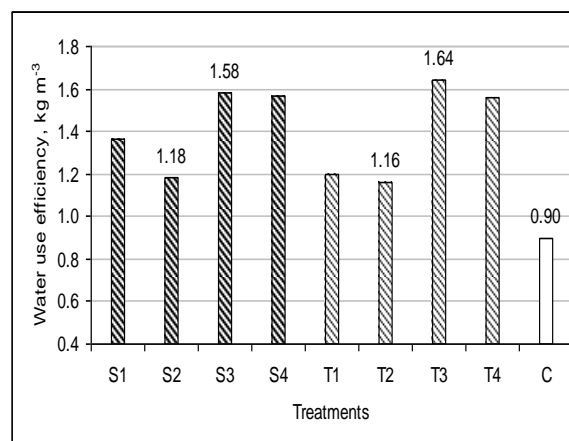


Figure 6. Effect of watering and fertilizer levels on energy use efficiency under both square and triangular layouts

## CONCLUSIONS

From the above mentioned investigation, conclusions can be obtained the following: Sprinkler irrigation with 100 and 50% ETC saved water by 17 and 40%, respectively compared with flood irrigation. The highest values of coefficient of uniformity, distribution uniformity and application efficiency of low quarter were achieved by square layout.

The highest value of WUE ( $1.64 \text{ kg m}^{-3}$ ) was obtained by treatment T3, while the lowest value of WUE ( $1.16 \text{ kg m}^{-3}$ ) was obtained by treatment T2. The value of WUE was  $0.90 \text{ kg m}^{-3}$  for flood irrigation.

The highest value of EUE ( $18.20 \text{ kg kW}^{-1} \text{h}^{-1}$ ) was obtained by treatment T3, while the lowest value of EUE ( $11.88 \text{ kg kW}^{-1} \text{h}^{-1}$ ) was obtained by treatment T2. The value of EUE was  $13.66 \text{ kg kW}^{-1} \text{h}^{-1}$  for flood irrigation. Treatments of square layout produced the better results compared to triangular layout. Treatments of 100% ETC produced the better results compared to 50% ETC. Treatments of 100% recommended fertilizer produced the better results compared to 75% recommended fertilizer.

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## RESEARCH REGARDING THE CULTIVATION OF BENINCASA HISPIDA IN ROMANIA

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### Abstract

*Benincasa hispida* (winter melon, wax gourd or ash gourd) is a common vegetable widely grown in East and South Asia, with a very large fruit which by maturity loses its hairs and develops a waxy coating. The fruit is used in traditional medicine due to its proprieties: anti-inflammatory, demulcent, diuretic, expectorant, febrifuge, laxative and tonic, etc. The present paper presents the results of a field research regarding the cultivation of this plant in the pedoclimatic conditions of Romania. The research was carried out in an ecological experimental field from south of Romania (in the period May-October 2012) and is very important for the introduction to culture of this plant in our country. The results obtained and presented in this paper reveal the degree of adaptation to climate and soil and the physicochemical proprieties. Due to our results we consider that *B. hispida* is a plant that can be grown in our country with good technological and economical performances.

**Key words:** characteristics, production, wax gourd growth experiment

### INTRODUCTION

In the last decades, Romania confronted itself with several periods of drought that affected the traditional cultures from our country. Due to the variations in climate and the scarce precipitation in different areas (Dobrogea, South of Moldova or South of Romanian Lowland), there are many arable lands that present future dangers of degradation or even desertification. To prevent this phenomenon, a viable solution is the use of plants that maintain the soil quality and that are especially resistant to drought. In this context, the purpose of our paper is to present the opportunities created by the the cultivation of the subtropical plant “ash or wax gourd” (*Benincasa Hispida*) in the pedoclimatic conditions of Romania.

*Benincasa Hispida* (Thunb.), Cogn. syns. *B. cerifera* Savi (named after the count Giuseppe Benincasa) is known under different names: Eng. - ash gourd, wax gourd, white gourd, white pumpkin, winter melon, watermelon; San. - Kusmandah; Hin. - Petha, Raksa; Chin. - tung kua; Span. - calabaza china or calabaza blanca. This plant is a common

vegetable widely grown in East and South Asia, with a very large fruit which by maturity loses its hairs and develops a waxy coating. The fruit is used in traditional medicine due to its proprieties: anti-inflammatory, demulcent, diuretic, expectorant, febrifuge, laxative and tonic, etc. Also, the fruit is widely used in Japanese, Chinese, Indian and Indonesian cuisine and in the last decades is in great demand in the United States.

### MATERIALS AND METHODS

The present paper presents the results of a field research experiment regarding the growth of this plant in an ecological field from south of Romania (in the period May-October 2012). The experiment consisted in the cultivation on one 100 meter row of 50 nests. In each nest, there were planted approximately 6 seeds from which the vines formed and spread on the ground and during the experiment period no fertilizers or irrigation was used. The paper includes the measurements and the analyses performed regarding the soil, plant and fruit.

## RESULTS AND DISCUSSIONS

### *General aspects of the research*

The seeds were planted on 7<sup>th</sup> May 2012, on one 100 meter row. The first plants have sprung up on 21 May (germination period 14 days). The situation at the 50 nests level in presented in (Table 1 and Photo 1).

Table 1 First springing - 21 May

Nests	Number of plants that sprung
6, 45, 48, 49, 50	0
1, 3, 4, 7, 8, 36, 39	1
2, 10, 12, 13, 14, 19, 21, 24, 25, 28, 34, 37, 38, 44	2
5, 9, 15, 16, 17, 29, 30, 31, 41, 42, 46	3
11, 18, 20, 22, 27, 40, 43, 47	4
23, 26, 32, 35	5
33	6



Photo 1. Carina Dobre in the field

The plant reached in one month from germination around 10 cm high and 10 days after that almost 25 cm (Photo 2).



Photo 2. First springing

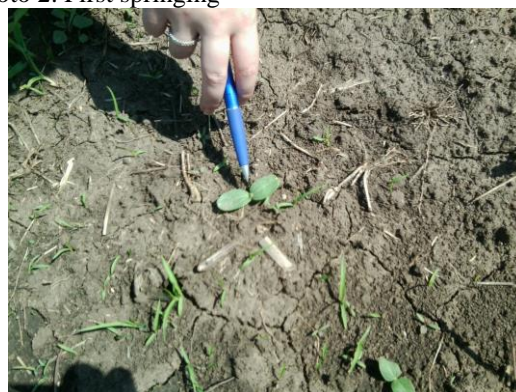


Photo 3. First springing



Photo 4. Rythm of growth

The flowers were observed for the first time on 17 July (at almost 60 days from germination) and were pollinated by bees. The flowers observed on 31 July were yellow, with hairy stalks, with male peduncle approximately 8 cm long and female peduncle approximately 6 cm long (Photo 5).



Photo 5. Benincasa Hispida flower – 31 July 2012

In fact, the plant is self-fertile, and the flowers are “monoecious (individual flowers are either male or female, but both sexes can be found on the same plant)” [1].



The fruits appeared one month later. They were very hairy at the beginning, in general with a globular form (Photo 6).



Photo 6. Benincasa Hispida fruit – 23.08.2012

At maturity (October – 6 months from the beginning of the experiment), the fruit developed a light tough skin and it's coated with a layer of white wax. The fruit flesh is white, thick and with a slight flavour of cucumber (Photo 7 and 8).



Photo 7. Benincasa Hispida fruit – 08.10.2012



Photo 8. Benincasa Hispida fruit (Cut)– 08.10.2012

### ***Main results of field experiment [1]***

The vines grown spread on the ground with an evident tendency to seek shadow. All the fruits grew inside the next row cultivated with barley.

The length of the vines varied between 1.86 m and 5.50 m.



Photo 9. Benincasa Hispida fruit in the field – 08.10.2012

We obtained a maximum 4 fruits per a vine but there were also vines with no fruit. The smallest fruit had 0.28 kg and a diameter of 24 cm. The biggest fruit had 5.18 kg and a diameter of 73 cm (Table 1).

Table 2 Research field results

Nest No	Vine No	Maximum length per vine Meters	Fruits No	Diameter cm	Weight kg
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	1	3.0	0	0	0
5	1	1.86	1	38.0	0.92
6	3	2.53	1	34.0	0.63
			1	27.0	0.40
7	3	2.85	1	54.0	2.47
			1	44.0	1.29
8	4	4.06	1	66.0	4.06
			1	47.0	1.56
			2	Immature	Immature
9	2	2.20	1	Immature	Immature
10	1	4.25	0	0	0
11	1	3.10	0	0	0
12	4.	4.68	1	55.0	3.12
			1	43.0	1.51
13	2	2.40	1	53.0	2.40
14	2	4.12	1	57.0	2.78
			1	40.0	1.13
15	3	4.00	1	58.0	2.41
			1	34.0	0.63
16	8	4.50	1	60.0	2.98
			1	46.0	1.50
			1	35.0	0.87
17	6	4.10	1	42.0	1.13
			1	Immature	Immature
18	4	3.00	1	Immature	Immature
19	3	4.25	1	43.0	1.18
			1	35.0	0.75
			1	39.0	1.02
20	3	4.70	1	41.0	1.08
			1	24.0	0.28
21	4	3.60	1	33.0	0.59
			1	38.0	0.82
22	4	4.33	1	48.0	1.81
			1	49.0	1.68
23	7	3.45	1	50.0	2.30
			1	37.0	1.03
			2	Immature	Immature
24	5	4.00	1	64.0	3.64
25	3	2.75	1	46.0	1.77
			1	48.0	1.57
26	4	5.50	1	47.0	1.78
			1	43.0	1.51
27	4	5.20	1	56.0	2.29
			1	42.0	1.33
			1	30.0	0.70
28	6	3.03	1	49.0	2.26
			1	41.0	1.13
			1	35.0	0.62
29	6	4.43	1	47.0	1.71
			1	43.0	1.38
30	6	4.44	2	Immature	Immature
31	3	3.66	2	Immature	Immature
32	4	4.30	1	45.0	1.45
			1	56.0	2.51
			1	41.0	1.15
			1	Immature	Immature
33	7	3.42	1	46.0	1.54
			1	40.0	1.04
			1	34.0	0.56
34	4	3.5	1	66.0	4.35
			1	52	2.07
35	4	4.25	1	50.0	2.25
36	3	3.50	1	55.0	2.90
			1	73.0	5.18
37	7	3.52	1	47.0	1.99
			1	38.0	1.19
38	1	3.40	1	33.0	0.73

39	4	5.0	1	50.0	1.56
40	4	4.80	1	53.0	1.93
			1	51.0	1.40
			1	40.0	1.19
			1	34.0	0.57
			1	Immature	Immature
41	3	4.60	1	57.0	2.55
42	3	3.0	1	60.0	3.10
43	4	3.35	1	52.0	2.18
			1	Immature	Immature
44	4	4.18	1	43.0	1.45
			1	51.0	2.29
			1	39.0	1.11
45	4	4.30	1	51.0	2.40
46	4	5.80	1	54.0	2.39
			1	49.0	1.56
			3	Immature	Immature
47	0	0	0	0	0
48	0	0	0	0	0
49	0	0	0	0	0
50	0	0	0	0	0
<b>TOTAL</b>	163	-	87 (from which 17 immature)	-	120.61 kg

From the total of 50 nests, we obtained 70 fruits that reached maturity and a total production of 120.61 kg. The fruits were analysed by ICA Research and Development Laboratory and the general physic-chemical analyses revealed: ash – 0.26%; carbohydrates – 1%; protein – 1%.

## CONCLUSIONS

The main conclusion of our field experiment is that the Benincasa Hispida plant can be adapted to the pedoclimatic conditions of our country with good technological performances. To promote this plant like an opportunity in our country the research has to be continued by taking into consideration different types of soil and climatic conditions.

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## THE ROMANIAN CONSUMER PERCEPTION ON THE BENINCASA HISPIDA FRUIT

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### Abstract

*Benincasa hispida*, also known as winter melon or ash gourd can be considered an exotic plant on the Romanian market. Its waxy aspect and special taste are not common among the vegetables traded in our country and introducing it in the eating behaviour of population can be difficult. The paper presents the main results of a questionnaire based survey regarding the consumer perception on the smell, taste and texture of the *B. hispida* fruit. The fruits tested were obtained during a field research carried out in an organic experimental field from south of Romania (in the period May-October 2012). In our approach to present the links between the perceptions of consumer, medicinal proprieties of the fruit and price, we have concluded that this plant can be accepted by the Romanian consumer if the marketing strategies are concentrated on the promotion of its curative proprieties.

**Key words:** consumer perception, *Benincasa Hispida* Fruit, survey

### INTRODUCTION

*Benincasa Hispida* (Thunb.), Cogn. syns. *B. cerifera* Savi is a vegetable widely grown in East and South Asia, with a very large fruit which by maturity loses its hairs and develops a waxy coating. The plant is known under different names: Eng. - ash gourd, wax gourd, white gourd, white pumpkin, winter melon, watermelon; San. – Kusmandah; Hin. – Petha, Raksa; Chin. – tung kua; Span. – calabaza china or calabaza blanca.

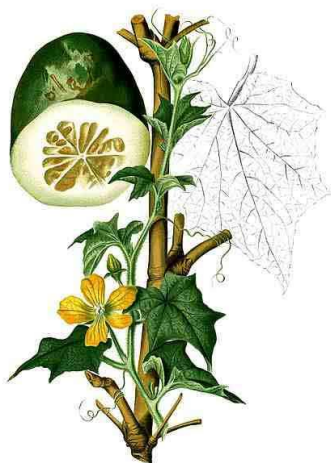


Photo 1. *Benincasa Hispida* (*Flora de Filipinas, Gran edicion, Atlas*) [1]

In the present, the ash gourd fruit is used due to its proprieties (anti-inflammatory, demulcent, diuretic, expectorant, febrifuge, laxative and tonic, etc) in traditional medicine and due to its taste and texture is widely used in Japanese, Chinese, Indian, Indonesian, vegetarian, dietary and vegan cuisine. The main markets for the ash gourd are located in China, India, Canada and United States where there already exists a positive perception over this vegetable.

In Romania, this vegetable is not marketed for different reasons: it isn't known; the consumer is not used to its taste; the import price is very high because the main producers are in India and China (for example the producer price per kg in India is 0.28 euro, the market price is 0.52 euro, and in United States the FOB price reaches 1.4 euro (1.85\$)).

To promote this product in our country in an efficient way is very difficult. In these conditions the main step is to connect the characteristics of the product with the perceptions and behavior of consumers [2]. This will permit to identify which attributes of the evaluated product are more important for

consumer: flavor, taste, smell, form, price or medicinal proprieties, etc.

## MATERIALS AND METHODS

The present paper contains the results of a survey regarding the Romanian consumer perception of Benincasa Hispida (ash gourd) fruit and presents the links between the perceptions of the consumer, medicinal proprieties of the fruit and price. The fruits tested were obtained during a field research experiment regarding the growth of this plant in an organic field from south of Romania (in the period May-October 2012). The data were analyzed with descriptive statistic methods using the IBM SPSS Statistics 20.0.

## RESULTS AND DISCUSSIONS

### *The main characteristic of the Benincasa Hispida fruit*

The fruits obtained in the experiment field during the May-October 2012 were analysed by ICA Research and Development Laboratory and the main results for 100 grams of fruit are: Vitamin C 1 – 13.03 mg, Calcium – 19.02 mg, Magnesium – 10 mg, Phosphorus – 19.02 mg, Potassium – 5.98 mg, Zinc – 0.6 mg, Selenium – 0.23 mg, Iron – 0.38 mg, Total Omega-6 fatty acids – 87.1 mg, Calories – 17.2 kcal.



Photo 2. Benincasa Hispida fruit (obtained by field experiment)

We also wanted to specify that the specialized literature mentions that the fruit can be preserved in dry cool atmosphere for 6 to 12

months [3]. We tested this characteristic and our experiments shown that the fruit has to be stored at over 20 C° temperature to resist over 5 months.

In literature the Benincasa hispida fruit is considered astringent, anthelmintic, aphrodisiac, demulcent, diuretic, febrifuge, styptic, tonic, nutritive, tonic, diuretic, alterative, and styptic. Also, different studies consider this fruit to be anti-ulcer, antioxidant, gastroprotective, anti-obesity, renoprotective etc. and that it has bronchodilator, hypoglycaemic, anti-angiogenic, anti-urolithiatic and hepatoprotective effects [4].

### *The main results of the survey*

Our questionnaires had a number of 11 questions organized in three sections:

-First section – the characteristics of respondents;

-Second section – the perception over the organoleptic characteristics of the Benincasa Hispida fruit;

-Third section - the links between consumer, price and medicinal proprieties.

**Section 1.** Characteristics of respondents and non-respondents for our survey study are (Table 1):

-35 completed the questionnaires;

-57.1% are between 25 and 45 years of age;

-57.1% are women;

-68.6% are residents of urban areas.

Table 1. Characteristics of respondents

	Frequencies	Percent
Under 25 years	8	22.9
25-45 years	20	57.1
Over 45 years	7	20.0
<b>Age - total</b>	<b>35</b>	<b>100.0</b>
Male	15	42.9
Female	20	57.1
<b>Gender - total</b>	<b>35</b>	<b>100.0</b>
Urban	24	68.6
Rural	11	31.4
<b>Residence - total</b>	<b>35</b>	<b>100.0</b>

**Section 2.** Our respondents considered that Benincasa Hispida: is a vegetable (68.6%); has a flavour similar to cucumber (48.6%) or raw yellow melon (25.7%); is similar in shape with a melon (60.0%); has a scent similar to cucumber (57.1%); has a texture similar to yellow melon (25.7%), watermelon (17.1%) or zucchini (17.1%).

The main words associated with the product were: has no taste – 17.1%; is refreshing - 11.4%; is special or different – 11.4%; is watery – 11.4%.

Table 2. Frequencies of responses

	Frequencies	Percent
<b>What do you think is what you just tasted?</b>		
Fruit	11	31.4
Vegetable	24	68.6
<b>What fruit or vegetable would you associate it taste-wise?</b>		
Zucchini	3	8.6
Pear	1	2.9
Raw watermelon	5	14.3
Cucumber	17	48.6
Pumpkin	2	5.7
Immature yellow melon	4	11.4
Radish	1	2.9
Turnip	1	2.9
Cactus	1	2.9
<b>What fruit or vegetable would you associate it by exterior aspect?</b>		
Zucchini	5	14.3
Watermelon	21	60.0
Cucumber	1	2.9
Pumpkin	5	14.3
Yellow melon	3	8.6
<b>What fruit or vegetable would you associate it smell-wise?</b>		
Zucchini	6	17.1
Raw watermelon	4	11.4
Cucumber	20	57.1
Pumpkin	2	5.7
Immature yellow melon	1	2.9
<b>What fruit or vegetable would you associate it texture-wise?</b>		
Zucchini	6	17.1
Pineapple	2	5.7
Raw watermelon	6	17.1
Cucumber	2	5.7
Pumpkin	5	14.3
Immature yellow melon	9	25.7
Turnip	2	5.7
Pear	1	2.9
<b>If you were to describe it in one word, what would it be?</b>		
Tasteless	6	17.1
Odd	1	2.9
Tasty	1	2.9
Bitter	1	2.9
Raw	3	8.6
Refreshing	4	11.4
Vapid	2	5.7
Watery	4	11.4
Succulent	1	2.9
Special/Different	4	11.4
Exotic	3	8.6
Interesting	3	8.6
<b>What do you think of this product?</b>		
Don't like it	4	11.4
Reasonable	4	11.4
Interesting	11	31.4
Good	9	25.7
Very good	7	20.0
<b>For what kind / types of food do you think is suitable for consumption?</b>		
Raw - Salads	20	57.1
Cooked - baked, boiled	4	11.4
Raw or cooked	5	14.3
I don't know	3	8.6

Regarding the general perception over the product, the majority of the respondents considered that it's interesting (31.4%) and good (25.7%). Only 11.4% responded that they didn't like the product. Also, 57.1% considered that the product can be consumed in raw form, in salads, and 11.4% only cooked.

**Section 3.** Because of its exotic flavour and aspect, the majority of respondents considered that they would consume this fruit, but due to its high price, only 65.7% said that they would buy the product.

Table 3. Frequencies of responses

	Frequencies	Percent
<b>Do you think you would buy this product?</b>		
Yes	26	74.3
No	9	25.7
<b>Would you be willing to pay between 4-8 Lei / kg?</b>		
Yes	23	65.7
No	12	34.3
<b>If you were to know that the product contains medicinal properties (low sugar) would you purchase it regardless of price?</b>		
Yes	30	85.7
No	5	14.3

Nevertheless, even the persons that considered the price to be too high, after reading the medicinal proprieties of the plant, they changed their mind. In these conditions, 85.7% of respondents decided that they would buy the product for his medicinal proprieties. If we match our responses with the international studies [3] we may observe that our respondents:

-Are not the only ones that considered this fruit to have no taste when it's fresh (Dr. L. H. Bailey: "I have been unable to relish the fruit when uncooked" – 1894);

-Assimilated the fruit with cucumber and propose the main use in fresh salads (in France and Indochina this fruit is considered "more digestible that the cucumber");

-Proposed to use this fruit like a vegetable and to be cooked (in many countries this fruit is considered a vegetable and is used in boiled meals, fresh juice, soups and sweets).

Actually "Because of its smooth texture and very mild flavor, the cooked ash gourd can be utilized to modify or stretch any strong-flavored vegetable or fruit such as the turnip, cranberry or rhubarb. Weight-watchers may find this low-calorie fruit vegetable pleasing

as a stomach-filler to help them resist more fattening foods. Gourmets may develop recipes for preparing sour, spiced or peppery-hot pickles from this versatile material”.

We also want to underline the therapeutic value of this plant [3]: the seeds – demulcent, tonic, prevent hunger; the ash – for wounds, candles; the fruit juice – nervous diseases, mercurial poisoning, hemorrhoids; the flesh of fruit – laxative, diuretic, aphrodisiac, etc.

## CONCLUSIONS

Benincasa Hispida is a plant resistant to drought, rich in chemical and physical proprieties, suitable for organic agriculture and with a long period of possible storage.

Our survey regarding the perception of consumers on this fruit shows that with a proper promotion this product can be introduced in the Romanian consumers behaviour.

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## LAND PROPERTY STRUCTURE - A LIMITING FACTOR IN STRENGTHENING THE AGRICULTURAL HOLDINGS

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### **Abstract**

*Romania has the largest number of EU holdings. For this purpose, this paper analyses the effect of the excessive agricultural land fragmentation caused by the laws and measures adopted in the previous period. The existence of small holdings is influenced by the land property structures and at the same time, by the training and experience level of holders (heads of holdings). For writing this paper, analyse of statistical data was used in terms of identifying the impact factors which led to this holdings situation and, specially, to the fragmentation phenomena, obviously in the agricultural economy. Are highlighted, in order to study the impact, the historical evolution of the Romanian village, the Romanian peasant psychology on property, ownership thirst, desire to have land that would be just his and the need of being the only one who operates it and has benefits of its exploitation. This conception, however, tends to obsession and is generated by a system that has taken the land from the peasant, leaving him without the essential object of his work. There still exists the fear of no longer having the land, impregnated a lot in their thinking; these resulted in a blockage concerning association, cooperation, lease or any form that could increase the agricultural holdings dimensions. This thinking is manifested in aged population, which is still one of the main problems of the Romanian rural. The effect of these factors, but also of others who will be found in the work act in a negative manner on the formation of a competitive agriculture with an European management orientation. That is why studying them may lead to solutions for the reduction of their influence, the formation of viable social structures and economically valuable.*

**Key words:** agricultural holdings, agricultural land, property, rural development

### **INTRODUCTION**

Direct measures, be they economic or extra-economic with indirect measures of agriculture led to changes in ownership structures, which generated a number of effects on the performance of agricultural holdings.

Concretization of these effects was performed by changes in the land use. Some of these measures, such as the extra-economic, especially reforms also generated effects on the mentality of land owners. These effects can be described by the reluctance of owners and / or holding heads of resorting to other measures such as cooperation or association in agriculture. The large number of small agricultural holdings, in which is included the peasant households is determined by the high number of landowners. This direct link between ownership and exploitation, determines the agricultural branch

performance and its knowledge help to find solutions to increase efficiencies in agriculture.

From historical point of view, the property experienced both crumbling land and assembly in compact form. Analyzing reforms, starting with that of 1846 and up to the one in 2000, one can see the main directions of substantiation and the effects of decisions that were taken through these reforms. Therefore, reforms represented state interventions that focused the orientation towards the large or small property. The reform occurred following the adoption of the law 18/1991, also known as the Land Law, makes its effects felt in the present (even if they were made modification by Law 1/2000), due to errors on the distribution of land to former owners. These measures led to excessive fragmentation of agricultural land and propelled Romania to an extensive system of exploitation that is far from being

competitive and to ensure a high standard of living.

Therefore it is necessary to know the situation regarding the agricultural land property and exploitation in order to find solutions that will contribute to the development of Romanian agriculture and generally of the rural environment.

## MATERIALS AND METHODS

The main instruments will be documenting research, and processing statistical data, collected from EUROSTAT and National Institute of Statistics, relevant to the topic, analysis and interpretation of data on surface and exploitation with the European Union to demonstrate the link between property and exploitation structures as limiting factor in strengthening the agricultural holdings.

## RESULTS AND DISCUSSIONS

### Land property structure and its influence

Existence of over 3 million of landowners determines an exploitation of small areas of agricultural land. This leads to low efficiencies per hectare and an inefficient use of resources. Land property structure in Romania are represented on one side by possession of small areas of agricultural land and on the other side of large areas.

Exploitation of these lands situation is as follows:

Table 1. Evolution of utilized agricultural land, number of holdings and surface per holding (2002-2010)

Specification / Year	2002	2005	2007	2010
Utilized agricultural area	13931	13907	13753	13298
Number of farm holdings	4485	4256	3931	3856
The average area of agricultural holdings	3,11	3,27	3,50	3,45

Analyzing Table 1 it can be seen that the number of farm holdings is very high, but shows a decreasing trend, and once with the decrease the number of agricultural holdings increases the average area of agricultural holdings.

Utilized agricultural area also shows a slight decrease which is explained through removing of agricultural land from the economic circuit,

failing to take use the agricultural land owned by people who do not live in rural areas, aging population in rural areas which hampers the exploitation consequently promote the reducing of used surfaces and so on. It can also be observed that the average of the surface of agricultural holdings range from 3.11 ha/holding(2002) to 3.45 ha/holding(2010) and reaches its peak in 2007 (3.5 hectares / holding). This fact is worrying because these low values cannot ensure the competitiveness and neither a reasonable standard of living of the rural population and hampers the rural development. Predominating in rural areas, in Romania, are holdings without legal personality, which hold about 99 percent of all holdings, as shows Figure 1.

Of the total agricultural holdings, in the year 2010, only 30,669 have legal personality, but these uses 5,852,854.26 hectares, while holdings which have no legal personality are 3825576 and uses 7445336.63 hectares. This is explained by the small size of agricultural holdings, through existence of numerous holdings of and semi-subsistence subsistence that occurred as a result of the law 18/1991, when the lands were returned to the owners and were worked, in a traditional manner, by them, to this day.



Figure 1. The structure of holdings by juridical form 2010(number)

Agricultural holding category without legal personality are individual agricultural holdings and freelancers, individual enterprises, Figure 2 captures that at the level



of 2010 there were 3,820,393 individual agricultural holdings and only 5183 authorized individuals, individual enterprises.

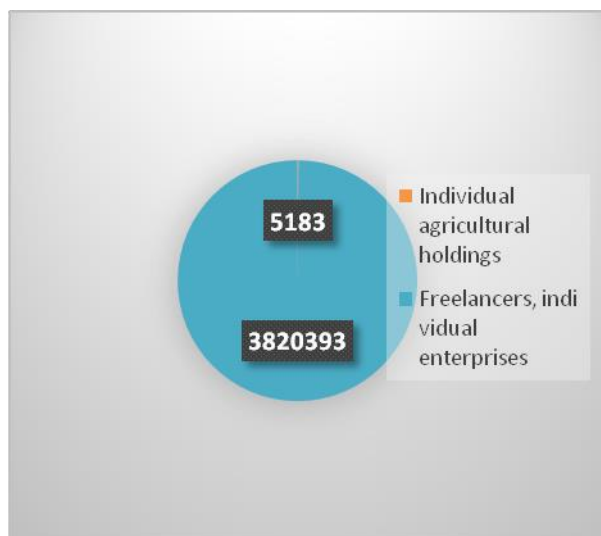


Figure 2. The structure of holdings with no legal personality(2010)

These figures are alarming because for a good part of those who have such farms, particularly individual, agriculture is the main source for ensuring the family needs while low yields they obtain from such exploitation makes it hard to them achieve this purpose. This type of exploitation is the most common due to the specific environment in which agriculture has evolved. On the one hand in the confrontation of Romania with problems of the land and on the other hand, problems of the technical and technological modernization process which is slow due to lack of resources. The land problems require solutions regarding resizing, to increase farm areas and modernization acts to increase efficiency and higher yields can be obtained with a higher quality that can help increase gross margin. These two aspects can form the basis of changes in the holdings size in order to increase economic dimension.

In terms of holdings with legal personality can be observed according to Figure no. 3 that in the year 2010, the highest share in the total of these companies were owned by private commercial companies (63%) followed by other types of exploitation (31%), Local Councils and Mayors (9%) and cooperative units (5%), while autonomous administrations, state companies and other

public institutions hold only 2% of total holdings.

These types of farms are generally large, which makes their exploitation to be more productive. Existence of an excessive number of agricultural holdings whose physical size is very large leads to imbalances through possession of too much power for producers.

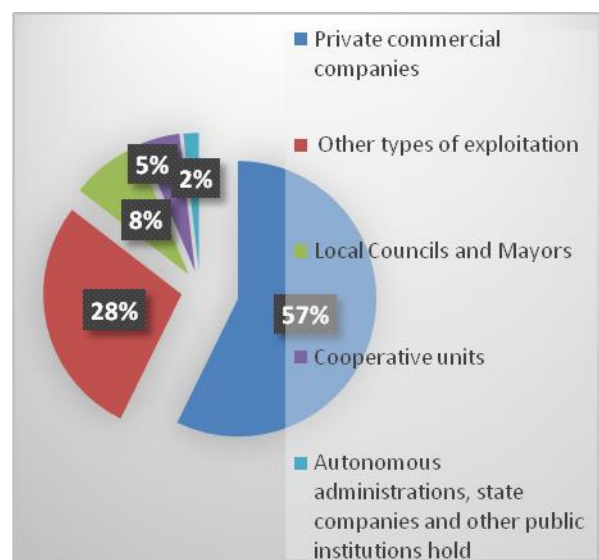


Figure 3 The structure of holding with legal personality(2010)

Otherwise this type of farm tends to suppress rural culture through major influence it has on its general purposes of carrying out human activities and agriculture in particular. This type of holding leads to the disappearance of smallholdings by "swallowing" them effectively.

Regarding the form of property of the land, it can be observed in Table no. 2 that for the analysis period 1990-2010 the private property has experienced continuous growth since 2000 until now. This fact is explained by the distribution of land that were conducted after the post-communist period, and the lack of data from 1990 and 1995 is explained by the slow process of restoring the property.

Table 2 Evolution of the private property for agricultural land,1990-2010(Ha)

	1990	2000	2005	2010
Total	23839071	23839071	23839071	23839071
Private property	:	15873954	17040004	17509298

Evolution of the number of holdings is closely related to land evolution, the manner of using it and property structures.

The situation presented reveals practically the opposite effect of post-communist period to the communist period, in the communist period the land was exploited under state tutelage while after communism to the present exploitation is performed by rural population and by people who no longer reside in rural areas, but who live in the close proximity and continue to conduct some agricultural activities.

Other differences can be pointed out in this case is about the size of agricultural holdings, which by destroying CAPs and IASs were excessively reduced.

The fact, however, that land is in private property change however the vision, the Romanian peasant, the farmer is free to practice agriculture in the way he wants, he can exploit traditional, to move towards organic farming, may associate or cooperate or he can alienate it or lease it. But the problems with which rural areas confront, restrict certain actions that can take place. Lack of resources, especially the financial ones leads to unexploitation and improper exploitation of agricultural lands, rural aging population limits the capacity to work the land and to conduct agricultural activities that generally require a high physical exertion, lack of interest from young people to practice as a farmer leads to outdated concepts, ideas suitable for a time past situations etc.

On the other hand the exploitation by the State of a smaller and smaller part of the land has implications at the control level of market situations that may appear.

### Exploitation in Romania and the European Union

In terms of agricultural area used Romania make a contribution of 6 percent at the utilized agricultural area. Greatest contribution has France with 16 percent, followed by Spain with 15 percent. Thus the ranking in terms of utilized agricultural area Romania ranks 6.

Graphic exposure of the utilized agricultural area share for holdings larger then 1ESU in total EU-27 utilized agricultural area:

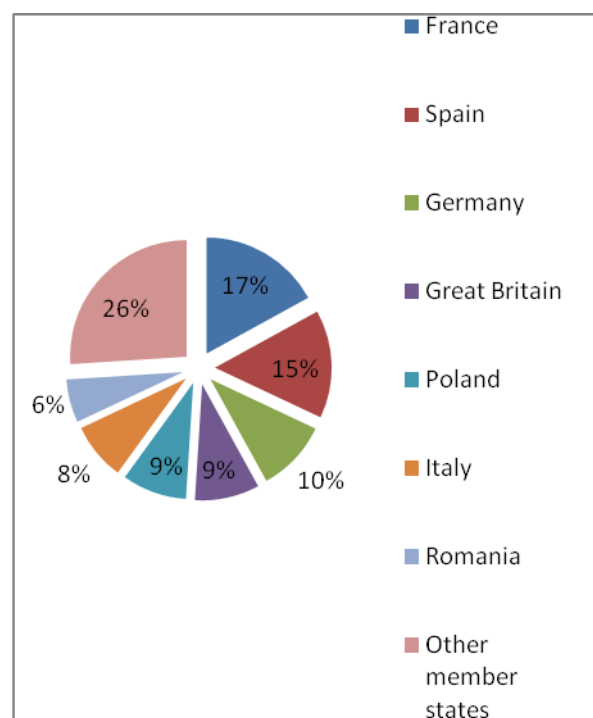


Figure 4 The utilized agricultural area(UAA) share, for holdings larger then 1ESU in total EU-27 UAA

This position reflects the importance of Romanian agricultural surface and demonstrates that it has agricultural potential. Regarding the mode of agricultural land exploitation, Romania is characterized by a large number of peasant households and the evolution of the number of holdings with at least one economic size unit in the year 2010 was as follows:

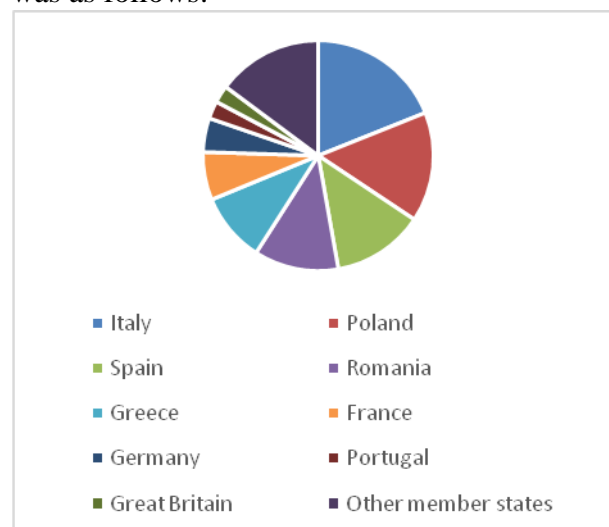


Figure 5. Number of holdings with at least one economic size unit in UE 27(2010)

The data shows that at the level of 2010, of the number of holdings 76% of the 745 million farms larger than one economic size unit (ESU) are formed by Italy with a contribution of 19 percent to that number, 15 percent Poland, Spain with 13 percent, Romania with 12 percent, Greece with 10 percent and France with 7 percent.

Gaps can be explained by the state of the agriculture development as a whole, Romania still represents the space in which operates very small holdings, many of them being less than one economic size unit. Also in the case of Romania it can be explained by the degree of excessive fragmentation of agricultural land and parcelling of it, besides this factor also operates the Romanians reticence to cooperate, associate or lease.

To this situation is added a large number of agricultural holdings are less than 1 ESU. This type of holding is more common in the former communist countries and those who by agricultural model practiced kept small holdings. Although at the level of in 2010 according the European Commission these holdings occupied only 7% of the EU UAA and 1.6% of the EU 27 standard gross margin agriculture, in structure analysis cannot be neglected because it holds a 48.85 percent share in total farm. Romania had in 2010 a total of 3 064 700 farms which represented approximately 50% of the total number of such holdings in the EU27.

In terms of share of agriculture to GDP the situation is as follows:

Table 3 Share of the agriculture in the GDP (%)

	2000	2006	2007	2008	2009	2010
UE 27	1.7	1.2	1.2	1.2	1.1	1.2
Romania	11.4	7.2	5.1	6.0	5.4	2.7

Is distinguished a decrease in the share of agriculture to GDP in 2010 and a closer value to EU-27 average. This illustrates a situation that indicates a favourable formation of GDP, it represents that a higher contribution to the GDP was made by other sectors and this reflects development.

From Table 4, one can observed that yields per hectare in the case of Romania, for wheat, maize and sunflower in the period

2000-2010, is below the EU average in 2010, even if the yields have experienced an increase compared to 2000.

Table 4 Evolution of yields for maize, sunflower, wheat in EU, 2000-2010(kg/ha)

countries	item	2000	2005	2010
Romania	Maize	1606,1	3981,6	4317,6
	Sunflowerseed	8223	14010	16067
	Wheat	2310,8	2998,5	2700,0
European Union	Maize	5520,9	7033,2	7095,8
	Sunflowerseed	1408,8	1672,6	1851,8
	Wheat	4985,8	5120,9	5257,5

## CONCLUSIONS

Data analysis showed that the land property structure affects agricultural land exploitation. The importance of knowing this relationship derives from the need to counter the effects of agricultural policy errors made and exploitation, elaboration of solutions that exploit the possibilities of alliances Romania among developed EU member states.

These are the basis of drawing up strategies which has as fundamental purpose Romanian rural area development in general and specifically agricultural development as well as bringing it to the level results obtained in the EU.

Strengths regarding property structures in Romania:

- Large utilized agricultural area ranks Romania on 6th place in the European Union
- The geographical position of Romania, which prints favourable features for organization of agricultural activities
- Soil structure that includes a large area occupied with land whose soil are classified as class I
- Tradition regarding agricultural activities
- Agricultural land structure that offers the possibility of using land use categories
- High suitability for arable land
- The legal framework which facilitates the establishment of agricultural holdings
- The large number of agricultural holdings, which have a size higher than one economic size unit

Weaknesses regarding the situation of property structures:

-Excessive fragmentation of the agricultural land, mainly due to the adoption of Law 18/1991

-Increased level of land abandonment

-Average area of agricultural holdings in Romania inferior to that of the European Union

-Accentuated reduction of the area occupied by vineyards and meadows

-Inefficient land use as a fundamental resource in agricultural activities

Ambiguity within legal status of the agricultural land

-Incomplete use of agricultural area

-Practice of extensive farming

-Develop in time a mentality of refusing the agricultural land parcelling and association, which prevents the increase the holdings size

-Poor land-exploitation due to an aging population

-Aid delay of granting to the farmer which slows the development of holdings

-Disinterest manifested by the youth to practice agriculture, which prevents the change of attitude regarding association and fusion

-Reduced EU competitiveness due to low yields per hectare

Suggestions

-Increasing the degree absorption of European funds in order to develop holdings

-Consolidating the legal framework to solve issues relating to property and lease

-Supporting land consolidation and agricultural association in an accentuated manner;

-Rational exploitation of the agricultural land  
Romania is a country with a high agricultural potential.

National changes in general and changes at the level of agriculture in particular through reforms have led to the present situation of agriculture. Balancing land structures as well as its proper exploitation is the basis for evolution and the possibility to align Romanian at EU agricultural performance.

The study demonstrates that ownership structures in Romania acts as a limiting factor

in strengthening agricultural holdings therefore all agricultural measures aimed at agriculture and rural development in general, should be based on property without neglecting the reactions of rural population when discussing property issues.

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## TOURISM DESTINATION MAPPING THROUGH CLUSTER ANALYSIS

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### *Abstract*

*The concept of tourism destination appeared in theory and practice after the development of mass tourism and tourism marketing. They are theoretically “travel market units” or areas that are capable “to exist independently and efficiently in the tourism market according to the principles of marketing and the policy of tourism product”. However the main idea of which we start this paper is that the most of tourism destinations are not born naturally, they were created by implementing an efficient development management of attractions, accessibility and amenities at a specific area level. We consider that the stakeholders can intervene in an area with touristic potential to support the development of rural tourism and implement measures that can transform it in a touristic destination. With this purpose in mind we present in this paper a methodology to map the areas with rural tourism development potential by utilising cluster analysis. The case studies are the villages from Gorj County with touristic potential that have a proximity access to high value natural and/or anthropic touristic resources. The main results of our research is that in this county exists five areas where can be implemented tourism destination management plans and through which can be assured a better promotion and valorisation of rural tourism.*

*Key words:* cluster analysis, rural tourism, tourism destination

### INTRODUCTION

Dealing with tourism destinations as being geographical concentrations of cluster type [1] and space delimitation of these ones [2] starts from the idea that the group of localities with touristic potential around the natural resources and/or anthropics with a high touristic value may generate the formation and the development of the local touristic market.

The concentration of the specific terms of the rural tourism industry in limited areas taking into account the proximity criteria of the places represent the main idea regarding the researches inside this work.

By specific methods of the cluster theory which we used, the work identifies the best group of the places inside the touristic destinations of Gorj county, so that they may assure the logistic low costs and the distributions of the touristic products as well as the concentration of the touristic resources.

We consider that these groups may be changed into lifely touristic destinations by the incorporated methods of the touristic management at the local level of these

components and by sustaining of relationships that develops spontaneously within a given geographical area [3].

### MATERIALS AND METHODS

Mapping the touristic destinations we started from the point that every touristic destination needs orientation and promotion of the touristic objectives with a uniform character which allow the creation of specialized touristic products as well as of certain touristic connections efficient from the economic point of view. Taking into account this goal the methods of grouping these localities from one area were the following: the nearness of these localities regarding the most important touristic objectives (natural resources or anthropic ones recognized at the national level); one may organize at least one touristic pension inside the localities with a medium, high and very high potential, obtaining in this way many more groups, each of them concentrated on promotion and evaluation of natural objectives or anthropic ones; the group must allow the best organization of touristic circuit, that is every

selected area within a touristic destination is at less than 50 km from the other ones.

The main instrument used in order to demarcate the touristic destinations is represented by the spatial-geographic mapping. This allows us in the context of our research to demarcate which is the best group of the areas within the touristic destinations starting from the spatial proximity of those.

In order to achieve the delimitation of the touristic destinations we created a cluster mapping for which we used multiple types of stats analysis placed at our disposal by the Statistical Package for the Social Sciences program (SPSS).

*ALSCAL (Multidimensional scaling)* - MDS is a statistical method used to obtain the geometric representation of the distances; in this work we applied it with the intention to view the dimensional structure of the clusters; *The principal component of the analyses* – PCA represents a statistical analysis method used to achieve the predictive models starting from the data of analysis obtained from the exploratory observations; More accurately, PCA takes over an n dimensional variable and through orthogonal transformation it allows its representation on a map compared with the criteria of the minimal quadratic error; within these researches when the distances between areas cannot be calculated directly, the distances become variables expressed through normal standardized deviations, following their focus towards the average and the reduction of the standard deviations.

*Centroid Linkage (Hierarchical Cluster Method)* – HCM uses algorithms of statistical analysis which allow the connection between the objects inside the cluster based on the distance between them. One of the analysis methods from this statistical approach is represented by the complete linkage clustering, based on the maximum distances between the objects.

Next to the specified cluster type analysis methods we also used IDW (INVERSE DISTANCE WEIGHTED) and ADW (AVERAGE DISTANCE WEIGHTED). These represent the interpolation methods of the landmarks based on the reversed

distances, more accurately the average between those. This interpolation function is known by the name of Shepard Method and it allows interpolation through the smallest squares from the inverse of the distance, being similar to the ponderate method after the distance inverse. In our steps to analyze which area presents the best concentration towards the other areas from the touristic destination, The used formulas are:

$$IDW = \frac{1}{j-1} * \sum_1^j \frac{1}{D_j} \quad \text{and} \quad ADW = (j-1) * \frac{1}{\sum_1^j \frac{1}{D_j}}$$

Where D= the distance of an area "j" towards the other areas, J = The areas within a touristic destination

## RESULTS AND DISCUSSIONS

The Gorj County presents the following main features: landforms: plain, hill, mountain, hydrographical network of the Jiu river; natural protected places of national interest and Nature 2000; the majority of the anthropic touristic objectives (museums, festivals, archeological sites, historic monuments, religious monuments) they are concentrated in the north of the county approximately parallel with the mountain line; 7 commons with very big potential, 22 commons with big potential and 29 of them with average potential, and those with very high potential and high are concentrated especially in the north area of the county; the city Targu- Jiu represents the main polarizing economic center of the county.

Areas with touristic potential are dispersed linear along the mountain line, but we considered that is necessary to select more elements that can stay at the group's base, respectively natural resources categories and anthropic that can constitute the main nucleus of the future touristic rural products from the area.

### *The touristic destinations design based on the natural touristic resources*

From the natural touristic resources point of view, it can be observed the fact that besides the achieved score for the natural scenery of plain or hill some areas can dispose of some

strengths. Thus, of the 58 communities with medium potential, high and very high, 28 have direct access to natural areas of national interest or Natura 2000 reserves.

Given direct access to protected areas of these cities we have seen fit to design tourist destinations in the county that have as main objective the promotion of tourism products centered on these elements. So the questions that we must respond initially are: each locality has the best distribution within that group of localities in terms of proximity and grouping by proximity localities may be attracted to the group. How many places have the best distribution within that group of cities in terms of proximity and how many localities can be attracted in the group's proximity.

To identify the number of clusters(groups of localities) we applied ASCL and PCA methods on the matrix of destination between the 28 localities, which visually showed us that it can be formed three main tourist destinations (Figure 1).

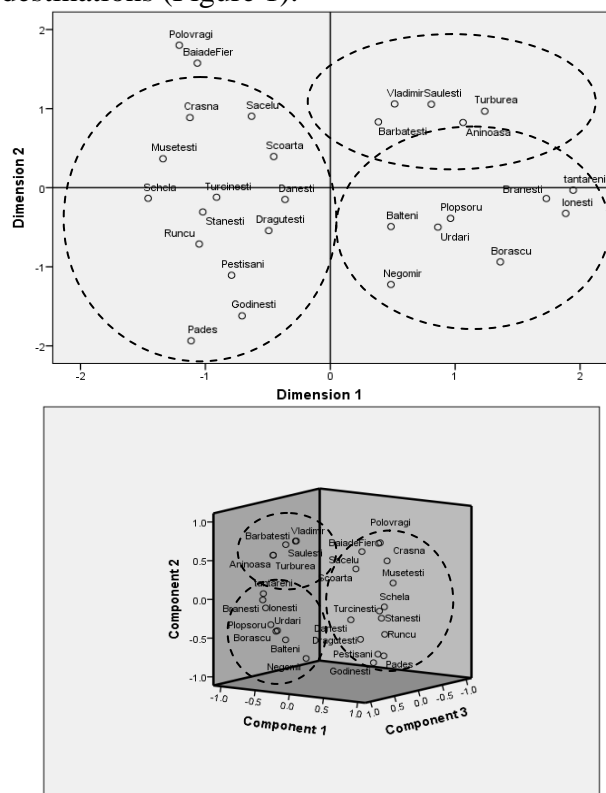


Figure. 1 ALSCAL (Multidimensional Scaling – Derived Stimulus Configuration Euclidean distance model) and Principal Component Analysis Extraction Methods

Optimal grouping of localities in the three clusters is done correctly with the HCM - Centroid Linkage (Hierarchical cluster method). Processing matrix distances between places with high natural potential; This method allowed us to obtain an optimal grouping of localities within the three destinations. Thus, according to the applied HCM method ,the component of tourist destination s is the following: 5 localities-group 1,15 localities -group 2; 8 localities-group 3 (table 1, figure2).

Table 1 Hierarchical Cluster Method – Centroid Linkage

Cluster 1	Cluster 2	Cluster 3
Aninoasa	Baia de Fier	Bălteni
Bărbătești	Crasna	Borăscu
Săulești	Dănești	Brănești
Turburea	Drăgulești	Ionești
Vladimir	Godinești	Negomir
	Mușetești	Ploșșoru
	Padeș	Tântăreni
	Peștișani	Urdari
	Polovragi	
	Runcu	
	Săcelu	
	Scoarța	
	Stănești	
	Turcinești	

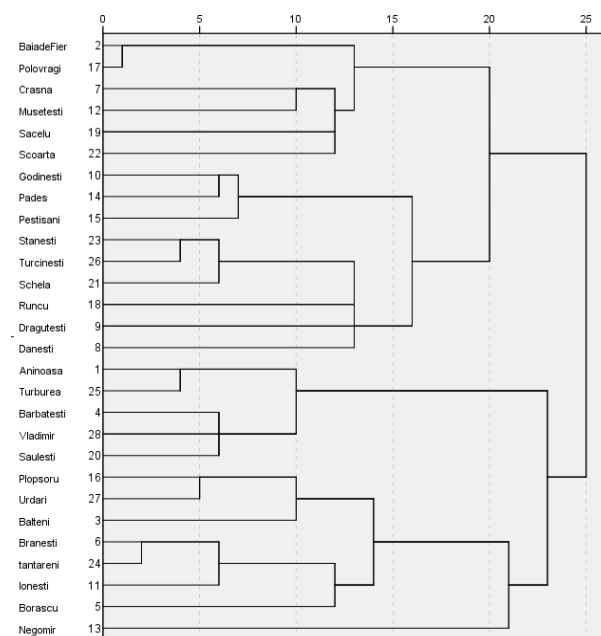


Figure. 2 Hierarchical Cluster Method – Dendrogram using Centroid linkage – Rescaled Distance Cluster Combine

The next step is to calculate the inverse distance weighted (IDW) and average distance weighted (ADW) between localities within each destination

that permits the identification of the locality with the most good spatial concentration towards the other areas, but those most dispersed.

The appliance of these methodologies offered us a good clasification of these areas, more respectively the higher the IDW is and the lower the ADW, by that the respective areas are more grouped. By calculating the mentioned indicators at the two clusters mentioned before (tabel 2), it can be noticed that areas such as Saulesti, Turcinești and Plopsoru presents the highest spatial concentration towards the other areas that have access to the same cluster. This allows us to conclude that the 3 areas can represent the reference point within each cluster and it can be considered the optimal starting points for the touristic circuits at the delimited touristic destination level.

Table 2 The evaluation of the IDW (Inverse Distance Weighted) și ADW (Average Distance Weighted) of the areas with natural potential Gorj County

	IDW	ADW
Cluster 1		
Vladimir	0.068	14.6
Turburea	0.071	14.1
Bărbătești	0.075	13.4
Aninoasa	0.086	11.6
Săulești	0.091	11.0
Cluster 2		
Padeș	0.023	43.4
Godinești	0.029	34.9
Schela	0.030	33.0
Polovragi	0.031	32.7
Baia de Fier	0.033	30.3
Săcelu	0.033	30.3
Peștișani	0.035	28.6
Runcu	0.036	28.1
Crasna	0.037	26.9
Dănești	0.037	27.1
Scoarța	0.037	26.8
Drăgulești	0.038	26.4
Mușetești	0.039	25.7
Stănești	0.039	25.4
Turcinești	0.045	22.0
Cluster 3		
Negomir	0.034	29.4
Borăscu	0.044	22.7
Ionești	0.045	22.0
Bălteni	0.050	19.8
Țânțăreni	0.053	19.0
Brănești	0.059	17.0
Urdari	0.061	16.5
Plopsoru	0.062	16.1

### Design of the touristic destinations based on the anthropogenic touristic resources

From the anthropogenic touristic resources point of view, at the county we can find historic and architectural monuments,

archeological remains, habits and folkloric traditions. Most of the areas also present traditional and folkloric objectives which justify the creation of touristic concentrated products in this domain.

Considering that the areas with anthropogenic resources are dispersed on the county's territory, for an optimal association within the clusters which can capitalize the local resources we will apply for the start the HCM method on the matrix distances between the 32 areas with anthropogenic resources.

Leaving from the premise that 2 or 3 clusters can be formed, applying this method gave us an inadvertence between our dates which lead to the elimination of the areas Plopsoru and Aninoasa and forced us to remake the calculations. The new results showed an optimal formation of the 2 touristic destinations. (9 areas –group 4; 21 areas – group 5) (table 3).

Table 3 Clusters component generated by the HCM method

Cluster 4	Cluster 5	
Baia de Fier	Arcani	Mătășari
Bengești-Ciocadia	Bălănești	Mușetești
Bustuchin	Bolboși	Padeș
Crușeț	Câlnic	Peștișani
Dănciulești	Ciuperчени	Runcu
Hurezani	Crasna	Schela
Polovragi	Drăgotești	Scoarța
Prigoria	Glogova	Slivileți
Săcelu	Godinești	Stănești
	Lelești	Telești
		Turcinești

After this we calculated the weighted inverse distances (IDW) and the weighted average distances from each area identifying as the center of the clusters the areas such as Baia de Fier and Arcani. Hereinafter, we counted the inverse distance weighting (IDW) and the average daily wage (ADW) between the localities of each destination, identifying them as clusters centres Baia de Fier and Arcani localities (Table 4).

Centralizing the information given by a spacial- geographical locality, we may conclude that at Gorj county level there is a spacial- geographical potential for the development of the following touristic destinations (Figure 3).

G1 – located in the Southerner part of the county conditioned of 5 localities



(Aninoasa, Bărbătești, Săulești, Turburea, Vladimir), having a proximity access to natural resources and protected areas;

Table 4 The evaluation of the IDW (Inverse Distance Weighted) și ADW (Average Distance Weighted) of the areas with anthropogenic potential Gorj County

No.	Localities	IDW	ADW
Cluster 1			
1	Danciulesti	0.019	53.3
2	Cruset	0.023	43.7
3	Hurezani	0.028	36.0
4	Bustuchin	0.031	32.2
5	Sacelu	0.037	27.2
6	Prigoria	0.039	25.7
7	Bengesti-Ciocadia	0.043	23.1
8	Polovragi	0.045	22.0
9	Baia de Fier	0.047	21.2
Cluster 2			
10	Glogova	0.026	39.0
11	Crasna	0.027	36.6
12	Schela	0.028	36.3
13	Slivilesti	0.028	35.5
14	Pades	0.029	34.4
15	Scoarta	0.030	33.0
16	Bolbosi	0.030	33.2
17	Musetesti	0.034	29.7
18	Godinesti	0.037	26.9
19	Dragotesti	0.037	27.2
20	Balanesti	0.037	27.0
21	Stanesti	0.038	26.3
22	Matasari	0.038	26.5
23	Ciuperceni	0.040	24.8
24	Turcinești	0.041	24.3
25	Lelesti	0.042	23.6
26	Telesti	0.043	23.1
27	Pestisani	0.044	22.8
28	Runcu	0.046	21.8
29	Câlnic	0.047	21.1
30	Arcani	0.052	19.3

Source: own calculations on the basis of distances from the <http://www.distanta.com/> site.

G3-located in the south-eastern part of the county, consisting of 8 locations (Balteni, Borascu, Branesti, Ionesti, Negomir, Plopsoru, Tantareni, Urdari), with proximity access to natural resources and protected areas;

G4-located in the eastern part of the county, consisting of 9 cities (Baia de fier, Bengesti-Ciocadia, Bustuchin, Cruset, Danciulesti, Huruzeni, Polovragi, Prigoria, Sacelu), with direct proximity access to natural resources;

G5-located in the north-west and west of the county, consisting of 21 localities (Arcani, Balanesti, Bolbosi, Calnic, Ciuperceni, Crasna, Dragotesti, Glogova, Godinesti, Lelesti, Matasari, Musetesti, Pades, Pestisani, Runcu, Schela, Scoarta, Slivilesti, Stanesti, Telesti, Turcinești), with direct proximity access to natural resources.

## CONCLUSIONS

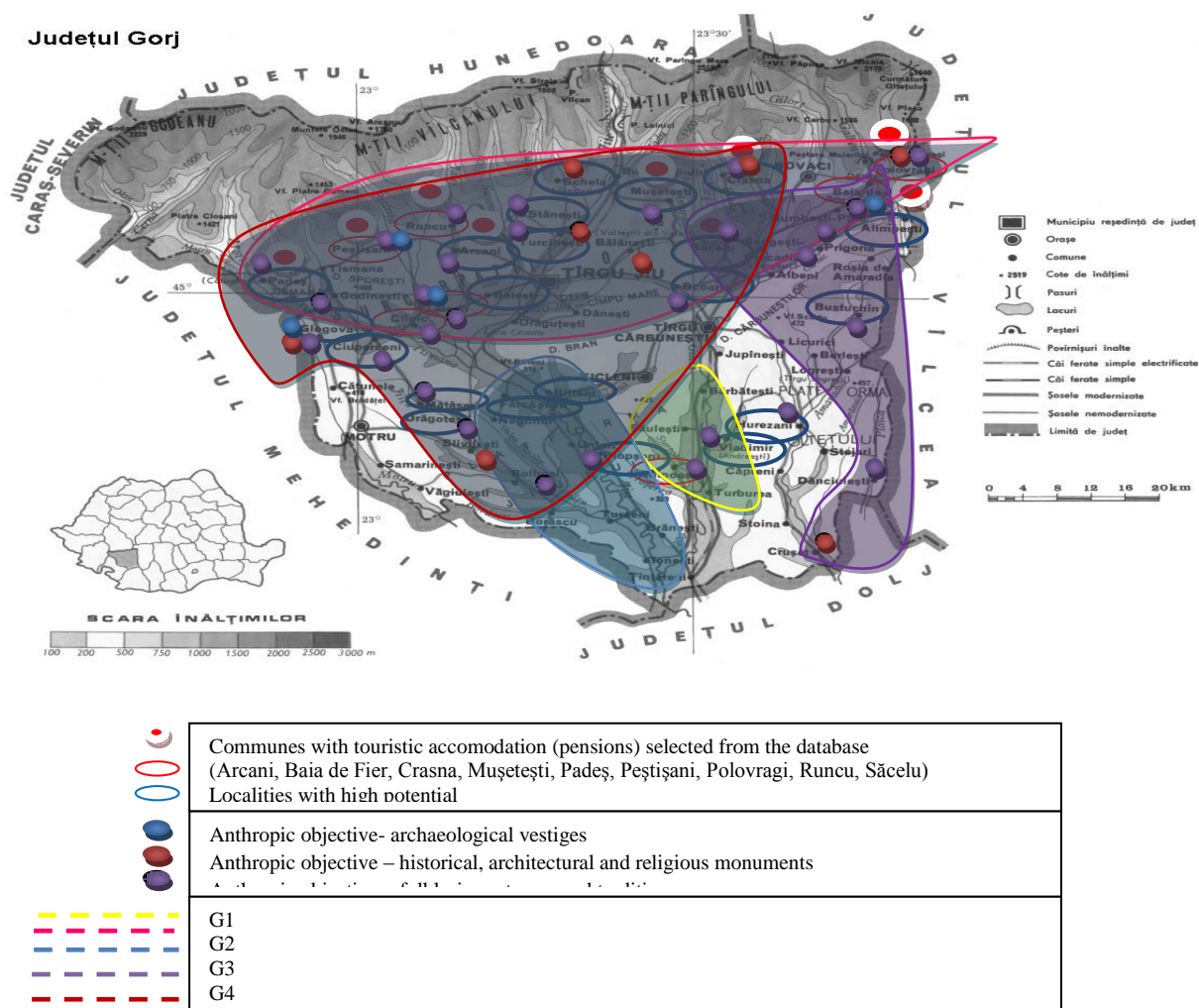
Findings of this paper highlight ways of grouping rural localities so as to ensure optimal access to local tourist resources. Thus, as a criterion for organization to layout the space grid of the localities of tourist resources has allowed the location and mapping tourist destinations and to establish polarizing centres. This approach allowed us to identify localities in the county Gorj with tourism development potential, locations that allow the best distribution from natural and anthropogenic local tourism resources (most optimal training sightseeing in the defined area as a tourist destination).

This methodology allows the placement of natural and anthropogenic resources that can be exploited through tourism products at the level of tourist destinations so that ensure optimal use of proximity and relative proximity analysis of localities allowing joint use of tourism resources.

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Figure 3. Territorial delimitation of touristic destinations in terms of development's potential



## THE ANALYSIS OF THE INFRASTRUCTURE OF IRRIGATION AND LAND RECLAMATION AT CĂLĂRAȘI COUNTY LEVEL

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### Abstract

*The irrigation development in Romania, and also at Calarasi county level was in a phase when sufficiency was emphasized, allowing the consistent allocation of the subsidies for the expenses of the non viable systems use. Large land stretches were developed and they did not have competitive characteristics in an open market economy. The Revolution and the measures taken subsequently for the re-distribution of lands to the former owners, as well the low perceived land taxes, led to a severe fragmentation of the lands, to the tendency of practicing the subsistence agriculture and to the complications in the water management and of the demand for irrigation water supply. One of the measures that should be taken for the rehabilitation of the irrigation system is to inform EU that it is needed a continuous support of the irrigation system in order to increase the viability of the rural areas, to stop the continuous depopulation in the rural areas and to prevent the fragmentation of the arable land, this support consisting of subsidies given for the irrigation water until the irrigation systems will be rehabilitated. At the level of year 2011 the surface of the land reclamation arrangement, in the public and private sector, existing in Calarasi county was of 181,523 ha of the net surface with irrigation works, 91,604 ha arrangement with drained works and 459 ha works for the fights against soil erosion. The present research analyses and proposes measures for the development of the infrastructure that contribute to the decrease of damage that appear following these extreme natural phenomena.*

*Key words:* drainings, intensive development, infrastructure, land reclamation

### INTRODUCTION

The irrigation is a measure which intervenes to ensure the soil moisture regime, according to the plant requirements (agricultural crops and vineyards) in the periods in which deficits record from this point of view. The irrigation need is evidenced by decrease of soil water reserve below a certain threshold, known among experts as the "*minimum threshold of soil moisture*", which has as effect, significant reductions in production.

From the researches made in heaven – (Grumezea N., Kleps C., 2005) both in our country and abroad, the size of this indicator is conditioned primarily by soil (textural type) and then, to a lesser extent also by other factors, including the culture specific. Based on these considerations, we can define also the concept that refers to the irrigation opportunity. Thus, there is insufficient appreciating that irrigation would be necessary only in dry areas characterized by long periods of low rainfall and high

temperatures, accompanied by often and frequent winds. In certain areas of our country or Baragan Plain Dobrogea (known as the driest areas), plants can tolerate longer periods in which such phenomena manifest, compared to some situations in the areas where rainfall is more abundant, temperature is lower and winds frequency winds is lower, but soils with heavy texture or tending to it. In the second case, found especially in the piedmont areas where vertic soils are present and to some extent the reddish-brown, droughts, although low, have an effect many times equal or even more harmful to culture crops (Otiman, P.I., 2009).

### MATERIALS AND METHODS

To study the land reclamation infrastructure of Călărași three specific research methods were used: dynamic, deductive and quantitative economic analysis, SWOT analysis, survey or participative research that involves collecting information on site using

the research techniques "observation" and "interview".

The study on analysis of irrigation infrastructure in Călărași had as its starting point the information obtained from the following sources: Statistical Yearbook Călărași - Edition 2012 Socio - economic profile of Călărași county, Romania's pre-accession economic plan, the statistic data of Department for Agriculture and Rural Development; Călărași Development Strategy, elaborated by the county council, Publications of the National Institute of Statistics and data obtained from site observations.

## RESULTS AND DISCUSSIONS

Starting from the natural specific, characteristic of our country, we must always consider that irrigation is not primarily a technological link to obtain a surplus production. Researches carried out on the long term periods showed that, in the last years characterized by precipitation occurring in relation to the plant requirements (both in terms of time and quantity), the productions obtained reach the level of those obtained under irrigation.

The production-related damage is recorded in years when water from a natural way (by precipitation) cover plant requirements both in terms of quantities as well moments when they occur.

Therefore, the important aspect on which reference was previously made is that our country under irrigation is, in fact, a correction that is applied to a natural factor, namely rainfall, when they are not present in the periods in quantities required by the plant requirements. In such cases, irrigation is really a factor to increase production and this of course starting from a certain level (PND 2007-2013).

As a result, we have developed solutions and some were even applied, but there are still large areas of agricultural land affected by excess moisture, which obviously leads to lower crops due to mainly impediments frequently occurring, in performing maintenance of agricultural crops. The

Danube use as a source of water, also corroborates with its presence in the vicinity of the driest areas of the country, both in terms of number and frequency of periods of moisture deficiency (RDA South Muntenia, 2011).

Integrating agriculture of Calarasi county in the market system is ensured by strengthening the private system and a type of economic organization in which natural processes mix with economic mechanisms in a manner that creates an organic balance – offer –demand. For this purpose, open development strategies are needed that exploit the benefits created by the dominant share of private ownership in agriculture and provide intensive development to achieve competitive supply of agricultural products and an expanded market for all types of farms, with wide access to market products and production factors (CJCalarasi, 2012).

The hydrographical network consists of two river basins of the river Danube basin and a sub basin at Mostiștea.

The Danube River, which demarcates the county in the South and South - East from km 450 (Gostinu) at km 300 (Cernavodă) splits into two branches: Borcea on the left and The Old Danube on the right - that shut between them: Ialomita Pond or Big Island of Ialomita. The hydrographical network of the county is entirely dependent on the Danube River. Besides Dâmbovița and Arges rivers, which by their lower sectors drains the SW part of the county, other less important rivers belong to the local network. On the territory of Călărași county, the Danube has a length of 150 km. Multiannual average flow of the Danube is 5890 m<sup>3</sup> / s entering the county and about 5970 m<sup>3</sup> / s leaving the county (DARD Calarasi, 2012).

The lakes in Călărași county are generally anthropogenic nature, represented by ponds spread mostly on Mostiștea valley and its tributaries on Rasa, Luica, Zboiul, Berza and Pasărea.

In the year 2011 (CJCalarasi, 2012) the surface of land improvement, in public and private sector, existing in Călărași county was of 168,987 ha net surface with irrigation works, 86,694 ha drained works and 339 a works against soil erosion (Table 1).

Table 1. Situation of land improvement works in Calarasi county in 2011

Specification	U.M.	Of which:	
		gross	net
Irrigation	Ha	172.629	168.987
Draining	Ha	93.776	86.694
Fight against soil erosion	Ha	339	339

The structure of land reclamation works carried out in 2011 in Calarasi county reflects that 67.2% of the total facilities of land improvements is represented by irrigation works and almost 32% of irrigation and drainage works, fight against erosion being under 1% (Fig. 1)

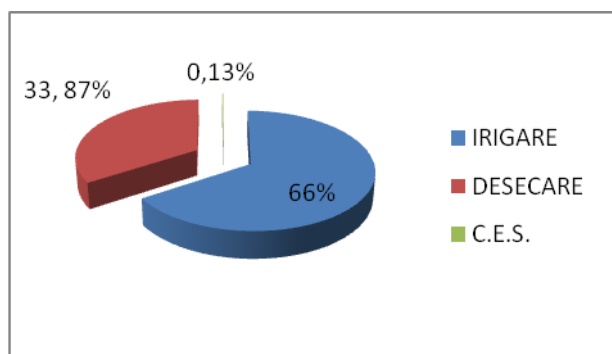


Fig. 1. Structure of land improvement works in Calarasi county in 2011



Photo 1. Floating pump station - Irrigation system Gălățui-Călărași

In 2012, at the level of Calarasi county, two investment objectives developed: Rehabilitation of drain pump SPE Dunărica Boianu Sticleanu precincts with a plan of 1,200,000 lei in the second semester of the year, achieving on 31.12.2010 a value of 1,107,791 lei, meaning dismantling works of

old installations and purchase of technological equipment SPE from Dunărica station (Photo 1); Rehabilitation of channel CA I from arrangement Pietroiu Stefan cel Mare - stage I foreseen in the investment plan in 2010 with a value of 1,500,000 lei and the state budget rectification, the budget allocation was suspended, being postponed for 2013.

At the level of Calarasi county, Est Giurgiu Management Unit manages areas with land reclamation works as follows: Costinu Greaca Arges - 11,371 ha Oltenița Surlani Dorobanțu - 9788 ha (Photo 2); Mostiștea I - 20,000 ha Mostiștea VI - 38,672 ha Terrace Mihai Bravu - Chirnogi - 6724 ha.

86,555 ha of the total area equipped for irrigation, only 19,195 ha are declared of public use in the following facilities: Gostinu Greaca Arges - 11,371 ha and Mostiștea I - 7824 ha.



Photo 2. Oltenița Surlari Dorobanțu Precincts, CĂLĂRAȘI county

In the drainage activities that developed in 2012 (County Statistics Department, 2012) in Calarasi county operations were performed to remove excess moisture resulting from the sudden melting of snow in spring and of rainfall in spring or during the year.

Regarding the investment plan for 2012, in Calarasi county the program was elaborated of "Rehabilitation of land drainage works from Oltenița Surlani Dorobanțu facility" for spaces in SPE Cochira, SPE Surlari, SPE 422 and SPE Port, which involved replacing the technological equipment from the pump stations with new pumps, hydro-mechanic and electric installations.

All these issues imply taking some measures for infrastructure development to contribute to the damage diminishing that appear following these extreme natural phenomena.

## CONCLUSIONS

In order to rehabilitate land improvement in Calarasi county, it is proposed the rehabilitation of irrigation infrastructure; public funding for rehabilitation projects, modernization/re-technology and extension of land improvement that are viable technically, economically and socially in compliance with the environmental standards; funding a multidisciplinary study - water management, energy, transport and irrigation identifying long-term solutions and optimize supply gravitational energy needed for the water supply of the irrigation system; funding a study to identify land in land improvement that agricultural uses with reduced viability or non-viable and proposals for sustainable use of these lands; the introduction of cadastre in land improvement.

For the long term sustainable development, it is proposed to pass to conservation facilities and infrastructure in areas that do not meet minimum operating conditions which could not be sent freely on application to the organisations of water users for irrigations or have not been used by law, but it represents from technical-economic point of view potentially viable areas or areas that could be connected in the future to gravity supply (or with reduced pumping) from other water sources; strengthening the protection capacity against floods, by providing operating parameters of the defence line on the Danube, bringing its section to projected rates and making some defence works on the shore in the critical areas identified; rehabilitation/modernisation of drainage pump stations by equipping them with advanced pump units which will improve the operating efficiency and will reduce electricity costs and restoring drain transmission capacity of the channel network; preventing and eliminating the effects of landslides, torrential correction and stop depth and surface soil erosion; creating a

modern system of permanent monitoring of infrastructure to fight against floods.

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## THE ROLE OF THE LOCAL PUBLIC ADMINISTRATION, IN ACCESSING EUROPEAN FUNDS. CASE STUDY, CĂLĂRAȘI COUNTY

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### Abstract

*The major significance of the actual financing context is that, through the community budget, the rural communities can receive money in order to support development strategies, the financing under programs specific to the rural sector can be correlated to the financing programs by regional policy, environment policy, enterprise policy, education sector policy, etc. But, in order to benefit efficiently by the community interventions system, the major problem for the Romanian rural communities is related to: the identification of the different funding opportunities; the elaboration of a project portfolio adequate for the won development options; finding co-financing sources. Taking into consideration the complexity of such an approach and considering the particular situation of the Romanian rural sector it results that the key role in the rural development and use of the opportunities provided by the European context belongs to the public administration. The good information and information dissemination at the community level, possibly with best practice examples from other EU counties can have an essential role in attracting funds and projects that improve the effectiveness of the development strategies.*

**Key words:** public administration, development strategy, economic and social development, implementation of European programs, strategic directions, sustainable development

### INTRODUCTION

The economic and social development of Călărași county is set up in accordance with the regional development concepts, correlated with economic sector and civil organizations, with Romania's National Development Plan, Development Plan Regional Development Strategy of the South Muntenia, etc. . and external factors (EU programs, provisions of international conventions, international relations of Local Councils and County Councils) that may positively influence the development processes.

With a decreasing population and its density of approximately 62.6 inhabitants / km should be it must be considered mainly rural county, numbering 194,190 inhabitants (County Department of Statistics, 210) in rural areas (59% of the total population in 2009) which is 21% higher than the average of the new countries that join the EU.

Thus, agricultural and rural development will form a solid pillar. Success and prosperity of the county depend on its economic performance. The county is dependent on

agriculture and rural economy. The spread of globalization threaten traditional agriculture.

### MATERIALS AND METHODS

In order to study the role of public administration in accessing and implementing European funds Calarasi county, three specific research methods were used: dynamic, deductive and quantitative economic analysis, SWOT analysis, survey or participative research that involves collecting information on site using the technique of research "interview".

The study on analysis of the involvement of the public administration in accessing grants in Calarasi county had as its starting point the information obtained from the following sources: Statistical Yearbook Calarasi - Edition 2012 Socio - economic Calarasi, Statistical data from the Department for Agriculture and Rural Development; Calarasi development Strategy, developed by the county council, Publications of the National Institute of Statistics and data obtained from site observations.

## RESULTS AND DISCUSSIONS

The stakeholders that could contribute to the development of the rural communities are directly local authorities, local businesses interested in promoting activities and special products obtained, implicitly interested in local economic development by promoting electronic commerce, financial assistance and technical adoption of innovative solutions in the private sector, teachers, students wishing to return in the commune after graduation, initiative committees established within the projects implemented in recent years in the village (they have experience in identifying and prioritizing needs - public consultation but especially in identifying funding sources and implementing various projects) and investors attracted by facilities (infrastructure, the potential of young people, spaces, the possibility to connect to the gas in the near future, urban land available for the construction of houses and investment).

By the rural infrastructure development program (CJ Calarasi, 2010), the financial allocation by Government Decision 432/08.04.2010 for projects in Calarasi county of 59,196,964.00 lei, for the following objectives: **water abstraction and distribution** in 21 towns in the county, accounting for 55.44% of the total, **sewerage and treatment stations** in 4 localities with a value of 14,523,440.00 lei, respectively - 24.53% of the total, **to build a platform storage and waste recovery**, in Fundeni and Ștefan cel Mare villages, with a value of 4046 .090,00 lei and - 6.82%; **rehabilitation of main roads** - made in Gurbănești and Nana communes, with a value of 4,021,042.00 lei, respectively - 6.79%; **little bridges on roads** - made in Nana commune, Călărași county with a value of 3,800,000 lei (MADR, Dezvoltare Rurala).

Related to project financed under post-accession funds – by ERDF/ROP program, in Călărași county, on 31 January 2012 these have the following structure: FROM EUROPEAN REGIONAL DEVELOPMENT PLAN, BY *Regional Operational Program 2007-2013 – Priority axis 2, Major Intervention Area 2.1. "Rehabilitation and modernisation of county road network, urban streets – including construction/rehabilitation of ring roads "*, projects: "Modernisation and

rehabilitation of county road DJ 301 section Fundeni - Budești, km.13+000 - km.36+578". The project is funded by the European Union, funding contract *no.231/12.05.2010* – project total value: 43.795.745,88 lei, project implementation duration: 31 months; **"Improvement of access to European transport road network in Călărași county, by the rehabilitation and modernisation of DJ 201B, km.19+000 - km.39+950, on section limit of Ialomița county- Valea Argovei și DJ 303, km.26+294 - km.48+278 Valea Argovei - Mânăstirea"**. The project is funded by the European Union, funding contract *no.430/07.07.2010* – project total value: 44.944.350,96 lei, project implementation duration: 31 months; **"Modernization and rehabilitation of county road DJ 303 SECTION Călăreți - Valea Argovei KM.0+000 - KM.26+294"**. The project is funded by the European Union, funding contract *no. 564/08.10.2011* – project total value: 55.557.533,56 lei, project implementation duration : 31 months.

**FROM THE COHESION FUND, By Environment Sector Operational Program 2007-2013 – Priority Axis 1, Major Intervention Sector 1.1. "Extension/modernisation of water/waste systems", the project "Extension and rehabilitation of water and sewerage systems, in Călărași county"**. The project is funded by the European Union, funding contract *no.91.803/09.10.2010* – project total value: 440.395.303 lei, project implementation duration: 62 months. **FROM THE EUROPEAN SOCIAL FUND, by Administrative Capacity Development Operational Program 2007-2013 – Priority Axis 1, Major Intervention Sector 1.3. "Improvement of organisational efficiency", projects:** "Personalized training for a modern public administration". The project is funded by the European Union, funding contract *no.28/07.08.2010* – project total value: 1.312.972,35 lei, project implementation duration: 12 months; "Development of professional competences within the local public administration in project management and public procurement sector". The project is



funded by the European Union, project implementation duration : 12 months.

The vision of socio-economic development of rural communities in Calarasi county is to create and sustain a competitive socio-economic sector, a stable, healthy and diversified one to ensure continued economic growth and the improvement of the life quality of citizens in Calarasi communes. (CC Calarasi, 2012).

Table 1. Correlation of socio-economic development objectives in Călărași county, with external funding sources

Proposed objectives and actions		External funding opportunities
1. Development of basic infrastructure		
1.1 Roads		POR-Axis 2
1.2 Water –sewerage		POS Environment
1.3. Gas		
1.3.1	Connection to gas network	POS Environment
1.3.2	Biogas use	Fund for Environment ,POS Competitiveness
1.4. Electric power		Romanian Fund fro energetic efficiency, Fund for Environment, POS Competitiveness – Axis 4
2. Development of rural economy and agricultural productivity increase		PNADR, POR
2.1 Commerce		Cross Border Cooperation Program
2.2 Tourism		POR – Axis 5, PNADR
3. Protection and improvement of environment quality		
3.1 Soils and waters		
3.1.1	Use of agricultural best practices	PNADR
3.1.1	Continuation of obsolete land rehabilitation	PNADR
3.2 Waste		PNADR, Environment Fund, POS Competiveness – Axis 4
4. Improvement of social conditions		POS D R U
5. Improvemnt of education, culture, health and pleasure conditions		
5.1 Education		POR – Axis 3
5.2 Culture		Cultural Fund
5.3 Health		POS-HRD
5.4 Pleasure		Cultural Fund

The economic and social development strategy of Calarasi county aims to use the potential, opportunities and real availability for development, including the creation of a stimulating and competitive business environment, designed to attract significant private investment in the country and abroad. Some of the proposed objectives we can mention the importance of skills training for

public participation, stimulating adaptability of citizens to change the culture, transforming villages into a common reference point for other communes, not least, the efficient and focused use of all local resources, correlated with attracting and rational use of public and private financing funds, internal and international funds (ADR Muntenia Sud, 2012).

To this end, we propose the correlation of the objectives and actions to be achieved, with external financing possibilities (Table 1).

## CONCLUSIONS

The Project management will allow the village local administration to develop the skills to identify, develop and implement projects under its responsibility and according to the local development strategy, **from the phase of identification, design and planning to the evaluation of the results** to ensure that work is carried out as planned and within budget.

The stakeholders will have to effectively implement the mechanism of **decentralization and externalisation**, because, firstly, the public administration must be a good planner, manager, monitor and evaluator of the project in its various stages of development and implementation.

In order to optimize and increase the project results and their number and their consistency with limited human resources and internal logistics, their implementation is oriented as follows (Dragulin D., 2012):

- many sectoral projects of low value to be implemented by specialized units of the town all, but also by NGOs sector and the private sector, especially through public-private partnerships;

- Big infrastructure projects must be the favourite for the use of internal resources of the town hall in terms of planning and control and externalisation to achieve different stages of their implementation (consulting, design, implementation, support and project management).

Thus, following the internal assimilation of project management mechanisms, local

administrative structure will know (Iova RA, 2012):

□ to plan projects as a whole and to present them to the beneficiaries (local stakeholders) and to approve the project terms (budget, resources, time scheme, conditions, responsibilities);

□ to allot financing, material and human resources to start the project (human resources, sub-contractors logistics, etc.);

□ to elaborate and to implement evaluation and monitoring systems;

□ to control the project development from all points of view

(financial, qualitative, delivery terms on projects or concerned activities);

□ to report to the beneficiaries regarding the way the project develops;

□ to provide advice and assistance to participants in the project to accomplish the tasks according to the requested standards;

□ to evaluate the project in testing phases and to make the needed changes;

□ to evaluate the project results after a certain period from delivery, from the point of view of beneficiary satisfaction and improvement of objectives in activity.

These things will be possible primarily through **training programs for projects responsible persons within the Town Hall** with the result in the creation and introduction of project management culture by projects, including the use of IT & C technologies in the local public administration in order to obtain maximum performance in the design of projects for local sustainable development of the village. These projects will result in each town halls in the creation of a department of development and implementation of projects, consisting of a sufficient number of specialists who will identify and ensure the implementation of the projects proposed by local development strategy.

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## SOME ENVIRONMENTAL FACTORS AFFECTING BROILER HOUSING IN WINTER SEASON

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### Abstract

*The main objective of this study was to study some environmental factors affecting broiler housing in winter season. The results showed that, temperature fluctuations between house ceiling and floor ranged between 0.4 to 5.93 °C during the first two days of age. The average house temperature reduced gradually from 29.7 to 21.3 °C. The indoor relative humidity ranged between 43.6 to 74.3 %. Specific heating power, specific fuel consumption and heating energy requirements ranged between 3850.2 W/°C, 0.34 kg/h. °C and 308.9 kJ/h. kg at the first week of age to 6213.4 W/°C, 0.36 kg/h. °C and 19.3 kJ/h. kg at the end of the life respectively.*

*Keywords:* broiler, relative humidity, specific heating power, temperature

### INTRODUCTION

Environmental control is an important factor that effect on broiler performance and meat yield. Indoor air temperature is one of the most important environmental factors because, maintaining the correct air temperature is crucial in chicks brooding, especially during the first seven to ten days of the chick's life. Early in life, the chick is poorly equipped to regulate its metabolic processes to adequately control its body temperature. As a result, the young chick is dependent on environmental temperature to maintain optimal body temperature. Supplemental heating systems play an important role in environmental management, especially during the brooding phase. However, in many locations for a portion of the growout supplemental heating may not be needed. On the other hand, proper ventilation is needed throughout a growout, even during times when supplemental heat is being provided, for control of air quality if not for cooling.. Environmental parameters inside the poultry housing are mainly include; air temperature, air relative humidity, ventilation, and light level during brooding. In 2010,

Egyptian production of chicken's meat was 685000 tonnes. (FAO, 2012) (El-Hadidi, 1989) informed that, Light is an important factor during brooding that can not be ignored. There is evidence that such long photoperiods (22-24 h/day) can adversely affect the functional development of eyes of chickens. Broilers must receive 22 hours light and 2 hours darkness from 24 o'clock to 2 o'clock from the second week of bird age. (Lacy, 002) showed that, both pancake and radiant brooders allow chicks to move toward or away from the heat source to seek a comfortable temperature. In recent years radiant brooders have become popular, since they have been shown to reduce fuel costs by 15 to 30% as compared to pancake brooders and forced air furnaces. (Cobb Broiler Management Guide, 2008) reported that, at placement, floor temperatures should be at least 32°C with forced air heating. If radiant heaters/brooder stoves are used, floor temperatures should be 40.5°C under the heat source. (Fairchild, 2009) indicated that, ammonia production can be reduced through the control of air relative humidity which in turn is regulated by ventilation. An air relative humidity level of 50 to 70% is recommended to minimize ammonia production and dust.

(Arbo Acers Guide, 2009).

Light intensity of 30–40 lux (3–4 foot candles) from 0–7 days of life and 5–10 lux (0.5–1.0 foot candles) thereafter will improve feeding activity and growth. The intensity of light should be uniformly distributed throughout the house (reflectors placed on top of lights can improve the distribution of light). (Fouda et al., 2012) found that, when using perforated tube for heat distribution led to reduction in gas consumption, supplementary heating and litter moisture content at the end of life by 27.07, 15.35 and 20.39% respectively. While feed conversion efficiency was increased by 3%. (Ghoname et al., 2012) showed that, using forced air heating without polyethylene tube temperature stratification ranged between 0.4 and 5.93 °C. Whereas, employing the forced air furnace with perforated tube, led to minimize the temperature stratification to -2.9°C and 0.043°C during the first two days age. Using forced air furnace with perforated tube decreased feed conversions ratio from 1.65 to 1.60 after five weeks age.

-The objectives of the present work were to investigate the effect of some environmental factors on broilers.

## MATERIALS AND METHODS

Experimental work was conducted to investigate the effect of some environmental factors on broilers housing. The main experiment were carried out in private broiler house on winter 2011, Menofia Governorate were located at (30.7° "N and 30.9° "E), Egypt. It is most important to arrange all equipment (feeders, drinkers, and supplementary light) so that the tasks associated with management, such as feeding and drinking, can be carried out easily. Therefore, the broiler house was equipped by 100 tubular feeders using hand-feeding system arranged on the interior surface area by 5.25 m<sup>2</sup> per one feeder. It also equipped by 50 round-long drinkers evenly arranged on the interior surface area by 10.5 m<sup>2</sup> per one drinker. To provide adequate light intensity inside the broiler house, 26 lamps (40 Watt)

was evenly distributed particularly at the first two weeks of age, so that the chicks can find the feeding and drinking systems easily.

## MATERIALS:

### Heating air system

Forced air conventional system (furnace, counter flow heat exchanger, axial fan taken motion directly from electric motor 3 phase with 1.5 kW in power). The fan air displacement is 3 m<sup>3</sup> /s. and electric control box.

### House specification

Broiler house having gross dimensions of 525m<sup>2</sup> The house is East – west oriented.

### Chick

The broiler housing occupy 5000 chicks that have one day age. The hybrid (Cobb) was used in this experiment.

## METHODS:

### Measurements

#### Temperature measurements

Sensors were used to measure air temperatures inside and outside the broiler house. Inside the house air temperatures were measured in two different levels at height of 0.25m above the floor surface and at height of 3 of floor surface.

#### Relative humidity

Indoor relative humidity and out door relative humidity was also measured using digital hygrometer. with ± 5% accuracy. The air relative humidity during the experimental work was measured daily at different points inside the house.

#### Specific heating power

Specific heating power is the quantity of energy added to the broiler house ambient air which make temperature rise in that house by one degree using heating system (Hanan, 1998).

$$Sp = \frac{Q_{add}}{TR}$$

Where:

Sp = Specific heating power, Watt/ °c

Q<sub>add</sub> = Heat energy addition, W

TR = the temperature rise in the house ambient air by 1°C.

### Specific heating power for every m<sup>3</sup> of the house volume

$$Sp\backslash = \frac{Q_{add}}{TR \times V_h}$$

Sp\ = specific heating power which make temperature rise in the house ambient air by 1 °C/house volume m<sup>3</sup>

V<sub>h</sub> = house volume, m<sup>3</sup>.

### Specific fuel consumption

Fuel consumption really which was used for rise the air temperature in the house by 1°C

$$S.f.c = \frac{n.f.c}{TR}$$

Where:

S.f.c Specific fuel consumption, kg/h.°C.

n.f.c = fuel consumption in the operating time, kg/h.

## RESULTS AND DISCUSSION

### Indoor temperature and air relative humidity

Air temperature is one of the most important factors that effect on broiler performance. (Figure.1) showed the relation between indoor and out door temperature during different day hours.

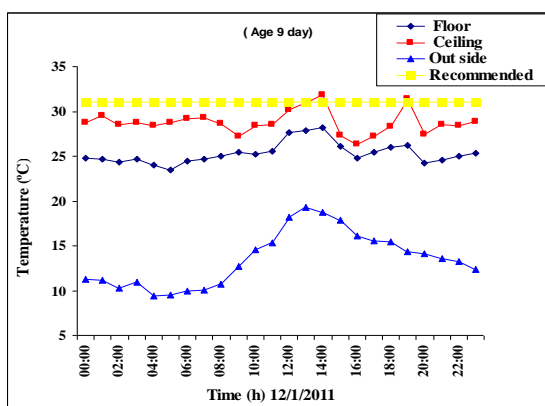


Figure1 .The relation between indoor and out door temperature

The ceiling temperature for all day hours was higher than floor temperature which is more important for chicks'. In addition to the floor house temperature was lower than the recommended temperature for this period of life. The recommended temperature at chicks' zone is 31 °C but, the average floor and ceiling temperatures were 25.3 and 28.7 °C

respectively while the average outdoor temperature was 13.7 °C. There is 5.7 °C difference between recommended temperature and floor house temperature which affecting broiler performance.

The relation between air temperature and relative humidity is adversely proportional. When broiler age increase, the air temperature decreased and air relative humidity increase. (Figure.2) showed the relation between indoor air temperature and relative humidity during birds age. The average house temperature reduced gradually from 29.7 °C at the end of the first week until reached to 21.3 °C at the end of the fifth week of age.

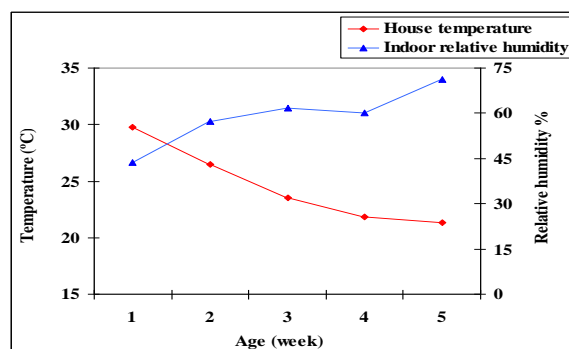


Figure 2. The relation between indoor air temperature and relative humidity during birds age

The floor temperature was lower than the recommended temperature during all age periods . If chicks are chilled, nutrients that might have been used for body development are used to maintain body heat. Chilled chicks also tend to huddle together and most do not seek out feed or water, so a number of birds may die. The performance of the chicks that survive chilling is likely to be limited due suppressed digestive or immune system functions.

The ability of indoor air to hold moisture depends upon its temperature. The level of indoor air relative humidity influences the ability of the birds to cool them through panting and influences ammonia production. The indoor relative humidity was increased from 43.7 % in the first week of age until reached to 71.3% at fifth week of age. Indoor air relative humidity increased at the end of the heating period due to the heat energy supplied during that time was insufficient to

absorb more moisture from the indoor air. In addition to, increasing the moisture adding to the house from broiler faecal. An air relative humidity level of 50 to 70% is recommended to minimize ammonia production and dust.

### Energy requirements

The heating energy requirements is dependent up only in broiler age and mass. As birds increased in age, the body mass increased and sensible heat from birds increased also. As a result, The heating energy requirements reduced. (Figure.3) showed the relation between heating energy requirements and body mass during birds age. The broilers body mass was increased from 0.13 kg at the first week of age until reached to 1.9 kg at fifth week of age. So, the heating energy requirements decreased gradually from 308.9 kJ/h.kg at the first week of age until reached to 19.2 kJ/h.kg at fifth week of age.

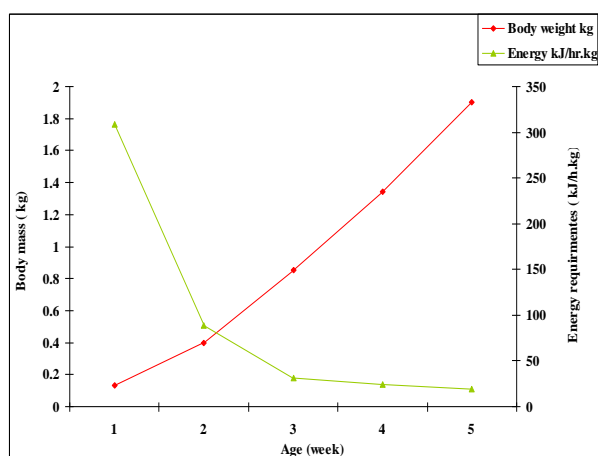


Figure 3 .The relation between heating energy requirements and body mass during birds age

### Specific heating power (SP)

Specific heating power dependent on heat energy addition to the house and temperature rise in the house. (Figure.4) showed the relation between specific heating power during different period of age. Specific heating power increase from 3850.3 W/°C at first week to 5929.5 W/°C at the end of the second week of age because the brooding area was increased after 10 days of age and reduced to 3122 W/°C at the end of third week because the heat energy addition reduce with increased birds in age. But, after that the brooded birds were translocated from a small

partial area to the whole house brooding. In addition to, the heating system can not be delivered hot air to the end of the house leaved the third part of house volume cold. Therefore, the heating system was continuously operated to rise the indoor air temperature to the recommended level. This means that, more increased in supplementary heat energy addition and gas consumption rate occurred. As a result of that, the heated house volume increased so, the specific heating power increased again until reached to 6213.4 W/°C.

### Specific heating power for every m<sup>3</sup> of the house volume (SP')

Specific heating power for every m<sup>3</sup> of the house volume dependent on heat energy addition to the house, temperature rise in the house and house volume. (Figure.5) showed the relation between specific heating power for every m<sup>3</sup> of the house volume during different period of age. Specific heating power increase from 6.6 W/m<sup>3</sup>.°C at first week to 6.8 W/m<sup>3</sup>.°C at the end of the second week of age because the brooding area was increased after 10 days of age and reduced to 2.88 W/m<sup>3</sup>.°C at the end of third week because the heat energy addition reduce with increased birds in age. But, after that the brooded birds were translocated from a small partial area to the whole house brooding. In addition to, the heating system can not be delivered hot air to the end of the house leaved the third part of house volume cold. Therefore, the heating system was continuously operated to rise the indoor air temperature to the recommended level. This means that, more increased in supplementary heat energy addition and gas consumption rate occurred. As a result of that, the heated house volume increased so, the specific heating power increased again until reached to 3.8 W/m<sup>3</sup>.°C.

### Specific fuel consumption (S.F.C)

Specific fuel consumption dependent on gas consumption and temperature rise in the house (Figure.6) showed the relation between specific fuel consumption during different period of age. Specific fuel consumption increase from 0.34 kg/h.°C at first week to

0.54 kg/h.°C at the end of the second week of age because the brooding area was increased after 10 days of age and reduced to 0.2 kg/h.°C at the end of third week because the gas consumption reduce with increased birds in age. But, after that the brooded birds were translocated from a small partial area to the whole house brooding. In addition to, the heating system can not be delivered hot air to the end of the house leaved the third part of house volume cold.

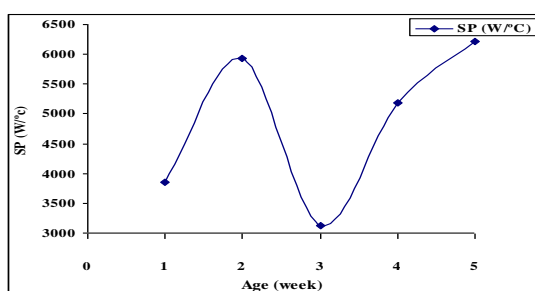


Figure 4. The relation between specific heating power during different periods of age.

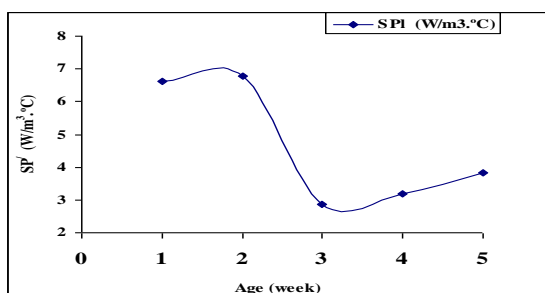


Figure 5. The relation between specific heating power for every m<sup>3</sup> during different periods of age

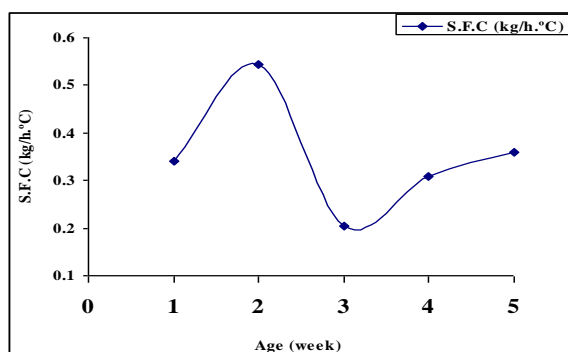


Figure 6. The relation between Specific fuel consumption during different periods of age.

Therefore, the heating system was continuously operated to rise the indoor air temperature to the recommended level. This means that, more increased in supplementary heat energy addition and gas consumption rate

occurred. As a result of that, the heated house volume increased so, the specific heating power increased again until reached to 0.36 kg/h.°C.

## CONCLUSIONS

The main results of the present research can be summarized as follows:

- Temperature at chick zone was lower than the recommended by 18.4 % which affecting broiler performance at 9 day age.
- The average floor house temperature was lower the recommended by 11.8 % through the life cycle.
- Average house indoor air relative humidity through the life cycle was 58.8% which was in the recommended range.
- Heating energy requirements reduced gradually with increasing birds in age by 93.7% from the first week of age.
- Average specific heating power was 4860.8 W/°C.
- Average specific heating power for house volume was 4.7W/m<sup>3</sup>.°C.
- Average specific fuel consumption was 0.35 kg/h.°C.

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## EFFECT OF FARMERS FIELD SCHOOL ON VEGETABLES PRODUCTION IN DISTRICT PESHAWAR KHYBER PAKHTUNKHWA

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### Abstract

*The Farmers Field School (FFS) aims at benefiting poor farmers by improving their knowledge of existing agricultural technologies and integrated crop management to become independent and confident in their decision. The study on effect of farmer's field school on vegetables production before and after FFS implementation in district Peshawar in four selected villages on each crop in 2011 was conducted from 80 farmers. The results were compared by using paired t-test. It was observed that 80% of the respondents were satisfied with FFS approach as there was a significant increase in vegetable production. The seed rate of tomato and cucumber decreased from 0.185kg/kanal to 0.1 kg/ kanal and 0.120kg/kanal to 0.01kg/kanal while production of tomato and cucumber were increased from 8158.75kgs/kanal to 1030.25kgs/kanal and 3230kgs/kanal to 5340kgs/kanal, respectively after the activities of FFS. FFS brought a positive effect on vegetable production and technology adoption improving their income, skills and knowledge ultimately lead farmers towards empowerment. The input cost including seed, crop management, FYM, and weedicides for tomato were reduced by Rs.28, Rs. 3170 and Rs.658 and cucumber reduced by Rs.35, Rs.570 and Rs.430. Only fertilizers cost was increased by Rs. 2200 in case of tomato and 465 in case of cucumber. FFS facilitator and coordinator should be more skilled and practical oriented to facilitate poor farmers. In light of the above study, more FFS should be planned so that the more farmers should be benefited.*

**Key words:** Farmer Field School, vegetables production

### INTRODUCTION

Farmer Field School (FFS) is one of the agricultural extensions, group-based and non-formal learning approach that has been used as a tool to bring desirable changes in the behavior of the farmers. It aims at benefiting resource poor farmers by improving their knowledge level regarding existing agricultural technologies as well as their decision making capacity through discovery based learning in the field (Ruttan, 2003). The FFS approach promotes field observation and experimentation based on principles of adult education (Berg and Jiggins, 2007).

FFS provides a first experience platform with a group of 25 or 30 farmer's activities based on technically sound facilitator, participatory training and agro-ecosystem to the farming communities where they can share their experiences and knowledge to improve their existing practices leading towards sustainable agricultural production (Tripp, 2005). The basic principles of FFS is to grow a healthy crop, control natural enemies, and observe

crops regularly. Through FFS farmers become powerful decision makers and experts in their respective field (Sulaiman and Hall, 2003).

FFS were introduced by the Government of KPK in 2001 in all the 24 districts of the province on different fruits and vegetables. Vegetables and condiments are the only crops that are grown on small land holdings in all seasons throughout the year. The vegetables are short duration crops which can be grown on uneven small spaces. Diffusing technology on improving the vegetable productivity through FFS will put the prices of vegetables within the reach of urban and rural poor. Vegetables are popular for their freshness, taste and nutritious value (GoP, 2008).

District Peshawar is famous for seasonal and off-seasonal vegetables due to its favorable climatic and soil condition. Vegetable cultivation is a profitable farming activity on the one hand and an essential part of the human diet on the other. Another important feature of the vegetables is that these can be grown on a small land holding for self consumption as well as commercial purposes.

Due to quick turn over the trend to grow more vegetables is increasing in the farming community (Zulfiqar, 2005).

The desired level of agricultural productivity is not achieved at the satisfactory rate because unfortunately in Pakistan there is prevalence of the traditional farming practices, inadequate use of the inputs by the farmers, poor extension services and provision of trainings. There is also a lack of modern agro-technical practices, unawareness about modern technologies and many other constraints that are faced by the farmers (Sinha *et al.*, 2001). Vegetable productivity can rapidly be increased through the appropriate application of modern techniques in agriculture so it is necessary that the farming community must be aware with the scientific knowledge, improved practices and techniques (Gibson and Brown, 2003). Most of the countries with agro-based economy had enhanced their crop production by towering (high) crop frequency and surge use of high yielding crop varieties.

The efficiently and effectively transfer of the modern agricultural technologies is necessary to enhance the agricultural productivity including cereals, pulses, vegetables, fruits and cash crops. The available literature suggests that technology transfer is slow and adoption is important. Thus in order to bridge the existed gap, the present study was initiated. The purpose of this study is to investigate the behavior of the farmers, accelerate the capacity building of growers and empowering them in decision making. This will enable them to adopt new technology to enhance vegetable productivity of selected four villages of district Peshawar. Moreover, suggest policy recommendations so that maximum profit can be obtained through application of FFS approach.

The objective of the paper is to study the effect of FFS in vegetables production before and after its intervention.

## MATERIALS AND METHODS

The Farmer Field School (FFS) approach evolved from the concept that optimal learning derives from experience-in the case

of farmers, from observations in the field. The FFS integrates the domains of ecology and non-formal education to give farmers the opportunity to learn about their crop and to learn from each other. Learning objectives of FFS are; i) grow healthy crop, ii) conduct regular field observations, iii) conserve natural enemies of pests, iv) farmers understand ecology and become experts in their own field. The FFS based IPM approach was institutionalized in Pakistan in 2001.

Farmer Field Schools were established in Peshawar District with the farming communities by Agriculture Extension Department on Tomato and Cucumber vegetables. The initial data was obtained from Agriculture Extension Department Peshawar. Presently study was conducted to assess the impact of FFS on the production technology of vegetables. In order to analyze the effect of FFS on vegetables production, four vegetables growing villages were selected purposively in Peshawar District namely Mathra, Paloosi, Regi and Potwar.

Then from each selected village two FFS were randomly selected and from each FFS ten farmers were selected at random, thereby making a total of 80 farmer respondents. The interview schedule was pretested in the field and was modified accordingly. The data was collected by interviewing the farmers and by filling a questionnaire in the field.

The collected data was analyzed by using computer Software Statistical Package for Social Sciences SPSS and Microsoft Excel. The results so obtained were presented in term of counts and percentage. Paired T-test was applied for comparison among two variables to see the impact of FFS on vegetables production in Peshawar District in comparison to non FFS farmers.

## RESULTS AND DISCUSSIONS

Due to Farmer Field School (FFS) intervention there is a significant decrease in seed rate of tomato (Table 1). Before Farmer Field School the seed rate per Kanal was 0.185Kg and but after Farmer Field School the rate decreased to 0.100Kg, so there is a

0.085Kg. Similarly in case of Cucumber a decrease of 0.11Kg/Kanal was noticed.

Table 1. Comparisons of average seed rate (kg/kanal) of tomato and cucumber before and after FFS

Crops	Before FFS	After FFS	Mean Difference	t-ratio	P value
	Seed rate (kg)	Seed rate (kg)	Seed rate (kg)		
Tomato	0.185	0.1	-0.085	8.322	0.00
Cucumber	0.120	0.01	-0.11	4.005	0.00

Confidence level 95%

Due to Farmer Field School intervention in the villages an increase in production was observed (Table 2). In case of tomato an increase of 2143.75Kg/Kanal and in case of cucumber an increase of 2110Kg/Kanal was noticed. The results of production of tomato are in line confirmation with the (Mehmood, 2006).

Table 2. Comparisons of production (kg/kanal) of tomato and cucumber before and after FFS

Crops	Before FFS	After FFS	Mean Difference	t-ratio	P value
	Production (kg)	Production (kg)	Production(kg)		
Tomato	8158.75	1030.25	2143.75	-12.08	0.00
Cucumber	3230	5340	2110	-8.02	0.00

Confidence level 95%

From Table 3 presented below one can see that there is a significant difference of fertilizers quantities used per kanal.

Before FFS farmers use 1 bag of urea, 1 bag DAP, ½ bag NPK, 2 liter of pesticides and 1 trolley of FYM. After the FFS approach farmers of the area use half bag urea, half bag

DAP, 1 bag of NPK, 1 liter pesticides and 1 trolley Farm Yard Manure.

Ciszinsky (1981) described the same practices fertilizers in his tomato field to obtain the maximum benefits from this approach.

Table 3. Quantity of fertilizers, pesticides and FYM/ kanal used before and after the FFS interventions

Particulars	Before FFS	After FFS	Mean Difference	t-ratio	P- value
	Quantity used		Quantity used		
Urea	1 bag	½ bag	-0.5	6.223	0.00
DAP	1 bag	½ bag	-0.5	8.44	0.00
NPK	½ bag	1 bag	0.5	7.001	0.00
Pesticides	2 liter	1 liter	-1	11.01	0.00
FYM	1 trolley	1 trolley	0	0.01	0.00

Confidence level 95%

Based on the data from Table 4, it was concluded that the total cost of different inputs for tomato production before Farmer Field School were at higher rates. After FFS interventions, the seed cost reduces Rs 28/-, crop management cost Rs 3170/-, weedicides

cost Rs 205/-, and Farm Yard Manure Cost reduces Rs 658/-. These results of the study are in conformity with the findings of Gyali and Salokhe (1997) and Ciszinsky (1981). After Farmer Field School decrease in seed cost, crop management, Farm Yard Manure

cost and weedicides cost were noticed. It was also observed that there is an increase in cost of Farm Yard Manure and fertilizers which attributes to higher yield. It is also mentioned

here that total expenditure on inputs before Farmer Field School was Rs 10373/- and after Farmer Field School the expenditure was Rs 9828, which shows a decrease in cost.

Table 4. Input Average cost/kanal on crop protection for tomato before and after FFS (Rupees)

Variable	Before FFS		After FFS		T-ratio	p-value	Mean Difference
	Mean	Standard Error	Mean	Standard Error			
Seed cost (Rs)	928	393.5	900	223.5	24.541	0.00	-28
Fertilizer cost	4400	281.5	6600	159.7	-76.053	0.00	2200
Crop management cost	3980	563.5	810	310.8	15.421	0.00	-3170
Weedicides cost	415	271.3	210	154.5	11.50	0.00	-205
FYM cost	650	292.8	1308	176.9	-16.156	0.00	-658
<b>Total</b>	10373		9828				

Confidence level 95%

From the data analyzed in Table 5 it was gathered that the total cost of different inputs for Cucumber production before FFS were at higher rates in case of seed cost after FFS. It

was depicted that before FFS seed cost is Rs 125/- and after FFS was Rs 90/-, crop management cost reduced from Rs 950/- to Rs 380/-, Pesticides cost decline by Rs 430/- .

Table 5. Average input cost/kanal on crop protection for cucumber before and after FFS (Rupees)

Variable	Before FFS		After FFS		T-ratio	p-value	Mean Difference
	Mean	Standard Error	Mean	Standard Error			
Seed cost (Rs)	125	343.5	90	223.5	20.16	0.00	-35
Fertilizer cost	410	481.5	875	219.7	19.53	0.00	-465
Crop management cost	950	663.5	380	310.8	17.2415/-	0.00	-570
Weedicides cost	640	371.3	210	154.5	13.50	0.00	-430
FYM cost	280	192.8	360	176.9	-16.156	0.00	20
<b>Total</b>	2405		1915				

Confidence level 95%

After FFS, decrease in seed cost, crop management, Farm Yard Manure cost and pesticides cost was noticed. It was also observed that there is an increase in cost of Farm Yard Manure and Fertilizers which attributes to high yield. It is also mentioned here that total Expenditure of inputs before FFS was Rs 2405/- and after FFS the expenditure reduce to Rs 1915/- which shows a significant decrease in cost. The results of fertilizers cost in are in conformation with the findings of Mangan (1997).

## CONCLUSIONS

The result shows that introduction of FFS by Agriculture Extension Department KPK brought a positive change in farmers behavior, the farmers empowered through FFS to adopt modern technology of crop production, decision making and crop management and using the integrated Pest management Practices.

It is recommended that:

-Agriculture extension should spread their FFS activities in the rural masses and train the farmers in this technology.

- There should be a close coordination among the FFS facilitator/farmers for achieving the optimal results.
- The capacity of FFS facilitators/farmers is enhanced through trainings.
- The knowledge obtained through FFS should be utilized in the farmer's field in order to enhance their production in vegetables.

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## VAT TAXATION ON AGRICULTURAL PRODUCTS – A CONTROVERSIAL ELEMENT OF FISCAL MANAGEMENT IN THE REPUBLIC OF MOLDOVA

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### **Abstract**

*Currently, through VAT, to the national public budget of the Republic of Moldova is collected a part of the taxable supplies made on the territory of the country, as well as goods or services imported. In 2013 year the share of VAT in the total taxes collected will constitute 79% including also the VAT taken from the domestic supplies - 20%. Simultaneously, it was proceeded to cancel the reduced rate of 8% for agricultural products in their natural state and to implement the standard rate of 20% to recovering the difference of 12% over a period of 30 days. The Executive explains this change by the need to harmonize local regulations with Directive 2006/112 EU from 26 November 2006 of the unification of applied rates, of the creation of equal tax conditions for all sectors of the national economy. In reality is looking for other purposes - to establish tight controls on all parties of local business, to increase budget revenues at all costs, to conceal gaps in fiscal administration and management of agricultural sector, etc. Examining the experience of other countries has shown that the problem can be solved through different ways: by reserving the 12% difference in special bank accounts of households and their strict direction for product development by imposing agricultural product wholesale buyers to transfer the VAT directly to the budget (but not households, as they do now), etc. In our opinion, the first variant is optimal and will lead both to simplifying the fiscal management, as well as the revitalization of the agricultural sector.*

**Key words:** accounting, fiscal management, products, VAT taxation

### **INTRODUCTION**

VAT's share of 2013 in the structure of tax revenue is planned in quantum of 78.6%, which demonstrates conclusively the importance of the timely completion of taxes for national public budget. Also under the pretext of unification of VAT shares in the real sector of the national economy has canceled the reduced rate with the size of 8% for the supplies of agricultural products and the conditions of passage in the account or in refund of the VAT from the budget and it was again supplemented with excessive demands. Therefore, the possibility of conducting entrepreneurial activity by farmers will be reduced even more, subject to a greater risk to food security of the country. This, in turn, imposes the need for a more efficient mechanism of administration of VAT, which will be more convenient both for households and for the whole society.

### **MATERIALS AND METHODS**

Investigations on the topic have focused primarily on the Fiscal Code and the Civil Code of the Republic of Moldova and the methodological Norms of sheet accounts that target various aspects of facility management and accounting for VAT in the agrarian sector of the country. It also has been generalized the experience in the field for the local farmers as well as the economic subjects from Ukraine. Preference was given to monographic method for describing economic events and social processes by applying the elements of comparison, induction and deduction.

### **RESULTS AND DISCUSSIONS**

Value added tax, which is known to economic agents and to the wide public in various countries under the abbreviation VAT, is a general tax state through which the national

public budget is part of the tax collected goods or services supplied by Moldova, as well as imported goods or services. Size of the tax (or current debt to the state budget) in chapter VAT is determined as the product of the total value of taxable and tax rate is set by Article 96 of the Fiscal Code for the respective year. In the meantime the only obligation shall be determined only by subjects of entrepreneurial activity who are registered as VAT payers and have registration certificate duly approved.

VAT shares are expressed as a percentage of the taxable value of supplies or imports made and vary depending on natural (substantial) form of commodity alienated or purchased abroad, socially important goods and services of taxable items or output direction of their destination country and other factors. Currently for most goods and services supplied or imported quota-standard VAT rate is of 20%. Also for some goods (bread and bakery products, milk and dairy products, natural and liquefied gas, drugs) is fixed in VAT share reduced of 8%. An identical rate was applied until 2013 year and has delivered its own manufacturing agricultural products in the country without prior processing, and for sugar content obtained by industrial crops stern (regardless of country's origin). To note that the application of reduced VAT rates is not contrary to international practice is widely prevalent in the Member States of the European Union and aims for pragmatic purposes for one country or another (combating shadow economy, creating new jobs, ensuring fair competition, etc.)

However, in our opinion, the current system for collecting and managing the added value tax is highly sophisticated, unstable and unpredictable. Large masses and external partners are stated continually and strongly the numerous and permanent changes in tax legislation and normative adjacent acts have a reforming and progressive character, as they result from government work programs, different developing strategies and agreements with financial international organizations, that already in the near future this will lead to tangible results not only for

the budget or the influx of foreign investment, but also for the welfare of all the people, etc. But paying closer examination of lawmaking and disinterested fiscal is clarified, with all regret, that many so-called reformers actually watch other purposes that are more tangible and more commonplace. They, on the one hand, are trying to be pleasant in the eyes of foreign creditors and donors and to support their own reputation by militants for a national economy prosper and, on the other hand, unconditionally subordinate local business and squeeze the whole of it at all costs with more receivables from budget (even if such actions contradict they common with sense and lead to tense the situation in the country). About bankruptcy and not proper character of such a policy demonstrates conclusively the increasingly frequent failures lately (which are, however, ignored), and that alarming fact that in 2011 for the first time in the history of Moldova and its predecessor in person of MSSR food imports exceeded exports. A similar situation was repeated the following year. This means that in a short time the country has deteriorated itself from an agribusiness state with intensive agriculture in a country of villages with depopulated areas, parcels of raw land and battered roads.

In the continuance of the policy of expansion of imposable base and increase of tax burden, the Moldovan Parliament, at the proposal of the Ministry of Finance, decided to cancel the reduced rate of VAT in the amount of 8% for the supply of agricultural products and own manufacturing products in 2013 to replace it with the standard rate of 20% (or 2.5 times higher than the substituted one) with concurrent entitlement to reimbursement of 60% of the VAT on those supplies which were paid to the budget. Also the repayment is determined by the Government and return time should not exceed 30 days. Proponents of this "innovation" state that the complete budget must contribute equally to all businesses (including farmers), no one deserves to be disadvantaged without reason, that all taxpayers must be in the same fiscal conditions and the unification VAT rates are



made by simplifying the tax administration, etc. Of course, such an approach, in fact, is correct and no one contests it. But the real practice of relations between taxpayers and budget row between producers and blanket object servants of different categories is much tougher and significantly different from the criteria or purposes stated. In addition, it is quite strange that the VAT rate unification policy is associated, exclusively, with their increase, while in developed countries it is found also in certain stages as a reverse evolution.

Besides this fact, the agricultural producers (and, together with them, all the lucid specialists) asks: why to pay to the budget the full amount (i.e. 100,000 lei) so that in a month its decisive part in proportion of 60% (which in this case is equivalent to 60,000 lei) to be returned to the payer? Is not it easier and more logical to pay the budget at the outset only 40% of the calculated duty and the other 60% to remain on bank accounts of enterprises, enabling them to make current payments connected operatively to purchasing diesel, seed, phytosanitary means and other stocks? These and many other questions of the mentioned domain should be discussed only giving one answer: a farmer due to current power tends to fill budget gaps and shortcomings in tax administration. On closer examination of the new mechanism for collecting and VAT refund is found explicitly that it is mainly a masked form of borrowing the cash from households that own form for these shortcomings:

- It does not have a voluntary character and is imposed in a forced (by law) to farmers;
- Completely neglecting the deplorable financial condition and solvency of most households reduced;
- Civil law provisions on loans that have a universal character and can not be denied intentionally replace with some household rules significantly narrower that harm the rights and interests of taxpayers, placing them into a total dependence of omnipotence and needs tax officials national public budget.

Today it can be said with all certainty that the VAT mechanism optimization problem in

agriculture is not only a fiscal or accounting problem, but, first and foremost, a political issue that is of major importance for the future of the country and can be solved only with the all political forces who rule the state. Methods for solving this problem are extremely varied and interested parties to discuss asset (but, until, without any visible success). The more so as the amount of subsidies planned for 2013 in order to support local farmers is only 460 million lei (including 60 million - donations under the pilot project within the European program ENPARD), which is totally inadequate and represents only 2% the amount of the state budget or about 20EUR with a report per hectare. For comparison, we can mention that EU agriculture subsidies takes about 45% of the share, and the total size of direct and indirect subsidies exceed 300 EUR per hectare (that is 15 times higher than the level reached in Moldova). Therefore, training mechanism VAT administration in the indirect farm subsidies is appropriate and can really contribute to the sustainable development of them. In addition, the solution of the problem also reduces multiple torrents of documents, living labor costs, payments to the bank and many other bureaucratic procedures, routine, usually lead to abuse of office and corruption.

In practice it is also possible to optimize with another option of the tax mechanism whose essence consists in these things since the amount of VAT to be paid by the household budget is part of receivables wholesale buyers (wine factories, sugar, oil extraction, canned production, etc.) is 1/6 the size of these commitments of payment and need to be paid by buyers of agricultural enterprise, it would be easier to give up this sophisticated, multistage and vicious and bound scheme by Law and the buyers should transfer VAT amounts indicated in the invoices of the farmers not into their bank accounts, but the budget directly mentioning the rural taxpayer whose tax liabilities are extinguished? Later, as the declaration of VAT (VAT form 2012) is to attach them to the list of the invoices issued (VAT form provided), amounts allowed for passage in the account shall be

recovered from household budget through commercial banks and in the presence of debts they will be directed to settle these debts. Since such a change mechanism for collecting and managing tax have won farms as well as national public budget, the potential advantages of the amendment lie in the followings:

- for households - reduce the number of banking operations, reduce the dependence on buyers (it remains only in terms of trade relations, but not the tax liabilities); exclude the risk of applying financial sanctions in the form of penalties for delay; avoid the need and disappearance of permanent financial resources from economic to honor their tax obligations, etc.
- for budget - ensure more uniform and faster completion of tax revenues due to higher solvency food industry enterprises, increase significantly the amounts collected monthly from taxpayers from the fact that they (of course, through wholesale buyers) will be transferred by destination full amount of VAT calculated (that is of 20% of the taxable amount of supplies of agricultural products), but only part of it (as it now has in place) determined according to Article 101 (1) of Tax Code which shrinks obviously some liable restitution payments from the budget, whereas the amounts of VAT, usually are lower than the recovery rate amounting to 60% from January 1, 2013 provided in Article 1012 (1) of the same law etc. In addition, it is important to note that changing the tax collection mechanism does not affect all budget size or maturity commitments and wholesale buyers pay no property rights. These buyers, regardless of the fiscal policy of the Moldovan state at one stage or another of development of society, are obliged under Article 753 (1) of the Civil Code to pay the seller (in this case - the farmer) price. And this price, if taxable supplies, including, now, and VAT at the standard rate of 20%. Therefore, wholesale buyers need not be concerned that they are going to pay TVA – to farm or budget. But in both cases it is one and the same sum. But exactly here, in our opinion, is hidden the apple of discord.

Representatives of big business and their influential patrons in the government circles assert that such a change perfidy against the international practice, as it undermines the integrity of the local tax system, as its implementation will result in additional costs, etc. The reality, however, is much tougher and has nothing in common with the pseudo arguments mentioned or interests of society as a whole. Just overdue with farms and often for partial or total avoidance of honoring payment from these wholesale buyers practically bears no responsibility. By the time, committing the same violations in relation to the budget can have the most serious consequences. Thus, failure to pay VAT amount in a term of 2 months can result not only in calculating penalties, but with undeniable collection of cash from bank accounts suspended operations in these accounts; withdraw cash from the tellers, the seizure of goods liquids, etc. Obviously such actions do not agree at all true owners of companies collecting, processing and marketing of agricultural products (or food) and their protectors. To solve the problem and changing legislation, requires political will of the Moldovan Parliament, the realization that agriculture is the foundation of the national economy and that it is this branch (but not many companies, firms and intermediaries have occupied the internal agricultural market), require a high bias regime (including VAT taxation chapter).

## CONCLUSIONS

1. The current mechanism for collection and refund of VAT on the supply of agricultural products is highly sophisticated and vicious, is associated with increased risks for taxpayers' agriculture and is essentially a disguised form of borrowing cash focused on an erroneous interpretation of the provisions of the Civil Code of Moldova.

2. Optimization problem in terms of VAT tax system is a complex problem that must be solved not only on the basis of statements treacherous, for urgent or narrow group interests, but taking into account the vital

needs of all parties: farmers, wholesale buyers, public budget national, etc.

3. Variant of the most successful management VAT in applied and social plan is one which focuses on the redistribution of tax liabilities between farms and buyers with simultaneous return of the tax budget amounts listed on the account.

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## PROMOTING ACCESS TO WATER SUPPLY AND SANITATION: ISSUES AND CHALLENGES IN ROMANIA

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### Abstract

*The human right of access to public water supply and sanitation (WSS) has been recently (2010) recognized and stated by the United Nations General Assembly. The human right to water and sanitation entitles everyone to water and sanitation services which are available, accessible, affordable, acceptable and safe. Therefore, in Romania, the challenge to reduce the urban/rural disparities in terms of ensuring people's right of access to public WSS systems adds another reason for the need to develop the water infrastructure, besides that of compliance with the EU water Directives.*

**Key words:** *disparities of access, human right of access, public utilities, water supply and sanitation*

### INTRODUCTION

Access to water and sanitation is one of the vital and stringent issues of sustainable socio-economic and human development, in most of the world, so there is a strong need to state and promote this issue as much as possible. Therefore, the relationship between access to water and sanitation and international human rights law has been clarified in the last decade, since in July 2010, the United Nations General Assembly has recognized that water and sanitation are a human right.

As we shall try to further emphasize, understanding water and sanitation as a human right should have significant implications also for the regional and rural development. This right is now defined at the international level, and obliges Governments to take concrete steps towards ensuring access to safe water and sanitation for all, without discrimination.

### MATERIALS AND METHODS

Since the human right to water and sanitation entitles everyone to water and sanitation

services which are available, accessible, affordable, acceptable and safe, we shall first try to find out practical definitions of those concepts.

Then we shall point out to the main three dimensions of access:

- the geographical disparities of available WSS services;
- the specific barriers or exclusion faced by vulnerable and marginalized groups;
- the financial affordability concerns.

Based on the highlighted characteristics of the WSS infrastructure in Romania, we may present these main three dimensions of equal access to water and sanitation in a conceptual framework and place the case of Romania within this framework in order to emphasize some current issues and challenges to be considered when promoting access to water supply and sanitation in order to comply with the EU Water Directives.

### RESULTS AND DISCUSSIONS

The human right to water and sanitation requires a local assessment of needs and progressive implementing. Different

approaches, technologies and policies for WSS may be appropriate in different contexts, and a master plan needs to be in place to outline the steps towards universal access.

Ensuring affordable access to water and sanitation is a central step towards guaranteeing full enjoyment of the right, and special attention to groups which experience disadvantage, social exclusion or are vulnerable, is critical for ensuring that people are not excluded from enjoying this basic human right because of discrimination or neglect.

Therefore, the main principles of implementing the human right to water and sanitation, by providing equitable access to WSS systems are (UNECE-WHO, 2011):

**-Availability:** Under human rights law, there must be a sufficient number of water and sanitation facilities and water must be available continuously and in a sufficient quantity to meet personal and domestic needs, which includes drinking, bathing, hygiene, cooking and washing clothes and dishes. Determining the required amount of water and number of toilets will depend on a local assessment of community and individual needs.

**-Accessibility:** Water and sanitation facilities must be physically accessible within the vicinity of each household, school, health institutions, public buildings and workplaces. Accessibility requires taking account of the special needs of those with reduced mobility including people with disabilities and elderly people.

**-Affordability:** Water and sanitation and water facilities and services must be affordable to all people in a way which does not limit people's ability to afford other essential basic services. The affordability of water and sanitation includes construction, connection, maintenance, treatment and delivery of services. Water and sanitation services do not need to be free of charge for everyone, but solutions must be found to ensure that those living in poverty are able to access these services despite their limited capacity to pay.

**-Acceptability:** Sanitation facilities must be constructed in a way which ensures privacy

and which ensures separation of male and female toilets in most cultures. Water should be of an acceptable taste, colour and odour.

**-Quality / Safety:** Sanitation facilities must be hygienically and physically safe to use. Water also must be of such a quality so that it poses no risk to human health.

To get sustainable and equitable access to water and sanitation, it will take a holistic approach, able to:

-integrate solutions for access to safe water and solutions for access to improved sanitation. While popular demand, and the attention of the authorities, is usually stronger for water supply than for sanitation, to ensure sustainability water and sanitation need to be approached together;

-comply with all the different dimensions of equitable access. The literature distinguishes at least three key dimensions: geographical disparities, specific barriers faced by vulnerable and marginalized groups, and affordability concerns.

A range of policy options are available to fight inequities of access in each of those key dimensions. However, it is also necessary to think in terms of an overall policy package, since there are important linkages between the different dimensions.

Although access to water and sanitation for all is a common aspiration and obligation for all countries, the performance to fulfil those aspirations and obligations is uneven.

The Millennium Development Goals call for halving the proportion of the population without access to improved water sources and sanitation by 2015. As of 2010, 2.7 billion people still lacked access to improved sanitation, facing enormous health risks.

Also, in 1990, 63% of the world people living in low and middle-income countries lacked access to a form of improved sanitation. It is true that by 2010, this non-access rate had improved by 19 percentage points, to 44%, but the situation is still worse in rural areas, where 57% of the population lack access to improved sanitation (Global Monitoring Report, 2012). The main reason why the sanitation target of the MDGs will not be achieved is the large urban-rural disparity of

access to WSS, (especially in South Asia and Sub-Saharan Africa, but also in some European countries)

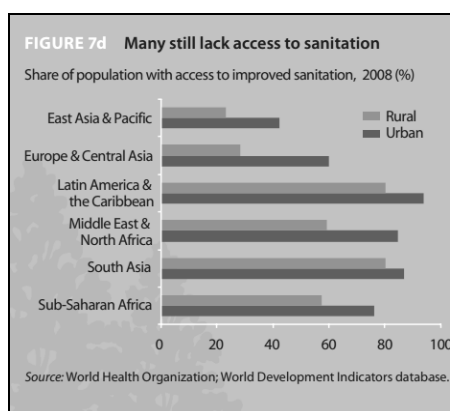


Figure 1 - Urban-rural disparity of access to water and sanitation worldwide

Source: Global Monitoring Report 2012, Progress toward the MDG, Food Prices, Nutrition and the Millenium Development Goals

At present (2010), 12 percent of Europe’s population (about 110 million people) still live in homes that are not connected to a piped water supply. According to the best estimates of the World Health Organization (WHO), more than 13,000 children under the age of 14 die every year from water-related diarrhoea, mostly in Eastern Europe and Central Asia (EECCA). Thus, despite normal aspirations, access to safe drinking water and to improved sanitation remains a challenge in several countries of the pan-European region, among which also in our country, in Romania.

Within each European country, access to water supply and sanitation is also inequitable. It does not affect human populations randomly; rather it affects mostly the poor and rural populations. Rural areas have consistently lower levels of access than urban areas to water and sanitation services.

The rate of access to water and sanitation by rural populations in the EECCA is 10 percentage points lower than that of urban populations (WHO-UNICEF, 2010). Across the entire pan-European region, rural households are 8 times more likely to lack access to piped water supply than urban households.

Unfortunately, this issue of rural-urban disparity of access to water supply and

sanitation is very striking in Romania and we consider it to be one of the main features of the Romanian water infrastructure, as well as a major shortcoming for sustainable economic development, given that rural wastewater is simply discharged into the environment, polluting the soil and water (Frone Simona, 2013).

The actual development gap of water supply and sewage utilities not only hinders Romania from fulfilling EU water quality standards but also jeopardizes human and environmental safety in some regions and areas (mostly rural) and therefore inhibits the start up and development of new businesses (such as tourism business), capable to plenty use and enhance potential value of local natural and human capital (Frone Simona, Frone D.F., 2011).

As we shall briefly point out, the current situation of the water/wastewater infrastructure development is still critical in Romania, especially in rural areas at regional levels: inadequate water treatment, poor sewerage network and low access to centralized water and wastewater systems are the main weaknesses of this environmental sector.

Only about 65% of the population benefit from mains drinking water supply and indoor plumbing. This includes 98% of urban population and 33% of the rural population, quite low ratios in comparison with those in Europe, respectively 96 -100% of the population connected to public water supply network in urban areas and 87% in rural areas. Even worse, only 52% of Romania’s population is connected both to water and sewage services and up to 70% of the wastewater is untreated or insufficiently treated and flows directly into natural receivers.

Thus, as we may notice from our graph in figure 2, in Romania the total number of localities with public sewer is only approx. one third (35.4% in 2009 and in 2010) of the total number of localities supplied with drinking water network (NIS, 2011).

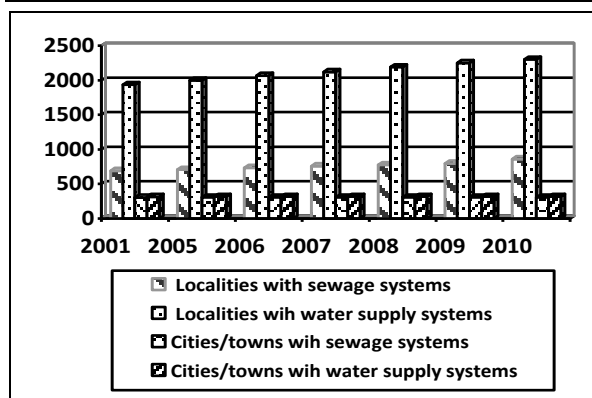


Figure 2- Evolution of the sewerage system as compared to the water supply network in Romania (total and urban)

Still, the situation in towns and cities is more balanced in the sense that almost all (97% in 2010) towns and cities supplied with drinking water, have also public sewerage, so the big gap between the two types of water services occurs especially in rural areas.

While on the whole country, only approx. 54% of the total rural localities (but 96% for cities and towns) are equipped with public water supply, some regions have a slightly better situation as compared to the national average (Southeast, West, Northwest and Center) the generally better economically and socially developed regions in Romania. Southern regions are below the national average share, these being in general less economically developed regions.

So, as regards the regional access of the population to public sewerage network, the development regions with the highest percentage of residents who have homes connected to sewerage systems (of the region's population) are: 1. Bucharest-Ilfov region, with a rate of 81.5%, explained by the vast agglomeration of Bucharest; 2. Western region (Vest), with 48.1%; 3. Central region (Centru), with 49.6%. The lowest percentage of residents with homes connected to sewerage systems relative to the entire population is in the less developed South Muntenia (Sud-Muntenia) region: 28.3%, meaning that access to WSS is definitely an issue of economic development.

We have also tried to express (Figure 3) the relative level of rural regional development of water distribution systems and public sewage

networks, by using two synthetic indicators, namely:

Irureglapa: Percentage of localities with drinking water facilities, out of the total number of rural localities in the region;

Irureg2can: Percentage of localities with sewerage network, out of the total number of rural localities in the region.

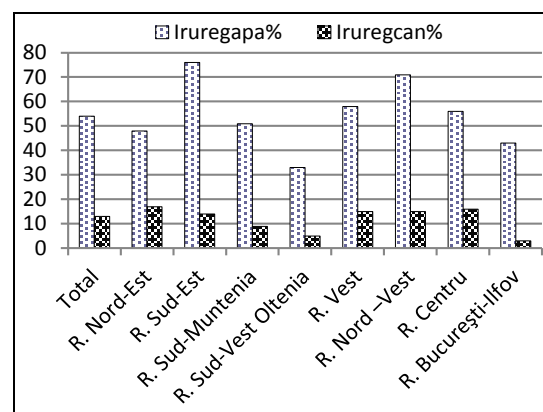


Figure 3 - Relative level of rural development in Romania of the public water and sewerage networks, by development regions (2009)

On the other hand, in terms of the endowment and access in rural areas to sewerage sanitation systems, the situation in Romania is particularly weak, accounting for only 13% of the national rural settlements, indicating a general state of rural underdevelopment, to be tackled by developing with massive investments the WSS networks and improving access of all categories of people to the water and sewerage (sanitation) public utilities.

## CONCLUSIONS

We may conclude that in Romania, the main issues of the disparity of access to water and sanitation are the geographical disparities, represented by an important gap between the development of the water supply network and sewerage system, and between the urban and rural areas.

There are in Romania also other issues of disparity of access to water and sanitation services which are due to the other dimensions of access, so they are figured in the conceptual framework (table 1) but they are less significant and not analysed here.



Table 1. The conceptual framework of equitable access to water and sanitation: the case of Romania (RO)

Basic characteristics of water and sanitation services	Access challenges	Equitable access dimension
No physical access (no water available, water sources polluted, no facilities)	Certain areas of a country (rural areas, poor urban neighbourhoods, areas affected by environmental degradation or scarcity) have no physical access or have access of lower quality than other areas	Geographical disparities  <b>RO</b>
Low quality of physical services (water contamination, discontinuous service)		
Good quality of physical services	Physical services are not adapted to the physical or cultural needs of certain groups (people with disabilities, schoolchildren, nomadic people)	Access by vulnerable or marginalized groups  <b>RO</b>
	Persons belonging to certain groups are discriminated in the provision of physical and customer services (e.g. due to unsafe tenure, ethnicity or illiteracy)	
	The water and sanitation bill represents a too large share of disposable income for some households	Affordability by users  <b>RO</b>

Source: Own interpretation and analysis for the case of Romania, based on the report *NO ONE LEFT BEHIND Good practices to ensure equitable access to water and sanitation in the pan-European region*, UNECE/WHO-Europe Protocol on Water and Health, 2011

In any case, the concept of human right to water and sanitation requires states to ensure that the cost of access to water and sanitation remains affordable and adequately reflects the needs of marginalized and vulnerable groups, and secondly, that there is a safety net for those who can not afford to pay or who can afford to pay only a minimal fee.

For the period 2004 - 2018, total investments required in Romania for compliance with

European Directives on drinking water and wastewater were estimated at the huge amount of 19 billion euros. The funds allocated by Sectoral Operational Programme (funded by the Cohesion Fund and national co-financing) and the National Rural Development Programme (funded by European Regional Development Fund for Agriculture) represent only about 17% of these needs [ANAR, 2010].

Therefore, implementing an integrated WSS network development strategy is still a challenge but also a must for a sustainable and equitable rural and regional development in Romania.

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## ASPECTS OF THE FUTURE COMMON AGRICULTURAL POLICY

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### *Abstract*

*The paper aimed to present the main CAP reforms imposed by the actual situation of agriculture development in the EU. The Common Agriculture Policy is focused on decoupling, modulation and cross-compliance. The single payment scheme will assure aids only for farms where production complies with environment, food safety, animal and plant health, animal welfare, and agricultural land maintenance in good condition. The new legislation provides the introduction of "green payments" related to the adoption of agricultural practices beneficial for the climate and the environment. The demographic growth imposes more production and a better distribution of food in the world. The EU has to be prepared to produce more because of the mass emigration to the rich countries from the region where food demand can not be covered.*

**Key words:** Common Agricultural Policy, EU, future challenges

### INTRODUCTION

By the end of the 70s, it emerged the need of a reform of the Common Agricultural Policy, because of the negative consequences encountered both at national and international level, in particular linked to the pursuit of food self-sufficiency of the Community. So urgent was the need to remedy a disastrous situation involving the following obvious causes:

- deficiencies and excesses of production;
- increase of agricultural expenditure due to the surplus of production, resulting in financial instability;
- disparities regarding aid regulations;
- imbalances between sectors, resulting in disputes between the member states;
- greater sensitivity to environmental protection and food quality;
- enlargement of the European Community with the entry of new member states;
- the crisis of world agricultural markets.

### MATERIALS AND METHODS

Taking into account the recent publications in the field, the paper is in fact a professional study presenting the author opinions on the future of the Common Agricultural Policy in the context of the EU enlargement, involving

the development of agriculture in close connection with food demand, food safety, animal and plant health, animal welfare and environment protection.

### RESULTS AND DISCUSSIONS

Over time both the objectives and instruments at the service of the C.A.P. have been improved through successive reform measures. We like to remember the Mac Sharry Reform, 1992, so the goals set by Agenda 2000, and then the Fischler Reform, which represents the latest and the most recent manifestation of a deep and constant evolutionary process, which was consolidated in the E.C. Regulation no. 1782/2003(Costato Luigi, 2013).

The most relevant and innovative profiles made to the CAP can be summarized in the three following items: the decoupling (Decoupling), the modulation, and the environmental - compliance (cross-compliance).

With the decoupling of aid and the establishment of the Single Payment Scheme, which was considered the innovative element of the Fischler Reform, Community aid is constituted by a single payment per farm for the farmers of the European Union, regardless of the production and subject to compliance

with environmental, food safety, animal and plant health, animal welfare, as well as maintaining the land in good agricultural condition. With the decoupling, farmers have no production constraints, they are certainly free in their choices and are no longer prompted by the "hunt for subsidies"

The decoupling has become a formidable incentive to non-cultivation of land to non-secure high productivity, resulting not only a production decrease, but also the reduction of the cultivated area.

If we refer to the evolution of the global socio-economic background and in particular of the question of the balance between the availability of food resources and their consumption, agriculture plays a very important role, especially essential for food production at great risk resource of scarcity.

We can say that regarding the expected future food demand, growing rapidly, the variability of atmospheric phenomena, also due to climatic changes and the frequency of natural disasters, with consequent effects on yields of agricultural crops, the current common agricultural policy underestimates the complex problem of food self-sufficiency.

The strategy of food self-sufficiency appears very obvious throughout the regulation which was in force in particular from 1962 to 2003, making the EU to become a powerful food industry. The encounter was a great element of strength in foreign policy. So with the Regulation 1782/2003, which introduced the "Decoupling", i.e. the decoupling of production aid from the Community, the support given to farmers was related to the eligible hectare farm, even if the land was not cultivated. As a consequence, this was definitely a disincentive for farmers to operate, to cultivate the land in the less fertile areas or particularly supposed to weather hazards.

The new Common Agricultural Policy is being developed within a new institutional framework particularly important. Recently, the European Community has approved, after long discussions, the legislative proposal on the future agricultural policy, which should come into force the next year, 2014.

After the Treaty of Lisbon, last year, the legislative process will be very different than in the past. Brussels will decide not only the confrontation with the ministers of agriculture of all the 27 member states, but even after a vote by the European Parliament, which will be the legitimate representative of all the interested agricultural categories.

This was proposed but not yet approved, as the amounts available for the agricultural sector, which accounted for 45% of the Community budget, remained intact.

However, with the new reform it is still uncertain that the extent of financial support to farmers in the EU-15 will surely be reduced, given that the 12 countries that have recently joined the EU will participate for the first time fully in the allocation of funds to destined to agriculture.

The general layout of the new CAP is confirmed on the two traditional pillars. The first pillar will continue to include the regime of direct payments and market measures, which include the stabilization of the farmers' income.

The second pillar will continue to promote multi-annual rural development measures and to the competitiveness of the agricultural enterprises, with programs at the local level. For direct payments regarding the first pillar, the system of decoupling is confirmed and also will be closely connected to the severe environment requirements (Fabiani Franco, 2012).

The new legislation provides the introduction of one of the main innovations of the reform, the "greening", a form of "green payments" related to the adoption of agricultural practices beneficial for the climate and the environment. The "greening" through diversification of crops at farm level means as companies with a greater area than 10 hectares should have at least two crops, while those over 30 hectares at least three crops. They must preserve all land under permanent pasture and should be areas of ecological interest.

The EU member states may allocate up to 30% of direct aid payments to the "greening". The "greening" is automatically recognized in

all organic farms. Decoupled payments are the real heart of the matter and the criteria on which they are based, decoupled payments being still subject of an intense debate.

The main issue under discussion concerns the reference to the main indicators, which can be: the utilized agricultural area, the gross marketable production, the value added, as well as the level of employment. The choice of one or the parameter can radically alter the scope of aid for each country and for farmers. In addition, if the cut of the funds provided for agriculture prove of particular importance, the introduction of the "greening" with the related environmental constraints, could be called into discussion. It remains crucial that common sense and balance prevail, that you recognize the absolute necessity of strengthening the productive agricultural activities and emerge stronger constraints on the steady loss of agricultural land ( Russo Luigi, 2012).

Moreover, the issue of "food security" will always remain of high actuality. According to the FAO, it is expected as in 2050 world population to be by 50% higher compared to nowadays. It is forecast to reach 9 billion people compared to 6.5 billion at present, while the demand for food is expected to increase by 70%, by virtue of the demographic growth, the improvement of consumption levels, as well as the changes caused by income variation (De Castro Paolo, 2011).

It is not only a need of a better distribution of food in the world, but it is also essential to produce more ( Cassati Dario, 2013).

Do not forget that a lot of people, who can not be fed in their home, will determine a mass emigration. As it was the case even in the distant past, the rich countries of the starving population will encourage mass emigration to Europe, even in a short time, causing tremendous political and social situations. Therefore, it is essential that the European Union to accumulate agricultural products with food destination.

## CONCLUSIONS

The increased food demand due to the population growth imposes a new distribution of food and a stimulation for producing more agricultural products.

The EU is facing a difficult challenge in order to comply the need of producing more with the food safety, environment protection and climate change.

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## ENTREPRENEURSHIP – A MAJOR FACTOR IN THE DEVELOPMENT OF MOLDOVIAN ECONOMY

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### Abstract

*Entrepreneurship is the tendency of a person to organize the business of his own and to run it profitably, using all the qualities of leadership, decisions making and managerial caliber etc. The term “entrepreneur” is often used interchangeably with “entrepreneurship”. But conceptually they are different. In a way, entrepreneur precedes entrepreneurship. It is concerned with the development and coordination of entrepreneurial functions. Entrepreneurship is an abstraction and entrepreneurs are tangible persons. Well designed and controlled research studies on entrepreneurship are very few. If we view entrepreneurship as opposed to management, it becomes still more difficult to define entrepreneurship. Entrepreneurship is a role played by or the task performed by the entrepreneur. The central task of the entrepreneur is to take moderate risk and invest money to earn profits by exploiting an opportunity. For this he must possess far-sightedness to perceive an opportunity so that he can exploit it well in time. Although an entrepreneur has to perform diverse functions yet he must manifest many qualities in himself to be a good entrepreneur.*

*Entrepreneurship can be defined as the tendency of mind to take calculated risks with confidence to achieve a pre-determined business or industrial objective. That points out the risk taking ability coupled with decision making.*

**Key words:** business, coordination, entrepreneur, entrepreneurship, functions

### INTRODUCTION

Entrepreneurship plays an important role in economic development as a source of innovation and change that stimulates increased productivity and economic competitiveness. Entrepreneurship is closely related to knowledge and flexibility, two factors that have gained new significance as a source of competitiveness in a global economy increasingly globalized. Once with technological change and increased global competition brought about by globalization and economic liberalization, the assumption that encouraging entrepreneurship is to encourage the competitiveness of a country, today seems more valid than ever. In market economy conditions, interest for business is increasing. This requires high competence and professional preparation by all persons who wish to start a business. Is why the transmission and appropriation of a knowledge in business volume may present substantial support in choosing different

forms organizational-legal of entrepreneurship.

### MATERIALS AND METHODS

During the investigation there were used such research methods as: analysis, monographic as well as other methods and procedures that allowed revealing the essence of the investigated problem.

### RESULTS AND DISCUSSIONS

Perspective of the Republic of Moldova in the European Union, globalization of world economy, competitive environment with rules rooted implies the need of highlighting and clarifying certain notions and promoting the values contemporary entrepreneurship. Economic reforms in the 1990s in Moldova have brought significant changes in the mentality of the people concerning private property, competition and entrepreneurship. Nowadays, entrepreneurship is recognized by the all relevant bodies, is developing under

Moldovan law, becoming one of the most popular terms commonly used by economists, politicians, journalists and ordinary people. Business is considered now a main factor in the development of market economy of the republic.

Entrepreneurship is associated with success, money and prosperity, both for the individual and for society. The more entrepreneurs there are, with as many successful businesses are, all the more developed is the country. Today entrepreneurship provides each opportunity to achieve purposes and obtain income from their own business. This is demonstrated in that in Moldova every year open their own businesses thousands of people, majority being guided not dream of becoming the richest and prosperous, but want to ensure a decent living. (2)

Entrepreneurship as main object of activity has the creation, financing and management of enterprises, with a view to make profits. One can talk about a new company an individual activity with the purpose of taking up in labor, but also about the existing business development activities.

Entrepreneurship as a subject of discussion and analytic was introduced by the economists in the eighteenth century and continued to attract interest of economists in the nineteenth century. Entrepreneur is a major player and a symbol of market economy. In the modern sense of market economy, an entrepreneur is a economic agent adopting the asset and innovative behavior who accepts deliberated financial risks to develop new projects. In this sense, a large number of societies grant great attention and recognition entrepreneurs, largely due to contribution they bring these to the evolution of business environment and the influence that they have on macroeconomic indicators. Recognition of the value entrepreneurs date even from the eighteenth century in France, when French economist Richard Cantillon (1697 - 1734) coined the term entrepreneur, describing him as a merchant who risks their own capital.

From that time until nowadays, entrepreneurial activity was associated with taking risks.

Another writer interested about entrepreneurial aspects and which brought a great contribution entrepreneurial school of thought was Jean Baptiste Say (1767-1832). Thus in Say's opinion, entrepreneur devotes time, talent and resources in the production, distribution and consumption of goods and services. Reward's entrepreneurs, Say's opinion, represents the excess of income of a company.

The progress in entrepreneurship is due largely economist Joseph A. Schumpeter and the Austrian School. Joseph Schumpeter in 1934 said: "In entrepreneurship there is an understanding that we make in relation to a particular type of behavior and who includes: initiatives, organization and reorganization of socio-economic mechanisms, acceptance of risk and failure".

For J.Schumpeter an entrepreneur is a person able to convert a new idea in a successful innovation which makes "new combinations", such as the introduction of new products or processes, identifying new export markets or resources or creation of new types of organization. He created a heroic vision of the entrepreneur as being a person motivated by "the dream and desire to found a kingdom private", "desire to conquer, the impulse to fight, to prove superior to others" and "joy to create".

(1)

To complete the list of information about the activities and qualities which boosts results have been undertaken several studies. Their conclusion was all successful entrepreneurs had following three qualities: control indoor capacity planning, risk taking, innovation, use the feedback, decision making, independence. This list situated around a process improve continues by adding new features.

In view behaviorist school representatives, who give the most attention the elements that characterizes entrepreneurs, the main aspects that are specific are those of: innovators, leaders, risk assumed, independent, creative, tenacious, energetic, original, optimistic



oriented results, flexible, materialistic, insã remarkable progress in tackling labor content and characteristics of entrepreneur makes Jacques Fillon. In his last study he achieved an integrating approach very interesting and useful for specific characteristics of the activities of entrepreneurs that is characterized by:

**Determination and perseverance:** more than any other factor, dedication to success as an entrepreneur can overcome obstacles. Strong determination and perseverance can make a contractor to handle any data hardships that others would consider insurmountable also can even compensate for the lack of experience and skill of the staff.

**Desire to earn:** entrepreneurs examine a situation, determine how they can increase your chances of winning. As a result, risks that ordinary people are considered as high, are high risks for entrepreneurs.

**Search feedback:** entrepreneurs are often described as having efficient ability to learn fast also strong desire to know how well they do and how they can improve results. Feedback is important because the entrepreneur is ready to learn from mistakes also from previous experiences.

**Solving persistent problems:** entrepreneurs are not intimidated by difficult situations. Confidence and general optimism makes it impossible to see it as something that just take longer to be resolved. Simple problems are boring, entrepreneurs are highly persistent but are realistic in assessing what can and what can not do also where they need help to solve difficult problems, but unavoidable.

**Initiative and responsibility:** entrepreneurs have always been independent people, they seek and take initiative, are put in situations that are personally responsible for the success or failure of the whole operation. They like to get involved in personal problems where their impact can be measured.

**Orientation to opportunities:** one thing that clearly differentiates entrepreneurs is concentration more on opportunity than on resources, structure or strategy. When they decide to take action they do in a calculated mod trying to do everything to get as many

chances to win but avoid to take unnecessary risks.

**Tolerance for failure:** the entrepreneurs use failure as an experience from which they can learn something. The more efficient entrepreneurs are those who expect difficulties and are not disappointed, discouraged or depressed by failure.

**Self confidence and optimism:** although entrepreneurs often incurring major obstacles, confidence in personal abilities leads them to overcome and making the others to maintain their optimism.

**Realization of visions:** entrepreneurs know where they want to arrive. They have a vision or concept of what will be their company. Not all entrepreneurs predetermine their vision for their companies, while some develops their vision, aware of what is the firm and can arrive.

**High energy level:** the high amount of work done by entrepreneurs involves existence a higher energies from them. Many entrepreneurs carefully monitors the quantity of consumed energy and knows when to retreat for relaxation.

**Creativity and innovation:** creativity has long been regarded as something genetic, with which you are born and you can't acquire. One of famous theories appeared the late-twentieth century century say that it can be learned.

**Independence:** the frustration in front of the bureaucratic systems together with the desire to make a "difference" makes some people very independent who want to do things their way. But entrepreneurs don't take all decisions, but they want the authority take them on the most important.

**Teamwork:** the desire for independence and autonomy does not make him to stop work as a team. In fact, while the entrepreneur clearly knows where is the firm, the firm's staff dealing with the activities of "daily" in the the firm.

**Managerial ability:** this is not an absolutely necessary feature for entrepreneurs but it is important to know that a successful entrepreneur also needs for this kind of knowledge.

Synthetic entrepreneurial activity consists in identifying and exploiting economic opportunities. Entrepreneurial activity is a process that takes place in different environments and business units that cause changes in the economic system through innovation by those who capitalize economic opportunities, creating values both for individuals and for the society. Entrepreneurship is a significant contribution to society and the development process, some of its obvious benefits being:

- creating new markets - due to creative ability and resources to benefit, the entrepreneurs can come with innovative products;
- discovery of new resources - the entrepreneurs are often dissatisfied with the traditional materials and resources and they try to find alternatives in order to facilitate the work and to improve performance;
- the mobilization capital of resources, by the status of the organizers and the coordinators of the process for obtaining a product, entrepreneurs are directly responsible for the proper allocation of the capital and human resources;
- introduction of new technologies, products and industries, innovators and risk lovers, the entrepreneurs take the advantage of every occasion to turn an opportunity in profit;
- creating jobs, the millions of jobs are created by the private sector, being in the top categories of employers.

Entrepreneurial activity depends on many factors. The main factors which influence entrepreneurial activity are:

1. internal factors;
2. external factors.

Internal factors depend on : size, type and specific activity, personality and entrepreneur training and level of training of the people involved and company culture. These factors have a much greater impact on enterprise performance.

External factors depend on: the features and functionality of the economic system, national economic conjuncture and market which the firm operates. These factors, due to the content favorable or unfavorable, could have a major impact on entrepreneurial initiatives.

Through the entrepreneurial activity is aiming to achieve personal goals of the entrepreneur, business objectives as well as mixed objectives.

The objectives of a personal nature are those which entrepreneur justifies entrepreneurial activity. They hold of person, being an inner impulse that triggers ideas fueled by entrepreneurial activity. Within this group include:

- objectives of safety and security personal;
- objective of ensuring a social status;
- objectives to guarantee your own independent;
- objectives of success in business;
- objectives regarding your satisfaction.

Business objectives are characterized by:

-Generals objectives, which require the rendering of useful services needed company (manufacturing and marketing products and services) and making profit (remuneration for assuming the risk of investing money in a business). Here we also include social objectives which require assuming some social responsibilities (protection of consumers' interests, development interests of employees and the community in which the company belongs).

-Subsidiary objectives that are established for each functional domain in part (production, marketing, accounting, research staff) these being in interdependent with each other.

Mixed objectives are those that represent a correlation between achieving profit, customer, employee and that of the entrepreneur. These objectives appearing in a situation where personal objectives are correlated and consistent with business objectives.

-In the design phase of the business, when the are established needs, values, dimensions and advantages must foreshadowed and finality entrepreneurship. Entrepreneur must know, at this stage, the principles who will guide the entire activity:

- Elaboration of objectives, strategies and action plans that will be revised according to the context;
- Production and supply of goods or services on which people and wish them;

- Attracting and retaining a customer;
- Making a profit sufficient to attract potential investors and keep existing ones;
- Giving rewards (material and moral) incentives which train human resources.

Entrepreneur can have, after initiating a business, both the satisfaction and dissatisfaction.

Among the most important satisfactions may be called:

-Independence (autonomy) - is gained, after initiating of a business because he is the one who takes decisions and makes things to have a certain direction set by himself. For the entrepreneur, the business entails a high degree of responsibility. And in this case, the entrepreneur wishes to assume it. Freedom of decision and action that is conferred by holding of a business is a necessity assumed for him.

-Self-Realization - the entrepreneur, who own their own business, doesn't encounter obstacles to self-realization, only the ones determined by his own capacity and creativity.

-The possibility of an unlimited gain - most of entrepreneurs can obtain much more gain than if they work for others. The entrepreneur, if successful, can obtain a profit to cover his interest on borrowed capital and that could reward risk taking, effort, talent and his entrepreneurial and managerial capacity.

-Work safety - is another aspect for the entrepreneur who has a guaranteed job, and advantage that it can to work as long as it is able to work without being forced to retire.

-Employing of family members - in case the business will register good results, entrepreneurs will be able to engage the whole family. This is another advantage, because the business will have the continuity through its takeover by children. On the other side, in the business conducted by family members, there may be a moral and a better confidence.

-The independent using of accumulated capital - the entrepreneur can put his capital in their own business, instead of investing in businesses owned by others and that can be risky or to keep his money in the bank deposits.

-Application of their knowledge and skills - For some people finding a suitable job for their knowledge can be a problem (due to excess of labor in the force field). Thus, an entrepreneur can start a business, where his skills and knowledge are an advantage.

-Exit out of routine - is another problem common. There are people who feel the need to change, who want to leave an activity monotonous, routine. Starting a business is an opportunity to fulfill the personal satisfaction.

-The power and influence - for any entrepreneur the affair gives power and influence, because he is the decision maker, influencing the actions, can decide the fate of the company, and all these aspects creates a great psychological satisfaction for him.

As a dissatisfactions of entrepreneurial activity may be mentioned:

-The revenue uncertainty - due to oscillations in the the business evolution may appear of revenue fluctuations . In many cases, the entrepreneur can be paid to the last, due to the numerous financial payments.

-The risk of losing the capital - Many entrepreneurs contribute with some goods or important sums of money. They can be lost in the event of a business unsuccessful.

-The burden of total responsibility - in case of failure or success in business, the entrepreneur is solely responsible. Along with the increase of business, will increase and the responsibilities.

-Recourse to the experts - because an entrepreneur can not be known in all fields he is forced to recourse to the experts and to listen to their recommendations. This is an injury to their sense of interdependence.

-Frustration if successful - once with development of the firm would be supplemented number of employees and awarding some privileges, which may seem frustrating for some entrepreneurs.

-Deviations from ethics - sometimes, if successful, is imposed a deviation from the values of professional ethics.

-A very busy work program - entrepreneur does not have a fixed work schedule. He is the first to come and last to leave. In the early

stages of business, he must do it 14 hours a day, 7 days a week without holiday.

-Damage of family relationships - due to the long working hours and consumption of energy and time, the entrepreneur has less time for family and his loved ones.

-Impaired health condition - the extensive work, a prolonged stress, nervous and energy consumption, bring the body into a state of exhaustion, often brings to the occurrence of illnesses.

## CONCLUSIONS

In conclusion, it can be mentioned that entrepreneurship will remain important for all countries and organizational configuration management, continuing to exist as long as the company will create conditions for the emergence of this type of organization and the roles and contribution of entrepreneurs to amplify substantially simultaneously with their manifestation in terms of quality education, what current reflects the entrepreneurial revolution that according to the statements of many experts, will reach its peak in the XXI century, generating multiple mutations, some with even difficult to imagine now, and the welfare state developed to allow access to new areas of universities develops many true business incubators that are available to entrepreneurs to be able to experiment and test new theories of business, is imposed of business support by continuing to reduce bureaucracy in the establishment and operation of the new businesses, better public information on government programs to stimulate private initiative to the popularization greater business success recorded by Moldovan entrepreneurs.

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## RENEWABLE ENERGY BETWEEN AGRICULTURE AND INDUSTRY

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### Abstract

*The paper aims to present the evolution of renewable energy in the entire world, including Moldova and Romania as states that tend to reach their micro- and macro-economic objectives. One of the most important goal remains the development of renewable energy from agricultural waste and so the energy coming from natural sources such as solar, wind or water without air pollution. As a conclusion, the solution to obtain this renewable energy is to attract financial resources from EU or USA investors.*

*Key words:* evolution, EU states, investors, Moldova, renewable energy

### INTRODUCTION

The renewable energy sources: solar energy, wind energy, hydraulic, geothermal, biofuels, etc. represent inexhaustible sources that are widespread all over the world. Today it is shaped the tendency to use widely all these sources by producing and assembling various technologies such as solar panels that absorb heat from the sun and transforms it into thermal and electrical power, or wind turbines, located in areas predisposed to continuous movement of the air masses, for wind energy capture and as for many other technologies. The efficient use of renewable sources would limit the excessive use of energetic resources of minerals (coal, oil, natural gas) and would significantly reduce gas emissions to prevent greenhouse effect.

### MATERIALS AND METHODS

To characterize the evolution of renewable resources distribution, as a share of gross energy consumption in the European Union, we examined statistical reports of the EU's statistical office, Eurostat.

We also investigated the report for 2011 prepared by Observ'ER – a structure composed of engineers and experts in renewable resources sphere- part of the "Eur'Observ'ER 2020" project, supported by the European Union.

In the context of social development and national economy growth, we would like to emphasize the objectives suggested by Energy Strategy of the Republic of Moldova until 2030 as well as the projects designed to ensure financial technology implementation in the assimilation and transformation process of renewable resources.



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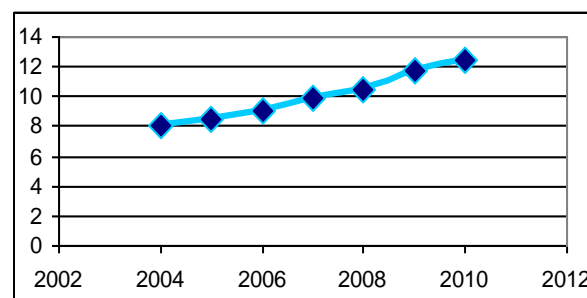
### RESULTS AND DISCUSSIONS

According to a statement given by European analysts, in European industry, currently, are employed some 1.5 million people, and for 2020 the figure is expected to rise to 4.5 million people. [2] Most sought jobs are related with the producing of solid biomass with more than 273 000 jobs, followed by photovoltaics and wind energy with 268 110 and respectively 253 145 jobs estimated for

2010.[4] This event speaks of a continuous integration of EU Member States in the process of renewable sources application, circumstance which would provide both work places for people and benefits stated above. According to an EU General Report activity, adopted by the European Commission on 26 January 2012, the EU strategy is to reduce greenhouse gas emissions by at least 20% compared to 1990 level and increase the distribution of renewable energy in total consumption energy to 20%. [3] In this context, at a national level, the Government of Republic of Moldova approved at February 5, 2013 Energy Strategy of the Republic of Moldova until 2030, which provides the achievement of the objectives, measures and activities focused on energy improvement and renewable energy use increasing as well as attracting investments in this area. Being a member of the Energy Community Treaty, Moldova aims at compatibility with the market rules of the EU and the Energy Community, but as well to promote without delay an efficient and correct transposition of EU legislation. [5] To achieve the proposed objectives, Moldova, and Romania, as an EU member state, tend to get grants, long-term credits and international investment. The project "Energy and biomass" with a total budget of 14 million EUR, granted by the EU and 0.56 million EUR, granted by the United Nations Development Programme, aims to provide with thermal energy locally produced from biomass more than 130 kindergardens, schools, medical centers, other public institutions and over 500 rural households. Another project, strengthening capacities for sustainable management of energy, with a budget of 1.6 million euros granted by the Swedish Agency for International Development, provides a normative framework drafting for energetical efficiency and renewable energy sources. Funding sources come boundless and from the budget support program in energy sector reforms with a budget of 40 million euros. [5] In this context we note the attitude of the state towards the development of the energy sector for social prosperity. We remark European

Bank for Reconstruction and Development which gives to Moldova 35 million euros to improve the energy efficiency of the residential sector through a project oriented towards housing associations and small and middle-sized businesses. Currently, ProCredit Bank operates after a policy of energy efficiency and the MoREEFF loans are offered to clients who wish to invest in developing renewable resources without adverse environmental impacts, calling them "Green Loans". So MoREEFF project consists of two components: a credit line of 35 million euros and a fund grants amounting to 11 million EUR, provided by the European Union and the Government of Sweden. In a report published by the European Union's statistical office, Eurostat, was made a comparative analysis between EU Member States. Thus, on average, in the EU-27 Member States, the share of renewable resources in total gross energy consumption increased from 8.1% to 12.5% in the period 2004-2010. [6] (Figure 1).

Fig.1. Evolution of the share of renewable energy in total consumption



Source: Eurostat, 2011

As we mentioned, the purpose of the EU is to achieve 20% energy from renewable sources in total consumption of energy, but as well as reducing the dioxide emitted into the atmosphere. Each EU Member State has established this purpose at national level, being an objective which requires foreign investment and cooperation between states. According to data presented in the report of the EU's statistical office, Eurostat, in 2010, the share of renewable resources in their total energy consumption for Romania represented 23.4% compared to the established aim for

2020 of 24%. [6] Thus, Romania, has deviated from the intended purpose with less than 1%, which speaks of a good development and a well realized legislative and normative framework. Among EU member states that in 2010 recorded a high percentage of renewable energy in final consumption is highlighted Sweden (47.9%), Latvia (32.6%), Finland (32.2%), Austria (30, 1%), Portugal (24.6%), Estonia (24.3%), and among those with low weight included Malta (0.4%), Luxembourg (2.8%), UK (3.2%). [7] As for Moldova, the record for 2009 of renewable energy share in gross final consumption was of 11.2%. [8]

According to data presented by Ernst & Young, Bloomberg New Energy Finance (BNEF) reported that the investment point in renewable energy at a global level for 2012 was around 149 billion dollars (113 billion euros), which represented a decrease compared with 2011 when its level was 180 billion dollars (137 billion euros). [9] Regardless of the economic and financial crisis, registered investments, even with a slight decrease compared to 2011, contributed to the development of this field globally, representing a total cash respectable for this sector of the economy.

In fact, many imposing market companies take measures to reduce excessive energy consumption, focusing on streamlining it. Such restructures significantly reduce costs in the company, representing a benefit, as in the case of any increase in sales. Moldovan enterprises should exploit the enormous potential offered by the agricultural sector whereas their economic development is largely based on the export of products and services from industrial-agricultural area. If small and medium-sized enterprises should invest in installing technologies to produce bioenergy and transform agricultural waste into biomass, it would cover the consumptions at least at company level.

And yet, Moldova, through the agricultural potential that it holds, but also by geographical location that allows the setting of the technologies is unable to capitalize on by lack of funding. Since Moldova is dependent on imported energy sources with

the share of 94%, there are performed meetings with experts from the European Union. Recently a group of experts from Poland, amply documented about Moldova, proposed solutions for biogas production, for heat and electric energy from renewable sources such as waste arising from the production of wine, sugar, oil and livestock waste.

Moldova has engaged in a "green revolution" by setting and achieving the objectives for energy efficiency, promoting boundless participants in these projects. Savings that could be achieved, in the state budget, following the implementation of Government objectives by 2020 would be about 1.2 to 2.4 billion lei, saving 20-40% of total energy consumption.

With the changes made within the legal-normative frameworks and relative economic stabilization, exists the certainty for attracting foreign investors. Currently, as specifies the Ministry of Economy, Industry financing package for energy efficiency and renewable energy form over 100 million euros.

## CONCLUSIONS

We note that renewable resources have become priorities for sustainable development of both EU Member States and the Republic of Moldova. By joining the Energy Community Treaty, the Republic of Moldova has set targets that follow to be implemented. However the national authorities optimism is not shared by the participants in "green" projects, one of the causes being the lack of grants from the state. Compared to previous years we can notice that the level of investment in renewable resources had increased significantly. Thus we believe that in the near future, Moldova, through intensive cooperation with EU Member States will achieve its proposed strategies.

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## ASSESSING SELF-CONSUMPTION IMPORTANCE ON THE INCOME IN RURAL AREAS

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### Abstract

*Value of goods produced and consumed is an important part of the lifestyle of the rural population, own consumption delimiting subsistence economy size and living standards. Under these circumstances, this paper aims to assess the importance of self-consumption in population income and expenditure structure and its implications for different social groups in rural areas. In 2011, in rural areas, the equivalent consumption of agricultural products from own resources accounted for 37.4% of total revenues and 47.0% of the total food consumption. In this context, our main results emphasize that high values indicate an involution in own consumption from an economic perspective and a growing importance of agriculture in ensuring non-monetary income of the rural population.*

**Key words:** food consumption, lifestyle, self-consumption, social groups

### INTRODUCTION

The self-consumption in Romania is a way of life in rural areas and this phenomenon is extended in the present even in urban areas due to the strong connection between these two areas of residence (more and more people from urban areas possess houses with land in rural areas).

Due to the economic crisis of the last years, the dimension of self-consumption has risen, reaching in rural areas a level of 33.4% of total income of a household (2011) after a minimum of 28.1% in 2009. This tendency becomes more important when we notice that compared with 2006 in 2011 the self-consumption has grown with 45% in real terms.

In this context, the present paper purposes to analyse the dimension of self-consumption in direct correlation with the level of income and expenditure of the households. To reach this objective we assessed the importance of self-consumption in population income and expenditure structure and its implications for different social categories especially in rural areas.

The main results of the paper emphasize that the high values and rising of self-consumption indicate an economic involution and reveal a growing importance of agriculture in ensuring the income of the rural population.

### MATERIALS AND METHODS

In order to set up this paper, the data regarding income, expenditure and self-consumption have been collected from National Institute for Statistics for the period 2006-2011 [1]. Starting with this data we realized a statistic analysis based on time series of data and fixed basis index. Also, following the purpose of our research, we made an analysis from an ante and post enlargement point of view and also between rural and urban areas.

### RESULTS AND DISCUSSIONS

In Romania, as we already mentioned, the self-consumption is a way of life. Even in the period of economic growth (2006-2009) when the total income and monetary income were increasing, the income in kind from own resources rose with over 20%.

Starting with 2010 the effects of the economic crisis and the political measures that affected the incomes of all households determined self-consumption to reach a level with 34,4% higher than in 2006 (Table 1).

Table 1. The monthly average income of household in the period 2006-2011, by main income categories, in Romania

	Total income	Monetary income	Income in kind	Equivalent value of own resources
2006	1386.3	1118.8	267.6	221.2
Share in total income (%)	100.0	80.7	19.3	16.0
2007	1608.9	1305.6	303.3	254.2
Dynamics 2006-2011 (% 2006=100)	116.1	116.7	113.4	114.9
Share in total income (%)	100.0	81.1	18.9	15.8
2008	1885.3	1566.3	319.0	261.2
Dynamics 2006-2011 (% 2006=100)	136.0	140.0	119.2	118.1
Share in total income (%)	100.0	83.1	16.9	13.9
2009	1940.0	1622.9	317.1	266.2
Dynamics 2006-2011 (% 2006=100)	139.9	145.1	118.5	120.4
Share in total income (%)	100.0	83.7	16.3	13.7
2010	1819.3	1526.0	293.3	258.8
Dynamics 2006-2011 (% 2006=100)	131.2	136.4	109.6	117.0
Share in total income (%)	100.0	83.9	16.1	14.2
2011	1804.1	1473.7	330.4	297.4
Dynamics 2006-2011 (% 2006=100)	130.1	131.7	123.5	134.4
Share in total income (%)	100.0	81.7	18.3	16.5

\*real values expressed in constant prices of 2006  
 Source: INS

The share of self-consumption in total income followed the trend we mentioned reaching a minimum of 13,7% in 2009 and a maximum of 16,5% in 2011 (Figure 1).

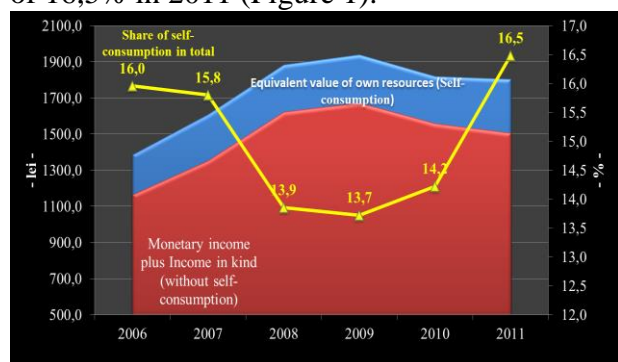


Figure 1. The monthly average income of household, by the main income categories and the share of self-consumption in total income, in the period 2006-2011, in Romania

The evolution of monthly average household expenditure in the analysed period, even if it followed the same trend, had a smaller dynamics than the income (Figure 2).

The effect of the economic crisis is reflected by the saving ratio too, which after a maximum of 11,6% in 2009 reached in 2011 only 9,7%.

In this situation, the importance of self-consumption in the total expenditure structure grew from a value around 15,5% in 2008-2009 to a value of 18,2% in 2011.

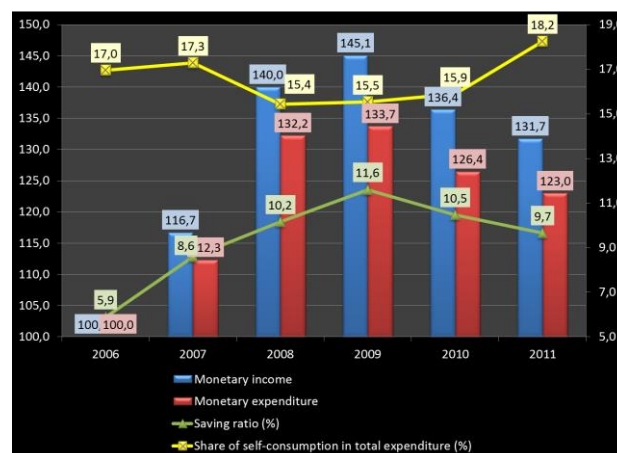


Figure 2. The monthly average monetary income and expenditure of households, saving ratio and the share of self-consumption in total expenditure, in the period 2006-2011 in Romania

### Rural-Urban comparisons

The monthly average income structure by residence areas indicates that the increasing importance of self-consumption in our country is due especially to the household from rural areas (Figure 3). In rural households the self-consumption reached in 2011 a value of 33,4% and the monetary expenses represented only 65,3%.

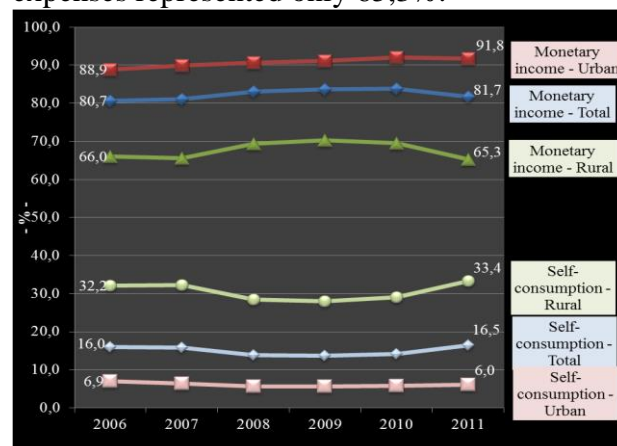


Figure 3. Income structure by area of residence – 2011

The increase of the share of self-consumption in total income in the period 2006-2011

doesn't seem important but if we analyze the dynamics of this indicator in the period 2006-2011 (Table 2) we may observe that the incomes from own resources had the biggest growth (45.0%). This situation is high importance due to the gaps between these two types of households. Even the monetary income of rural households increased more than in urban households, in 2011, the rural population earned only 57.7% from the level of urban income.

Table 2. The monthly average income and expenditure of household dynamics in the period 2006-2011, by area of residence, in Romania

	Area of residence	2006	2011	2011/2006
		lei	lei	%
Total income	Total	1386.3	1804.1	130.1
	Urban	1575.4	1965.1	124.7
	Rural	1139.9	1592.6	139.7
<b>Rural/Urban - %</b>		<b>72.4</b>	<b>81.0</b>	-
Monetary income	Total	1118.8	1473.7	131.7
	Urban	1400.0	1803.6	128.8
	Rural	752.1	1040.5	138.3
<b>Rural/Urban - %</b>		<b>53.7</b>	<b>57.7</b>	-
Income in kind	Total	267.6	330.4	123.5
	Urban	175.4	161.5	92.1
	Rural	387.8	552.1	142.4
Self-consumption	Total	221.2	297.4	134.4
	Urban	109.5	118.9	108.6
	Rural	366.8	531.8	145.0
Savings ratio - %**	Total	3.2	9.6	-
	Urban	3.6	10.5	-
	Rural	2.0	7.6	-

\*real values expressed in constant prices of 2006

\*\* calculated for monetary incomes and expenses

Source: INS

The gaps between urban and rural population in 2011 in terms of monetary income was 1.73:1 leu, smaller than in 2006 when it was 1.86:1 leu. The rural household succeeded to reduce these gaps regarding monetary incomes due to the higher increase of the incomes from gross salary and other salary rights, independent non-agricultural activities and social protection. Despite this gap reduction, in 2011, the saving ratio in rural households (calculated for monetary resources) was only 7.6% while this indicator reached 10.5% in urban households.

Table 3. The monthly average income dynamics, by area of residence and major social category, in 2006-2011 periods

	Rural	Urban
<b>Employee</b>		
<b>Total income</b>	<b>130,2</b>	<b>120,9</b>
<b>Monetary income</b>	<b>131,7</b>	<b>124,4</b>
Gross salary and other salary rights	138,4	126,1
Income from agriculture	105,9	92,6
Income from independent non-agricultural activities	136,0	52,2
Income from social protection	101,2	123,0
Income from sale of assets from household patrimony	111,0	58,5
<b>Income in kind</b>	<b>125,3</b>	<b>87,3</b>
Equivalent value of own resources (self-consumption)	130,2	105,2
<b>Unemployed</b>		
<b>Total income</b>	<b>97,5</b>	<b>130,1</b>
<b>Monetary income</b>	<b>86,1</b>	<b>136,6</b>
Gross salary and other salary rights	184,1	145,4
Income from agriculture	83,9	49,2
Income from independent non-agricultural activities	163,2	173,5
Income from social protection	95,8	132,9
Income from sale of assets from household patrimony	13,7	136,6
<b>Income in kind</b>	<b>131,5</b>	<b>99,2</b>
Equivalent value of own resources (self-consumption)	133,2	109,1
<b>Self-employed in non-agricultural activities</b>		
<b>Total income</b>	<b>120,7</b>	<b>113,1</b>
<b>Monetary income</b>	<b>109,2</b>	<b>114,6</b>
Gross salary and other salary rights	89,1	128,5
Income from agriculture	74,9	244,3
Income from independent non-agricultural activities	103,7	115,5
Income from social protection	141,4	129,7
Income from sale of assets from household patrimony	127,4	100,2
<b>Income in kind</b>	<b>151,4</b>	<b>100,9</b>
Equivalent value of own resources (self-consumption)	151,5	95,0
<b>Pensioner</b>		
<b>Total income</b>	<b>147,3</b>	<b>140,9</b>
<b>Monetary income</b>	<b>155,8</b>	<b>148,4</b>
Gross salary and other salary rights	145,8	130,7
Income from agriculture	91,6	116,3
Income from independent non-agricultural activities	104,2	96,4
Income from social protection	174,8	165,3
Income from sale of assets from household patrimony	293,0	83,1
<b>Income in kind</b>	<b>133,3</b>	<b>96,8</b>
Equivalent value of own resources (self-consumption)	135,3	115,9
<b>Farmer</b>		
<b>Total income</b>	<b>147,8</b>	<b>105,7</b>
<b>Monetary income</b>	<b>127,1</b>	<b>114,9</b>
Gross salary and other salary rights	155,7	81,2
Income from agriculture	121,8	171,3
Income from independent non-agricultural activities	153,7	230,4
Income from social protection	103,1	77,1
Income from sale of assets from household patrimony	189,0	63,6
<b>Income in kind</b>	<b>173,7</b>	<b>89,7</b>
Equivalent value of own resources (self-consumption)	174,8	90,8

Source: INS

### Rural-Urban social categories comparisons

In employees' households the total income increased in the period 2006-2011. We also observe in rural areas an increase of incomes from non-agricultural activities (36.0%), salaries (31.7%) and self-consumption (Table 3). The contribution of self-consumption to the formation of income in 2011 was 20.8% (Figure 4).

In unemployed' households from rural areas we may observe a reduction of 2.5% in total income and an increase of 84.1% of salary rights, 63.2% of social protection income and 33.2% of self-consumption. Due to this situation, the contribution of self-consumption to the formation of income in 2011 was 32.1%.

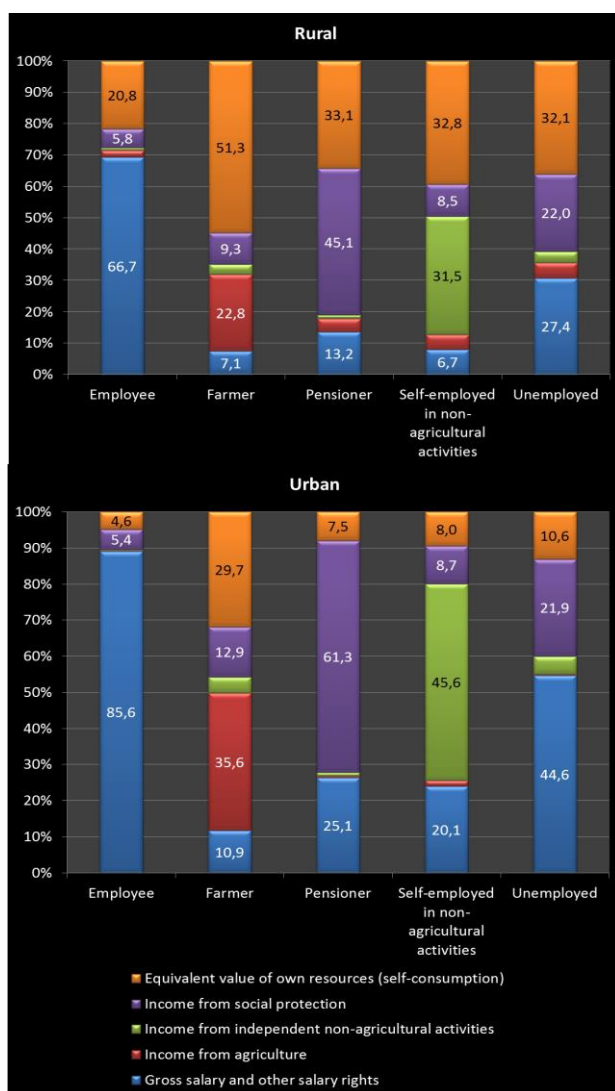


Figure 4. The monthly average income structure, by area of residence and major social category, in 2011

For the households of those self-employed in non-agricultural activities from rural areas in 2011 only 31.5% were incomes from the main activity, over 32% being formed by the self-consumption incomes. We also may observe that in urban households there is an evident tendency to complete the incomes by selling agricultural products or by self-consumption.

In pensioners' households, if, in urban areas, there is a direct dependence to pension and social protection incomes, in rural areas, the self-consumption increased in the period 2006-2011 with 35.3%. So, in 2011, the contribution of self-consumption to the formation of income was 33.1%.

The income of farmers' households from rural areas registered the biggest increase (47.8%) due to the growth of salary rights (55.7%) and agriculture (21.8%), but especially due to the growth of self-consumption (74.8%). In these conditions, in 2011, 51.3% of the farmers' income was formed by the self-consumption and only 22.8% by sale of agricultural products.

### CONCLUSIONS

1. Starting with 2010, the effects of economic crisis and the political measures that affected the incomes of all households determined self-consumption to reach a level with 34,4% higher than in 2006.
2. The gaps between urban and rural population in 2011 in terms of monetary income was 1.73:1 leu, smaller than in 2006 when was 1.86:1 leu.
3. Self-consumption value in 2011 remains between 20-30% of revenue of all professional categories, with the highest value of 51.3% for farmers.

### REFERENCES

- [1] [www.insse.ro](http://www.insse.ro), Tempo online

## CURRENT TRENDS OF ROMANIAN RURAL FAMILY

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### Abstract

*The profound changes experienced by the Romanian society had a profound social impact on the structure and functions of the rural family. The paper aims to highlight the main trends recorded using a number of indicators: ruralization rate, birth rate, infant mortality rate, percentage of children born outside marriage, fertility rate, percentage of population aged 65 and over. Statistics from censuses and statistical yearbooks were processed to identify the trends of the Romanian rural family: changes in reproductive behavior, increased aging, declining birth rates.*

**Key words:** fertility rate, reproductive behavior, rural family,

### INTRODUCTION

Character of relations within the family (dominated by tradition or open to new) influences decisively, by the primary social values, how to make decisions and reporting to the other individual. [1] So the family is the social group with utmost importance in ensuring the harmonious development of its members in relation to biological, emotional, psychological, financial protection, proper socialization and education of children. In this paper I will analyze demographic factors involved in the development of rural space and the evolution family (household) areas.

### MATERIALS AND METHODS

Family is an independently dynamic system that integrates social mechanism, with a pronounced historical character. Thus rural social dynamics as a whole, was passed on dimensioning household, the functionality and role of the family.

To characterize the demographic changes of the rural population in the period 2002-2012 we used the following indicators: ruralization rate, birth rate, infant mortality rate, percentage of children born outside marriage, fertility rate, percentage of population aged 65

and over, nuptiality rate, divorce rate, general mortality rate. [2]

Statistical data from censuses and statistical yearbooks were processed to identify the main coordinates of the family's demographic and social areas, during the analyzed period.

### RESULTS AND DISCUSSIONS

Romanian population decreased continuously in recent years, as it was at 1<sup>st</sup> of July 2010 of 21.4 million inhabitants, less with over 1.8 million than in 1990 and less with 250,000 people compared to 2002. Under these conditions, the population structure by residence shows that Romania remains a country with a deep rural character (Table 1).

Table 1. Population of Romania by regions and areas of residence), Source: INS

	Census 18 March 2002		1 st of July 2010	
	Urban (%)	Rural (%)	Urban(%)	Rural(%)
Romania	52,7	47,3	55,1	44,9
North-East	<b>40,6</b>	<b>59,4</b>	<b>43,1</b>	<b>56,9</b>
South-East	54,6	45,4	55,1	44,9
South Muntenia	<b>39,7</b>	<b>60,3</b>	<b>41,4</b>	<b>58,6</b>
South-West Oltenia	<b>43,8</b>	<b>56,2</b>	<b>47,9</b>	<b>52,1</b>
West	60,9	39,1	62,9	37,1
North-West	51,1	48,9	53,3	46,7
Centre	58,4	41,6	59,3	40,7
București-Ilfov	87,9	12,1	91,9	8,1

Predominantly agrarian regions are South Muntenia (58,6%), North-East Region (56,9%) and South-West Oltenia Region (52,1%).

Table 2. Population of Romania by areas of residence and gender

Year	Total		Male		Female	
	Urban (%)	Rural (%)	Urban (%)	Rural (%)	Urban (%)	Rural (%)
1990	53,22	46,78	52,96	47,04	53,47	46,53
1997	55,01	44,99	54,40	45,60	55,59	44,41
2004	53,63	46,37	52,71	47,29	54,50	45,50
2010	55,07	44,93	54,01	45,99	56,07	43,93
2011	55,00	45,00	53,89	46,11	56,05	43,95
2012	54,96	45,04	53,82	46,18	56,05	43,95

Source: INS

In terms of population distribution by residential environments, a growing percentage of urban population is seen to 54,96% in 2012 and decrease in rural population both male (46,18%) and female (43,95%). It is indicated that in the the whole of Romania, the share urban population of females is greater than that of males, while the rural share of females is lower than that of males.

A reference for the population profile is age structure. Distribution by age of population shows that between 2002 and 2010, the aging of the population has increased.

During this period the share of young population up to 15 years of age decreased from 18,5% to 16,0% for males and for females, from 16,8% to 14,3%, At the same time, the share of persons aged 65 and over increased by 0,4 percentage points for men (from 12,0% to 12,4%) and 1,2 percentage points for women (from 16,1% to 17,3%), The process is more pronounced in rural areas.

In the period 2002-2010, the share of population aged 65 and over in the total rural population has decreased (from 15,3% to 15,1%) for males and in urban areas increased (from 8,8% to 10,0%). In contrast, share of females rose in both rural (from 20,7% to 21,7%) as in urban areas (from 12,0% to 13,8%).

Table 3. Population of Romania, by gender, age groups and residence environments, in the 2002 and 1<sup>st</sup> of July 2010 Censuses

	Romania		Urban		Rural	
	2002	2010	2002	2010	2002	2010
<b>Male</b>						
Total (Thousand persons) of which in %:	10568,7	10434,1	5493,4	5632,7	5075,3	4801,4
Under 15 years of age	18,5	16,0	17,0	14,7	20,2	17,4
15-24 years of age	16,3	14,3	18,2	14,4	14,3	14,3
25-34 years of age	17,3	16,6	17,8	18	16,8	15,0
35-44 years of age	12,4	16,5	13,6	16,7	11,0	16,3
45-54 years of age	13,9	12,6	16,0	13,7	11,6	11,3
55-64 years of age	9,6	11,6	8,6	12,5	10,8	10,6
65-74 years of age	8,2	7,4	6,1	6,3	10,3	8,6
Over 75 years of age	3,8	5,0	2,7	3,7	5,0	6,5
<b>Female</b>						
Romania Urban Rural						
2002 2010 2002 2010 2002 2010						
Total (Thousand persons) of which in %:	11112,2	10997,2	5941,6	6166,1	5170,6	4831,1
Under 15 years of age	16,8	14,3	1,05	12,7	18,8	16,4
15-24 years of age	14,9	13,0	16,5	13	12,9	13,1
25-34 years of age	16,1	15,0	17,5	16,4	14,4	13,2
35-44 years of age	11,8	15,3	14,3	16,4	8,9	13,8
45-54 years of age	13,8	12,5	15,6	14,5	11,9	9,8
55-64 years of age	10,6	12,6	9,0	13,0	12,4	12,0
65-74 years of age	10,1	9,5	7,6	7,8	13,0	11,6
Over 75 years of age	6,0	7,8	4,4	6,0	7,7	10,1

Source: INS

### Birth rate

Demographic decline of the population does not come from increased mortality, but from the declining of birth rates well below replacement level of generations.

Table 4. Live births and birth rates, by residence, in 1990-2011\*

Year	Total		Urban		Rural	
	Number	Rate (%)	Number	Rate (%)	Number	Rate (%)
1990	314746	13,6	156950	12,9	157796	14,3
1995	236640	10,4	109722	8,9	126918	12,3
2000	234521	10,5	108254	8,9	126267	12,3
2005	221020	10,2	117780	9,9	103240	10,6
2010	212199	9,9	117851	10,0	94348	9,8
2011	196242	9,2	106667	9,1	89575	9,3

Source: INS\* in 1000 inhabitants,

In 2011, the number of live births was of 196,200, lower with 118,500 compared to 1990, seen as a pronounced decrease trend. It is noted that in the period 1990-2011, the birth rate was higher in rural areas than in urban areas, with the exception in 2010, when the birth rate in urban areas was 0.2% higher than in the countryside.

The birth rate is trending downward since 1990, in both areas of residence, in recent years one can see an approximation of the size of the birth rates by residence due to higher birth rates in urban areas.

Table 5. Distribution of live births by mother's education level in the period 1994-2010

	1994	1998	2004	2006	2008	2010
TOTAL	100,0	100,0	100,0	100,0	100,0	100,0
PRIMARY	7,8	9,1	9,2	8,9	8,9	9,1
SECONDARY	38,5	37,0	33,2	29,4	27,5	24,7
VOCATIONAL	13,0	11,6	11,1	11,7	11,5	10,2
HIGH SCHOOL	33,7	30,9	26,1	25,4	23,1	21,8
POST HIGH SCHOOL	0,6	1,9	4,2	4,5	3,8	3,3
UPPER	3,7	5,2	10,5	13,6	17,4	24,9
OTHER SITUATIONS	2,7	4,3	5,7	6,5	7,8	6,0

Source: INS

Further development of children depends on the level of education of mothers. In recent years, the share of newborn children whose mothers have a low education level (primary and secondary) showed a downward trend from 46,3% in 1994 to 33,8% in 2010. Similarly, the percentage of children whose mothers have an intermediate level training (vocational and high school) decreased from 40,7% in 1994 to 32,0% in 2010. A growing trend, significant even after 2004, is in the percentage of children registered as newborns whose mothers have a relatively high level of education (post high school and upper). It was of 14,7% in 2004 and 28,2% in 2010. [3]

### Percentage of children born outside marriage

In Romania, the number and, respectively, the percentage of children born outside marriage has increased.

Table 6. The share of live births by the legal situation during 1995-2010(%)

	1995	1999	2003	2007	2009	2010
WITHIN MARRIAGE (%)	80,3	75,9	71,8	73,3	72,0	72,3
OUTSIDE MARRIAGE (%)	19,7	24,1	28,5	26,7	28,0	27,7

Source: INS

In 2010, this ratio was 27,7% compared to 19,7% in 1995 and 26,7% in 2001.

Table 7. The share of live births by the legal situation and residence environment during 1995-2010(%)

	1995	1999	2003	2007	2008	2010
URBAN						
WITHIN MARRIAGE	82,9	78,1	75,8	76,5	75,9	76,7
OUTSIDE MARRIAGE	17,1	21,9	24,2	23,5	24,1	23,3
RURAL						
WITHIN MARRIAGE	77,9	74,1	68,3	69,6	68,7	66,2
OUTSIDE MARRIAGE	22,1	25,8	31,7	30,4	31,3	33,8

Source: INS

Increase in the proportion of children born outside marriage was registered in both areas of residence, but was more pronounced in rural areas. During 1995-2010, the percentage of children born outside marriage had increased in urban areas from 17,1% to 23,3% and in rural areas from 22,1% to 33,8%.

### Rank of alive new-born

Most couples, respectively, women opt to have one or two children.

Table 8. Distribution of live births born by rank, in the period 1992-2010(%)

RANK OF ALIVE NEW-BORN	1992	1998	2004	2006	2008	2009	2010
TOTAL	100,0	100,0	100,0	100,0	100,0	100,0	100,0
I	53,9	53,0	52,4	53,3	53,4	53,0	52,4
II	26,3	29,2	29,4	29,9	29,7	30,3	30,6
III	8,5	8,6	9,0	8,6	8,6	8,5	8,7
IV	4,2	3,9	4,1	3,6	3,6	3,7	3,7
V	2,5	2,0	2,1	1,9	2	1,9	1,9
VI+	4,6	3,3	3,0	2,7	2,7	2,6	2,7

Source: INS

The structure of live births by rank shows that in Romania, in the last 18 years, around 50% of babies were ranked I and between 25-30,% of rank II. This means that only about 20% of total newborn children, belong to families with more than two children, a determinant factor in ensuring the balance between generations.

**Nuptiality rate**

Number of marriages per 1000 inhabitants (Nuptiality rate) declined steadily during 1990-2011, both in rural and in urban areas from 7,5 ‰ or 9,1 ‰ in 1990 to 3,9 ‰ respectively 5,8 ‰ in 2011.

Table 9. Nuptiality rate, by area of residence (‰), in the period 1990-2011

	1990	1996	2002	2006	2008	2010	2011
<b>Total</b>	8,3	6,7	5,9	6,8	6,9	5,4	4,9
<b>Urban</b>	9,1	6,9	6,6	8,1	8,2	6,4	5,8
<b>Rural</b>	7,5	6,4	5,1	5,2	5,4	4,2	3,9

Source: INS

Table 10. The average age of spouses by environments, gender, in the period 1991-2011(years)

	1991	1995	2000	2005	2010	2011
Urban						
<b>Male</b>	27,5	28,6	29,4	31,3	31,5	31,2
<b>Female</b>	24,7	25,6	26,3	28	28,4	28,2
Rural						
<b>Male</b>	26,1	27,2	28,2	29,7	30,1	30,6
<b>Female</b>	22,4	23,2	24,0	25,3	26,1	26,6

Source: INS

Average age at marriage has increased in both rural and urban area.

The largest increase during the period studied in rural areas is 4.5 years for men and 4.2 years for female.

**Divorce rate**

At the same time it is highlighted that divorces increase constantly in rural areas, while in urban areas the number of divorces is variable with a maximum of 28,702 in 1998.

**Fertility**

The total fertility rate indicates the balance between generations, very important in terms of the relationship between changes in population and socio-economic development in the long term. In the European countries,

including Romania, there was for some time signaled the downward trend in fertility rates.

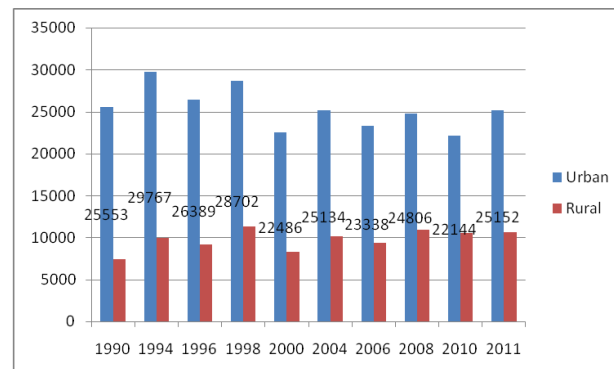


Fig.1. The number of divorces, by residential environments, in the period 1990-2011

Table 11. The number of divorces, by residential environments, in the period 1990-2011

	1990	1996	1998	2004	2008	2010	2011
<b>Urban</b>	25553	26389	28702	25134	24806	22144	25152
<b>Rural</b>	7413	9197	11283	10091	10879	10488	10628

Source: INS

Romania has seen a significant fall in total fertility rates after 1990, it practically stabilized since 1995 at an average of 1,3 children born by a woman during her fertile life, well below that estimated by experts as the need for simple replacement of generations in time (2,1 children in average for a woman).

Table 12. The fertility rates, in the period 1990-2010(%)

Year	General fertility rate	Total fertility rate
1990	56,2	1,8
1991	48,7	1,6
1993	44,3	1,4
1995	41,1	1,3
2000	40,3	1,3
2001	37,8	1,2
2005	39,4	1,3
2009	41,0	1,4
2010	39,4	1,3

Source: INS

The fertility rates specific for different age groups with the highest intake at birth (20-24 years and 25-29 years) decreased over time. For example, during 1990-2005, the fertility rate of women in the age group 20-24 years halved, and for the group 25-29 years, the



fertility rate decreased slightly until the late '90s, which then saw a slight increase.

Table 13, Fertility rates by age\*, in the period 1990-2010(%)

Year	15-19 years of age	20-24 years of age	25-29 years of age	30-34 years of age	35-39 years of age	40-44 years of age	45-49 years of age
1990	51,5	145,2	97,8	46,4	19,4	5,5	0,4
1991	49,8	131,1	78,6	34,2	13,9	4,0	0,3
1993	47,0	124,6	74,2	28,3	11,4	3,2	0,3
1994	45,0	119,3	75,8	28,7	11,3	3,2	0,2
1995	42,0	109,5	73,4	29,4	11,0	3,1	0,2
2000	39,0	90,2	78,5	38,7	13,4	3,1	0,2
2001	35,8	82,2	73,8	37,4	13,7	3,0	0,2
2005	33,5	73,3	83,9	51,8	18,7	3,6	0,2
2007	35,2	66,5	81,0	54,4	18,3	3,9	0,2
2009	39,3	67,5	82,7	59,4	22,1	4,7	0,2
2010	36,9	62,3	79,9	59,2	23,3	4,6	0,2

Source: INS \*number of live births per 1000 women in that age group

Table 14, Mortality rates, by residence and gener, in 1990-2011\*

Year	Total		Male		Female	
	Urban	Rural	Urban	Rural	Urban	Rural
1990	40,20%	59,80%	40,88%	59,12%	39,42%	60,58%
1991	40,30%	59,70%	41,25%	58,75%	39,21%	60,79%
1992	40,47%	59,53%	41,42%	58,58%	39,36%	60,64%
1993	40,82%	59,18%	41,68%	58,32%	39,80%	60,20%
1994	40,88%	59,12%	41,73%	58,27%	39,85%	60,15%
1995	41,30%	58,70%	42,04%	57,96%	40,41%	59,59%
1996	40,69%	59,31%	41,57%	58,43%	39,66%	60,34%
1997	41,53%	58,47%	42,26%	57,74%	40,64%	59,36%
1998	41,88%	58,12%	42,62%	57,38%	41,02%	58,98%
1999	41,92%	58,08%	42,74%	57,26%	40,98%	59,02%
2000	42,39%	57,61%	43,01%	56,99%	41,68%	58,32%
2001	42,40%	57,60%	42,86%	57,14%	41,85%	58,15%
2002	41,99%	58,01%	42,63%	57,37%	41,24%	58,76%
2003	42,12%	57,88%	42,72%	57,28%	41,43%	58,57%
2004	44,16%	55,84%	44,55%	55,45%	43,70%	56,30%
2005	44,57%	55,43%	44,96%	55,04%	44,12%	55,88%
2006	45,09%	54,91%	45,50%	54,50%	44,64%	55,36%
2007	45,47%	54,53%	45,81%	54,19%	45,08%	54,92%
2008	45,16%	54,84%	45,51%	54,49%	44,77%	55,23%
2009	45,16%	54,84%	45,22%	54,78%	45,10%	54,90%
2010	45,29%	54,71%	45,65%	54,35%	44,88%	55,12%
2011	45,60%	54,40%	45,65%	54,35%	45,53%	54,47%

Source: INS\* in 1000 inhabitants

### General mortality

For understanding of some basic features of developments in the Romanian population in

recent years and its health indicators, mortality is a good starting point. As the main statistical indicators show, mortality among males was and remained higher than the mortality of females. Another feature is the fact that mortality is higher in rural areas than in urban areas, both in male and in female persons. The phenomenon of "male supramortality" continued to be recorded both in urban and rural areas, though with higher values in urban areas.

### CONCLUSIONS

Change reproductive behavior of rural population, a drastic reduction in the birth rate.

1. The birth rate was higher in rural areas than in urban areas, with the exception in 2010, when the birth rate in urban areas was 0.2% higher than in the countryside.
2. Distribution by age of population shows that between 2002 and 2010, the aging of the population has increased.
3. The share of persons aged 65 and over increased by 0,4 percentage points for men (from 12,0% to 12,4%) and 1,2 percentage points for women (from 16,1% to 17,3%), The process is more pronounced in rural areas.
4. Further development of children depends on the level of education of mothers. The share of newborn children whose mothers have a low education level (primary and secondary) showed a downward trend. A growing trend, significant even after 2004, is in the percentage of children registered as newborns whose mothers have a relatively high level of education.
5. Increase in the proportion of children born outside marriage was registered in both areas of residence, but was more pronounced in rural areas.
6. Only about 20% of total newborn children, belong to families with more than two children, a determinant factor in ensuring the balance between generations.
7. Average age at marriage has increased in both rural and urban area.

8. Divorces increase constantly in rural areas, while in urban areas the number of divorces is variable with a maximum of 28,702 in 1998.

9. Romania has seen a significant fall in total fertility rates after 1990, it practically stabilized since 1995 at an average of 1,3 children born by a woman during her fertile life, well below that estimated by experts as the need for simple replacement of generations in time (2,1 children in average for a woman).

10. Mortality is higher in rural areas than in urban areas, both in male and in female persons

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## ASPECTS OF THE COMMUNICATION IN THE EDUCATIONAL SYSTEM. CASE STUDY, HIGH SCHOOL SECTOR

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### **Abstract**

*The pupil-teacher communication and the teacher communication skills seem to be key concepts to reach the objectives of the educational act. Recent studies highlight the link between the teacher communication skills, their efficiency, and the fact that these skills could play a more important role for the education than the teaching staff training, his intelligence level and teaching methods. The research goal was the investigation of the aspects specific to the educational communication, that constitute facilitator factors and barriers in the learning process and in the relation teacher-pupil. The quantitative analysis was based on a questionnaire for pupils and teachers, that aimed the investigation of the respondents perception on what it is a good teacher in order to identify those skills that make the difference, from the pupils point of view, and also from the teachers point of view, between a competent teacher and an ineffective one. The research used a double approach, quantitative and qualitative one. The quantitative study allowed the inclusion of a number of 151 subjects and the survey of some dimensions of teacher-pupil communication. The qualitative research used a number of 47 subjects, but it allowed the consolidation of the approached topics. The results obtained were interpreted based on the differences that appear in the pupils and teaching staff opinions, but also through the investigation of those dimensions that make the difference, in the case of a model teaching staff, between the pupils and teachers perceptions.*

*Key words:* different skills, ideal teacher, messages, teaching communication

### **INTRODUCTION**

A communication skill is a very broad concept, frequently studied and often overlapped on interpersonal skills. Research in this field emphasize different skills or very similar concepts.

Teaching communication, held in the educational context, is defined in a general sense as instrumental form of communication directly involved in supporting a systematic learning process (Iyamu, E., Iseguan, A., 2009). In this definition of teaching communication, it is observed that there are no content restrictions (learning can be focused on acquiring knowledge, developing skills, motivations, attitudes), the institutional framework (teaching communication can exist outside learning) or related to the partners. The presence of learning provides communication the status of teaching communication provides communication status. Thus, teaching communication occurs in the presence of the following 'couples':

teacher-pupil, pupil-pupil, manual-pupil. Particular case of teaching communication, teacher-pupil communication has been studied mostly from pedagogical perspective, following as main theoretical model, the scheme of communication between two people and of transmission of information (Kearney, P., Plax, T. 1985), but reported in the school context. In the classical sense, the communication is the process of the transmission of information (messages) between a transmitter and a receiver (pupil or teacher) through a specific channel or code of communication (verbal, nonverbal, para-verbal). Researches that aimed at identifying communication barriers classified the communication dysfunctions according to the communication scheme components namely related to the emitter barrier, barriers related to pupil communication problems and barriers related message due to coding system or transmission of messages or characteristics of the environment in which communication occurs (Pânișoară, 2003 Cucuș, 1996).

Regarding the factors related to teacher, the literature (Shaunessy, 2009, Cooper, 1997; Kearney, 1985; Brusckhe, 1991) has many researches that set as the center of teacher communication skills the ability to send clear messages to listen, to give feedback. Yuksel-Sahin (2008) emphasizes empathy, active listening, feed-back and self-disclosure as the attributes of effective communication in the educational context, by increasing the satisfaction level related to pupil-teacher relationship, of the feeling of trust and motivation. Teacher-pupil relationship is one of the key factors of learning (Garcia et al., 2006; Monzo 'and Rueda 2001; Piante 2006). Teacher's humour is one of the features highlighted by literature (Bradburn, N., Sudman, S., Wansink, B. 2004), enhancing the teaching act.

## MATERIALS AND METHODS

The research was made in parallel, quantitatively and qualitatively.

The **quantitative methodology** included the science approach to elaborate a questionnaire to evaluate the opinion related to the communication skills of the teaching staff. The developed questionnaire was administered to a number of 151 respondents, respectively, 104 pupils and 47 teaching staff in the high school area. The instrument includes 16 questions, descriptors of communication behaviour that respondents must evaluate depending on the frequency of manifestation.

The evaluation aims the behaviour of an ideal teacher. Teachers respondents assessed their own behaviour.

The results obtained were interpreted in terms of differences in the opinions of pupils and teachers, but also by investigating those dimensions that make a difference between the pupil and teacher perceptions regarding the ideal teacher.

The **qualitative research** used as a data processing technique, the technique of content analysis, respectively: **case analysis**.

A "case" must include mandatory the presentation of the following elements: the

communication context (where? In what context the dialogue occurred?) Communication actors (Who?) examples of messages exchanged, ways of perceiving the messages sent (or reaction to messages receiver), recorded both by the transmitter and the receiver.

The "Case" was used as the main unit of analysis for each product of qualitative research (also quantitative, where possible).

The following types of non-verbal behaviour were registered: paralanguage, looking and gestures implying eyes and hand gestures, including handling of objects.

The quantitative study used two questionnaires, one for pupils and one for teachers. The questionnaire included 16 items, with variants of answers on a Likert scale from 1 to 4.

## RESULTS AND DISCUSSIONS

From the analysis of the information obtained, differences are founded between the evaluation of teachers and pupils. Teachers tend to evaluate their own behaviour closer to variant "ideal" than pupils. For the ideal teacher assessment, both pupils and teachers often indicate the behaviour of communication facilitating. Pupils indicate such a type of behaviour, as they go up superior high school (Figure 1).

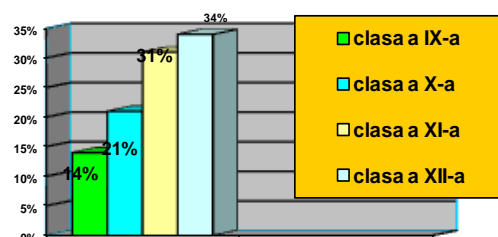


Figure 1. Percent of pupils who appreciate facilitator behaviour, on study years

In case of the teaching staff, this comparison was performed using the evaluation of their own behaviour. The results show that students make a clear distinction between opinion they have of a regular teacher and the ideal teacher

image who facilitates communication, meaning that the ideal teacher is seen as facilitating communication strategies using them often, even all the time. Regarding the evaluation made by teachers participating in the research, differences between personal behaviour and ideal teacher behaviour remain on all dimensions, except for items in the teacher's questionnaire, where teachers evaluate their behaviour as being very close as frequency of an ideal teacher behaviour. Teachers see themselves as being close to the model in terms of how to encourage creativity, to appreciate pupil to resolve conflicts and they facilitate learning by accepting questions from the pupils. (Table 1).

Table 1. Answers appreciated by all teachers, in an unitary way

No. crt	Affirmations	1 = total disagree	2 = partial disagree	3 = partial agree	4 = total agree
3	Encourage creativity				*
5	He is disturbed that pupil asks questions	*			
8	Resolve conflicts that occur in t classroom in a discrete way				*
9	Appreciate the pupil qualities, in an open way				*

The image of the ideal teacher, the differences between the pupils and teachers opinion are present in 7 of the 16 behaviours investigated in the questionnaire. These differences shape the way in which the teachers and pupils relate to the ideal model. Thus, teachers consider the ideal teacher 'can put in the pupils shoes " more often than appreciating the pupils. Both pupils and teachers appreciate the high level of "empathy" of ideal teacher but the pupils seem to perceive more acutely the pupil-teacher gap than teachers do.

Another difference arises in assessing the extent to which the ideal teacher 'raise tone'. The pupils opinion is that the ideal teacher does not raise the tone almost never, and this opinion is clearly different from that of

teachers who believe that raising the tone is often the case the ideal teacher.

This difference can provide some clues about the relatively small number of disciplinary ways in the entire class, that teachers consider at hand, because even a "perfect" teacher has to "raise his voice".

Differences appear in terms of closeness to the pupil (item 14).

The latter ones perceive the ideal teacher as being closer to pupils than teachers see that - in their view ideal teacher keeping a distance pupil-teacher.

The importance for pupils to personalize the relationship appears also in different appreciation of the degree to which ideal teacher gives examples of personal life (item 16): pupils considered that ideal teacher is that who gives examples of personal life.

Facilitating learning by encouraging pupils to ask questions about study objects (item 5) appears to be an important behaviour rather for the pupils, who frequently quoted as the ideal teacher than other teachers. It is possible that they perceive as being less important this strategy than others.

Another behaviour related to teaching activity is pupil disruption. Teachers think that this behaviour occurs more often than pupils consider. The Paraphrase behaviour role in facilitating communication is perceived differently by teachers and by pupils, the latter considering the use of paraphrase ("reads what you said, in a way that shows you understand that." - Item 7) is more often in the case of ideal teacher than teachers appreciate. This result may indicate the perceived importance of feedback of pupils. Ability to resolve conflicts that arise in the classroom (item 8) is a skill of the ideal teacher considered as having high frequency by pupils, although both pupils and teachers consider to be frequently present in the behaviour of teachers.

Nonverbal behaviour (facial expressions and gestures) is however important for teachers than for pupils, assessing it as less frequent in the teaching act of the ideal teacher.

The humour (item 15) is a quality of the ideal teacher mentioned both by pupils and

teachers, but pupils appreciate that the model teacher uses humour more often than teachers appreciate.

Data processing shows that the "ideal" teachers is synonymous with "efficient", "professional" and appears to be related to the purpose of education seen as accumulation of knowledge. Pupils describe the ideal teacher as a charismatic, sympathetic, severe person but at the same time, close to the pupils.

It is the image of a relationship based on partnership and not necessarily focused on the activity of acquiring knowledge.

From the information collected, it appears that both pupils and teachers appreciate as ideal teacher, the person who has a series of features for their valuing. (Table 2)

Table 2. Features of ideal teacher, according to a scale from 1 to 4 (1 = very low, 4 = very high)

No.crt	Features
1	Solid professional knowledge
2	Communication skills
3	Creativity
4	Authority
5	Self trust
6	Own vision
7	Rapid adapting to decisions
8	Ability to make changes
9	Assertiveness communication
10	Sense of humour
11	Inspiring those around
12	Constant Stimulation of pupils
13	Generosity

Most teachers believe that communication skills are acquired through practice, training and self-training.

However, teachers believe that the image you create using the communication is very important and we should not lose this perspective.

A teacher who has developed communication skills and has good listening skills and openness to pupils.

## CONCLUSIONS

From the teachers point of view, communication loses importance once with pupil growing old. Thus, the older the pupil grows, the less important communication with him is considered.

High school teachers believe that at present, the pupil is subject to a very rich communication flow compared to his capacity of detecting information and selecting useful value criteria useful value.

The increase of the number of information sources and pupils access to them, it is considered a disturbing factor in terms of behavioural patterns.

Mostly, the high school teachers considered that, at this level, the pupil knows his interests in education, has skills in community integration, and communication has as main role to support the pupil to overcome accidental moments (a day when not feeling well or a negative event in the family and so on). From the point of view of teacher-guide, communication performance at this level were presented as organizational performance and group conflict management (eg organized trips, extracurricular activities, interventions at another teacher to require fewer homework or to consent class from certain hours).

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## THE ANALYSIS OF THE POTENTIAL FOR THE ECONOMIC RE-LAUNCH OF CĂLĂRAȘI COUNTY

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### **Abstract**

*The Romanian society being affected by the restructuring process, the economy of Călărași county has a potential to re-launch, based on the following strengths: agricultural potential, technical potential, water resources that can enhance the development of fish breeding, commercial, industrial and tourism activities on the Danube and inner rivers; the geographical position at the border and at the crossroads of the transit roads between Asia and East Europe; access to the navigable way. Calarași county being close to the Danube creates a remarkable tourist attractiveness, but insufficiently used. The big number of islands with a unique picturesque, the ramification of the main waters through unique braches, create both a natural scenery which involves relaxation but also good conditions for the sportive hunting and fishing. The present research analyses the natural, economic and human potential that Calarași county posses, starting from the premises that its agriculture constitutes a main sector in the occupied county economy (47.2%) as well the agricultural surface (84%) from the total county surface.*

**Key words:** active rural population, agricultural structures, county natural potential, employment rate, migration in the rural area

### **INTRODUCTION**

Calarasi is situated in South-East part of Romania, on the left branch of the Danube, on the border with Bulgaria, the central part is intersected by the parallel of 44 ° north latitude and the meridian of 27 ° east longitude. The county has 5,088 km<sup>2</sup>, representing 2.13% of Romania's surface.

The main natural wealth is the agricultural lands which occupy about 84% of the county surface (CJ Calarasi, 2012).

**The industry** is mainly focused on manufacturing activities. Main branches represented in the county are: food and beverage industry, textile, pulp and paper, non-metallic mineral products industry, metallurgy and metal products, industry transport activities. In the manufacturing industry, the share is held by the food industry, which in the first six months of 2011, contributed with 59.1% to the county's industrial production, followed by textile clothing industry, with 19.7%, pulp and paper industry 9.8% and other non-metallic mineral products by 4.2% (County Department of Statistics, 2012).

**Agriculture** is the main economic activity. Its base is the agricultural area of 420,780 ha, respectively, 2.9% of the agricultural area of the country, the 8th place in size among counties. Of this area, 413,135 ha is arable land, respectively, 4.4% of arable land and 5th place among counties (DARD Department of Agriculture and Rural Development Călărași, 2012)

### **MATERIALS AND METHODS**

For the study of rural realities of Călărași three specific research methods were used: dynamic economic analysis, deductive and quantitative, SWOT analysis, economic survey or participative research that involves collecting information on site using the research techniques "questionnaire" and "interview".

The study on analysis the economic potential of Călărași county had as starting point the analysis and processing of data and information from the following sources: Statistical Yearbook Călărași - Edition 2012 Socio - economic profile of Călărași county, Romania's pre-accession economic plan, statistical data of the Chamber of Commerce

and Industry and the County Agency of Labour Force Training and Employment, Statistics of the Department of Agriculture and Rural Development; Călărași county Development Strategy, elaborated by the county council, Publications of the National Institute of Statistics and data obtained following the questionnaire.

The starting point in identifying potential development of the county was to analyze the social, economic and institutional situation that led to the identification of key issues the county faces with, and its potential in order to establish strategic directions that support and is in line with the general purpose the development strategy at regional level.

The collaboration with local and county stakeholders allowed the development of a partnership vision of economic and social particularities of the county, identifying the problem tree and SWOT analyses.

The results obtained from the interpretation of this set of data led to the elaboration of a research report, based on which action directions were identified for business development, human resources development, development of local public administration; social services development.

## RESULTS AND DISCUSSIONS

The immediate effect of the application of the Land Law in Călărași county agriculture, the restructuring of the farming units by small individual land prevalence has diminished positive implications of the privatization process, generating an economic model less viable in terms of resources and efficiency. These structures determined high consume of labour, which attract a trained unemployed labour force in other sectors of activity, in agriculture, representing the small farmers who produce for their own consumption and for selling products on the agri-food market. Further on (Figure 1.) presents the evolution of production and agricultural services and its dynamics, on industry and sectors, during 2003-2011, expressed in thousand lei prices of the period. It is found out thus an increasing trend of the total production from

7797059000 thousand in 2003 to USD 16,884,651,000 in 2005 and 2,041,731,000 RON in 2011 (County Department of Statistics, INS, 2012). Within the total production, the share is held by crop production, followed by animal production, and agricultural services.

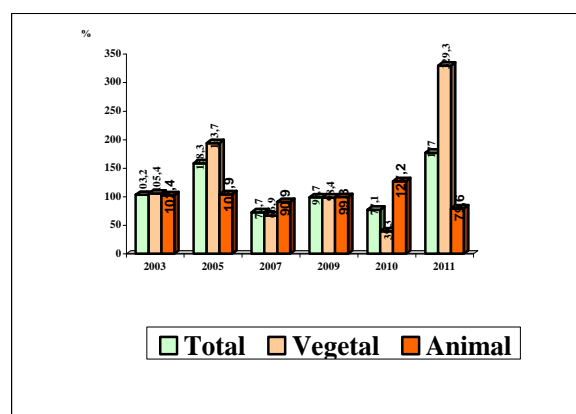


Figure 1. Dynamics of total agriculture sector production and sectors (previous year = 100)

Of the total area of 292,154 ha, 112,895 ha are operated in associative system, 93,609 hectares are exploited and 85,650 ha lease system are constituted as individual holdings. On land use categories, we note that the individual holdings of the 85,650 ha, 77,646 ha are arable land, 7,750 hectares are vineyards, 198 hectares are occupied by pastures and meadows and 56 ha of orchards. Within farms of associative type (SA + SC + AF) of the 112,895 ha, 112,777 ha is arable land and 118 ha are covered with vineyards.

The same situation is met in companies established by leasing land where, in the 93,609 ha, only 2 ha are covered with vineyards and 5 ha of pastures 93,602 ha difference, is arable land. Although in most towns in the county the system of land operating is made by leasing and associations, such as localities: Cuza Vodă - 74% and 9% rented association, Lupșanu - 78% and 14% leased association, Ulmu - 95% in association Ulmeni - 81% and 9% rented association and so on, there are localities where over 50% of the agricultural area is operated in individual system, such as Căscioarele - 85%, Tămădău - 65% ,



Belciugatele - 60%, Fundulea - 61% Budești - 59%, Frumușani and Nana - 58% etc (DARD Calarasi). Given the current size of individual farms in Romania, the rational use of land lease requires stimulation of the partnership and ownership concentration by buying farmland.

The Legislation in force enables local increase in the size of farms and encourage land use directly by the owner or lessee ([http://www.scribub.com/economie/agricultur a/](http://www.scribub.com/economie/agricultur)). The aging of rural population, as well as the population in general has implications in many areas of agricultural structures, the quality of labour resources, managerial leadership, organization of production, the type of technical progress. In terms of main demographic indicators, the population of Călărași county has a number of features which give generally a balanced character to its structures and its evolutionary processes.

Regarding the total population of the county, it is on a declining level from 341,631 persons in 1990 to 310,823 persons in 2011. On the same level it is also situated the total population on average: urban-rural, so the urban population declined from 131,260 persons in 1990 to 120,483 persons in 2011, while the rural population reduced to 210371 to 192396 persons in the same period (County Department of Statistics, INS, 2012).

Therefore, within 21 years, the county population as a whole showed a continuous decline. The general context of demographic aging, the share remained relatively constant, varying from 63.0% in 2002 to 61.1% in 2003, and in 2011 reached to 61.5% of the population; as regards the population age structure, population is found in the age group of 60 years and over increased from 16.6% in 2003 to 17.31% in 2011, while the population in the age group 0-14 years, registered a declining trend (County Department of Statistics, INS, 2012).

The aging rural population, as well as the general population has implications in many areas on agricultural structures, on the quality of labour resources, managerial leadership, organization of production, the type of technical progress. In the total population,

gender distribution is relatively normal: 49.0% men and 51.0% women, the same proportion as the national level. Further on Below we will present the evolution of the population employed in agriculture compared to other sectors of the economy, the Calarasi, where, with a continuing trend of steady employment (Figure 2) on the county economy as a whole (from 101,4 thousand persons to the end of 2003 it reached 101, 3 thousand persons in 2011), the agriculture developed specifically as a result of land privatization and inadequate technical facilities (County Department of Statistics, INS, 2012). Significant changes occurred in the structure of the active population on activity sectors, but also within each sector separately. The number of persons employed in agriculture in the period 2003-2011, showed an accentuated decline from 56.1% to 47.3%.

In terms of industry and constructions, the number of persons employed in these activities had little oscillating evolution from 16.9% to 16.6% for industry and from 2.7% to 4.1% for construction in the analysed period. Instead, services increased from 24.3% to 32% in the same period. Note that the number of employees increased in the analyzed period, respectively from 43,975 persons in 2003 to 47,498 persons in 2011 (Figure 2).

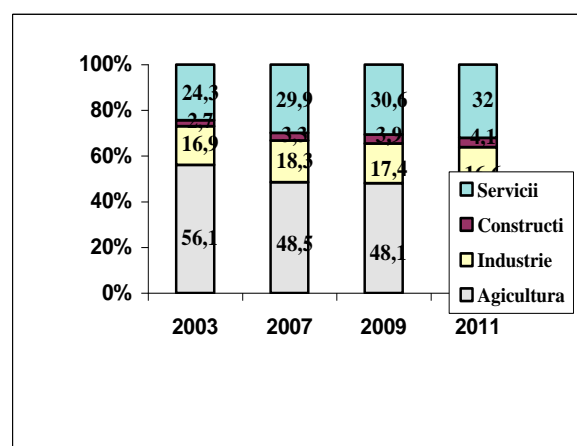


Figure 2. Structure of civil employed population on main economy sectors according to CAEN Rev. 1, in Călărași county

Note the activity population structure by age and sex in 2011, this proportion holds persons aged between 30 and 40 years followed by persons between 40 and 50 years in both sexes, satisfactory aspect for agriculture characterized by aging and feminization (AJOFM Calarasi, 2012). The share of women in total employed population is between 15% (Fundeni locality) and 45% (localities: Oltenița, Modelu, Ulmeni, Sărulești, Roseți and Radovanu).

Compared with the situation until 2003, there is a significant decrease, with positive socio-economic consequences, of the participation of the population in the age group over 65 years, in the social and economic activities of agriculture and a relatively high proportion; an increasing trend of persons looking for work or those able and unemployed.

The trends on immediately following period make us appreciate the active employed population will continue to decrease, while increasing the number of unemployed persons. If during the period 2003 - 2006 the number of unemployed has increased by 1.4 thousand persons (from 8,600 persons to 10,000 persons), with an unemployment rate rising from 7.8% to 9% in five years, the number of unemployed decreased by about 5,000 people, the unemployment rate reaching 4.6% in 2009, rising to 5.1% in 2011.

This is the result of development in the county textile industry and food industry, which attracted particularly labour among women, female unemployment rate is 4.3%, the rate of unemployment among men is 6% (figure 3).

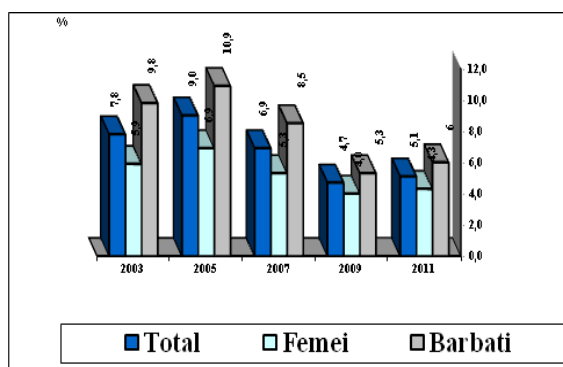


Figure 3. Unemployment rate registered at the end of the year in Călărași county

Special attention is needed for the harmonious development of the rural areas in the European area by encouraging private initiative for processing, marketing, distribution, storage of agricultural production and agriculture related services and activities in order to raise the living standards of rural community members (Current Situation Analysis NDP 2007-2013).

We elaborated for this purpose, intervention sectors, on measures, with the aimed objectives, which include the main aspects on which action must be taken in order to relaunch the economy of Calarasi county (Table 1).

In rural areas 49.1% of Calarasi county lives in the county's total population, mostly employed in agriculture and related activities (ADR Muntenia Sud, 2012).

Table 1. Intervention sectors in economic re-launch of Călărași county

<i>Objectives</i>	<i>Intervention sectors</i>
<ul style="list-style-type: none"> <li>ensure a natural environment for improvement and development of activities in agricultural sector;</li> <li>facilitate access of the rural community members to support, social, physical infrastructure;</li> <li>business support in agriculture and rural development sector;</li> <li>stimulate transformation of peasant houses in family farms with commercial character, that bring substantial incomes</li> </ul>	<ul style="list-style-type: none"> <li>modernisation of technical infrastructure of rural communities</li> <li>investments and modernisations in agricultural and fish product marketing, purchase of new agricultural equipment for vegetal farms, etc.</li> <li>rehabilitation and modernisation of education and medical units in the rural area.</li> <li>forestation of some areas under continuous degradation by creating protection forest areas</li> </ul>
<ul style="list-style-type: none"> <li>Attract specific funds in order to increase the economic potential of related important activities within county economy</li> </ul>	<ul style="list-style-type: none"> <li>development and modernisation of fish farms, as well as extension of activities in aquaculture sector</li> <li>exploitation of food industry potential</li> </ul>
<ul style="list-style-type: none"> <li>diversification of alternative activities, non agricultural ones, less developed at present: rural tourism, local brand products preservation, with positive impact on communities in the rural area</li> </ul>	<ul style="list-style-type: none"> <li>development of crafts (production of construction materials: bricks, lime, wood, bean, etc.);</li> <li>construction of agro tourist pensions;</li> <li>preservation of traditions and local brand products.</li> </ul>

For this reason, strategic objectives for efficiency and diversification in agriculture and rural development mean development of

the education, health, the municipal technical and business development in agriculture. Encourage conversion of farms in family farms with commercial character, bringing substantial revenue, will be an important process in reducing the flow of young labour force migrating to urban areas.

Agriculture-related activities represented by forestry, fisheries, aquaculture, beekeeping, veterinary and phytosanitary sector, food industry, etc. are important for the development of county economy, especially rural economic development by creating opportunities, helping rural harmonious development of the whole European area (situation analysis NDP 2007-2013). Strengthening and diversification of agriculture related complementary nature allows achieving local priorities to promote job creation, poverty reduction, community economic stabilization and final results raise the standard of living and quality of life.

The human resource development in Romania implies the existence and implementation of a strategy that is based on capital investment in basic infrastructure, provision of equipment for training courses and training schemes for trainers.

This strategy implies the development of institutional structures for the efficient management of the Structural Funds and strengthening of regional and local authorities to develop policies to reduce regional imbalances in the labour market. Human resources development strategy is based on increasing adaptability of workers to the market and actively combat social exclusion. The conditions for successful strategy are improvement of education system and stopping its decline and its adaptation to the market requirements.

In the rural area of Călărași there are local development plans aiming especially the infrastructure, requiring more complex development plans, taking into account all elements relating to rural concerning traditions, culture, natural resources, human resources, community and social relations. Among these are related to the demographic policy of the county, and the country for

which the negative natural increase is a concern (CJ Călărași, 2012)

## CONCLUSIONS

One way to revive the rural area in regional economic context is the development and promotion of its specific sector of services and activities based on the exploitation of local resources.

The potential of the rural area, largely viewed only through the context of existing agricultural areas and activities related to their work relies on the existence of specific resources not sufficiently used so far and that can be an alternative and also an opportunity to diversify the rural economy related to activities such as agriculture and with non-agricultural specific in agro-food processing, manufacturing and agro processing.

In the current economic situation, the development of this sector and exploitation based on the revival of traditional crafts and using skilled labour is essential for reviving the socio - economic development of the rural area.

The population aging observed in the region requires implementing policies that lead to active aging adults. Retired population growth means national development and expansion of services for the specific needs of the elderly (community care, home care, pain relief, medical centers, day centers, community psychiatric, medical and social facilities) offer development services travel for elderly (quantity and quality by providing travel agents - experienced guides take care of retirees), the development of aesthetics and beauty. It is recommended to increase school registration to qualified areas: tourism and food, cosmetic and hygiene of the human body

South Muntenia Region is a region with high growth opportunities with superior economic results than the national average, being on the third pace at national level. Sectors that will improve in the next period: construction, financial transactions, tourism and agriculture. We recommend an increase in the level of education in these areas.

Industry in Calarasi county is characterized by a high degree of diversity. Calarasi county is considered a less industrialized town than Argeş and Prahova counties, Northwest and Central Regions, which are highly industrialized. In industrial production of the county manufacturing industry dominates, mainly the activities of metallurgy, clothing, food, textiles etc.

If on the whole there is a decline in demand for work in this area, instead, there is a lack of specialists in almost all areas related to manufacturing industry. It is recommended the education for vocational qualifications in the industry.

In order to eliminate the disparities existing in the rural area, actions are necessary that can promote rural development dynamism and that can allow using all types of its potential. In order to improve the situation in the rural area it is needed to support specific activities and to improve the economic value of agriculture.

The region agriculture plays a decisive role in creating and maintaining within the rural communities the environment for specific activities development. Following the market demand for a higher quality and diversified products it is necessary to develop and modernize productions based on modern and ecological technologies, able to ensure the increase of the agriculture competitiveness.

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## THE POTENTIAL OF RURAL AREA DEVELOPMENT OF INDEPENDENȚA COMMUNE IN CĂLĂRAȘI COUNTY

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### *Abstract*

*The concept of development means all forms and methods of socio-economic development, and it is based first of all on ensuring a balance between these socio-economic systems and the elements of natural capital. Călărași county is situated in the South-East part of the country and of the Romanian Plain, on the left shore of the Danube. It has a surface of 5088 sqkm and it occupies 2.1% of Romania surface. The relief is mainly represented by fields. The county depends on agriculture and economy in the rural area. In the rural area of Călărași county 49.1% of the total population in the country lives, most involved in agricultural activities or activities related to it. The proposed paper presents aspects regarding the potential of sustainable development of Independența commune in Călărași county.*

*Key words:* commune, region, rural area, rural development

### INTRODUCTION

The socio-economic development of Călărași county is elaborated in accordance with the conceptions of regions development, correlated with the economic sector and civil organisations sector, with the National Development Plan of Romania, the Regional Development Plan, South Muntenia Region Development Strategy, etc. And with external factors (EU programs, provisions of the International Conventions, international relations of the Local Councils and County Council) that can influence positively the development processes [1]

Having a decreasing population and a density of about 62.6 inhabitants/km, we must consider it as being mostly rural, counting 194,190 inhabitants in the rural area (59% of the total population in 2009) that represents with 21% more than the average of the countries that joined EU recently. Thus, the rural and agricultural development will form a solid pillar. The county success and prosperity depend on its own economic performances. The county is dependent on agriculture and economy in the rural area. The spread of globalization threatens the traditional agriculture.

### MATERIALS AND METHODS

For the presentation of Independența commune, I processed the information taken from the Fiche of each locality, provided by each local council and information collected from the County Department of Statistics and from Călărași Department for Agriculture and Rural Development.

The sheets provided by the County Department of Statistics were analysed, for **the elaboration of the diagnosis analysis of the commune**, that included: data about commune situation and about its physical-geographical characteristics; statistics and census made at local level, in demography, labour force employment sectors, economic sector, education and culture, animal and vegetal production.

### RESULTS AND DISCUSSIONS

Independența Commune is situated at about 16 km West-North-West of Călărași municipality. Situated in the south part of Călărași county, the commune is in a contact area between Bărăgan Plain and the Danube Valley, area marked by a clear line of monometric and morphological differences,

confirmed by a row of permanent human settlements[2]. Independența village is situated at the East limit of the second terrace of the Danube, named by the population coast, beyond that Bărăgan Plain lies. The terrace area maintains the shore of Gălățui river, that communicates in the south part by an artificial canal, near Rasa village, with the Danube and Borcea branch. Independența communes is formed of three villages: Independența, Potcoava and Vișinii.

The data of the census in 2002 indicate a population of 3916 inhabitants. By the specific of their origin, the villages of Independența communes, formed as plain villages, near the water source and in the area where the water is near to the surface.

By the specific of their origin, the villages of Independența commune were formed ad field villages, near the water source and in the area where the groundwater is near the surface.

Table 1. Commune surface

<b>AGRICULTURE</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Agriculture surface according to its use – hectares	5489	5507	5507
Arable land - ha	5418	5435	5441
Surface – vineyard and vine nursery - ha	71	71	65
Surface – pastures – ha	-	1	1
Surface with non agricultural land total - ha		349	349
Surface with water and pounds – total – ha		68	68
Surface with constructions total - ha		160	160
Surface – communication ways and railways total – ha		120	120
Surface with degraded and non productive land – total – ha		1	1
Total surface – private property - ha		5656	5656
Agricultural surface – private property – ha		5507	5507
Arable surface - private property - ha		5435	5441
Pasture surface – private property - ha		1	1
Surface with vineyard and vine nursery – private property - ha		71	65

The main occupation of the inhabitants in Independența commune is the agriculture – the plants growing and animal breeding. The agricultural land of the three villages that form the commune stretches on a distance that

vary between 4 and 25 km and wheat, may, barely, oats, maize are grown. Later on, the sugar beet, sun flower, peas, beans were added [3].

Table 1 presents a general image of the agriculture and surfaces used for these crops. From the data taken from the Statistical Yearbook of Călărași county it results that the total population of the commune on 1<sup>st</sup> July 2011 was of 3462 inhabitants. The social-economic conditions have a remarkable influence also regarding the multiple aspects on the structure and evolution of the demographic phenomena. The decrease or increase of the natural increase was and is caused, mainly, by the low or high values of birth rate and death rate.

In the table below it can be seen the natural movement of the population in Independența commune.

Table 2 Population movement

<b>Indicator</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Total population on 1 <sup>st</sup> July	3503	3477	3462
Born – live	25	30	26
Deceased	64	64	58
Natural increase	-39	-34	-32
Marriage	13	10	11
Divorce	3	4	5
Born - dead	0	0	0

As regards the labour force, the total number of employees in year 2011 was of 226, from this number on an average 55 persons being employed in agriculture, forestry and fishing, and 46 persons employed in transport and storage activities.

As regards the situation of SMEs in the commune, from the research that I made on the site it resulted that from the 12 SMEs identified in the commune, most of them are small size enterprises that deal with the retail trade in non specialized stores, mainly the sale of food products, drinks and tobacco.

One of the main representative SMEs in the commune is the agricultural enterprise named Agrozootehnica Independența, that has a number of 220 employees and deals with animal breeding, having a modern farm for cattle breeding, established with the support of European programs, vegetal growing, services providing and seed production.

As it follows, the surface with the main growing was analysed (Table 3).

Table 3 Surfaces grown with the main growing in Independența commune in the period 2009-2011

Surface	UM	2009	2010	2011
Surface grown with cereals	ha	2150	2050	2450
Surface grown with maize berry - ha	ha	1250	1320	1100
Surface grown with sun flower	ha	1450	1310	1080
Surface grown with vegetables	ha	25	22	28

The rest of the surface was grown with turnip, soybeans, fodder, etc.

Table 4. The vegetal production in Independența commune, in the period 2009-2011

Vegetal production	UM	2009	2010	2011
Total production of cereals	to	9980	10250	8575
Total production of maize berry	to	5625	7900	4200
Total production of sunflower	to	4640	3930	2100
Total production of potatoes	to	140	110	135
Total production of vegetables	to	105	96	118
Production of grapes	to	180	190	160

Table 5. The evolution of animal stock in Independența commune in the period 2009-2011 [3]

Categories	UM	2009	2010	2011
Cattle	Head	406	385	424
Swine	Head	840	884	970
Sheep	Head	2720	2810	2963
Poultry	Head	21200	21250	23350

Independența commune is a very clean, neat commune, with hardworking inhabitants, that want to live in a modern, civilized environment, but at the same time, they have occupations specific to the village.

Several projects were finalized in 2009 and 2010 as follows:

Investments finalized in 2009:

1. Works for maintaining the paved roads (framework agreement) in Independența commune.

2. Pavements arrangement in Independența village.

3. Specific means of transport purchase (waste lorry) under the project "Waste management system in communes : Independența, Cuza Vodă, Grădiștea, Al. Odobescu, Vâlcelele, Ciocănești and Vlad Țepes.

Investments finalized in 2010

1. Works for maintaining the paved roads (framework agreement) in Independența commune.

2. Purchase of 94 waste dump bin, 428 pieces of Euro bins, with the capacity of 240 l and 10.589 pieces of Euro bins with the capacity of 120 l under the project "waste management system in communes : Independența , Cuza Voda , Gradistea , Al. Odobescu , Valcelele , Ciocanesti si Vlad Tepes"

3. Modernization of sportive base in Independența commune

4. Execution of drainage works on the football field in Independența commune.

Projects finalized:

- roads rehabilitation under RDP program - Independența, Potcoava and Visinii villages – length 7.9 km

- road paving by commune association under RDP program – Length 8 km

- No. 3 Road asphalt – Independența village

- Park arrangement – Independența village

- kindergarten yard arrangement -

Independența, Potcoava and Visinii villages

- Construction of ecological landfill under the Program Pollution Control in Agriculture - satele Independența, Potcoava and Visinii villages

- sidewalks construction – Visinii village

- roads paving in Vișinii village

- Rehabilitation of the general school with I-VIII forms, A and B corpus - Independența village.

Proposed projects:

- water supply according to GO 7/ 2006- Independența village

- Roads paving and bitumen covering - Independența village

- Construction of cleaning and sewerage station - Independenta village

## CONCLUSIONS

In the rural area of Călărași county 49.1% of total population of the county lives, most of it employed in the sector of agricultural and related activities. From this reason, the achievement of the strategic objectives that supposes the efficiency and diversification of the agriculture and rural development sectors, it means the development of education infrastructure, health infrastructure, technical-town infrastructure and business development in the agriculture sector.

The vision regarding the economic-social development of the rural communities in Călărași county is the creation and support of the competitive, stable, healthy and diversified social economic sector, to ensure the continuous economic growth and the increase of the quality of life of the commune inhabitants.

The socio-economic development strategy of the rural communities must capitalize the potential, opportunities and real possibilities for development, including the creation of a simulative and competitive business sector, aimed to attract important private investments in the country and abroad.

Independența commune is part of the rural communities in Romania that will gain an urban aspect in a short time duet to the effort of its inhabitants, who found the resources needed for the creation of a well construed locality.

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## SPECIFIC CONDITIONS AND FORMS FOR THE DEVELOPMENT OF THE RURAL AREA IN SOUTH MUNTENIA REGION

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### **Abstract**

*The development of the rural area refers to the modifications in the rural area and the specific forms that supports these modifications, represented by the technical and social infrastructure. The rural area of the region was formed from administrative point of view of 7 counties, in 2010, containing 519 communes, with 2019 villages. The rural area, by the development potential it has, plays an important role in the economic and social life of the region, being different by the urban area by the profile of the economic activities, occupational structures and available resources. In the rural area, the agriculture dominates as main activity, the percent owned by it at the regional level being of 35.5% of the total employed population in 2010. The proposed paper presents the aspects regarding the infrastructure for the development of the rural area in South Muntenia Region.*

**Key words:** agriculture, infrastructure, region, rural area, rural development

### **INTRODUCTION**

The population of South Muntenia Region has rural population mainly. It is a remarkably important potential resource for the development of the rural communities, the population of the region was in 2008 of 1.925.334 persons, that represents 58,6% of the total population of the region.

The rural population of the region is characterized by a continuous decrease, it is registered in the trend existing at national level, the number of the inhabitants in the rural area being in 2008 with 31,802 lower than in 2004. the percent of the rural population in the total regional population remained unchanged, in 2008 it was registered the same percent as in 2004, that is 58,6%. The natural movement of the region population after the year 2004 was characterized by an increase of the birth rate (in 2004, 9.4 ‰ born live, and in 2008 it reached to 9,6‰) concomitently with a slightly decrease of death rate (in 2004, 13‰ deceased, in 2007 decreased at 12,8‰, and in 2008 returns to the value of 13‰), both phenomena are fit into the national trend [1]. In territorial profile, Ialomița, Călărași and Giurgiu counties register a birth rate of

11,9‰ born live in 2008 in Ialomița is of 11,2‰, in Călărași and in Giurgiu of 10,0‰. In Teleorman and Giurgiu counties the highest death rates are registered, that is of 16,8‰, respectively 15,7 ‰, higher than the region average of 13‰ deceased [2]. A factor for the decrease of the population in South Muntenia Region is the migration, both internal and external one. The mutations in the socio-economic structure of Romania determined an intense territorial mobility of the population, with direct consequences in the number modification and socio-demographic structure modification of the population in territorial profile. For the internal migration, the urban-rural flow is the one that possesses the highest percentage within it. The segment of population that is willing to mobility is represented by the urban population that migrates in the rural area.

The labour force in the rural area specific to the rural economy dominated by the primary sector, constitutes one of the key resources of the rural development. the population in the rural area is employed mainly in agriculture, having the status of family worker and they have a level of education more reduced compared to those in the urban area. In the rural area, the employment rate is higher than

in the urban area, and the unemployment level is more reduced.

## MATERIALS AND METHODS

In order to present the conditions for the rural development in South Muntenia Region I analysed the documents that describe the entire infrastructure of the region and the analyses made in order to elaborate the documents regarding the Region infrastructure. In fact, the present paper is just a part taken from a much larger study that I made about the rural development in South Muntenia Region.

I elaborated the present study by the method of specific research, by dynamic economic analysis and by processing data from the Regional Statistics Direction and also data taken from the Regional Development Plan 2007-2013 regarding the development of the infrastructure in South Muntenia Region.

## RESULTS AND DISCUSSIONS

In the rural area the agriculture predominates as main activity, the percent it possesses at the region level being of 35.5% from the total population employed in year 2008. another characteristic of the labour force in the rural area is its reduced level of training, with influences on the productivity and on the living standard. Related to the labour force in the rural area, it resulted following the analysis of the age groups that the tendency is that the labour force is getting older.

The infrastructure constitutes an element of support with a remarkable importance for all the economic, social and cultural activities in the rural area.

Essential element of the economic system, the infrastructure represents the factor that allows the connection between all the other elements. The infrastructure covers both the structural sector, providing unity to the system, and the space sector, thus achieving a viable territorial configuration or non viable one, that materialize by different levels of accessibility. It represents in fact, the circulator system of

the socio-economic body, individualized in a well determined area, that is the regional area. South Muntenia Region characterises itself by a well defined infrastructure as a result of its advantageous geographical position. Its configuration around Bucuresti-Ilfov Development Region has as a result the definition of a dense transport and communication infrastructure, a prolongation of that developed in București municipality, the most important urban and administrative centre. The transport infrastructure refers in this paper to the road, railway and fluvial transport, vital ways of the economic activity of the country and of the region, making possible the mobility of the labour force, of the raw materials and of the commercial products. The roads density is of 34,3 km /100 kmp and the railway density is of 45,2 km /1000 kmp. The roads and railway quality is low, a big part of the road network (over 50%) must be modernised and a big part of the railway network (over 2/3) must be electrified. There is a long term governmental strategy that has as objective the rehabilitation of the national roads until the year 2020.

The road transport is situated over the last years in a continuous development, it tends to become the leader in the sector due to the decline registered by the railway transport. The structure of the public roads in South Muntenia Region in 2008 had 4 international road ways and the future highway Constanța-București-Oradea, that cross the region territory, benefiting by an international connection both for the urban area and for the rural area.

The structure of the public roads reflected especially by the percent of the modernised public roads compared to the total county and commune roads, places the counties in the South part at lower values compared to the counties in the North part. Thus, at the region level, the county and commune roads represent 14,56% of the total national level, in Argeș county, these roads represent 26.39% of total region, followed by Prahova county with 20,35% and Dâmbovița county with 15,00%. Compared to the total level of the country of the county and commune public

roads that were modernised in South Muntenia region, the modernised roads represent 13,00%. The density of the public roads is of 100 km<sup>2</sup> territory, it presents the value of 44,4, in Argeş county, 46,4 in Prahova county, 43,4 in Dâmboviţa county. In Giurgiu, Ialomiţa, Călăraşi and Teleorman counties, this indicator has values under the region value. The national roads network, mostly modernised, ensure a good communication especially between the urban centres in the region and the rural area.

As regards the technical condition, most of them are not corresponding, and this determines that the access to be difficult to the national road network of the rural population in some communities (especially in the South part of the region). The qualitative and quantitative improvement of the county and commune public roads network in the rural area benefited by European support in the period 2002-2008 under SAPARD Program, measure 2.1. „Development and improvement of rural infrastructure”. The international road network allows the connection of the county and commune public roads to the national and international economic area.

The railway network of the region is well developed, the rails are under function, totalizing at the end of 2008 a length of 1.251km, the region being on the VI place in the country from this point of view.

The naval transport. The Danube river is the unique navigation way, the hydrographical network of the region not allowing the naval transport. The commercial changes with the neighbouring countries is made by the Danube ports at Giurgiu, Olteniţa, Călăraşi, Zimnicea and Turnu Măgurele that are on the main navigation way, existing a real potential of rural area development by the use of the agricultural products at export, on this transport way. The poor technological equipment and the moral and physical obsolete one of the river ports and the gradual reduction of their activity, are factors that contributed to the decrease of the level of use of the existent transport potential, the naval transport having the lowest costs, with

unfavourable influence on the communes and villages that are near the port centres.

Characterized by a positive evolution over the last years both from the covering area point of view and from qualitative point of view, the regional system of telecommunication ensure at present an increased and rapid access of the region inhabitants to the national and international telecommunication network. The program of investments in this sector facilitated, by the modern and performing equipment of the telephone network and by the modernisation of the information transport infrastructure, the increase of the number of beneficiaries and of the volume of information, including in the rural area where the deficit of these services is significant.

The regional network of drinking water supply has a total length of 9.058 km, representing 17,82% of the simple length of the networks existing at the national level. It is worth mentioning the percent of 85,76% of the localities in the rural area supplied with drinking water, higher that the percent of 14,24% for the urban area. The counties that have the most localities in the rural area with drinking water network are Argeş county with 69 localities (23.88%), Prahova county with 64 localities (22.14%) and Dâmboviţa county with 46 localities (15.92%). At the region level, Prahova county with a length of the drinking water supply network is of 2.874 km (31.73%) and with a number of 78 localities beneficiaries (23.14%), has the first place, followed by Argeş and Dâmboviţa counties, more than the counties in the South part of the Region.

The rural population ensure the drinking water resources complementary to the distribution network from individual or community sources, represented by wells or caught springs.

The services for natural gas distribution are ensured for a total number of 145 localities, at the region level. The natural gas network has a length of 4.993 km (15,64%) of the total of 31.927 km at the country level. The supply is for a number of 43 municipalities, towns and 102 communes. In the rural area, there are 94 localities connected to the network, in the

South region and 121 localities in the North region.

An important aspect for the region development and for the rural area development is the social infrastructure that is the education and health infrastructure.

The medical assistance infrastructure registers at region level a percent of 14,19% of the national level, for hospitals and 20,18% for medical clinics. There is a major deficit of ensuring the health infrastructure in the rural area, this requires major investments.

The education infrastructure. The percent of education units at region level is represented by values between 3,12% for primary education, to 17,93% for secondary education. Prahova is the county with the highest number of schools, 183, and high schools 49, and 7 post high school units. Argeş county has the highest number of faculties, 2 high education units. It can be noticed that the education infrastructure is well represented at the region level, the education is made in good conditions, mentioning that in the rural area, this infrastructure can be considered inadequate to the process of rural development, needing a restructuring of the school structures and investments projects correlated with the local needs.

## CONCLUSIONS

The complex development of the rural area is a national importance objective taking into consideration the conditions provided by the European Union, that determined the intensification of the theoretical and practical concern in this sector. Many of the traditional approaches were not adequate to the market economy especially to the rural area, considering the new requirements. It is needed a modern approach, considering that the rural area has a large variety of local resources that can be used based on their sustainability, in order to develop the rural area.

The analysis of the region agriculture highlighted the specific characteristics determined by the diversity of the forms of relief and soil, climate and vegetation resources.

The economic indicators at the region level regarding the agriculture highlight the following aspects: the region position on the first place as regards the arable land (total agricultural surface of the region has 2.444.000 ha, it represents 70,9% of the total surface, the rest being occupied by forest 19,7% and water and ponds 2,9%; of the total agricultural surface, the highest percent of possessed by the arable land 80,7%, followed by pasture 11,8% and vineyards and orchards 3,1%; the total arable land of the region has 1.802.225 ha, the highest surfaces are in Călăraşi county with 408.548 ha, Teleorman county with 367.091 and respectively Ialomiţa county with 342.854 ha, counties situated in the Romanian Plain; the high percent of the private sector in agriculture (99%), the production of the main vegetable growing and mead production, the agriculture of the region having a real potential of development, although at present it is characterised by a low agricultural productivity, mainly due to the obsolete technical equipment and the use practiced and it is under the process of transition to the market economy, the vegetal agricultural production registers high differences at the level of different areas of the region under the conditions of a structure of similar arable land.

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## THE EFFECTS OF GLOBALIZATION ON THE FOREIGN TRADE

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### *Abstract*

*Dealing extensively with the effects of globalization, we intend to prove that this process greatly influences the development of foreign trade. It's obvious that all the efforts directed towards the development and promotion of the state's, society's or firm's trade must contribute to the development of foreign trade worldwide. The current context of globalization requires radical changes both in the way of its involvement in the world trade and in the export sector, at the company or firm group level as well as in the way the institutions support companies in implementing the best solutions to create and maintain certain competitive sustainable advantages.*

*Key words:* export, foreign trade, globalization, market

### INTRODUCTION

Addressing globalization, at least in terms of international economic development during the last decades, cannot be conceived without taking into account the crucial relationship between this phenomenon and international trade. But the meaning of determination isn't clear, since the two phenomenological categories are dynamically interrelated and influence each other, at different stages and degrees, according to a set of given global realities.

In this context, the study of foreign trade in terms of integration and globalization processes, with all the chances and opportunities they bring, but also with so many imposed challenges, represents a necessity that requires a vast space of investigation in this area.

### MATERIALS AND METHODS

During the investigation there were used such research methods as: analysis, monographic, statistic as well as other methods and procedures that allowed revealing the essence of the investigated problem.

### RESULTS AND DISCUSSIONS

Globalization is a complex phenomenon that describes at the same time, both the economic

phenomena and their political, social, etc. consequences. The economic aspect of globalization can be specifically measured by the size of the flows of goods, services, capital and labour force.

It is considered that the term **globalization** has its origins in the literature devoted to multinational companies, first designating a limited phenomenon, further expanding its meaning up to identifying itself with the new phase of global economy.

1. In 1983, *Theodore Levitt* proposed this term to denote the convergence of markets worldwide. The two factors modeling the international economic relations modelers are globalization and technology. "Global Society" acts as if the whole world (or its main regions) constitutes a single entity: selling the same things, in the same way and everywhere. The company, also, adapts itself to the national specific features if it failed to handle and recompose specific demands. The term applies especially in the management of multinational companies and only concerns international trade.(2)

2. In 1990, *Kenichi Ohmae* extended the concept to *the totality of a chain of value creation* (design/engineering, production, marketing, service, finance). In this case, the company creates its international sale services, then it produces locally and subsequently it gives the full control of the value chain to the

subsidiary. This process leads to the emergence of a new stage - global integration - which occurs when firms from the same group manage their finance departments of investment and staff recruitment at international level. In this case, globalization means some form of management, globally integrated, and specific for multinational companies.(3)

3.The third definition focuses on *redefining the rules of the game*, rules previously imposed by the nation-states and which are reshaped at present by the multinational firms. By this definition we move from the internal management plan of companies to the international system architecture. The definition evokes ongoing developments but not the final state of the international system.

4.Finally, according to the fourth definition, globalization means *a new configuration of the international economy*. If once the economy was inter-national and respectively determined by the interaction of several processes that took place especially at the level of the nation-states, the current period is specific for globalizes economy in which national economies are decomposed and then rearticulated within a system of transactions and processes operating directly at international level. The definition emphasizes the qualitative leap compared to previous stages: the nation-states and governments lose their capacity to influence the development of national economies being replaced by certain regional entities representing supports in the multinational network. In addition, this interdependency between the territories subject to this model grows so powerful that lead to synchronous developments, if not identical, at least homogeneous.

According to OECD estimations, there have been *distinguished three stages of globalization*:

1.the first phase, **internationalization**, took place in the first three postwar decades and it is characterized by the intensification of trade, the world countries preserving their national character;

2.the second stage, **transnationalization**, specific for the period 1970-1990, is

characterized by an extraordinary dynamism of the foreign investment flow and foreign implantation;

3.the third stage, **globalization itself**, which begun in 1990's and marked the emergence of borderless economy or global economy, is characterized by the emergence of global production, information and financial exchange networks (flows).

Often in the specialized literature, we can find the use of the concept "**mondialisation**". Although, apparently, the terms are similar, they are still used in different contexts: "*mondialisation*" – to emphasize the geographical dimension of the process and *globalization* - to emphasize the existence of the world as an organized geo-economic system.

From an economic point of view, **the goal of globalization** is to increase profits and keep alive various firms for which the national space is insufficient, because of increased research and development costs, shortened product life cycle, increased quality requirements etc. The globalization of economic life offer advantages arising from the differences existing between the economies of the world countries, differences which constitute the source of profits. In order to improve these advantages, the geographical mobility of firms increased greatly, while the *relocation* of production representing an aspect of contemporary realities.(1) It is considered that *economic globalization will be formally completed* when the goods, services, capital and labour force achieve completely free circulation and local governments and authorities from any country begin to treat equally the firms irrespective of nationality or origin. In other words, the process will end up when the differences between the economies of the world countries don't generate sufficient benefits in order to allow profit. Given that this situation is still far, it is expected an intensification of the globalization process.

*The most important factors acting in favour of globalization are the following:*

1.*technical progress*, which allowed the increase of a range of products, reduction of

the transportation costs, increase of the speed, safety and quick transmission of information etc. Internet development represents, from this point of view, a decisive factor in the globalization process;

2. *liberalization of international trade and international investment*, which has enabled the development of international trade with fewer barriers, to this positive development contributing decisively the GATT/WTO system.

3. *liberalization of capital markets*, allowing the increase of FDI and transnational companies. Multinational and transnational firms have an important role in the process of globalization.

Analyzing the works of various experts in this field, we concluded that they were basically divided into two groups. Half of them are for globalization and another half - against globalization. Further, we'll try to highlight briefly the conclusions regarding *the pros and cons of globalization*.

Globalization is a favorite topic of right liberal circles, which consider the market as the sole regulating factor of economy, both nationally and internationally. Expressing, as a rule, the position of large international companies and international corporations, we can say that they support unlimited growth of international trade, rapid movement of the scientific and technical achievements and access of all countries to financial resources for development.

On the other hand, economists and left political scientists envisage the social dimension of globalization, considering globalization as a process of distributing the economic power, widening economic disparities and social differences worldwide. Globalization leads to greater economic and social inequalities, both nationally and internationally, enhances competition, but also unemployment, intensifies unprecedented growth of the role of capital markets in relation to the power of national administrative bodies, fact which affects national sovereignty.

Without seeking to provide a categorical answer, choosing between the two points of

view, we can only mention the need that this process takes place based on *rules valid for all participants in the international economic flows, in order to ensure a more equitable share of the globalization results*. The globalization process has been accelerated lately by the *deregulations of capital movements* and by the opening of the vast majority of world countries to the market economy, manifested above all, through the *diversification of economic internationalization forms*. The oldest form of internationalization is the *global trade*, and in this respect we distinguish two types of trade. (1)

1. The first type of trade is based on the *complementarity of national economies*, the specialization of each of them being found in external trade balance, sometimes showing a surplus, sometimes showing a deficit, depending on the comparative advantage highlighted by the relative differences of the achieved productivity.

2. The second type of trade is based on *the similarity of economies* that have the same level of development, the intersection of the export and import flows being materialized in the intra-sectoral or intra-productive exchange (it regards especially the manufactured goods produced in a regime of monopolistic competition).

A newer form of internationalization is represented by the **foreign direct investment (FDI)** coming to meet new requirements, such as:

- inability to produce sufficient quantities of goods in the origin countries, especially in the primary sector, because of the scarcity of natural resources;
- inability to sell sufficient quantities of goods in the destination countries because of the existence of protectionist barriers (in the secondary sector);
- the ability to better meet the demand in the countries of implantation, especially in the developed countries, where production subsidiaries allow maximum closeness to sale markets;
- the opportunity to benefit from macroeconomic comparative advantages in the

countries of implantation, particularly in the developing countries due to low labors costs. In developing countries, FDI pursued not only the access to natural resources or to protected markets but also the benefit derived from macroeconomic comparative advantages.

The most recent form of internationalization consists in the emergence of so-called "enterprise networks" as it became more convenient to conclude and develop contractual relationships with partners who operate in the countries of implantation (usually the countries with a continuous industrial development) rather than create production subsidiaries controlled by a powerful structured and hierarchical system. This system, called *the partnership system*, has many advantages, allowing simultaneously the reduction of capital contribution and number of expatriate staff, and also easier management of the problems encountered locally.

In conclusion, the process of *firm internationalization and international movement of capital* is among the most obvious manifestations of the world economy globalization, being marked both by the state decisions (deregulation measures) and by the technological changes that allow the instantaneous dissemination of information and reduction of costs.

According to a holistic view on the evolution of market and conditions of costs, certain enterprises take into consideration only their own interests, locating production (directly or indirectly) inside different countries. Thus, the concept of "*internationalization*" of firms represents an evolutionary process in which *national productive systems* tend to merge into a *single world production system*.

*The growth of international trade* has always been faster than global economic growth, at least in the last 250 years, except for the period 1913 -1950. Between 1720 and 1913, world trade growth was about one and half times higher than that of GDP. Weak GDP growth between 1913 and 1950 - the period with the lowest average economic growth after 1820 - was accompanied by an even smaller growth of the international trade, hampered by

war and protectionism. During this period there was the Great Depression (1929-1933), when the volume of international trade decreased by about 60%, representing an unprecedented contraction of trade in modern times, the countries trying to overcome their own economic crisis and unemployment through protectionist barriers.

Table 1. The rhythm of export growth (annual average in % )

	1960-1970	1970-1980	1980-1990	1990-2000	2000-2006
World	9.2	20.5	6.0	6.7	11.8
Developing economies	6.7	26.0	3.1	9.1	12.9
Africa	8.6	21.6	-1.7	4.7	14.3
America	5.6	20.9	1.7	7.0	8.4
Asia	6.3	30.2	4.7	10.5	13.7
Oceania	11.2	13.5	4.3	2.9	9.3
South-East Europe	8.5	18.1	2.2	8.2	7.4
Developed economies	10.1	19.0	7.6	5.7	11.2

Source: UNCTAD, (United Nations Conference on Trade and Development) *Development and Globalization: Facts and Figures*, 2008

The average growth rate recorded in the period 1960-2006 of 10.72% produced no significant changes in the share of developed countries in total world exports, but led to significant changes in the case of developing countries, whose share in world exports increased from about 3.1% in 1980-1990, to about 13% in 2000-2006.

Over the last 50 years, international trade has increased obviously faster than production, fact which increased the dependence of global economic activity of countries on the international trade. The average annual exports of goods increased by about 6% between 1948 and 1997 while the average increase in production was only 3.7%. In other words, trade has multiplied 17 times (physically, not in value) while production increased by only 6 times, in the same period of time. As for manufactured products, trade increased 30 times, while production only 8 times. During the period 1995-2000, the growth rate of world exports was over two times faster than world production, but this trend didn't maintain in the next years.



Referring to the volume of goods exports by regions (Table 2) we can remark that the largest share of this volume during the period 2003 - 2011 belongs to such regions as: Western Europe, Asia, North America, the other regions recording insignificant shares.

Table 2. The volume of world goods exports by region in the period 2003-2011

	2003	2004	2005	2006	2007	2008	2009	2010	2011
World (billion dollars)	7274	8880	10121	11762	13570	15775	12147	14855	17779
World (%)	100	100	100	100	100	100	100	100	100
North America	13.7	14.9	14.6	14.2	13.7	13.0	13.2	13.2	12.8
Latin America	5.2	3.1	3.5	3.6	3.6	3.8	3.8	3.9	4.2
Western Europe	43.2	45.3	43.0	42.1	42.5	40.9	41.1	37.9	37.1
Africa	2.4	2.6	2.9	3.1	3.1	3.6	3.1	3.4	3.4
Middle East	3.9	4.3	5.2	5.5	5.3	6.6	5.7	6.2	6.9
Asia	26.1	26.9	27.4	27.8	28.0	27.6	29.4	31.5	31.1

Source: WTO (World Trade Organization) report for the period 2004-2012

All these global values hide *significant differences among regions*.

The share of Asia in 2011 compared with the year 2003 increased by 5 percentage points (from 26.1% to 31.1%), the share of Middle East by 3 percentage points, while the share of Western Europe fell by more than 6 percentage points (from 43.2% to 37.1%) and North America basically maintains the share of about 13%. Latin America also recorded reductions of 1%, while Africa recorded an increase of 1%.

Western Europe increased slightly in 2003 and 2004 (from 42.4% in 2002 to 43.2% in 2003, then to 45.3% in 2004), and since 2005, the share of this region fell relatively reaching 37% in 2011.

However, it should be noted that, despite the relative decline in certain geographical areas, the absolute value of their external trade increased.

Similarly, the structure of international trade changed profoundly over the considered period, especially in regard to agriculture. The export of agricultural products represented almost 47% of total exports of goods in 1950 and only 6% in 2005. The manufactured products, which represented 38% of exports in 1950 fell to 34% in 2005. The share of extractive industries in total exports of goods remained much more stable, the variations

being conditioned by price fluctuations, mainly for oil and other energy products. Industrial products, however, are those that dominate international trade structure, thus reaching a share of over 70% in 2005.

Another notable trend can be also recorded at the level of exports of merchandise and services.

Table 3. World exports of merchandise and commercial services in the period 1990-2011

	Value (billion dollars)	Annual percentage change		
		1990-2000	2000-2005	2005-2011
Merchandise	17.779	6.5	10.0	10.0
Commercial services	4.149	6.5	10.0	9.0

Source: WTO Report for the period 2001-2012

Thus, if in 2002, world exports of merchandise constituted 6270 billion dollars, in 2011 it reached 17,779 billion dollars, or about 80% of the world trade. As for the trade in commercial services, in 2002 it exceeded 1500 billion dollars reaching in 2011 the sum of 4149 billion dollars, or about 20% of the world trade. It should be noted that these figures relating to international trade in services applies only to cross-border trade, without including the sales made by foreign companies existing in the importing countries.

Lately, globalization has been associated with the increase of private capital flows towards the developing countries (during the 90's) after a period characterized by low capital movements in this direction, in the 80's. In recent years, the structure of private capital movement changed significantly. The most important category is represented by foreign

direct investment, while portfolio investment and bank credits have fallen dramatically as a result of the financial crisis in the second half of the tenth decade.

The figures regarding *the flow of foreign direct investment* (FDI) confirms this intensification of the international economic interdependence.

Table 4 . The flow of foreign direct investment (billion dollars)

	1970	1980	1990	2000	2001	2002	2005	2006
World	12.9	54.9	208.7	1411.4	823.8	651.2	945.8	1305.8
Developing economies	3.4	8.4	36.9	246.1	209.4	162.2	314.3	379.0
Africa	0.9	0.4	2.4	8.5	18.8	10.9	29.6	35.5
Latin America	1.6	7.5	9.7	95.3	83.7	56.0	75.5	83.7
Asia	0.8	0.4	24.3	142.1	106.8	94.9	208.7	259.4
Oceania	0.14	0.12	0.56	0.12	0.16	0.14	383	339
South-East Europe	...	0.03	0.64	26.37	25.01	28.71	15.1	26.3
Developed economies	9.5	46.5	171.1	1120.5	589.4	460.3	590.3	857.5
North America	3.1	22.7	56.0	380.76	172.78	50.62	129.9	244.4
Europe	5.2	21.4	103.3	709.9	400.8	384.4	494.9	566.4

Source: UNCTAD, *Development and Globalization: Facts and Figures*, 2008

As we can see, during a period of 35 years, the flow of FDI has multiplied about 100 times, from about 13 billion dollars to about 1.306 billion dollars.

In 2006, global FDI inflows rose for the third consecutive year to reach 1.306 trillion dollars, close to the record level of 1.411 trillion dollars reached in 2000.

The growth of FDI occurred in all regions and was partly driven by increasing corporate profits worldwide and resulting higher stock prices that raised the value of cross-border mergers and acquisitions.

While FDI inflows in developed countries rose by 45 percent in 2006 from 2005, well over the rate of the previous two years, to reach 857 billion dollars, flows to developing countries attained record levels of 379 billion dollars.

The Europe as a whole remained the largest host region with 566 billion dollars accounting for 43 per cent of total FDI inflows in 2006, followed by North America with 244 billion dollars or an 88 per cent increase from 2005.

Regionalization of foreign trade, on the background of its increasing institutionalization, represents another consequence of the globalization process and a

feature of the international trade flows. More and more regional agreements are negotiated within WTO, and the existing ones tend to strengthen their position.

Regional trade agreements (RTA) are intergovernmental agreements between two or more countries, in which the parties agree on certain favorable conditions for mutual trade, other than those applied to other member states of WTO.

According to WTO, there have been notified over 300 regional trade agreements, such as customs unions, free trade areas or other types of preferential arrangements and more than half are in operation today. The structure of these agreements is complex and many countries are now part of several agreements. Generally, small developing countries are involved in several commercial blocks (on average in 3 agreements). For these countries, the chances are higher for regionalization rather than for globalization. Switching from the apology of import substitution strategy to the large regional markets that can provide increased protection, along with the access to an increasing number of consumers is one of the main motivations of these countries

choice. International trade represents a more important factor in the economic development for small countries rather than for large countries. Therefore, for them, regionalization is a more effective integration method into the global economy. Most agreements of this kind are between developed countries, especially the European ones (60%), while the developing countries account for a smaller share (15%). The rest are agreements involving both categories of countries. EU expands increasingly, the Asia - Pacific area emerges increasingly as a future economic power while African continent countries strive to form functional groups, all sustained by WTO effort to ensure a more developed free trade.

RTA are considered complementary to the multilateral trading system. At the same time, their effects on trade liberalization and economic growth are not clear, and experts' opinions about their economic impact are often contradictory. But whatever the conclusion, the advantages expected by the signatory countries can be questioned if the distortions are not minimized in resource allocation, as well as trade and/or investment diversion effects. Certainly, the economic impact of an RTA depends on how it was designed, its architecture, the way its internal parameters were chosen, especially those concerning the liberalization degree of trade.

## CONCLUSIONS

Continuous development of the globalization process influenced and determined considerably global foreign trade performance, the absolute value of which increased significantly.

It was also noted that the increase of world trade exceeds the increase of world production growth. Due to these trends there is an increase of the dependency ratio of national economies on the global economy and an important growth of the foreign market, which obliges states to take measures of foreign trade liberalization. The liberalization of the international movement of goods, capital, services, persons, labors

force and technology leads to the disappearance of commercial borders, but not of national borders.

We note that as an objective process, for trade liberalization and economic growth, is the adoption of common regulations by all states - agreements, treaties and conventions on the elimination of double taxation, favorable foreign investment regime, granting clause to the most favored nation, etc.

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## TOMATOES BALANCE SHEET IN ROMANIA

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### Abstract

*Tomatoes are one of the most representative vegetable species cultivated in our country. This allegation is based on the essential elements of tomatoes culture respectively area cultivated, total production and average yield per hectare - indicators for 2007-2009 reached average levels of 48.8 thousand hectares and 736.9 thousand tonnes respectively 15101kg / ha. Presentation of food helps establish balance of the demand and supply component parts total as follows: production, imports, exports (on request) food consumption and losses (on request). It is worth noting that in Romania, unlike global and continental do not appear reports for stocks, industrial raw materials, feed consumption, and other uses. Based on the total volume of supply and demand it could be determining the national balance sheet for the product.*

**Key words:** consumption, demand food, export, import, losses, offer, tomato

### INTRODUCTION

Tomatoes are noteworthy because of their importance food industry, as an intensification factor for the use of land and labor resources, feed, export and as a source of profit [3]. Knowing the ratio existing on the market between supply and demand of a product is an essential element, defining, the relationship between the buying and selling market. When referring to the tomato appears the need to increase transiting speed (on the market), due to the perishable nature of the product and also problems related to storage (short or long term - controlled atmosphere storage), packaging and selling them effectively.

### MATERIALS AND METHODS

Realization of the work is based on the anticipated documentation, using data published by the United Nations Food and Agriculture Organization (FAO) [4].

The offer on the commodity markets from agriculture is dispersed and irregular quantity. Production volume depends on the technical part of the equipment, on the other hand, climatic and biological conditions are random, printing these markets agricultural

commodities, are highly mobile. Quantitative offer a retail product market depends primarily by the benefit that it will make the entrepreneur [1].

Formation of total supply has the following components: total production, imports, stocks and exports (expressed in natural units of measurement - thousand tons). Determining the level of total supply - according to FAO regulations, is considering adding the output of the level of imports and stocks, minus exports. If the stock is negative, it is subtracted from the sum total production and imports. It should be noted that for Romania, statistical reporting data do not refer to stocks. Specificity food demand is materialized within the market through various forms of expression by the consumer. This can be referred to [2].:

- By mode of manifestation in time food demand can be distinguished current demand, periodic and rare;

- By the time evolution of food demand is constant demand, increasing and decreasing;

- For safety of food demand is highlights strong demand spontaneous and demand;

- According to the existence of the range of goods and fund on food demand there is an increase or decrease in consumer demand [3].

To establish the total demand are considering its following components: feed consumption, seeds, food consumption, raw materials, other uses, losses (in thousand tons).

According to FAO methodology, determining the overall level of demand is made by summing the above elements. In Romania total demand is made up only by food consumption and losses.

Establishing the effective balance takes into account the achievement difference between total supply and total demand.

In the case total supply and total demand, taking into account their components and their participation in setting the general level of the two indicators was established the percentage structure, distinct for both total supply and total demand.

Later processing of the data was performed by using time comparison method.

The data collected and analyzed, covers the period 2007-2009, are launched with the average period. Media was determined by computing the following equation:

$$A = \frac{X_1 + X_2 + \dots + X_n}{n}$$

Based on the above, the dynamic series were built, where the first term automatically became a basis for comparison. Were used two types of indices with fixed base and mobile base for determining for which the methodology was as follows:

$$Fbi = \frac{x_n}{x_0} \times 100;$$

$$Mbi = \frac{x_n}{x_{n-1}} \times 100.$$

## RESULTS AND DISCUSSIONS

In 2007, total supply was 838.1 thousand t, which contributed the production to 640.8 thousand t (76.5%), import 97.8 thousand t (23.6%) and export to 0, 5 thousand t (-0.1%).

Total demand reached 838.1 thousand tons, a level at which contributed food - 810.1 thousand t (96.7%) and losses - 28.0 thousand tons (3.3%).

Under these conditions the balance is unitary, total supply is equal to total demand.

In 2008 the same situation is found balance between total supply and total demand. Therefore the 981.0 thousand tons for total supply were made by contributions quantitative variables of components, as follows: 814.4 thousand t the production - 83.0%, 168.1 thousand t import - 17, 1%, 1.4 thousand t export - 0.1%. For total demand structure is as follows: 97.1% food - 953.0 thousand tons, 2.9% losses - 28.0 thousand tons.

When referring to the situation of 2009 are based on the same state of balance between total supply and total demand (907.5 thousand t).

Production was 755.6 thousand t (83.3% in total supply structure) import owned 156.6 thousand t (17.2%), while exports recorded 4.7 thousand t (-0.5%).

For total demand prevails nutrition with a share of 96.9% or 879.5 thousand t, followed at a distance of losses 3.1% - 28.0 thousand tons.

Calculating the average period for balance sheet components, in addition to the balance between total supply and total demand (908.9 thousand tons each), it is noted that the total supply has a structure (Fig. 1.): production 81.0% (736.9 thousand t), 19.2% for imports (174.3 thousand tons), -0.2% in the export (2.2 thousand t).

Total demand has two components (Fig. 2.): 96.9% Food (880.9 thousand t), 3.1% loss (28.0 thousand tons).

Table 1. Tomatoes: National balance sheet structure-thousand tons (2007-2009) \*

Crt No.	Specification	YEAR						Average 2007-2009	
		2007		2008		2009		Effective	%
		Effective	%	Effective	%	Effective	%		
1	Production	640,8	76,5	814,4	83,0	755,6	83,3	736,9	81,0
2	Import	197,8	23,6	168,1	17,1	156,6	17,2	174,3	19,2
3	Export	0,5	-0,1	1,4	-0,1	4,7	-0,5	2,2	-0,2
4	Total offer	838,1	100	981,0	100	907,5	100	908,9	100
5	Seeds	-	-	-	-	-	-	-	-
6	Food	810,1	96,7	953,0	97,1	879,5	96,9	880,9	96,9
7	Losses	28,0	3,3	28,0	2,9	28,0	3,1	28,0	3,1
8	Total demand	838,1	100	981,0	100	907,5	100	908,9	100
9	Balance sheet	0	-	0	-	0	-	0	-

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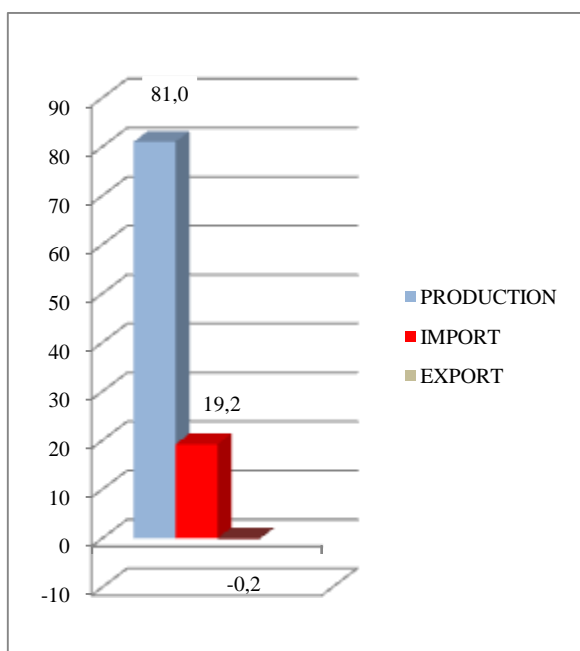


Fig. 1. Total supply - structure, period average (%)

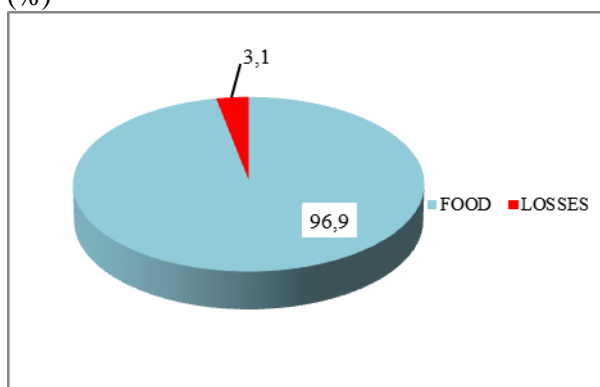


Fig. 2. Total demand - structure, period average (%)

Dynamics of elements of the national balance to the tomato is presented in Table 2.

Production has evolved unevenly, while increases occurred in 2008 (+27.1% compared to the first term of the dynamical series), followed by declines in 2009 (-7.2% compared to previous dynamic series + 17.9% compared with 2007). Average of the period is higher than the first bases of reporting by 15.0%, but is lower by 2.5% compared to the second.

Analyzing the evolution of imports can find their downward trend. Therefore the dynamics is dominated by subunit levels of component indices, except for those with chain basis for the average period (111.3%). Decreases compared to bases of reference were: 15.0% in 2008, 20.8 and 6.8% for 2009, 11.9% of the average period.

Situation is convenient for exports, in terms of relative values specific to dynamics, but the absolute value is much room for better for producers in Romania. Indicator increased by 2.80 times in 2008 compared to 2007, of 9.40 and 3.35 times for 2009 compared with terms of reference. The average of the period has surpassed of 4.40 times the specific situation of 2007, but was lower by 53.2% compared with the previous term of dynamic series.

Table 2. Tomatoes: Dynamics of national balance sheet items (2007-2009)

Crt. No.	Specification	YEAR						Average 2007-2009	
		2007		2008		2009		F <sub>bi</sub>	M <sub>bi</sub>
		F <sub>bi</sub>	M <sub>bi</sub>	F <sub>bi</sub>	M <sub>bi</sub>	F <sub>bi</sub>	M <sub>bi</sub>		
1	Producție	100	100	127,1	127,1	117,9	92,8	115,0	97,5
2	Import	100	100	85,0	85,0	79,2	93,2	88,1	111,3
3	Export	100	100	280,0	280,0	940,0	335,7	440,0	46,8
4	Ofertă totală	100	100	117,1	117,1	108,3	92,5	108,5	100,2
5	Alimentație	100	100	117,6	117,6	108,6	92,3	108,7	100,2
6	Pierderi	100	100	100	100	100	100	100	100
7	Total demand	100	100	117,1	117,1	108,3	92,5	108,5	100,2

Total supply of tomatoes has an uneven evolution over time increases occurring in 2008 (+17.1% vs. 2007), are followed by decreases -7.5% for 2009 compared with the previous term of dynamic series). For both categories of indices period average exceeds the reporting period: +8.5% compared to 2007, +0.2% compared with 2009.

Of the components total demand stands out the food consumption uneven evolution. Therefore we have increases for it in 2008 compared to 2007 (+17.6%), the decreases for the year 2009 to 7.7% from the previous term of dynamic series (+8.6% up on the year 2007). Therefore the average of the period exceeds both bases of comparison with 8.7 and 0.2%.

In the case of losses are not recorded, according to statistics, any variation thereof, during the of dynamic series analysis (the dynamics index contains strictly equal values of components). Total demand is characterized by a sinuous evolution for the period 2007 to 2009. In 2008 are finds the base reporting advancing 1.17 times, and in 2009 the first is observed overcoming basis of comparison and a 8.3% decrease from the second baseline by 7.5%. Regarding the average of the period we have levels above unit of two categories of indices (with fixed base or chain) - 108.5 and 100.2%.

## CONCLUSIONS

The total supply exports have a share almost insignificant, and production is the main constituent. Lack stocks may appear beneficial element, but at the same time and

as warning to lack of a "buffer" in case of need.

In the total demand prevailing food consumption (96.9%), and losses have a low share (3.1%), convenient compared to continental and global situation (lower weight, in the structure of two or three times); Romania has contributed to the establishment of world total supply and continental with weights of 0.51 and 4.09%, while in demand structure contributions were 0.64 and 4.08%; Components of national balance of tomatoes have evolved various in time: imports were decreasing (beneficial aspect), exports showed upward trends (positive), production, total supply, food and total demand varied uneven, and the losses was constant (at least satisfactory aspect).

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## BARLEY BALANCE SHEET IN ROMANIA

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### Abstract

*Barley is one of the most important cereal grown in Romania, after corn and wheat. This is based, at least on considerations of cultivated area (413.4 thousand ha - average 2007-2009), but also because of the multiple uses it may have (Food, feed, industrial raw materials, etc.). Presentation of food balance we consider interesting in terms of supply and demand components: production, imports, stocks, exports, seeds, feed consumption, industrial raw materials, food and other uses/losses. On the basis of total volume of supply and demand we could determine the balance sheet at national level for the product.*

**Key words:** *barley, consumption, demand, export, import, losses storage, supply*

### INTRODUCTION

Barley has importance as forage, in industry and in agrotechnics [1]. It emphasizes the importance of modalities under which barley forage can be used in animal feed (green mass, concentrated fodder, straw and chaff). In terms of industrial as raw material it is used for brewing and alcohol. In feeding barley can be used in the form of coffee substitute or pearl barley. Also, barley flour mixed with wheat that can be used in baking industry. Use barley straw-like materials, pulp and paper industry. Barley has as best preceding almost all crops, except those harvested late fall and does not allow due to the vegetation period, adequate preparation of land and sowing in the optimum time.

Barley capitalizes at high level the factors of production: seed, chemical fertilizers, residual effect of manure, substances control, irrigation water, etc. Since leaving the ground early, barley allows the installation of the second crops, especially forage plants, in which they achieve lower production costs for crops.

### MATERIALS AND METHODS

Carrying out the work involved documenting, through the use of statistical reporting data

[4]. In order to achieve the work was operated with a system of indicators, specific for the balance sheet of agricultural products and recommended, system used by the United Nations Food and Agriculture Organization - FAO.

**Offer** for an 'X' product is represented by quantity that producers are willing to produce at a cost "K", given the profit you will get [3]. Formation of total supply has the following components: total production, imports, stocks and exports (expressed in natural units of measurement - thousand tons). Determining the level of total supply - according to FAO regulations, is considering adding the level of production with level of imports and stocks, minus exports. If the stock is negative, it is subtracted from the sum of total production and imports.

Food demand can be expressed in many forms [2]:

- through the total value of food necessary to meet the food of the studied population (using natural units and / or energy);
- Quantification of components of assortment of the food demand by indicating needs of each group assortment for periods;
- Equivalence through converting appropriate indicators, the need for food production and distribution potentials (taking into account the capacities of production and consumption,

seasonal factors influencing consumer income possibilities through matching storage rings etc.).

To establish the total demand is considering its following components: food consumption, seeds, food consumption, raw materials, other uses, losses (in thousand tons). According to FAO methodology, determining the overall level of demand is by the sum of the above.

Establishing effectively balance is done as the difference between total supply and total demand. Depending on the values of total demand and total supply balance sheet may be surplus or deficit or encounter a situation of balance between the two constituent elements (respectively total supply and total demand).

In case total supply and total demand, taking into consideration their components and their participation in setting the general level of these two indicators has been established percentage structure, distinctive for both total supply and the total demand.

Subsequent was performed processing of the data by using comparison method in time. The data collected and analyzed, covers the period 2007-2009, are launched with the average period. Media was determined by computing the following equation:

$$A = \frac{X_1 + X_2 + \dots + X_n}{n}$$

Based on the above, the dynamic series were built, where the first term automatically became a basis for comparison. We used two types of indices with fixed base and mobile base for which the methodology of determination was as follows:

$$Fbi = \frac{X_n}{X_0} \times 100;$$

$$Mbi = \frac{X_n}{X_{n-1}} \times 100.$$

## RESULTS AND DISCUSSIONS

Table 1. presents the national balance sheet components of barley. For 2007 we can see

that the balance was positive, demand exceeded supply by 0.2 thousand tons.

Thus there was a total supply of 971.9 thousand tons of barley, which is based on the offer: 531.5 thousand t production (54.6%), 269.8 thousand t imports (27.8%), 311.0 thousand t stocks (32.0%), 140.4 thousand t exports (-14.4%). When setting total demand of 971.7 thousand t were helped with food consumption - 307.9 thousand t (31.7%), raw materials - 421.4 thousand t (44.4%), losses - 121.8 thousand t (12.5%), seeds - 83.5 thousand t (8.6%), food - 36.1 thousand t (3.7%), other uses - 1.0 thousand tons (0.1%).

In 2008 the total supply was 1241.0 thousand tons, a level at which components had the following percentages of participation: 97.5% production (1209.4 thousand tons), 34.4% imports (426.6 thousand tons), 20.1% stocks (250.0 thousand tons), exports -52.0% (645.0 thousand tons). Total demand was 1240.9 thousand tons, presenting this one as the following components: 0.7% other uses (9.0 thousand tons), food 4.2% (52.0 thousand tons), 4.3% loss (53.3 thousand t), 7.3% seeds (90.6 thousand t), 35.1% of raw materials (435.7 thousand t), food consumption 48.4% (600.3 thousand t). Result of this situation balance sheet is in surplus - 0.1 thousand t.

For 2009 is maintain the balance surplus (0.1 thousand t), the offer being 907.1 thousand tons, and the demand for 907.0 thousand tons. For total supply acted up: production - 1182.1 thousand tons (130.3%), import - 218.5 thousand tons (24.1%), stocks - 50.0 thousand tons (5.5%) and exports - 543.5 thousand tons (-59.9%). Formation of barley total demand is based on the, variable amounts of barley used in a number of areas such as: 382.9 thousand t of raw materials - 42.2%, 218.7 thousand t feed consumption - 24.1%, 149, 2 thousand t loss - 16.5%, 119.0 thousand tons of seeds - 13.1%, 35.7 thousand tons of food - 3.9%, 1.5 thousand tons other uses - 0.2%.

Determining the average period, it is found a balance sheet in surplus of barley (0.1 thousand t - fig. 1.). This offer is based on a total of 1040.0 thousand tons, which had the following structure (Fig. 2.):

- 93.7% production (974.3 thousand t);

- imports 29.3% (305.0 thousand tons);
- exports -42.6% (443.0 thousand tons).
- 19.6% stocks (203.7 thousand t);

Table 1. Barley: national-sheet structure in thousand tons (2007-2009) \*

Crt. No.	Specification	YEAR						Average 2007-2009	
		2007		2008		2009		Effective	%
		Effective	%	Effective	%	Effective	%		
1	Production	531,5	54,6	1209,4	97,5	1182,1	130,3	974,3	93,7
2	Import	269,8	27,8	426,6	34,4	218,5	24,1	305,0	29,3
3	Stocks	311,0	32,0	250,0	20,1	50,0	5,5	203,7	19,6
4	Export	140,4	-14,4	645,0	-52,0	543,5	-59,9	443,0	-42,6
5	Total offer	971,9	100	1241,0	100	907,1	100	1040,0	100
6	Feed consumption	307,9	31,7	600,3	48,4	218,7	24,1	375,6	36,1
7	Seeds	83,5	8,6	90,6	7,3	119,0	13,1	97,7	9,3
8	Food	36,1	3,7	52,0	4,2	35,7	3,9	41,3	4,0
9	Raw materials	421,4	44,4	435,7	35,1	382,9	42,2	413,4	39,8
10	Other uses	1,0	0,1	9,0	0,7	1,5	0,2	3,8	0,4
11	Losses	121,8	12,5	53,3	4,3	149,2	16,5	108,1	10,4
12	Total demand	971,7	100	1240,9	100	907,0	100	1039,9	100
13	Balance sheet	+0,2	-	+0,1	-	+0,1	-	+0,1	-

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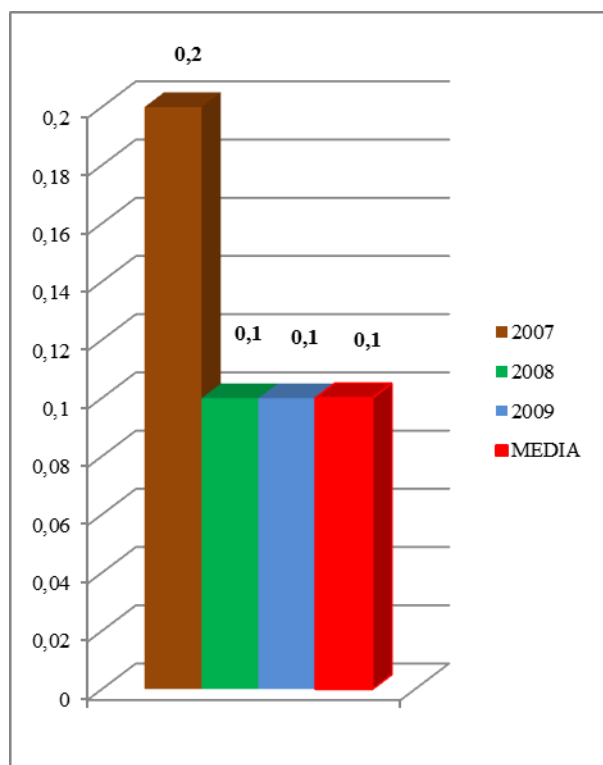


Fig. 1. Barley balance sheet (thousand t)

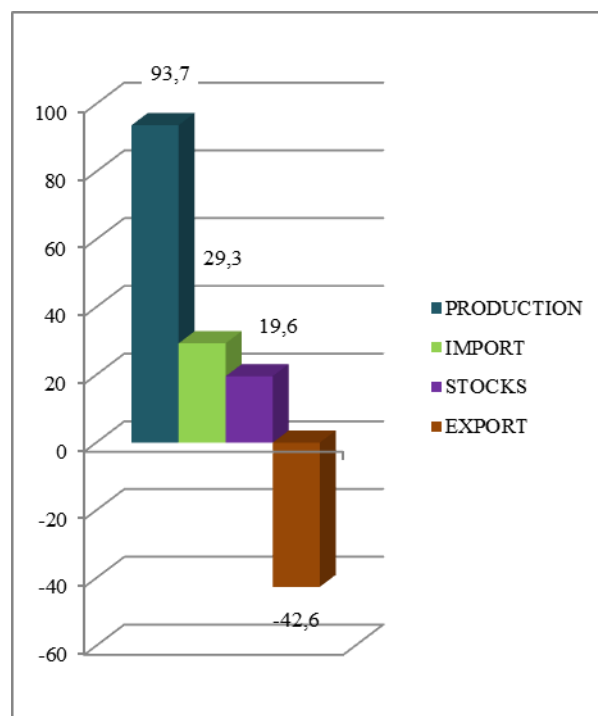


Fig. 2. Total supply - structure, period average (%)

Total demand reached 1,039.9 thousand tons, its structure presenting like (Fig. 3.):

- 0.4% other uses (3800 t);
- food 4.0% (41.3 thousand t);
- 9.3% seeds (97.7 thousand t);
- 10.4% loss (108.1 thousand t);
- feed consumption 36.1% (375.6 thousand t);
- 39.8% of raw materials (413.4 thousand t).

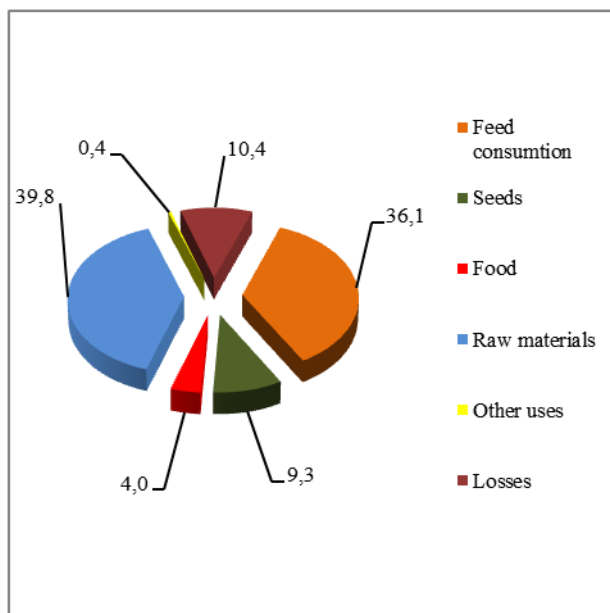


Fig. 3. Total demand - structure, period average (%)

Dynamic component elements of the national balance sheet of barley is presented in the Table 2.

Production increased by 2.27 times in 2008 compared to 2007, after which he recorded in 2009, a slight decrease compared with the previous term of dynamic series (-2.3%). Period average exceeded the first base of reporting by 1.83 times, but was lower than the second with 17.6%. Regarding imports it can be seen an uneven evolution. This creates sharp increases in 2008 compared with 2007 (58.1%), and decreased by 48.8% in 2009 compared to the previous term of dynamical series. Average of the period outrun both reporting bases by 1.13 and 1.39 times. The stocks know strictly downward trend, successive annual declines recorded was 19.6% in 2008 and 80.0% in 2009. Under these conditions the average of period was only 65.5% from the first term of the dynamical series but ahead by 4.07 times the previous term (2009).

Table 2. Barley: Dynamics of the national balance sheet items (2007-2009)

Crt. No.	Specificare	YEAR						aVERAGE 2007-2009	
		2007		2008		2009		F <sub>bi</sub>	M <sub>bi</sub>
		F <sub>bi</sub>	M <sub>bi</sub>	F <sub>bi</sub>	M <sub>bi</sub>	F <sub>bi</sub>	M <sub>bi</sub>		
1	Production	100	100	227,5	227,5	222,4	97,7	183,3	82,4
2	Import	100	100	158,1	158,1	81,0	51,2	113,0	139,6
3	Stocks	100	100	80,4	80,4	16,1	20,0	65,5	407,4
4	Export	100	100	459,4	459,4	387,1	84,3	315,5	81,5
5	Total offer	100	100	127,7	127,7	93,3	73,1	107,0	114,7
6	Feed consumption	100	100	195,0	195,0	71,0	36,4	122,0	171,8
7	Food	100	100	108,5	108,5	142,5	131,3	117,0	82,1
8	Seeds	100	100	144,0	144,0	98,9	68,7	114,4	115,7
9	Raw materials	100	100	103,4	103,4	90,9	87,9	98,1	108,0
10	Other uses	100	100	900,0	900,0	150,0	16,7	380,0	253,3
11	Losses	100	100	43,8	43,8	122,5	279,9	88,8	72,5
12	Total demand	100	100	127,7	127,7	93,3	73,1	107,0	114,7

Romanian exports of barley conveniently evolved from 2007 to 2008 (an increase of 4.59 fold) decreased by 15.7% in 2009 compared with the previous period, of the dynamical series. For the average of period it is found above par levels of the indices with fixed base and subunit levels for those with mobile base - 315.5 and 81.5%.

In case of total offer there is a sinuous evolution, specific increases in 2008 (27.7%) than in 2007 followed by decreases in 2009 (-6.7 and -27.9% by the terms of reference).

Under these conditions both period average beat of the reporting base: 1.07 and 1.14 times (Fig. 4).

Food consumption increased substantially in 2008 compared to 2007 (1.95 times), but for the year 2009 decreased substantially beside both reporting bases (-29.0 and -63.6%). For period average is observed advancing of the reference levels of 1.22 and 1.71 times. When referring to seed consumption trends can be seen its upward trend, the dynamics is dominated by the values of the indices above

unit components (except for those with the mobilr base for period average - 82.1%).

At the level of Food consumption it is noticeable an uneven evolution, increases by 44.0% from 2008 (compared to 2007), followed by decreases of 1.1 and 31.3% for 2009. Period average result of this situation is over-unit to both terms of comparison: 14.4 and 15.7%. Consumption of raw materials evolve tortuous, small increases from 2008 (3.4%), followed by decreases in 2009 (-9.1 and -12.1%). In this case the average of period outrun the year 2009 by 8.0%, but it is lower by 1.8% compared to the first term of the dynamic series.

Different uses of the barley increased spectacularly in 2008 compared to 2007 (9.0 times), then decreased in 2009 compared to 2008 with 83.3%, so the average of period surpassed both reporting base 3.8 and 2.53 times respectively.

Regarding losses is convenient to note a trend from 2007 to 2008 (-56.2%), but a much less convenient for the year 2009 (advancing by 1.22 and 2.79 times terms of comparison). Period average subunit known values for both indices - 88.8 and 72.5%.

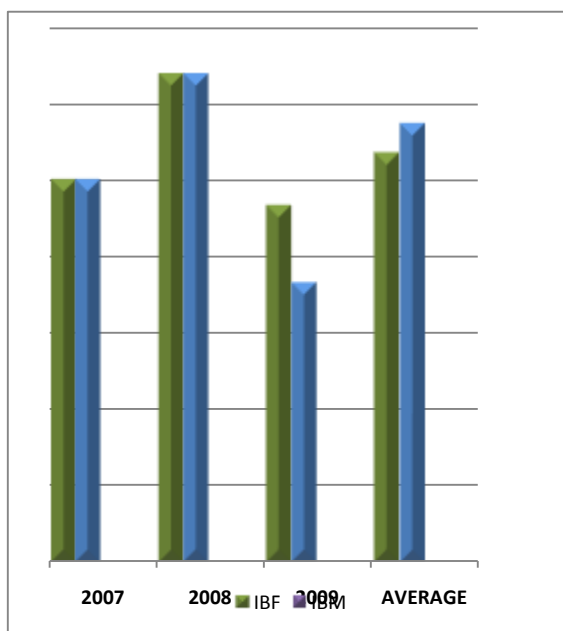


Fig. 4. Dynamics of total supply and total demand (%)

Regarding the total demand dynamics the trend it is found unevenly. Thus for 2008 demand increased by 27.7% compared to

2007, then in 2009 decreased by 6.7 and 26.9% compared with terms of reference and average reporting period exceeds basis by 7.0 and 14.7 % (fig. 4).

## CONCLUSIONS

In the first instance it is noteworthy the surplus character of balance sheet (0.1 thousand t), situation consistent with the global trend, but different from the European one.

Total supply (1040.0 thousand tons) are 0.73 and 1.31% to the global and European level and the indicator is as natural, especially on production - 93.7%. Are of noticed imports made (29.3%) but especially the exports (-42.6%);

Total demand register with percentage contribution of 0.74 and 1.31%, in the global and continental levels indicators. Unlike what happens in Europe and in the world, for Romania is predominantly the consumption of raw materials at the expense of food consumption in total demand structure (39.8 to 36.1%) - this shows poor development of Romanian livestock (especially in terms of existing livestock). At the same time distinct appearance occurs, high weight loss 10.4% (approximately a three and almost ten times higher than the global situation and continental - aspect that should give a lot of thought to all actors are on the branch of this product);

Most of the balance sheet items are evolving uneven, distinguishing stocks which presents strictly downward trend and seed material consumption strictly evolving upward.

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## INNOVATIONS IN AGRICULTURE AND THE INDICATORS OF THE LEVEL AND EFFECTIVENESS OF THEIR APPLICATION IN PHYTOTECHNICAL BRANCH

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### *Abstract*

*The integration of scientific and technical progress in agriculture development strategies contribute to stimulating sustainable economic growth, based on a scientific basis, which takes into consideration the objectives of mankind: conservation of natural resources, promoting the development of healthy and competitive economies, improving the social conditions of life and work of people, protection of the environment etc. On the background of deepening internal and external competition and the struggle for markets and in order to support local producers of phytotechnical production, one of the main priorities of agricultural development policy should be widely assimilation development and innovation in this field. In terms of implementation of innovation projects and technology transfer we consider appropriate and necessary the development of new indicators which characterize the intensivity and intensification efficiency in phytotechnics with the direct reflection of the level of implementation of innovative methods and technologies.*

**Keywords:** *innovations, new indicators, scientific and technical progress*

### INTRODUCTION

It is doubtless the role of the science and technical achievements in promoting of a system of durable agriculture. The technological and genetic progress led to the practicing of an intensive agriculture with the help of the agricultural technology which enhanced the productivity of agricultural crops by several times. The contemporary agriculture is exposed to some rapid modifications due to its technical and technological progress: “Who does not support the dynamics of innovations and change processes – is being lost his place on the market – either internal, national, or external, and enters very rapidly in the situation of a structural crisis, that is followed by diverse negative unforeseeable manifestations in the entire economy” [1]. Actually in such a state is today the branch of vegetal production in Moldova Republic.

### MATERIALS AND METHODS

This paper aims highlighting the importance of implementation of innovational

technologies in agriculture and the need to apply new indicators that would analyze and characterize the intensivity level and the economic efficiency of intensification in phytotechnics in terms of their use.

### RESULTS AND DISCUSSIONS

The development on the basis of innovational technologies is one of the most vulnerable aspects of autochthons agricultural business. Taking into account the specific nature of agriculture branch as a biosystem, the innovational mechanism of the agribusiness presents certain peculiarities, fact that decreases investment attractiveness of this area. In the branch of the vegetal production as in none of other sector of economy the production process is being combined with natural ones and is in close dependence of these ones. The relationship between innovations and development of phytotechnical branch has a contradictory character. On the one hand the obtaining of the over profit in a short period of time from the implementation of innovational projects in

this sector is impossible, the optimum solution being the resources allocation in projects of long length, which are hazardous. On the other hand, the innovational projects with ecological and social aspects require great investments and a long recuperating length, fact doing them unattractive for banking capital as they suppose a little and uncertain profit and respectively a degree of a bigger risk. Taking into account these realities it is necessary to elaborate a new mechanism concerning the providing of agricultural risks. A problem of underdevelopment of the phytotechnical branch in Moldova Republic should be a poor spreading of the innovations. The innovations spreading of agricultural science in this sector presents certain peculiarities, it can not be manifested in a short period of time, but needs more years. By this it is also being explained the pessimist attitude of the autochthonous agricultural producers regarding the technologies and innovational products. We refer to the varieties, hybrids, technologies of crops growing. Against the background of external and internal competition accentuation and the struggle for the sale market, as well as in protecting of autochthonous producers, one of the basic priorities of agriculture developing policy must be the development and assimilation in great detail of the innovations in this area. The world agriculture is centered on the increasing capacity of knowledge assimilation in producing vegetal production. This thing is obvious having as example the economically developed countries. That is just the point that offers them the possibility to maintain the equilibrium between demand and offer of food products on the internal market and to easily penetrate in the world developed agriculture products markets. In the Republic of Moldova there is a great scientific potential concerning the development on intensive and durable way of the plants cultivation system. We may mention that are realized and are in the disposal of the farmers basic works and also practical recommendations how we must efficiently process the soil, how to maintain its fertility for future generations. The main factors of intensifying of this sector are soils,

hybrids, seeds, qualitative planting material, etc [2].

One of the principal innovational directions are the biotechnological systems of creating new technologies of cultivation, hybrids and varieties of crops with new technical-economical qualities with a higher potential, resistant at low and high temperatures, etc.

The agriculture is apparently a branch being less exposed to the product innovations, the nature can not be changed from day to day, as it happens with a series of industrial products. At the same time, also in this branch the technical, biotechnological innovations of other type penetrate more and more rapidly influencing the competitiveness of the farmer's labor. [1] The harmonization of agriculture and environment development may be realized only by a systemic approach from the political, ecological, economical and social point of view in which the scientific investigation must bring him the contribution by innovations in the domain of biotechnology and technologies regarding the increase of the soil fertility. Under the aspect of the projects implementation innovations and technological transfer and the efficiency of developing process of intensive phytotechnical branch we consider timely to suggest the elaboration of indicators that should characterize the intensivity level and intensification efficiency in phytotechnics that include technologies and means application with innovational character, as:

$$N_i = \frac{Inov}{Sa_i} \quad (1),$$

where:  $N_i$  – level of production intensity in the branch of phytotechnics with taking into account the innovational technologies and means application;  
 $Inov$  – the means value with innovational character utilized in producing of vegetal production;  
 $Sa_i$  - the surface of agricultural land on which were applied means and technologies with innovational character, ha



$$R_{inov} = \frac{VPG_{f.inov}}{Sa_i} \quad (2)$$

where:  $R_{inov}$  - yield of farmland on which were applied means and technologies with innovational character, lei/ha;

$VPG_{f.inov}$  - the value of vegetal global production (in comparable prices) obtained as a result of applying means and technologies with innovational character, lei.

$$E_{int.inov} = \frac{VPG_{f.inov}}{Inov} sau \frac{Pb_{f.inov}}{Inov} \quad (3)$$

where:  $E_{int.inov}$  - economical efficiency of phytotechnical branch intensification, taking into account means and technologies with innovational character applied, lei

$Pb_{f.inov}$  - raw profit obtained as a result of applying of technologies and means with innovational character, lei.

It would also be timely to select and promote the most efficient crops, plant varieties, hybrids creation, production of planting material, perfecting the technologies of cultivation and production with application of irrigating technologies systems with high and stable output bringing in the highest profit per agricultural lot unity with high efficiency and demand on the external and internal food market. It is also recomandable the implementation of power crops based on the world new technologies generating high maximum results, such as artichoke, autumn raps, as the realiest energy regenerable sources (bioethanol, biomass, biodiesel) presenting for Moldova Republic a great ecological and economical interest; the projects implementation with modern technologies for processes organizing of processing, preserving, packing, transporting, selling with high rewarding results; the consolidation and efficient utilization of own financial resources of selected enterprises of the physical persons involved in the project as well as the directionning necessity of considerable financial sources from the state part and attraction of foreign capital.

## CONCLUSIONS

Taking into account the actual tendencies of agricultural production developing based on innovational production technologies, the indicators that should characterize the intensivity level and intensification efficiency in phytotechnics that include technologies and means application with innovational character will permit a more exact appreciation of the intensivity level of vegetal production and economical efficiency of intensification. But in the practice the evaluation of these ones is difficult enough, because of identifying of technologies and means value with innovational character in the total sum of the fixed means of production and production current consumptions as well as the obtained results. In spite of the impediment, these indicators must be determined on the basis of analytic book-keeping as at the moment the innovations represent one of decisive factors of economical efficiency of phytotechnical production intensification. In specialized forms of agricultural enterprises is necessary to include natural indicators as: consumption of fertilizers, kg., use of organic fertilizers, t / ha, surface inoculated (fruit plantations), including mechanized processing complex partial and applying innovative methods and technologies, ha, standard conventional surface sown (fruit plantations) irrigated, ha, consuming work, man-hours, required for the analysis and identification of reserves to increase the process efficiency.

It is also necessary to integrate scientific and technical progress in agricultural development strategies that will help stimulate sustainable economic growth, made on a scientific basis, to take into consideration the overall objectives of mankind: conserving natural resources, promoting sustainable development of national economy and competitive, improving the social conditions of life and labor of the people, environment and so on. is necessary to perform adaptive technologies implemented with low production consumption. In this context, an important role in the technological chain occupies selection of new varieties and hybrids native

seedlings production under business specializing in regional profile, applying irrigation systems with high and stable yields.

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## ANALYSE OF THE STRUCTURE OF THE AGRICULTURAL FARMS BY SIZE AND THE SHARE OF THE LIVESTOCK AMONG THEM. AN ARGUMENT FOR MORE HELPING FOR THE SMALL FARMS

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### *Abstract*

*The paper analyse the structure of the agricultural farms by size especially the distribution and density of animals for each group of exploitation in order to establish the financial system of supporting them. That because more than 70% from the small households are now unfinanced but more than 90% of cattles, sheeps, goats, horses are bred in the small farms. At present in Romanian agriculture there is a tendency to develop great and very great farms taking into account the advantages of the scale economy. At the other pole there are over than 3.8 million small exploitations unfinanced or economically nonsustainable. Paradoxically the small individual peasant exploitations are those wich are preserving Romania`s livestock (all of it that it left): 91.7% of the cattle, over 97% of the sheeps and goats, between 62 and 65% of the pigs and poultry. Taking account that almost all livestock of romanian agriculture is bred in the small farms and the density per 100 hectare in these farms is more than ten times greater than in the very big farms is necessary to help prioritarly the small farms in order to rise their income and performaces.*

**Key words:** agriculture, distribution, farm size, livestock, performance

### INTRODUCTION

The exaggerated crumbling of the lands, as well as the existence of a number of almost four million so-called agricultural exploitations are considered to be the main causes for the lack of performance within Romanian agriculture. In terms of market economy, the performance signifies a large output per hectare and per animal, significant a high work productivity and a production destined for sale.

However, this appreciation is strictly economical, there being certain aspects which are neglected, such as the social role and the importance of individual households in sustaining, from an economic point of view, one of the most numerous rural populations among the European Union's countries.

The data presented in this paper reflect this situation and allow for the observation of certain trends as far as the future evolution of Romanian agriculture is concerned.

### MATERIALS AND METHODS

As far as the material is concerned, we used statistical data concerning the numerical and

dimensional evolution of agricultural exploitations during the period of transition towards a market economy, as well as data pertaining to the last agricultural census (2010). The method we used is the one used within economic research, which is based on statistical data: research of data according to the established goal, selection, analysis, grouping and commenting of the results, synthesis and conclusions.

### RESULTS AND DISCUSSIONS

#### *The agricultural exploitations in Romania. Juridical status and dimension*

According to data provided by APIA (The National Agency for Payments and Interventions in Agriculture), in 2010 in Romania there were 3,856 thousand agricultural exploitations, among which 2,740 thousand represented 71.1% out of the total and were not financed.

This first, most numerous categories comprise over a third of the country's agricultural lands. However, they do not ensure the income necessary for the sustaining of a

family but rather only play a very important social role in the economical sustainability of a rural population which represents almost a half of the country's total (Lup, 2012).

The second type of exploitations (over one million and with an average surface of around 3 hectares – from 1 to 10 hectares) is represented by the subsistence and semi-subsistence farms; representing 27.1% of the total, they own slightly more than 21% of the country's agricultural surface.

The next category includes commercial farms of over 10 ha which are economically viable (according to their profile) and which, although representing only 1.8% of the number of exploitations, own combined over 44% of the agricultural lands (table 1).

Table 1. The structure of agricultural exploitations in according to size and juridical status

Type of exploitation	Size class ha.	Number Thousands	%	Surface Thousands ha.	%	Average size ha.
Unfinanced households	under 1 ha	2,74	71.1	5,073	34.5	1.8
Subsistence and semi-subsistence farms	1-10 ha	1044	27.1	3,108	21.2	2.89
Commercial farms	over 10 ha	72	1.8	6,504	44.3	90.33
among which: - family	10-50 ha	(60)	(1.5)	(1,494)	(10.2)	(24.9)
- commercial societies	over 100 ha	(12)	0.3	(5,010)	(34.1)	(417.5)
TOTAL exploitations	-	3,856	100.0	14,685	100.0	3.81

Source: APIA, 2001 (5).

Within this category we noticed the subcategory comprising family farms, with surfaces varying between 50 and 100 ha and sizes compatible with the farms in the countries of the European Union. However, their number is the smallest, 1.5% of the total, while the used surface barely surpasses 10% of the country's fields.

As concerns the farms of over 100 ha, their status being, in general, that of commercial societies, they are quite negligible as number (0.3% of the total), but they exploit over a third of the agricultural surface of the country. This category also has subcategories according to the surface, there being five of them, the last two of which exploiting from 2,000 to 5,000 ha and over 5,000 ha (table 2).

The very large exploitations, of over 2,000-3,000 ha, raise certain concerns even for the European Commission, as they represent the main hindrance for the creation of reasonably sized farms which could be economically sustained at a family level.

Table 2. Commercial farms according to size

Size category, ha.	Number	%	Used surface thousands ha.	%	Average size, ha.
100-500	9,735	79.2	2140,0	42.3	220
500-1,000	1,697	13.8	1176,3	23.2	699
1,000-2,000	639	5.2	868,5	17.2	1,359
2,000-5,000	184	1.5	524,5	10.4	2,850
> 5,000	35	0.3	351,7	6.9	10,048
Total	12,290	100.0	5061,0	100.0	412

Source: APIA, 2010 (5).

There is even a proposal that states that from a certain size upwards these exploitations should not receive any more subventions, given the fact that their economic power is sufficiently large for them to be able to "manage" while realising decent profits without subventions.

Obviously, the supporters of such large exploitations dislike the idea and state that this measure might jeopardise the competitiveness of Romanian agriculture and that they themselves are those who pay the taxes and contribute to the growth of the state's income. One should bear in mind the fact that only 35 such genuine units own almost 352 thousand ha (an average of over 10,000 ha), among which there are also a few which exploit several tens of thousands each. ***Livestock importance in Romania's agriculture***

By consuming the grass in meadows and pastures, as well as a significant part of the main and secondary cereal production, in the branch of livestock breeding there are obtained aliments with a nutrient value superior to that of vegetal ones and which must account for at least 1/3 of the human daily diet.

From an economical point of view, the transformation of the vegetal production into products of animal origin, the latter being indispensable in the human diet, animal husbandry has many advantages.

That is why its ratio, in relation to the total agricultural production, is considered to be an indicator of the intensification of agriculture, in the end being capitalised in a superior manner the land resource. It is the case of most states with a developed agriculture, where the weight of animal production surpasses 50%.

In many countries, among which Romania as well, increasing the weight of animal husbandry for it to surpass 50% of the total agricultural production represents a strategic objective.

During the planned economy, the highest weight of animal production in terms of economic value was recorded in 1987, the ratio being 49.5%. In the period following 1989, the highest weight of animal husbandry was recorded in 2009 – 39.6%. In the years which are favourable to vegetal production, this ratio can drop to below 30%.

Taking into account the large surface of natural meadows (over 4.8% million ha) and Romania's agricultural profile mostly based on the production of cereals, the increasing of the weight of animal husbandry still remains a strategic objective which may be realised by increasing both the number of animals, as well as their productivity. At present, the values of both these indicators are among the lowest in the European Union. Our density of cows per 100 ha of field is 10 times lower than in the Netherlands, while the milk production per cow is 2.5 times smaller.

#### ***The structure of the livestock according to its owners in Romania***

During the socialist agriculture (1962-1989) there were made considerable efforts in order to increase animal husbandry by increasing both the number of animals, as well as their productivity; the latter goal was to be achieved by improving the races of all the main species: cattle, sheep, pigs and even poultry (table 3).

Table 3. The distribution of the main species of animals according to the economic and social sectors in the years 1989 and 2010

Specification		Cattle	Pigs	Sheep	Goats	Poultry	Horses
0		1	2	3	4	5	6
<b>1989</b>							
TOTAL	Thousands of heads	6,291	11,671	15,435	1,017	113,968	663
	among which: - national units	1,144	6,087	2,730	0	57,737	64
	%	182	52.5	17.7	0	50.7	9.7
- agricultural cooperative farms	Thousands of heads	3,065	2,250	5,516	0	14,849	172
	%	48.7	19.2	35.7	0	13.0	25.9
0		1	2	3	4	5	6
- households of the population	Thousands of heads	2,082	3,334	7,189	1,017	41,382	427
	%	33.1	28.6	46.6	100.0	36.3	64.4
<b>2010</b>							
TOTAL	Thousands of heads	1,985	5,387	8,386	1,237	78,867	604
	among which: - public sector %	170	1,833	234	27	30,273	6
	%	8.6	34.8	2.8	2.2	38.4	1.9
- individual exploitations	Thousands of heads	1,815	3,554	8,152	1,210	48,594	598
	%	91.4	65.2	97.2	97.8	61.6	98.1
- individual in comparison to 1989	Thousands of heads	-267	+220	+963	+193	+7,212	+171
	%	-12.2	+6.6	+13.4	+18.9	+17.4	+40.0
Density per 100 ha, public sector	Heads	2.9	31.1	4.0	0.46	-	-
	Density per 100 ha, individual sector	25.0	25.2	112.2	16.6	-	-

Source: Yearbook of Romania 1990 and 2011 (4).

During this period, the total number of cattle increased by 1,534 thousand heads (33.6%), the total number of pigs increased by 7,006 thousand heads (150%), the total number of sheep increased by 3,150 thousand heads (25.6%), while the number of poultry increased by 69,276 thousand heads (150%). In the same period, the milk production per foraged cow grew from 1,343 l/head to 1,892 l/head (10.6%), while the wool production grew from 2.0 to 2.4 kg/head (20%).

The lower productivity per animal was caused not only by the dysfunctions of the system, mainly the inadequate foraging and management, but also by the fact that a large number of animals could be found in the households of cooperative members or those of people in areas which had not been cooperative members. As far as the regular households were concerned, both the foraging conditions, as well as the race structure were far below the norms which permitted the obtaining of a reasonable production.

Nevertheless, the peasants, even if they did it out of necessity, deserve the credit for having preserved the livestock, unlike the commercial societies; many of these former national enterprises liquidated their livestock, opting for the field agriculture.

Leaving aside the fact that, compared to the last year of planned economy (1989), the number of livestock was greatly diminished, especially as far as the cattle were concerned (by almost three times), but also the number of pigs (by 53.5%) and sheep (by 45.7%), the peasants managed to conserve most of the country's livestock existing nowadays.

When the General Agricultural Census took place in 2010, most of the livestock – the remains of it – could still be found in individual peasant exploitations of subsistence and semi-subsistence.

The weight of this category in relation to the country's livestock in 2010 was of 91.4% for cattle, 97.2% for sheep, 97.6% for goats, and 98.1% for horses. Lower weight was recorded as far as pigs (65.2%) and poultry (61.6%) were concerned.

The explanation for the lower weight of pigs and poultry is simple: these species are mostly

bred for self-consumption, meaning that their numbers are relatively constant at a familial level, obviously higher than in the period before 1990.

On the other hand, the pigs and partially the poultry have once again become specific to mega-complexes which make use of best technologies and best genetic material; however, their production is mostly oriented towards export. The number of these societies is quite low; they own little or no land and they do not contribute whatsoever to the growth of the income of the rural population in the area because the highly developed technologies they use are characterised, among others, by a high level of work productivity.

As far as the density of the animals is concerned, in relation to the surface of agricultural lands, this density is considered to be one of the main indicators which reveal the intensity of the agriculture; the difference between the large commercial societies and the individual household is relevant but it does not favour the former. For example, as far as the cattle are concerned, while the large farms have a density of only 2.9 heads/100 ha, the individual households' density is almost 10 times larger (25 heads/100 ha). As far as the sheep and the goats are concerned, their density in small-sized individual farms is 28 times higher and 36 times higher, respectively than in large and very large exploitations.

The differentiated distribution and the different density of animals in the two types of exploitations influences not only the rational usage of foraging resources (especially the natural meadows), but also the economical sustainability of the rural population. In the large farms the animals are being bred in an overcrowded manner and placed punctually in the territory, while ignoring the distribution of natural foraging resources, the latter being much more uniform especially in hill and foothill areas.

The scale economy realised at a high technological level ensures an economic performance, but the obtained income is not distributed to include the rural population as well, but rather it remains in the possession of

the owners and of a small number of well-paid employers.

On the contrary, the small individual exploitations are situated within the territory in a much more uniform manner and in accordance to the distribution of natural foraging resources. More importantly, these exploitations practise a more diverse agricultural system by combining the cultivation of plants with gardening and livestock breeding and by using the cheapest form of labour: human workforce. Thus, such exploitations represent the pivot of the economical sustainability of a rural population of almost 10 million.

A relevant example as far as the role of the livestock in economically sustaining the rural population is concerned is the current method of distributing the livestock according to categories which refer to the size of the agricultural exploitations (table 4).

Out of the total of 3,856 thousand agricultural exploitations existing in APIA's records, 3,722 thousand (96.5%) are animal owners with one or two species. Characteristic to the peasant individual exploitations is the vegetal - animal mixed profile, which is normal for this type of exploitations whose main goal is to ensure as completely as possible the assortment of aliments necessary to the family.

Table 4. The distribution of the main animal species according to the size of the agricultural exploitations

Size of the exploitation	U/M	Exploitations owning animals thousands of heads %	out of which:			
			cattle	sheep	goats	pigs
Country total out of which:	Thousands of heads	3,722	726	271	176	1,649
	%	100.0	100.0	100.0	100.0	100.0
below 1.0 ha	Thousands of heads	2,009	176	70	48	757
	%	54.0	24.2	25.8	27.3	45.9
1-10 ha	Thousands of heads	1,621	517	180	97	851
	%	43.5	71.2	66.4	55.1	51.6
over 10 ha	Thousands of heads	92	33	21	31	41
	%	2.5	4.6	7.8	17.6	2.5

Source: Agricultural Census 2010 (3).

On the other hand, the obtained animal products very often surpass the family's needs, meaning that the former are destined to

be sold on the local intra- or inter-community markets. However, this kind of situation is normal because the small-sized individual exploitations are, in fact, families who need money too in order to acquire numerous products which cannot be produced in the household.

From the data presented in table 2 results that most of the country's livestock is owned by small and very small family farms: 95.4% of the cattle, 92.2% of the sheep, 82.4% of the goats and 97.5% of the pigs. On the whole, out of a total of 3,722 thousand animal-owning farms, 3,630 thousand units (97.5%) are small and very small exploitations, below 10 ha. Even the very small exploitations – below a hectare – are animal owners, their number accounting for 54% of the total. These households breed more than 3/4 of the number of cattle's, sheep's and goats and almost half of the number of pigs.

An important place within the alimentary and economical sustainability of family farms is occupied by cows the latter being mostly bred in rural households by peasant families (table 5).

We can notice that almost 60% of the number of cows and heifers are being bred in small-sized family exploitations, with 1-2 cows per exploitation and that, together with the exploitations that breed an number of 3-5 cows, they basically own 4/5 of the total number of cows and heifers in the country.

Table 5. The dimensional structure of exploitations which breed cows giving milk and heifers (2010)

Size of the exploitation	Total sectors				
	Number of exploitations	% of the total	Number of animals (thousands)	% of the total	Number of animals per exploitation heads
TOTAL	761,528	100.0	1,396.9	100.0	1.8
1-2 heads	664,713	87.27	830.1	59.4	1.3
3-5 heads	77,221	10.14	263.9	18.9	3.4
5-10 heads	11,560	1.52	83.4	6.0	7.2
10-100 heads	7,737	1.03	162.9	11.6	21.1
over 100 heads	297	0.04	56.6	4.1	190.6

Source: Ministry of Agriculture and Rural Development, 2010 (6).

On the agricultural whole, the number of cows and heifers is very low, the density being of 9.5 heads/100 ha; more than 20 times lower than in some states in Western Europe.

For the national economy in general and particularly for the agriculture, this situation is totally dissatisfactory. On the other hand, the fact that most of the cows are being bred in peasant households largely contributes to the economical sustainability of this category of exploitations, which basically represents a large number of families in the rural area. With a role in the economy of agriculture and the economy of the state that can hardly be neglected, the livestock owned by peasant family farms is an important factor on which the survival of a significant part of Romania's population still depends.

## CONCLUSIONS

The exaggerated crumbling of lands and the existence of a large number of almost 4 million agricultural exploitations are considered to be the main causes for the lack of technical, economical and production performance in Romanian agriculture.

The process of grouping the lands and creating exploitations of sizes which are viable from an economical point of view at a family level is relatively slow and without much potential. In the period 2002-2010 the total number of exploitations diminished from 4,485 thousand units to 3,856 thousand, while the average surface per exploitations increased from 3.11 ha to 3.45 ha.

A serious problem is represented by the situations of subsistence and semi-subsistence individual exploitations, whose number reduced during the same period from 4,462 thousand units to 3,826 units, while their average surface increased from 1.73 ha to 1.95 ha, which is totally insufficient for the economical sustainability of a family.

At the other pole there are the mega-exploitations of large and very large sizes, with an average of over 10,000 ha/unit, which realise an agriculture of a high performance, but which have no impact whatsoever upon the income of the rural population that constitutes the majority in the respective areas.

Paradoxically, the small individual peasant exploitations are those which are preserving

Romania's livestock (all of it that it is left): 91.4% of the cattle, over 97% of the sheep and goats, between 62 and 65% of the pigs and poultry.

As far as the limit regarding the economical size which would ensure a number of 12 average wages is concerned, it would be equivalent to 3.5-4.0 UDE (€1,200), fitting into the second category of economical size of the agricultural exploitations (small exploitations).

Free labour, the usage of all the household resources and the vegetal-animal mixed profile permit small-sized peasant exploitations to obtain a larger income per surface unit, the case being entirely different for larger exploitations.

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## INTERDEPENDENCE BETWEEN SUSTAINABLE DEVELOPMENT AND HUMAN HEALTH

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**Key words:** human health, human development, quality of life, sustainability

### Abstract

*Sustainable development in Romania can be achieved only through consensus orchestrated prioritizing people's attitudes and values. In order to achieve a maximum performance, cultural change must precede structural and functional changes, such an approach leading to a lasting transformation. Cultural change is not about social traditions, history, language, art, etc., But those on the behavior, mentality, attitude towards work, economy and society. Sustainable development have to mean quality and achieve only limited natural capital, social and anthropogenic own or attracted. A drawing resources must be addressed by cost and their global rarity. Sustainable development for Romania, represents the effective management of resources in the national competitiveness and national foreign goods and services. Human health suppliers, health organizations that offer health services and those who need these services, meet on a market, called health services market, whose mechanism has features different from the other markets, not only from the point of view of the two forces, demand and supply, but also from the third party who pays. In the context of globalization, human development, defined as a process of people's expanding possibilities to choose, cannot exist without an appropriate health. People often make choices in the economic, social and political fields, situated in the centre of development policies. From the human health perspective, attention is aimed at quality of the economic development, and not quantity, in three critical domains: expectation and quality of life, educational level and access to all the necessary economic resources in order to lead a decent life.*

### INTRODUCTION

A look at economic life broken from life environment, the lives of people, families and communities, organizations and institutions, life actually means not to understand that economics is a living system constantly changing and evolving "addicted to changing ecological and social systems in which embedded" (Capra, 2004).

The one who first used the term "sustainable development" was Prime Minister of Norway, Gro Harlem Brundtland in 1987. Then, as chairman of the World Commission on Environment and Development, he presented the report "Our Common Future," which defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

Although sustainable development was initially meant to be a solution to the

ecological crisis caused by the intense industrial exploitation of resources and environmental degradation continues, it seeks primarily to protect environmental quality, sustainability now expanded concept of quality of life in complexity, and economically and socially.

Declaration of Rio de Janeiro in 1992, expressing the political will of ONU member states to take part in the global transition to a sustainable development model.

Declaration includes 27 principles that are the basis of sustainable development.

Under Principle 1, people stay in the center of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.

Widely accepted viewpoint is that of sustainable development, seeking the interaction and compatibility of four systems: economic, human (social), ambient (environmental or ecological) and technology.

Framework of global change, changes in socio-economic landscape, means adapting to uncertainties.

Of the many challenges in the economy and society, remember a few important: First, in most of the world is born a new work culture. In developed countries shift from industrialized to the post-industrialized society, which is associated with decreased acuparii blue collar industry, employment growth in the service sector, increasing employment insecurity and weakening of the importance of work as a means of achieving. The emergence of the knowledge society and knowledge-based work is a recurring theme in economic restructuring and globalization.

The new work culture, the speed of adjustment that needs to be quick and contradictions process are high, with unexpected influences on the human individual, his health.

There are big changes in how individuals and families concerning employment, career and employment security that derives from. They are faced with new concepts like "dezocuparea", which defines the forced retirement, early, without the possibility of reemployment.

In developed countries, people have only one job or career to retirement, but have some succession or simultaneously. The implications of these challenges on human health are major course, they both physically and mentally demanding human individual. Addressing the major contemporary issues caused by multiple interacting processes and phenomena of economic, political, social, cultural, ecological, called generic-globalization - is inextricably linked to the human factor, the complete well-being, physical, mental and social well-meaning human health.

Every day, the world is increasingly aware of the need to look at the health of our joint perspective on new reconstruction of human society. Being in complete interdependence with other forms of health: the environment, communities, organizations and institutional human health is seen in the present work, both as a commodity and as a capital good, the unity

of these two features giving and uniqueness. The effects of globalization have forced consideration of the impact on human health Human Health Index. Especially foreign studies, highlight that human health and the environment, must reflect the entire evolution of economic and social life. Man, as biological and social beings is primarily phone, meaning a conscious life form that follows, as Mircea Eliade, ascension, celebration of life lived.

Man as a biological and social is the second means, which is a conscious form of race that is looking for the most effective ways to achieve goals, normal or abnormal in a given time and under certain conditions of existential space.

The study of human health in the perspective of sustainable development is done in a period characterized by a state of deep crisis that affects all areas of global economic and social, national and international institutions, advance our common equilibrium constants. In this respect, we agree with the view expressed by physicist Fritjof Capra as the last decades of the twentieth century and the twenty-first century find our common evolutia a "crisis complex multidimensional facets whose touch every aspect of life our - health and livelihood, environmental quality and social relations, economics, technology and politics. It is a crisis of intellectual dimensions, moral and spiritual crisis of a magnitude unprecedented in human history. For the first time we have to face the very real threat extinction of the human race and all life on Earth. "Interrelation human health-conscious that sustainable development carries with it the signs of progress in scientific knowledge, which constantly revolutionizing the means in man's struggle with resource constraints, uncertainties evolution, human injustices, age shortcomings and imperfections Community democratic institutions, we conducted our analysis and under the requirements expressed by Pope John Paul II embodied in the question: progress or threat?

We present the quintessential question in the following passage: "Developing technology and advance our civilization, marked by technical mastery, demand a proportional

development of moral and ethical life. Unfortunately, the latter seems to always be left aside. Certainly progress is wonderful and it's hard not to see him as authentic signs of man's greatness ..., however, the same progress can not give birth to many anxieties. The first essential and fundamental issue restlessness, this progress, whose author and defender is man, human life on earth << is it more humane >> in all respects. A man is more worthy? We can not doubt that it is better in many ways.

However, this question lies with obstinacy on what is essential: the man, the man, the content of this progress, it becomes something truly better, or more mature spiritually, more aware of the dignity of his humanity, particularly against for the needy and weaker, more willing to give and help everyone? .. here it is rich and highly developed societies - while other companies, or at least most of them suffer from hunger and many people die every day of starvation and malnutrition. In parallel, some abusers, somewhat of freedom, which is directly related to an uncontrollable craving for moral consumption and even limited freedom that abuse others, that those who suffer from significant shortcomings and are dragged into the conditions of misery and poverty still more ... development is not a linear process, cvasiautomat unlimited as the human race itself, in certain circumstances, should rush forward towards some kind of endless perfection ... with an underdeveloped mess that has become intolerable We are facing a kind of overgrowth as inadmissible because as underdevelopment, is contrary to the true good and true happiness(Alexander, King from foreword to work Limitele certitudinii, Orio, Giardini; Walter, R. Stahel Editura Edimpress-Camro, Bucuresti, 1996, p. 43).

## MATERIALS AND METHODS

### The relation between health and economic development

Passing on to a narrower point of view, we have analyzed eight European Countries, all of them members of the European Union – France, Germany, Italy, Poland, Romania, Slovakia, Sweden and the United Kingdom.

The difference between them, besides population, surface of the territory and other social indicators, resides in their economic development.

Our intention is to point out the relevance of the health indicators in analyzing the macroeconomic environment of each country.

## RESULTS AND DISCUSSIONS

The most used and relevant health indicators are:

- life expectancy at birth and its derivative – healthy life expectancy at birth;
- mortality rate – adult mortality rate, infant mortality, maternal mortality;
- mortality causes;
- years of life lost.

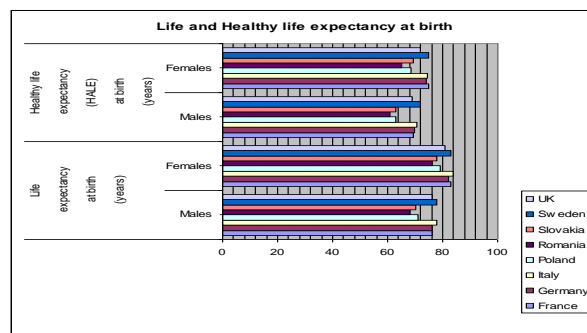


Fig.1. Life and Healthy life expectancy at birth  
 Source: WHO

Life expectancy at birth and healthy life expectancy as birth indicators show that women tend to live longer than men and place Italy and Sweden at the top among the eight countries, while Romania and Poland are situated last.

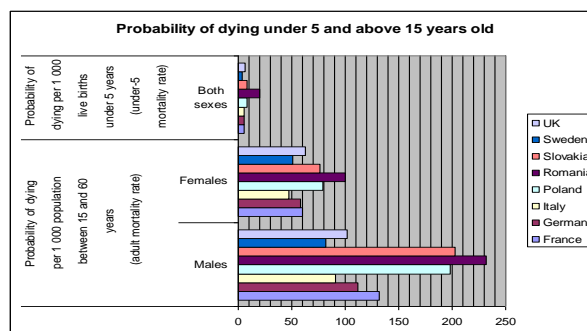


Fig. 2. Profitability of dying under 5 and above 15 years old  
 Source: WHO

The adult mortality rate, for both males and females place Sweden and Italy best, with the lowest rates. At the other end, Romania, Poland and Slovakia rank last, with a high rate of adult mortality. Infant mortality rate maintains the same order among the eight countries that we are analyzing.

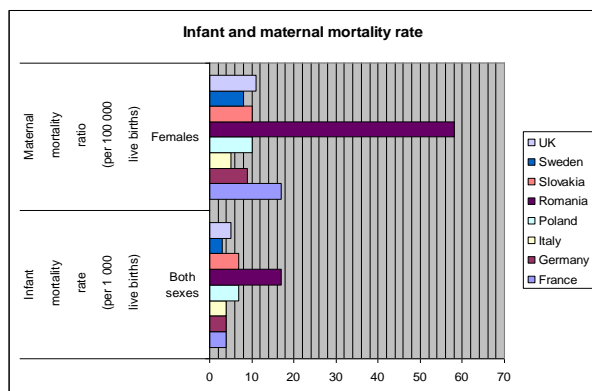


Fig. 3. Infant and maternal mortality rate  
 Source: WHO

Regarding the infant mortality rate, Sweden ranks best with only 3 deaths per 1000 live births, followed by France, Germany and Italy with 4. Situation changes a little when looking over the maternal mortality ratio: Italy leads with only 5 deaths per 100 000 live births, followed by Sweden with a number of 8 deaths of mothers per 100 000 live births. Last places for both this indicators are occupied by Romania.

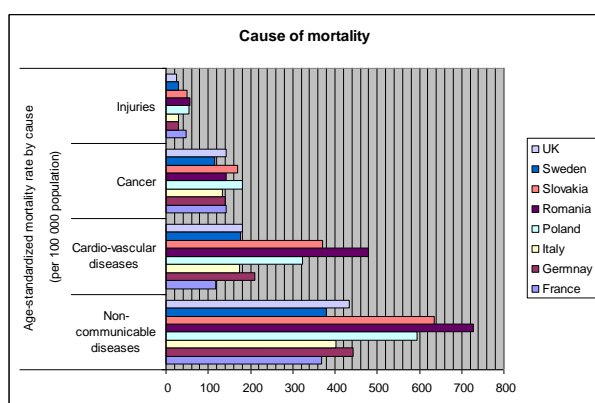


Fig. 4. Cause of mortality  
 Source: WHO

The causes of death have been divided into four major groups which are the most relevant for our analysis: non-communicable diseases, cardio-vascular disease, cancer and injuries. The highest number of persons dead of non-

communicable diseases is found in Romania, while the smallest in France. Cardio-vascular diseases killed 118 people in France and 479 in Romania. Surprisingly or not, the lowest numbers of persons killed by cancer are found in Italy and Romania, while Slovakia and Poland rank last, with 170 and 180 persons per 100 000 population. Injuries killed 26 persons per 100 000 population in the UK and 56 in Romania.

The years of life lost causes are divided into three broader groups: injuries, non-communicable diseases and communicable diseases. Each of these categories has a different share in the total, according to one of the eight countries, as shown in the following chart:

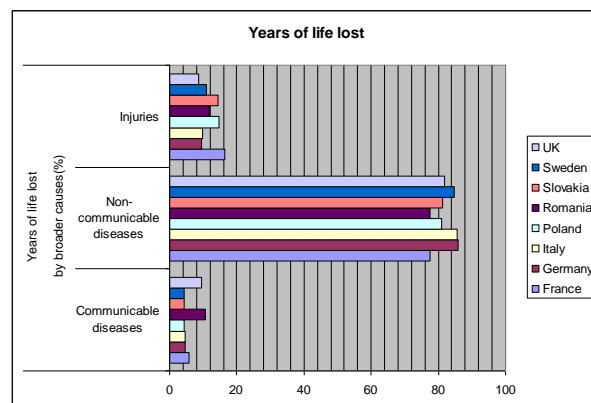


Fig. 5. Years of life lost  
 Source: WHO

Health indicators are relative. We cannot draw a correct conclusion without comparing health indicators to the macroeconomic indicators and see to what extent the latter influence the first ones.

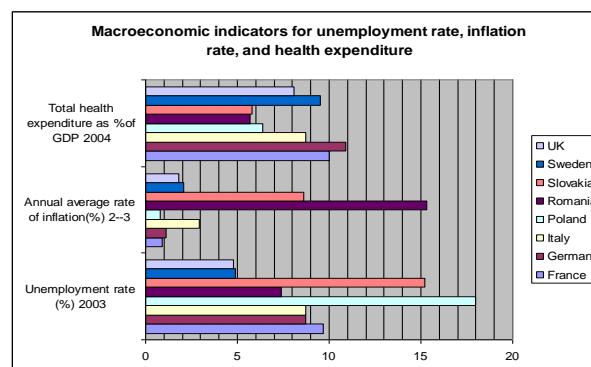


Fig. 6. Macroeconomic indicators for unemployment rate, inflation rate and health expenditure  
 Source: WHO

This chart clearly shows that the highest unemployment rate was found, for 2004, in Slovakia, while the lowest in Sweden and the UK. On the other hand, the annual average rate of inflation was highest in Romania and lowest in Poland and France.

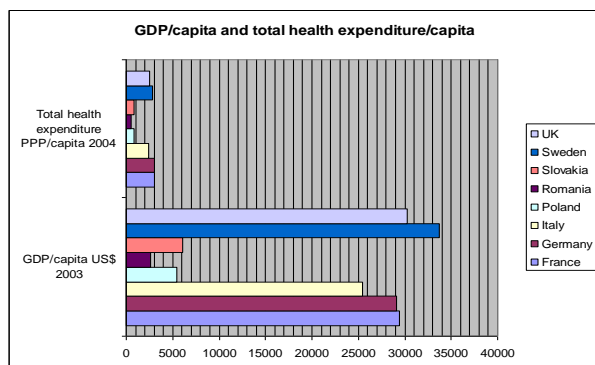


Fig. 7. GDP/capita and total health expenditure/capita  
 Source: WHO

The highest values for both indicators were found for Sweden and the lowest values for Romania.

Despite some small variation in ranking, the country that has the best macroeconomic indicators – Sweden – has also the smallest mortality and health affection rates. At the opposite end, Romania has shown high values for the mortality rate indicators and small values for the gross domestic product, GDP/capita and health expenditure/capita.

Therefore, we are entitled to maintain and emphasize the affirmation that health and economy are intercorrelated, and that the relation between them is reversed. If the economy of a country improves and develops, then more money can be invested in health, and by consuming health more money can be invested in the economy. Unfortunately, as shown by the charts, there can always happen the other way around. A poor economy leads to precarious health of the population. That is why developed countries have healthier population while in poor countries the indicators show less healthy population.

Special attention should be paid to developing countries, such as Romania, because the cost of transition from one type of economy (centralized) to another (open economy and markets) includes not only cutbacks in the population's income but also affecting the

population's health, which may lead to a vicious circle that could last in time.

## CONCLUSIONS

1. The concept of sustainable development means all forms and methods of socio-economic development, whose foundation is the first to provide a balance between the socio-economic systems and the natural capital items.
2. Sustainable development, chasing and trying to find a stable theoretical framework for making decisions in any situation, in which is found a report type man / environment be it environmental, economic or social.
3. For Romania, as a member state of the European Union, sustainable development is not one of the possible options, but the only rational prospect of becoming national, resulting to establish a new paradigm of development by the confluence of economic, social and environmental.
4. Health is a "good" price to be protected and a key area of sustainable development.

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## THE AUDIT OF RECEPTION PROCESS

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### Abstract

*The object of study case is to analyze the quality of the logistics department, focusing on the audit process. Purpose of this paper is to present the advantages resulting from the systematic audit processes and methods of analysis and improvement of nonconformities found. The case study is realised at SC Miele Tehnica SRL Brasov, twelfth production line, and the fourth from outside Germany. The specific objectives are: clarifying the concept of audit quality, emphasizing requirements ISO 19011:2003 "Guidelines for auditing quality management systems and / or environment" on audits; achieving quality audit and performance analysis; improved process performance reception materials; compliance with legislation and auditing standards applicable in EU and Romania.*

**Key words:** analysis, logistics, management systems, quality audit

## INTRODUCTION

Quality audit: According to ISO 9000 [1], auditing is a “systematic, independent and documented process for obtaining audit evidence and evaluating them objectively to determine the extent to which audit criteria are fulfilled”. The audit evidence may include registration, stating facts or other information that is relevant to the audit criteria and verifiable, and audit criteria are considered procedures, policies or requirements ensembles.[2]

**The main purpose** of quality audit is to detect deficiencies quality management system and the need to initiate some corrective activities to eliminate weaknesses, as well as opportunities to improve company quality system, its processes, products and services offered.

**The evaluation result** contains opportunities for improvement that should be the common point of view reached by audit partners (the auditor and the audited). The result will be submitted for management review process, where it will return the process owner with the necessary resources (money, time, personnel) to implement actions.

## MATERIALS AND METHODS

In order to set up this paper, the main information were taken from Miele Technica regarding reception process.

The audit procedure was the modern one in force. Making internal audit quality is regulated by the procedure "Internal Audit", one of the mandatory procedures. In the development process are the requirements of ISO 9001, cap.8.2 and ISO 19011 - Guide for quality and environmental audits.

## RESULTS AND DISCUSSIONS

**Miele in Romania.** Miele activity in Romania started in 2007, with the opening of the first mono-brand show room Miele in Bucharest. In 2009 it opened a new factory for the production of appliances components in Romania Braşov, in 2010 opens the second show-rom in Arad, and in 2011 the third store in Romania in Braşov.

Miele Tehnica Braşov is the twelfth production line of the company and the fourth outside Germany and currently has about 100

employees, the number will reach 300 in the coming years.

The main activity is manufacture of electronic components (modules) corresponding CAEN code 2611.

Quality orientation is reflected in the fact that people from Miele Tehnica implemented SMC – ISO 9001:2008, SMM– ISO 14001:2004, SMRS – ISO 8000:2008.

### Organization of logistics at SC Miele Tehnica SRL

Currently, university environment and business considers logistics as a strategic resource of the organization, a source of competitive advantage, a power that connects the enterprise with its customers and suppliers through two interrelated streams - that of the goods and the information.[3]

Logistics concept translates into saving materials, including all steps of the manufacturing process.[4]

At SC Miele Tehnica, is a separate logistics department, which has 3 functions: a) Planning materials and supplies; b) Materials Management - receiving goods, packaging management, commissioning, internal transport, delivery and external transport and c) Replenishment

In terms of spatial organization, logistics department structure is as follows:

Area 1 - there is reception and dispatch of goods, here are situated and ramps for truck access sites

Area 2 - is the location management

Area 3 - there takes place the preparation of materials for production

Area 4 - is the area where the workers takes the necessary materials from supermarkets

In the following figure gives the organization and the flow of materials logistics department at SC Miele Tehnica.

Making internal audit quality is regulated by the procedure "Internal Audit", one of the mandatory procedures. In the development process are the requirements of ISO 9001, cap.8.2 and ISO 19011 - Guide for quality and environmental audits.

Quality audits are planned in each component of SMC being subject to internal audit at least once a year. This will ensure timely detection

of potential nonconformities in relation to requirements of standard reference or other internal or external documents.

Below is showed the audit process from SC Miele Tehnica, which includes 3 stages: preparation of the audit, the audit itself and the conclusion of the audit.

Organization and material flow logistics department at Miele Tehnica can be seen in the Fig1.

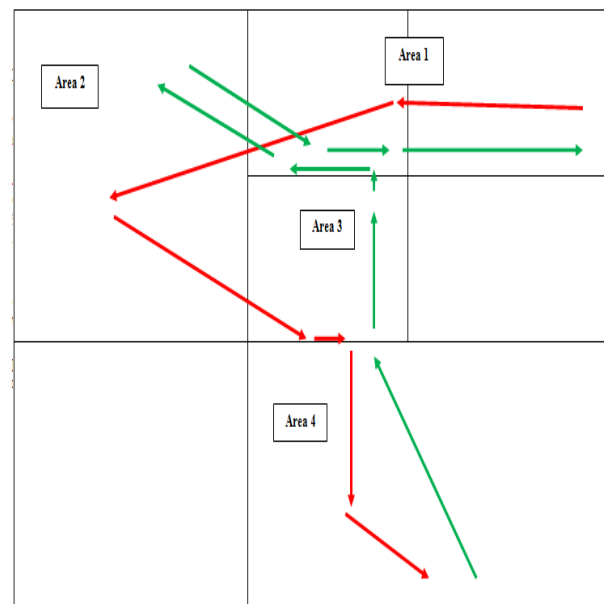


Fig.1. Organization and material flow logistics department at Miele Tehnica

#### Legend:

- Area 1 receipt of the goods / shipping / access ramps for the lorry
- Area 2: management locations
- Area 3: preparing of production materials
- Area 4: Shop Floor (Supermarkt & Line Side Rack)
- Components
- Finished electronics

Audit preparing meant: training team members study documents relating to the audit, preparing / development of working documents, communication with the audit client. Instruments represent questionnaires, interview guides and checklists, which help the auditors to obtain information about the process.



Table 1 Process audit plan

Hour	Activity
9:00	1. Opening session Analysis of the audit program
9:15	2. Review of process indicators Complaints, internal nonconformities Previous nonconformities
9:45	3. Qualification of staff
10:15	4. Storage conditions
10:45	5. How we work
11:30	6. Closing Meeting Presenting the results

**Proposal to improve** After finishing the audit, are detected nonconformities and causes that have generated them, and scoring.

Table 2. Nonconformity Report

Nr.	Description of nonconformity	Causes	Description of corrective actions
1	For the materials with special storage conditions are not shown instructions describing how their handling and storage are taken (e.g. MSD: Moisture Sensitive Devices, have no warning, it is based on the experience of warehouse staff)	Process was implemented as in Germany, the staff training was made, there is no documentation	The process will be documented by an instruction, training staff will also be documented by instructions
2	Raw material which has a special packaging (eg vacuum) are not inspected at the reception	Process was implemented as in Germany, the staff training was made, there is no documentation	The process will be documented by an instruction
3	There are not instructions for materials stored in special conditions	Process was implemented as in Germany, the staff training was made, there is no documentation	The process will be documented by an instruction
4	Returning materials in the production area are identified only with easily removable labels. There is a possible risk of mixing products that are placed on the same pallet	There is only one location where the labels are put	Setting of areas for labeling of each lot
5	Qualification matrix is not updated (eg Ianu Serban is not included in the matrix) while that person knew very well how to work and job requirements	The person is still in the training and evaluation has not been completed in time	Qualification matrix will be updated. Training procedure will be updated to specify when a new employee will be placed on qualification matrix

At set intervals, quality manager and logistics manager, meet for management sessions to review the preventive and corrective actions, and evaluate their efficiency.

Miele internal audits are conducted in a planned technique are documented and their purpose is to verify the conformity activities

related to quality regulations. Through these audits Miele technique has two aspects, the processes to be stable and continuous improvement of quality.

To check whether the quality activities and audit results are in agreement with plan, and to evaluate the efficiency audits each year, the logistics department is reviewed by internal auditors.

Those auditors have no responsibility inside the compartment. Result of the audit is transmitted logistics manager, which communicates to all involved.

## CONCLUSIONS

The case study show off how the Miele Tehnica achieved continuous process improvement, starting from solving internal audits. For this are used instruments such as questionnaires, interview guides or checklists, standard forms for reports of noncompliance, methods of analysis and improvement.

## ACKNOWLEDGMENTS

The authors address their thanks to Miele Technica for its support in collection information in order to set up this paper.

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## LOCAL FOOD SYSTEMS DEVELOPMENT IN THE REPUBLIC OF MOLDOVA: CHALLENGES AND OPPORTUNITIES

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### Abstract

*The main challenge of the food sector in the Republic of Moldova is to identify specific needs and opportunities for agriculture and rural development throughout food supply chains, and focusing investment in areas where the most impact will be made. The identification and allocation of resources requires analysis of main dimensions of food supply chains, in order to establish links and determine local factors. In small transition economies the diagnosis of the food supply chains, is typically based on limited data and incomplete information. In order to investigate the actual state of food supply chains were used specific methods and techniques: statistical and economic analysis of macro-economic indicators, semi-structured interviews of key stakeholders, analysis of the impact of public policies on the agro-food sector. In the article is analyzed the process of food systems formation and integration at the local and global level. Although it is a small part of the overall agricultural sector, various local food systems are under development in the Republic of Moldova. These systems bring consumers in close contact with farmers and mobilize them to support local farms and sustainable farming practices. While local food systems continue to face many barriers, many of them show considerable potential for growth.*

**Key words:** agriculture, food processing industry, local agro-food systems, food markets

### INTRODUCTION

The purpose of this paper is to present an analysis of the socio-economic environment of the local agro-food production systems, and challenges and opportunities for their development.

During the last decades the food production, processing and consumption in the Republic of Moldova has been changed significantly both at the local and international levels.

In agro-food systems, many international companies have organized their production in developing and transition countries in order to be more competitive on the global market.

This process is accompanied by positive and negative effects which can influence the welfare of the local population and the sustainability of the national agro-food sector.

At the same time, local production systems are competing on the external and internal markets by producing specific quality goods, through a more efficient use of local resources and rapid adjustment to changing market requirements.

As a result, a wide range of local agro-food systems has occurred, ranging from simple local food suppliers to more export oriented food industries. These systems are developing according to availability of local resources such as land, water, climate conditions, production costs, labor force, and the localization of internal and external markets.

In this perspective, local agro-food systems become the focus of the analysis in order to evaluate the level of sustainability and necessary policy requirements.

The challenge for the Moldovan agro-food sector is to identify specific agricultural and rural development needs and opportunities across the local agro-food systems, and to focus investment on those where the greatest impact will be achieved. This identification and resource allocation process can be facilitated by analyzing the main unresolved issues concerning the factors influencing their dynamics and effects, at both local and international level [0, 0, 0, 0, 0].

## MATERIALS AND METHODS

Responding to the need for new methodological approaches in agro-food research we employed in-depth qualitative, survey and case study research, to analyze the local agro-food production systems.

A central objective of our study was to understand and characterize the local and regional aspects of the food systems in the Republic of Moldova. Our research methods were multi-faceted, including:

- 1) historical research on the agricultural development,
- 2) in-depth interviews with agro-food network actors,
- 3) analysis of the available statistical data, and
- 4) case study approach.

The research was focused around three main topics: development of the agricultural sector, processing industries and local food markets. Constraints and opportunities for local agro-food systems that are faced by small farmers and processors were described.

A case study on the development of the local dairy production system that creates new relations between producers and consumers and provides food security was elaborated.

## RESULTS AND DISCUSSIONS

Since the beginning of the XXI century one can observe a very high level of changes in agro-food systems, globally, as well as regionally and locally. An agro-food system includes a set of activities and relationships that interact in order to determine the type, quantity, methods and actors involved in the production, processing, distribution and consumption of the food.

Food systems include not only aspects of food production, but also preparation of farm inputs, processing, distribution, access, use, and recycling of food wastes [0].

Accelerated growth of the food industry in developing and transition countries involves certain risks related to equity, sustainability and inclusion.

Given an unbalanced market power in the food chain, value addition and capture can be

concentrated on one or a few participants of this chain in the detriment of others.

Food industries can be sustainable only if they will be competitive in terms of costs, prices, operational efficiency, product offerings and other associated parameters and if prices paid to farmers will be remunerative.

Global transformation and upgrading of agro-food sector faced many challenges over time. Countries with economies in transition were involved in complex processes of transformation of political and economic systems.

In these countries, the liberalization of exchange rates and prices, and privatization of farms and enterprises caused a collapse of the system of vertical coordination and significant disturbances in the agro-food chain [0].

Disruption in relations between farmers, input suppliers and food companies also resulted in severe constraints faced by many farms in accessing essential inputs such as feed, fertilizer, seed, capital, etc.

Also in many countries with economies in transition privatization and market liberalization led to a decline in the supply of inputs and credit to farms and disrupted agricultural activity of several state-controlled institutions, agricultural and consumer cooperatives and processing enterprises [0].

In the case of Moldova, the results of the reforms have still not reached initial expectations. Currently, Moldova remains dependent on agriculture, which contributes about 12% to GDP. More than 30% of the country's working population is employed in agriculture and food sector.

Agriculture is one of the key driving forces in shaping Moldovan landscape, nature and culture over centuries. Favorable climate and high quality soils historically have determined Moldova's agricultural specialization, particularly in the production of high value crops like fruits and vegetables.

The status of the agricultural sector has changed dramatically over the last two decades along with the disruption of production and distribution networks. Land areas used for high value crops have been reduced more than twice. The shift in

production has also been accompanied by significant reductions in land productivity.

This situation is directly related to lack of investments, capital and credit availability to the agricultural sector, factors that have resulted in farmers applying low yield technologies and drastically reducing their use of agricultural inputs, especially such as fertilizer and other agricultural chemicals. The agricultural sector benefits with only 11.1% of capital investments, and the foreign investments in the Moldovan agriculture are even more modest, with only 4.4% of total investments in agriculture in 2011 [0].

Agriculture and food industry play the main role in the food security assurance and export growth. At present the competitiveness of the agro-food sector of the Republic of Moldova is insufficient and depends considerably on institutional and market risks.

Despite of the problems related to the transition period the food industry has maintained its importance. Thus food processing and beverage industry contributes with almost 50% of the total processing industry production [0]. At present in this sector activates several hundreds of companies and specialized units. The most important companies are concentrated in domains of vine production, fruit and vegetables processing, meat production and processing and dairy production.

Agriculture is divided into two distinct sectors: the commercial and the subsistence one. The vast majority of people engaged in agricultural work in small scale subsistent farms.

Following challenges and constraints affect the development of the product value chains in the agro-food sector of Moldova:

- a) low productivity in agriculture,
- b) brain drain from rural areas, and
- c) reduced efficiency of the energy sector.

**Low productivity in agriculture.** Subsistence farms provide a considerable part of agricultural production both in plant production (Table 1) and animal husbandry (Fig. 1).

Cultivation methods among subsistence households and peasant farms remain

traditional, with a low level of mechanization and productivity.

Table 1. Share of households and peasant farms in total agricultural plant production, 2007-2011, %

	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 beans	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
Vegetables	80,2	78,9	84,5	83,9	84,0
Fruits and berries	52,1	50,5	57,9	59,8	62,2
Grape	80,0	77,8	79,7	85,7	78,6

The agricultural sector is highly dependent on climatic fluctuations. Inefficient agricultural systems, underdeveloped market structures, extensive land parceling are just some of the factors that determine the insufficient potential for delivering sustainable primary agricultural product in the framework of the value chain.

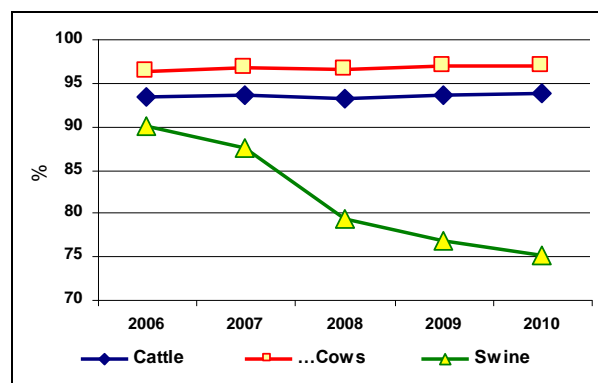


Fig.1. Share of households and peasant farms in selected animal production, 2006-2011, %,

Absence of highly productive agricultural technologies has led to land degradation due inobservance of crop rotations, soil erosion, deforestation, and limited technology adaptation to climate changes.

**Brain drain from rural areas.** The first waves of emigration took place in the early 80's of last century. From that time until the present the active population decreased by

about one third, and in recent years the rate of reduction of the active population averaged 2.8% annually. The state of the active population in 2011 was 1,257,000 people, including people employed - 1.173 million and 84 thousand unemployed.

From the Republic of Moldova emigrate mainly professional trained persons of working age due to the fact that developed countries impose additional selection criteria for immigrants such as health status, age, state of the criminal record, general and professional education, knowledge of languages etc.

As a result is deteriorating the demographic situation and the genetic potential of the country, it increases staffing problems of industrial and agricultural enterprises. In particular there is a lack of highly qualified teachers, especially in rural areas.

**Low efficiency of the energy sector.** At present consumption structure of the electricity in the Republic of Moldova is dominated by public consumption - about 35% and about 30% is industrial consumption. Other sectors of the economy such as agriculture, construction, transport and so on, play an insignificant role in the structure of the energy consumption.

Energy efficiency in Moldova is very low and is almost 3 times lower than in European countries. This leads to a substantial increase in energy costs.

Currently, there are following constraints for raising energy efficiency in Moldova:

- High energy consumption, which contributes to increased energy intensity;
- Increasing energy prices;
- Technologies and equipment is morally and physically outdated;
- Lack of knowledge and skills in energy efficiency and renewable energy resources;
- Excessive dependence on energy imports (95% of the country's energy is imported).

The value added to the agricultural raw material is very small. Domestic agricultural production and exports are mainly specialized in raw materials and semi-finished food products. Thus, comparing the output of the food industry and production of the agricultural raw materials one can observe that in relation to each lei of agricultural

production occurred only 0.63 lei of food industry production in the year 2011, which is lower than the level of this indicator during the 90<sup>th</sup> years of the last century. Moreover, this indicator has a decreasing trend during the last years, confirming the process of stagnation in the food industry (see Figure 2).

The competitiveness of the food industry is directly affected by outdated technologies, which do not allow the efficient use of energy resources. In turn, the low efficiency of the energy sector of the Republic of Moldova has a negative impact on the development of processing industry for agricultural raw materials.

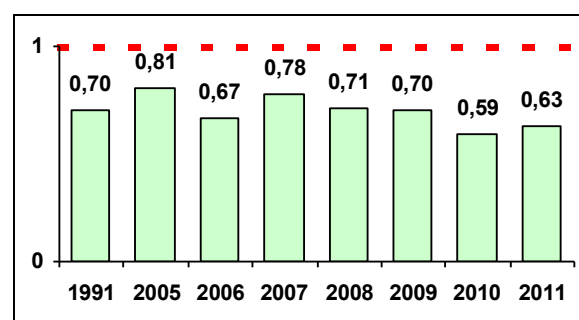


Fig. 2. Ratio between the production of the food industry and total agricultural production, 1990-2011

Traditionally the food processing industry of the Republic of Moldova was divided in two groups, namely the first one represented by large scale food processing plants, oriented mainly toward export markets and the second one supplying the local markets.

During the transition period a significant changes have taken place. Thus a large part of the export oriented food industries such as "Processing of fruits and vegetables", "Sugar production", "Production of alcoholic distillates" and "Vine production" that encompass mostly large scale enterprises, have suffered a serious decline (see table 2).

At the same time in different rural areas, predominantly in suburbs have appeared a impressive number of small and medium scale food business operators dealing with a wide range of food products such as "Production and processing of meat and meat products", "Production of bread and bakeries", "Production of cacao and chocolate products",

“Dairy products”, “Production of mineral water and soft drinks” etc.

These industries that are oriented mostly toward local markets show an increasing trend during the last years (Table 3).

Table 2. Declining and stagnating food industry sectors, 2007-2011, 2005=100%

	2007	2008	2009	2010	2011
Tobacco products	72.4	62.4	72.6	94.4	100.2
Processing of fruits and vegetables	115.5	109.2	84.0	84.3	80.5
Sugar production	55.6	98.7	36.5	91.3	71.0
Milling and starch production	95.1	105.0	88.6	79.7	71.0
Production of alcoholic distillates	50.1	53.0	42.0	46.7	56.9
Vine production	36.3	45.2	35.7	37.8	39.1

In the Republic of Moldova vertical coordination among primary agricultural production, food processing and trade, had undergone dramatic changes in the midst of 90<sup>th</sup>.

Table 3. Increasing food industry sectors, 2007-2011, 2005=100%

	2007	2008	2009	2010	2011
Production of animal feeds	97.1	110.9	194.3	231.8	332.9
Production and processing of meat and meat products	142.9	147.2	121.9	127.6	142.5
Production of mineral water and soft drinks	147.0	128.7	118.4	123.0	133.0
Production of bread and bakeries	118.4	129.0	121.2	124.8	127.3
Production of cacao and chocolate products	116.5	126.1	117.2	119.6	126.3
Dairy products	101.7	108.3	98.1	107.0	109.2

Rapid liberalization of prices and external trade, privatization of farms and enterprises without relevant institutional framework, caused the collapse of vertical coordination within the existing food value chains.

In a short time, the new system of vertical integration had started to develop in the agro-food sector. The process was led mostly by food business operators and traders. At the first stage the pace of new structure’s development was very slow. In order to enhance drivers of value chains creation, the Law on organization and functioning of agricultural and agro-food markets had been elaborated and approved by the Parliament on July 27, 2006.

This law establishes the legal framework for the organization of agricultural and agro-food markets by individuals and legal entities that produce, store, process and/or sell these products at the national or international level.

Main objectives of this law are the as follows:

- a)organizing activities of agro-food markets on competitive, effective and stable principles;
- b)covering the domestic food consumption and reducing the food trade deficit;
- c)ensuring the quality and safety of food products;
- d)increasing incomes from farming and agro-food activities;
- e)assuring a sustainable growth of economic performance and competitiveness of the agriculture and food industry;
- f)increasing exports of agricultural products.

An important provision of this law stipulates creation of the Councils on product chains as a body established by participants from the product chain and representatives of public authorities [0].

The activity of the Councils on products is focused mostly on interventions rather than on the broader and more comprehensive commodity chain development. Due to this, the impact of the law on vertical integration promotion is insignificant. The further intervention of the Government is needed to improve the value chain efficiency.

Distribution of food products in Moldova still rely on traditional markets. The food trade in the

capital city and regional centers is effectuated also through a chain of recently appeared supermarkets. There are currently about 190 supermarkets and three commercial Cash and Carry units that sell food products all around the country.

According to our estimates, approximately 10-20% of Moldova's population buys food in supermarkets. Respectively the greater is the size of the urban center the greater is the share of supermarkets in food product sales.

In Moldova there is a trend that has been also observed in other Western European countries, namely at the launch phase of supermarkets fruit and vegetables occupy less than 5% of commercial space in a typical supermarket. This percentage is even lower for stores or local food stores. The most developed retail chains in Moldova are: Fouchette, Green Hills, Nr. 1, Fidesco, Metro Cash & Carry, IMC Market, Linella, Cvin and Everest.

If we analyze the traditional channels of distribution, one can observe the presence in urban areas of over 1000 of neighborhood grocery stores. Thus, about 20-40% of food purchases are made at these stores, which are located in the home vicinity. Many of these stores do not sell a full range of fruit and vegetables that occupy less than 3% of the commercial space.

At the retail level, the inhabitants of Moldova as a rule procure agricultural products at local agricultural markets, street fairs and seasonal fairs and also from other small scale street vendors. However in rural areas, a considerable part of agricultural products is used for own consumption.

Nowadays the distribution network for fresh agricultural products encompasses 3 wholesale markets in Chisinau and one in Balti, 12 retail agricultural markets in Chisinau, plus another 38 regional agricultural markets and over 100 of local agricultural markets.

The agricultural market "Izumrud" (Albisoara str.) sells mainly local produce such as potatoes, carrots, onions, cabbage, radish, etc.) during the period from March to December. Imports from Poland, Turkey and Ukraine supplies the same products during the out season. Sales are done as a rule directly from trucks and other vehicles.

This market can offer 15 stalls for sale and at least 100 places for sales directly from the truck. The market has its own testing laboratory. The customers of this wholesale market are households, retail markets and neighborhood grocery stores and catering units.

The wholesale market "De sub pod" (Under the bridge) on Albisoara street mainly sells exotic fruits and vegetables imported from Turkey. This market has 70 marketing units of 12-15 m<sup>2</sup> each, which can be rented. Also, the market offers around 120-150 locations for sales directly from the truck.

The wholesale market "Amir" sells a range of fresh produce imported from Turkey, Poland and Ukraine. Eight cold stores with a capacity of 65 tons each are available for hire, and they are quite demanded.

The market also offers 153 marketing units with an area of 12-15 m<sup>2</sup> each that are available for rent, and about 100 places for sales directly from the truck. This market has its own testing laboratory. The customers of this wholesale market are mostly retail markets and supermarkets.

While representing a small part of the whole agricultural complex different local food systems are developing. These systems provide consumers in close contact with farmers, they mobilize consumers to support local agricultural producers and sustainable farming practices. While local food systems continue to face many barriers, many of them show a significant increase.

As a typical case of local agro-food system development one can mention the dairy sector of the Republic of Moldova, which during the transition period from centralized to market economy has suffered a serious decline. During the post reform period, from 1991 until now, the herd has been reduced significantly. Thus, the herd of cattle in this period fell from 1.061 million heads in 1991 to only 204 thousand heads in 2012, a drop of 5.2 times, while the herd of cows in the same period decreased 2.7-fold, from 395,000 to 144 thousand heads.

Nowadays, this sector is extremely parceled and depends largely on production in the



households of the population. Household milk production assured about 98% of the total cow milk production in 2011. In most cases the number of cows maintained in households does not exceed 1-2 heads. The wide involvement of the individual small-scale sector in the livestock production creates considerable obstacles in terms of compliance with hygiene standards, animal nutrition, and environmental protection norms in the Republic of Moldova, but also with those in force in importing countries.

The small size of farming units and the difficulties they faced in adopting standards of hygiene, environment, and animal health, accompanied by lack of vocational education in agriculture can be identified as the main obstacles in developing the dairy sector of the Republic of Moldova.

An alternative to individual milk producers to increase their bargaining power in relation to the processing industry is creating local associative structures.

Milk collection cooperatives have become in recent years an attractive consumer for small scale milk producers. The number of milk producers that have signed agreements on deliveries of milk with marketing cooperatives increased from 11% in 2001 to 21% in 2012, while the average volume of milk supplied under the contract also increased during this period from about 51% to about 88%.

Data of the study elaborated by the authors has demonstrated that an increasing role in collecting milk from farms is played by cooperatives that are an important milk consumer for about 21% of interviewed milk producers. Supplies to the local markets including local agricultural markets, schools and kindergartens, cafeterias and other local catering units are destinations of milk supplies for about 25 percent of respondents.

Thus, about 46% of interviewed milk producers deliver milk to industrial and final consumers located in close proximity, creating conditions for establishment of local food systems without involving other intermediate structure (see figure 3).

A good example here is the milk collecting cooperative "Vita-Lact" the village Ignăței,

Rezina district, which was established in 2001 by 12 farmers in order to consolidate their efforts to work together as a single entity for selling the milk collected from local milk producers.

Subsequently the cooperative has grown from 12 members in 2001 to over 420 members in 2011. Currently the cooperative manages 12 milk collection points located in neighborhood villages [0].

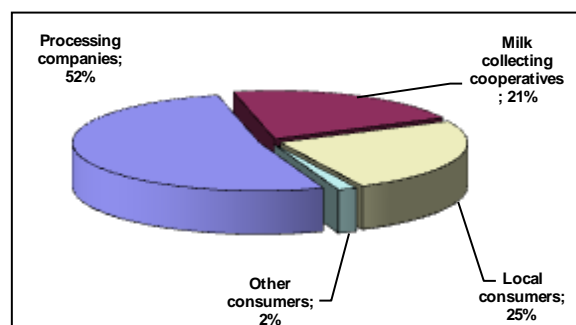


Fig.3. Distribution of milk producers according to distribution channels, 2011, %

Cooperative benefited from divers opportunities to train their members in fields such as cooperative development and administration, financial management, marketing techniques, veterinary services, milk processing and handling.

The status of cooperative made it possible to access various grants provided by international organizations. These funds were used to purchase milk processing and cooling equipment, milk testers for endowment of the milk collection points, purchase of a minibus, other agricultural equipment and building new milk collection points. These funds have enabled the cooperative to develop its own milk processing infrastructure. Thus with the contribution of cooperative members was established a milk processing unit "Paster Lact" SRL that allowed the marketing of milk and milk derivatives directly to the retail network, thus increasing revenues of the cooperative and hence of its members. Cooperative began to develop its own marketing network for final products by launching own market outlets, including in the capital city Chisinau. Currently the cooperative "Vita-Lact" supplies directly several grocery stores from Chisinau, Orhei

Rezina and Soldanesti. The cooperative is also a major raw material suppliers for the milk processing enterprise "Saturn" SRL, which produces under the brand "Bravi-Lacta".

Among recipients of the production from the "Vita-Lact" cooperative are also educational institutions such as kindergartens and schools in the neighborhood villages such as Meseni, Pripiceni and Peciste. During the summer period among beneficiaries of the cooperative are also summer camps for children in villages Saharna and Ignatei. The benefit in this case is mutual. Thus consumers have access to fresh, quality, healthy and affordable milk produces, while the cooperative benefits from a higher price of 6-7 lei/kg and direct sales to local market outlets.

Extending the up-stream vertical integration of the cooperative activities toward processing and sales to local consumers has many benefits such as reducing working capital requirements, elimination of prohibitive transaction costs, more competitive selling prices and acquiring more safe markets. There are also many social benefits out of the creation of this cooperative unit. Thus, occurrence of six new working places in a village has a special significance in the situation when there is a continuous flow of qualified labor from the rural to urban areas or outside the country, thus contributing to improving the livelihoods of the rural population.

Creation of local cooperatives can be seen as one of the most perspective forms of organization of agricultural production, which may comprise several aspects of agricultural production, such as finance, procurement of agricultural inputs, collection, transportation, and storage of agricultural products, as well as other specific activities particularly related to agricultural production.

## CONCLUSIONS

Moldovan agro-food sector is characterized by a reduction of the share of high added value products in total agro-food exports.

The food processing sector has weak linkage between primary agriculture, processing and trade especially at the local level.

The specific feature of the agro-food sector is underutilization of its production capacities and lack of investments.

Recently, new local food systems have developed in the agro-food sector.

The main drivers of the agro-food chain revitalization are mostly food business operators and traders.

Wholesale food markets are predominantly supplied by local producers.

Overall, the wholesale food markets that currently activates in the Republic of Moldova are poorly equipped and under obsolete standards.

An important role in creation of the local agro-food systems is played by associative structures such as marketing cooperatives.

Almost half of the interviewed household milk producers deliver milk to industrial and final consumers located in close proximity, creating conditions for establishment of local food systems without involving other intermediate structures.

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## PERFORMANCE OF MAIZE CROP FOR SILAGE PRODUCTION USING THREE DIFFERENT IRRIGATION SYSTEMS

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### Abstract

*In the humid and sub-humid areas, agricultural production is largely rain fed and this needs to be urgently supplemented by irrigation practice if the country is to meet its food demand. A two years study was carried out at the experimental site of the Institute of Agricultural Technology and Biosystems Engineering, Johan Heinrich von Thünen Institute (vTI), Braunschweig, Germany to compare performance of maize crop for silage production using three different irrigation systems; rain fed, drip and rain-gun sprinkler. Growth parameters such as plant height, stem diameter were measured. The total yields of silage were obtained for all treatments at the harvesting. The experimental results revealed that total yields obtained from different treatments were 25.76, 24.23 and 9.30 Mg.ha<sup>-1</sup> using drip, rain-gun and rain fed irrigated maize, respectively. The results also showed that the water use efficiency reached 11.01 Mg.m<sup>-3</sup> for drip irrigation, while it was 8.84 Mg.m<sup>-3</sup> for rain-gun system. In conclusion, supplementary irrigation in critical period of maize growth is an effective way to increase yield in the sub-humid regions. Therefore, it is suggested that optimum production of maize could be achieved by rain fed supplementary irrigation.*

**Key words:** drip, maize, performance, rain fed irrigation systems, rain-gun, silage

### INTRODUCTION

Water is the one of the most dominant limiting factor for crop production worldwide. The competition for the limited water resources for domestic and industrial needs is increasing considerably. It is therefore essential to formulate an efficient, reliable and economically viable irrigation management strategy in order to irrigate more land with the available water.

The objective of agricultural irrigation in the humid climate areas such as Germany is to compensate individual cases of precipitation deficits during the vegetation period with artificial water supplies in order not only to improve but also to save crop and crop quality. In Germany, irrigation is mainly applied to areas of intensive agricultural and horticultural activities with total average annual rainfall of 770 mm with extremes as low as 500 mm and as high as 2000 mm (Venus et al., 2011). It is estimated that about

531 x 10<sup>3</sup> ha of land, (3% of the agricultural acreage) today is irrigated. The irrigation methods employed are mainly sprinkler systems, for which generally groundwater is extracted. The annual amount of irrigation water used varies between 80 and 150 mm per year (Destatis, 2011).

Due to the importance of water to plant survival and substance, the amount applied during irrigation, time and method of application, water holding capacity of the soil and the water condition of the environment are factors that greatly influence plant growth, yield and general performance of crops.

Hose reel irrigator (rain gun irrigation method) as a common supplementary method for irrigation in Germany, through which water is applied to the soil in the form of spray via rain gun and pumps. It is a kind of an artificial rain and therefore may give better results. The hose reel irrigator consists of a reel, a polyethylene hose, a driving mechanism, a sprinkler cart, a large sprinkler,

an automatic drive shut-off and a chassis. For the drip irrigation system, water is slowly and directly applied to the root zone of the plants, thereby minimizing the losses by evaporation and percolation. Water oozes out of those drip nozzles uniformly at a very small rate, directly into the plant root zone (Abou Kheira, 2005; Grag, 2007).

Maize silage production plays an important role in satisfying the nutritional needs of livestock in many parts of the world. Due to climatic reasons, maize in the European Union is mainly produced in the form of whole plant silage. In Germany, maize production has increased but more in the form of whole plant silage which now is a highly valued substrate for biogas production. Temporary forages are mainly maize silage with nearly 50% in all regions. In Germany, as a whole, maize grain made 21.3% of maize production. In the year 2010 (Figure 1), the amount of maize grain has increased to  $464 \times 10^3$  ha and maize silage even rose to  $1.846 \times 10^3$  ha (Destatis, 2011; Venus et al., 2011).

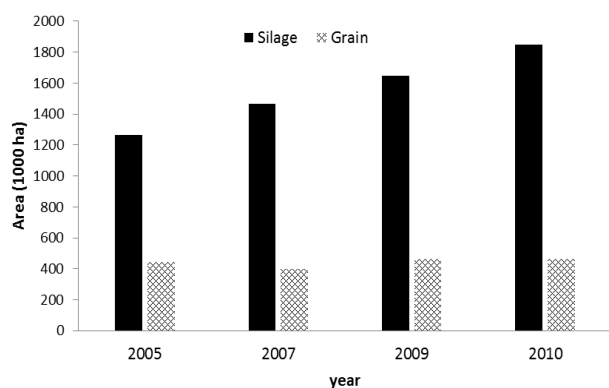


Figure 1. Cultivated area for silage and grain maize in Germany

Maize has high irrigation requirements and is very sensitive to water stress (Rhoads and Bennett, 1990; Akhtar and Nadaf, 2002). The water use efficiency for well-watered maize ranged from 1.2 to  $3.5 \text{ kg m}^{-3}$  (Musik and Duesk, 1980; Mohammad and Ayadi, 2004). Fully irrigated maize typically receives 500 to 600 mm of irrigation water. Accurate estimate of  $ET_c$  on a daily or seasonal basis can be valuable for best management of maize irrigation both in-season irrigation and for

strategic irrigation planning and management (Payero et al., 2008).

Good irrigation scheduling decisions and appropriate evaluation of the economic impacts at farm level are the main constraints of the adoption of irrigation strategies (El Amami et al., 2001). Deficit irrigation creates water stress that can affect the growth and development of maize plants. It is very important to estimate yield reduction due to applying irrigation strategies (Payero et al., 2006a; Payero et al., 2006b). The response of maize plants to water stress has been shown to change with hybrid (Lorens et al., 1987a; Lorens et al., 1987b) and can be affected by improving technological level (Dale and Daniels, 1995).

Effects of water stress on maize include the visible symptoms of reduced growth, delayed maturity, and reduced crop yield. Trooien et al., (1999) found water use efficiency (WUE) to be greater for limited irrigated crops, but full irrigation of maize was more profitable than limited irrigation.

For silage, whole plant moisture at harvest ideally should be between 65 and 70%. If the silage is too wet, seepage losses and the risk of acidity will increase. If too dry, packing of the silage can become more of an issue and oxygen exclusion will be difficult leading to dry matter losses. Traditionally, maize was harvested when the milk line of the grain had moved halfway to the base of the kernel (Alkhamisi et al., 2011).

Effective irrigation influences the entire growth process of crop from seedbed preparation to germination, root growth, nutrient utilization, flowering, yield and quality. Therefore the main objective of this study was to compare the performance of rain fed, drip and rain gun irrigation systems on maize crop (*Zea mays L.*) to identify the yield component and water use efficiency of maize silage.

## MATERIALS AND METHODS

The experimental work was conducted at the Institute of Agricultural Technology and Biosystems Engineering, Johan Heinrich von Thünen Institute (vTI), Braunschweig, Germany in summer 2009 and 2010. It is

located between latitudes of 52°17'52", 80°N - 52°18'02,41"N, and longitudes of 10°27'08,39"E-10°27'37,0,27"E, respectively. The physical and chemical characteristics of the soil at the experimental site are summarised in (Table 1). The soil type was characterized by a loamy sand texture in the upper 30 cm of the soil. The average weather conditions in this region are shown in (Table 2).

Table 1. Description of the soil parameters at the experimental site

Soil parameters	Organic matter [%]	Clay [%]	Silt [%]	Sand [%]	pH
Soil depth (0-30 cm)	1.4	6.3	46.7	47	5.5

Table 2. The average weather conditions at the experimental site (the German Weather Station "DWD", [www.dwd.de](http://www.dwd.de))

Parameters	Average from 1961 to 2008				
	May	June	July	August	September
Precipitation [mm]	57	70	57	68	51
Temperature [°C]	13.1	15.9	20.4	19	16
Potential ET [mm.month <sup>-1</sup> ]	88	91	94	99	97

### Experimental setup

The field experiments were conducted in two seasons during May to September 2009 and 2010 consecutively. Three separate crop areas A, B and C each of 30 m by 300 m were selected for all irrigation systems; rainfed, drip and rain gun, respectively. Two blocks of size 15 m by 15 m were selected for each plot one at 100 m and the second at 200 m distance from the field head (Figure 2). All plots were transplanted with maize in the third week of May for both two seasons. Maize seeds were planted at a spacing of 0.10 m within row and 0.75 m between rows. The soil was tested for essential fertilizer requirements and was fertilized accordingly.

Weed controls were carried out when the crop was at six-leaf stage. Drip lines were set up at plot B during the third week of planting where each drip line with 40 cm spacing between the drippers (0.6 L h<sup>-1</sup>) sited for two rows. A hose reel irrigation machine was used for the third plot (C).

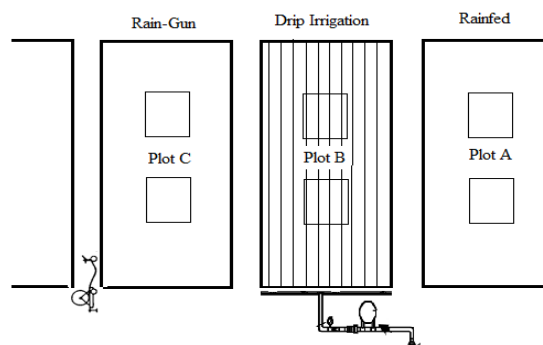


Figure 2. Schematic experimental field systems

The timing to apply irrigation was decided based on soil moisture conditions, where irrigation was applied when soil moisture content at 10 cm depth was below 25% (vol.). The harvest was done when whole plant moisture was between 65 and 70% moisture (at the end of September to beginning of October).

### Measurements

Soil volumetric water content, agronomic parameters, and water use efficiency, were used to evaluate the overall performance of each irrigation method.

Soil moisture content (M.C., vol.) measurements were taken throughout the experiment. For each block, the daily M.C. was measured using a hand-held 0.20 m soil moisture probe (Hydrosense probe). By using the data of weather station (DWD) located next to the experimental site, the irrigation controller model AMBER (developed by DWD) was used to monitor the daily changes of precipitation rate, temperature, evapotranspiration and create the irrigation balance and a five-day forecast of the demand for water enabled the further targeted irrigation use.

To calculate the amount of applied water, two water meters were used, one installed at the beginning of the main line of drip network, and the other installed on the reel hose

machine. Agronomic parameters such as plant height, stem circumference, number of leaves and steps per plant were taken directly before harvesting. Ten plants were tagged for growth rate measures. The plant height was measured using a ruler weekly 21 days after planting to calculate the growth rate of the treatments. The growth rate was calculated using equation (1) (Abdelrahman et al., 2009) as follows:-

$$R_n = \frac{(X_n) - (X_{n-1})}{7} \quad [1]$$

Where:

$R_n$  = growth rate in the week n (cm/day/week),

n = number of the week from the starting of the experiment,

$X_n$  = plant height (cm) in the week n,

$X_{n-1}$  = plant height (cm) in the previous week of the week n and

7 = constant, number of days per week (days).

To create the harvesting, whole plant moisture at harvest ideally should be between 65 and 70 %. The way to accurately evaluate whole-plant moisture was to collect plant samples and have them tested. Moisture content for the plants was measured according to (ASHRAE, 1997). The materials were put in the drier at a constant weight. Equation (2) was used to calculate the plant M.C. (%):

$$MC (\%) = \frac{(W_m - W_d)}{W_d} \times 100 \quad [2]$$

Where:

MC = moisture content in %,

$W_m$  = moist weight in kg and

$W_d$  = dry weight in kg.

On determination of yield of maize, all plots A, B and C were harvested separately by combine harvesting machine (which cut and chop plants and placed on containers that can be weighed).

## RESULTS AND DISCUSSIONS

Rainfall pattern during the experiment is shown in (Figure 3). Days with effective rainfall were observed constantly but with certain intervals until 30 days after transplanting. After this period, there was a semi dry spell for one month. After that, considerable amount of rainfall was measured

until harvest. The total seasonal precipitation was 124 mm during both growing seasons.

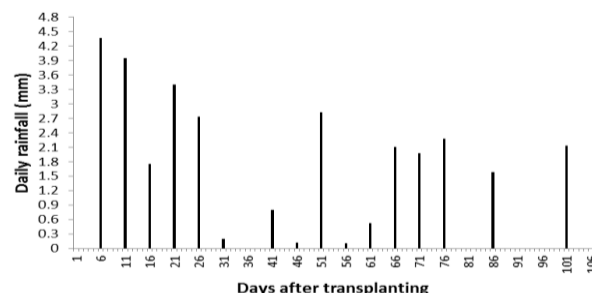


Figure 3. Pattern of daily rainfall during experimental period

According to the decision based on rainfall pattern and soil moisture content, number of days with irrigation varied by treatment. Rain-gun irrigation treatment received the largest irrigation amount during the experimental period (169 mm), followed by drip irrigation treatment (149.5 mm).

Rain fed maize clearly differed from supplementary rain fed irrigation on soil moisture content. Figure (4) shows the relationship between average soil moisture content for all rain fed, rain gun and drip irrigation treatments. Rain fed significantly differed from rain fed with supplementary irrigation on all days observed. According to the experiment limitation, where irrigation was applied when soil moisture content at 0.10 m depth was below 25%, the soil moisture content was in that range until 32 days after sowing for all plots. Starting from the fifth week of sowing, water stress was observed under rain fed conditions while the supplementary irrigation started at both B and C treatments until harvesting.

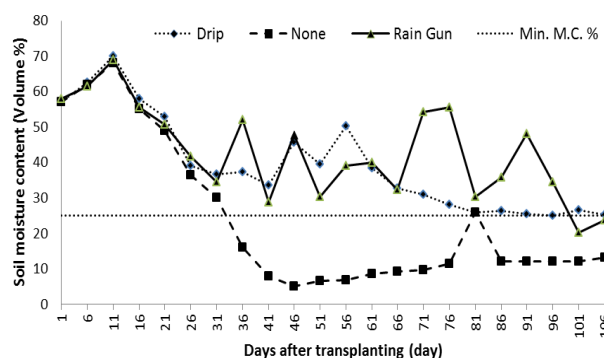


Figure 4. Change in soil moisture content during experimental period for all systems



The growth parameters were focused upon plant height, growth rate, leaf area, plant circumference and number of leaves per plant. The growth of plants increased slowly during the first 5 weeks in all treatments (Figure 5).

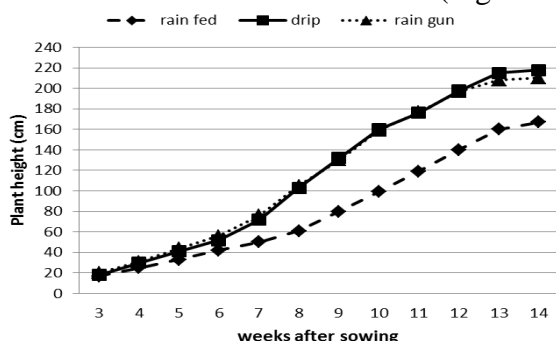


Figure 5. Plant height of maize

From the sixth week onward the growth started increasing rapidly. The growth rate factor in terms of plant height for all treatments is shown in Figure (6). The rate of growth decreased in week 11 for some treatments since during that time the crop had reached the flowering stage. Treatments with elevated amounts of water resulted in higher growth rates. Plants irrigated with drip and rain-gun had similar trend and higher development rates in comparison with those rainfed irrigated suggesting the decrease of available soil moisture. This is similar to results reported by others (Alkhamisi et al., 2011; Oya et al., 2012).

Table (3) represents growth parameters of maize as affected by the three irrigation systems. It shows that the highest value of plant height was 218 cm achieved with the drip irrigation system. The lowest value of plant height was 167 cm with the rain fed irrigation system. Drip irrigation recorded the highest values of leaf area and value of plant circumference, which were 857.2 cm<sup>2</sup> and 9.93 cm, respectively, but the number of leaves per plant was 17 for both drip and rain gun. Also, the table shows that the lowest values of leaf area, plant circumference and the number of leaves per plant were 503.4 cm<sup>2</sup>, 7.44 cm and 16, respectively, obtained with rain fed. This is in line with the assertion of Singh and Singh (2002) that depth, extent of root system, size and total area of leaves, number and location of

stomata, shoot growth and vigour of maize are affected by rainfall or water availability.

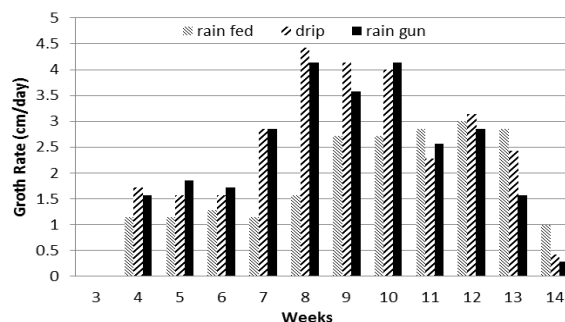


Figure 6. Growth rates represented in plant height of silage maize

Table 3. Average values of growth parameters of maize under irrigation systems

Growth parameters	Irrigation system		
	Rain fed	Drip	Rain gun
Plant height (cm)	167	218	210
Leaf area, (cm <sup>2</sup> )*	503.4	857.2	856.8
Plant circumference (cm)	7.44	9.93	9.92
Leaves per plant	16	17	17

\* Leaf area = 0.75 (max. width x length of the leaf) (Abou Kheira, 2009)

The relationship between irrigation levels and the yield of silage was similar for the used irrigation system, where the yield of silage decreased as the soil moisture level decreased. However, the decrease in the yield differed from one system to the other. The data obtained in Table (4) illustrate that the highest value of silage yield was 25.76 Mg ha<sup>-1</sup> obtained with drip irrigation followed by 24.23 Mg ha<sup>-1</sup> with rain gun irrigation and 9.30 Mg ha<sup>-1</sup> with rain fed. Crop water use efficiency as related to irrigation system and irrigation levels was calculated (Table 4). They show that the highest value of total irrigation water use efficiency (9.42 kg m<sup>-3</sup>) was obtained with drip irrigation followed by rain gun irrigation (8.26 kg m<sup>-3</sup>) that calculated as the total amount of water (rain + irrigation). The lowest value of water use efficiency was (7.50 kg m<sup>-3</sup>) recorded with rain fed irrigation. It is also evident that, the actual water use efficiencies according to

supplementary irrigation were higher than the total WUE, where it reached 11.01 kg m<sup>-3</sup> for drip irrigation in comparison with 8.83 kg m<sup>-3</sup> in case of rain gun system.

Table 4. Average yield and water use efficiency for the treatments under study

Treatment	Total rain fed, mm	Irrigation amount, mm	Total yield, Mg ha <sup>-1</sup>	Total WUE*, kg m <sup>-3</sup>	WUE**, kg m <sup>-3</sup>
Rain fed, A	124	0	9.30	7.50	-
Drip, B	124	149.5	25.76	9.42	11.01
Rain gun, C	124	169	24.23	8.26	8.83

\*calculated as total water applied (rain fed + irrigation amount)

\*\*calculated as increase in yield/irrigation amount

Comparing between drip and rain gun from the point of view of the recorded crop water use efficiency, it is clear that the drip system has an advantage in the beneficial use of water. This is because of higher values of crop water use efficiency recorded with drip than those recorded with the rain gun system. This may be due to the uniform distribution of moisture in the effective root zone of maize in the soil observed with drip irrigation system according to a related study done by Sourell et al. (2011).

## CONCLUSIONS

A comparative performance of maize silage under both drip and rain-gun systems of irrigation as complementary irrigation was conducted. It was established that drip irrigation system proved to be more efficient and gave higher yield than the rain-gun irrigation system. Thus, the overall efficiency of water use within this experiment is high, particularly under drip irrigation. High efficiency of water use is extremely important to farmers in water scarce areas as well as in sub-humid areas.

Using supplementary irrigation in maize silage production per ha is more than 160% and 177% for both rain-gun and drip system, respectively. So, supplementary irrigation in critical period of maize growth is an effective

way to increase yield in the sub-humid regions. It is, therefore, suggested that optimum production of maize could be achieved by rain fed supplementary irrigation. The effectiveness of the prompt irrigations allowed by hose reel rain-gun machines did not prevent them from the criticism of some working characteristics. The quite high energy required, average uniformity of distribution, the impact of big drops on crop and soil, were considered as peculiar to the rain-gun machines. Due to these reasons, and probably to the increasing diffusion of micro irrigation, the hose reel machines were often stereotyped because of their limits by sector literature and popular beliefs. Since modern irrigation must pay attention to water saving.

## ACKNOWLEDGEMENTS

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## THE MARKET OF ORGANIC FOOD PRODUCTION IN REPUBLIC OF MOLDOVA

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### Abstract

*In this article the authors will analyze the development of Moldavian organic agriculture in European agriculture field. Organic farming is an agricultural system designed to provide consumers with fresh, tasty and authentic food, at the same time respecting the natural life cycle of the systems. Moldavian population needs organic production for its health and welfare. The authors consider the organic farming as a solution that is able to prevent a future food crisis, as world's population is increasingly facing an acute shortage of food. Based on the literature in the field the authors describe the extension of certified organic areas in the period of 2003-2011, that had increased by 270 times from 80 ha to 22 102 ha. Moldavian local market of selling the organic products is almost non-existent because of the small farming practice in the country. The conclusion is that the premises for the development of national organic sector should be connected, exclusively to export markets at least for medium term. These are mature and can "digest" the local organic products, offering fair prices to local producers.*

**Key words:** organic farming, organic production, outlet market

### INTRODUCTION

Organic food production is rising worldwide. It is practiced in approx. 154 countries spread over five continents, in an agricultural area of approx. 31.584.720 ha, of which 42.9% in Oceania (Australia), 23.8% in Europe, 23.5% in Latin America, 5.5% North America, 2.8% in Asia and 1.6% in Africa. In Europe, there are run approx. 7.6 million ha of environmental management in approx. 178 940 farms today, of which Austria 12.9%, Finland 7.22%, Italy 6.86%, Sweden 6.8%, Greece 6.24%, Denmark 6.2%, 5.97% Czech Republic, Estonia 4.59%, Slovenia 4.6%, UK 4.42%, Germany 4.3%. Organic products in the world market are about 3.1 to 4.3%:

Organic farming creates more value for farmers, noticeable not only in higher retail prices by 20%. As free economic zones and industrial parks are punctual methods of attracting private investment in the economy, farming is a niche to attract investment and innovation in agriculture. Both international capital and local regulations may participate in this process. Organic agriculture can contribute to the sustainability of agriculture in general.

### MATERIALS AND METHODS

The material used for the study undertaken found in research, data analysis and interpretation of the scientific literature, report on the strategic development of agriculture in the years 2006-2013 published by Ministry of Agriculture and Food Industry of the Republic of Moldova, "local and regional perspectives" – information developed by the Organization of Finances Consulting and Moldovan Investment and Export Promotion Organization (MIEPO) about the importance of organic production.

### RESULTS AND DISCUSSIONS

The ecological products and commercialization is a real chance for Republic of Moldova to penetrate foreign markets which are saturated with products from conventional agriculture and organic products supports missing [4]. Value added in the production and marketing of organic products, along with low cost to obtain them, allowing increased accumulated income of rural communities in order to address socio-economic problems in the villages. Thus, support for the promotion and

development of organic agriculture is a fundamentally new - a rural development policy, aimed to encourage many rural initiatives, helping, while farmers are restructuring their farms, to diversify the range of products and to penetrate different markets to sell the products. The interest in ecological food production has increased in recent years, confirmed by the fact of production increase surface and volume.

The Republic of Moldova holds many of the various prerequisites necessary for organic agro-food production development. These include the following: favorable conditions for the cultivation of a large spectrum of ecological and organic value-added agricultural plants (vegetables, fruits and vines, essential and oleaginous crops, etc.); good ecological soil conditions, mainly on large terrains, due to the essential reduction over the last 10 years of chemicals used in agriculture; protection of agricultural plants against diseases and pests, which can be ensured through the application of integrated organic systems and crop rotation etc.

Legislation has recently been harmonized with EU requirements, in particular there were adopted Regulations on ecological principles and methods of processing organic food production, inspection and certification system in the field and organic food products import and export.

Organic farming has a great contribution to long-term economic development and plays an important role in improving of the environment, preservation of soil, improving water quality and protecting nature. Thus, the promotion and development of organic farming can be a benchmark in the rural economy and make it viable by expanding high value-added economic activities and generating employment in rural areas.

The area of ecologic agro-food products, certified in organic farming is about 32 thousand ha in Moldova. The main organic products cultivated are peaches, grapes, soy, walnuts etc. There is an increasing trend in cultivating cereals (about 57.9 % in 2009) and oilseeds and protein (47.2%). The area certified in organic farming is increasing

because more and more farmers become interested in practicing organic farming.

There are 168 companies registered at the Ministry of Agriculture and Food Industry owning lands with pure ecologic production [1].

Marketing of organic agro- food differs from the conventional by factors of production. Marketing of organic products includes the following steps [3]:

- Determining of household purpose;
- Determination of objective factors:
- Unique of organic products;
- Limitation of natural resources;
- Dependence on natural and biological factors;
- Potential and character of fixed capital structure;
- Planning range of products;
- Development strategy:
- Intensive;
- Extensive;
- The integration;
- Strategy development - new product to new markets.

Pricing on organic foods requires a direct influence of the state in certain facilities, namely budgetary subsidies, tax / customs, state-guaranteed bank loans, long-term investments in accordance with national / international.

Considering the low level of farming practice in Moldova, the local market of organic products selling is almost non-existent.

Over the last 5 years Moldova has had a rapid growth in the export of organic certified products; in 2009, 32,374 tons of organic products with the value of 580,7 million lei (34,6 million Euro) were exported, which represented 11% of the total agriculture export value. The main certified and exported organic products are: wine, shelled walnuts, dried fruits, sunflower seeds, sunflower oil, soy seeds, wheat for animal fodder, lavender essential oil, beans, barley and other.

There are exported 95 percent of vegetal organic products (cereals, oilseeds and protein, berries and herbs) to Germany, Switzerland, Netherlands and Great Britain.

Moldova is currently exporting preponderantly raw material and products of the first step of processing. Moldovan companies have small capacities to manage final products.

Organic producer SRL "AT-ZIN", located in community Barder, 25 km from Chisinau, is specialized in production of organic vegetables and organic vegetables seeds. Total production area is 60 Ha, out of which 40 ha are cultivated with organic cereals and 20 with organic vegetables [4]. The farm is certified since 2007 by organic certification companies CERPA-inspect and ICEA. There are 40 full time employees and additionally 12 seasonal workers. It had received state subsidy of 20% of the price for 200 tons of vegetables which have been purchased according to the law on Public acquisitions by the state for the social cantinas. There have been sold 400 tones of vegetables as conventional products in the open market. There were exported 120 tons of organic wheat to Italy, and the farmer received 25% higher price than on the local market.

Imported organic food, as well as a wide range of so-called (sometimes fraudulently) "environmentally clean products", with labeling that the product is produced on non-contaminated soils can be found in supermarkets, where they are sold at premium prices. There is an interest to develop and diversify the national market with Moldovan organic products on every level of the commodity chain. Until today, the institutional network between the potential organic market players has not been developed, because of no reliable supply of range and quantities of products, unavailability of grading and storing infrastructure, processing, packing and labeling.

Own dairy shop in Chisinau SRL "Logofat-Prim" is located in community Logofteni, in Falesti district 80 km distance from Chisinau. Total production area is 810 ha, and livestock farm with 160 milking cows. Milk processing factory was established with support from Netherlands. The farm is certified since 2007 by organic certification company CERPA-

Inspect and ICEA. Main crops are cereals, soybean, and sunflower and fodder crops. Last year 2009 it exported soybeans and sunflowers to Italy and received 25-30% higher prices comparing which the local prices. In the beginning of June 2010 it opened first small shop and trading with own organic milk products. The main product sold in the shop is a Gauda Cheese.

There are no specialized shops selling organic products, except one small organic dairy shop (see box), and not even separate shelves with organic products in the shops. It is the next step for the marketing of local organic products in the local food shops and supermarkets.

Table 1. Volumes of organic products sold in the local market 2009

wheat – 6500 t	barley – 1950 t
sun flower – 1750 t	soy bean – 450 t
corn – 2200 t	sweet corn – 150 t
pea beans – 269 t	tomatoes – 100 t
early cabbage – 420 t	late cabbage – 300 t
carrot – 60 t	beetroot – 80 t
onion – 120 t	potatoes – 600 t
sweet pepper – 200 t	

Prices in the local market do not vary much as compared with conventional agriculture. Prices for export are stipulated in long term contracts with buyers for the each product, a premium price is guaranteed compare to conventional. For example, in November 2009 when the price for conventional soy beans in the local market was about 0.28 euro/kg, organic producers exported soy beans to Italy and received 0.41euro/kg, which is 46 % higher than for conventional products. The same situation was registered for sunflower seeds: offered premium price was 23% higher then the conventional one.

There is an interest to develop and diversify the national market with Moldovan organic products on every level of the commodity chain. Until today, the institutional network between the potential organic market players has not been developed, because there was not reliable supply of range and quantities of products, unavailability of grading and storing

infrastructure, processing, packing and labeling.

Ministry of Agriculture, together with inspection and certification bodies accredited and authorized under existing legislation, implementing specific inspection and certification system for organic agricultural production conformity assessment in accordance with the regulations and international standards for operators in all parts of the country, is committed to implement the program. Above priorities and economic interest in developing organic food production there are basic components to enhance organic agricultural products in the country in the next five years by about 2 times. In order to develop sustainable agro-ecological and organic products to improve the competitiveness of local and export markets should be identified and implemented the following measures [5]:- Development of local markets and export promoting of organic products to existing market niche by covering also identifying new export markets and consolidation of existing markets;- Implementing legislation to strengthen control system with additional measures to supervise the inspection and certification bodies to increase quality;- Establishing an appropriate system of production, processing and marketing of organic products designed to meet the requirements of local and foreign markets;- Strengthening the training of all stakeholders in the organic sector, producers, processors, inspectors, experts from the ministry, exporters and importers etc.

The Ministry of Agriculture and Food Industry has authorized 3 Inspection and Certification Bodies in the field of organic farming, which are accredited in the national accreditation system: 1. CRPA –Inspect; 2. ICEIA –GROUP; 3. CERTIFICAT –Eco

These Bodies work with 65 economic agents from the Republic of Moldova, the total amount of agricultural land they operate on equals 10000 hectares and producing the volume of approximately 22469 tones.

Nevertheless organic production is affected by the fiscal, economic, trade, taxation and

policies sector in the same way as conventional agriculture.

## CONCLUSIONS

As a result of studying the market of organic products in Moldova, there was found that:

Republic of Moldova holds many of the various prerequisites necessary for organic agro – food production development. These include following:

-Favorable conditions for cultivation of a large spectrum of ecological land organic value-added agricultural plants (vegetables, fruits and vines, essential and oleaginous crops,etc).

-Local market of organic products selling is almost non-existent

-The international market shows a great interest for ecological products

-Trading of organic products is a priority for Republic of Moldova.

The premises for the development of national organic sector should be connected, exclusively to export markets at least for medium term. These are mature and can "digest" the local organic products, offering fair prices to local producers [7].

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## DYNAMICS OF ORGANIC AGRICULTURE IN THE UK

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### Abstract

*With the beginning of the 1990's, organic agriculture in the UK has expanded rapidly, in the middle of the year 2003 it represented 4% of the agricultural surface with around 4000 farms, managing almost 720.000 hectares. This growth was brought by the consumers and decisional factors which see organic agriculture as a contribution to environment, social and nutritional welfare purposes. This is one of the sustainable food production strategies; another being the integrated agriculture, a less restrictive option for the farmers. The most recent national statistics presented by DEFRA (The Department for Environment, Food and Rural Affairs) on organic farming were published in July of 2012. These present information gathered throughout 2011 for organic crops and livestock in the UK and the number of organic producers/processors registered with the Organic Certification Bodies in Great Britain.*

**Key words:** Great Britain, organic agriculture, sustainable strategies, organic producers/processors

### INTRODUCTION

Global sales of organic products continue to defy the economic downturn, growing in 2010 and with growth continuing into 2011.

One exception is, however, the UK where, despite areas of strong growth and improvement in the long term trend, overall sales were down by 3.7 percent in 2011, according to the latest organic market analysis by the Soil Association.

In the UK, the main cause of the market's overall decline was a 5 percent drop in multiple retail sales, which account for 71.4 percent of organic food sales.

Reduction of choice, lack of communication about the reasons to buy organic products and a lack of investment in own-label organic ranges are the key factors of this decline.

### MATERIALS AND METHODS

The article was mainly based on research extracted from the findings on the organic farming sector which were released on 5 of July 2012 by the Department for Environment, Food and Rural Affairs in the United Kingdom.

This governmental release shows information gathered during the year 2011 for organic crops and livestock produced in the United Kingdom, and the numbers of organic producers/processors who are registered with organic certification bodies in the UK.

### RESULTS AND DISCUSSIONS

The key results of the research are as follows: The total area of organic land in the UK has shown a decrease of 9% between 2010 and 2011 from 739 thousand ha in 2009 to 656 thousand hectares. The main surfaces in conversion and organic farming are situated in England, South West, Scotland, Wales and South-East including London (Tables 1,2 and3).

In-conversion land declined from 199 thousand ha in 2009 to 37 thousand ha in 2011. The largest surfaces in-conversion there are in England, South West and Scotland (Table 1).

Organic land remained stable at 619 thousand ha, of which the largest surfaces are in England, South West, Scotland and Wales (Table 2).

Table 1. In-conversion land

In-conversion	2009*	2010*	2011*
North East	7	4	3
North West	3	2	1
Yorkshire & Humberside	3	1	1
East Midlands	3	1	0
West Midlands	6	2	2
Eastern	4	1	1
South East (inc. London)	7	4	4
South West	35	14	14
England	68	30	25
Wales	37	4	2
Scotland	12	13	5
Northern Ireland	3	4	4
<b>United Kingdom</b>	<b>119</b>	<b>51</b>	<b>37</b>

Notes: \*Thousand hectares, Source: Department for Environment, Food and Rural Affairs (DEFRA), 5 July 2012

Table 2. Organic land

In-conversion	2009*	2010*	2011*
North East	27	31	28
North West	20	20	16
Yorkshire & Humberside	12	14	13
East Midlands	14	16	15
West Midlands	32	35	29
Eastern	14	17	16
South East (inc. London)	52	54	51
South West	140	175	157
England	311	362	326
Wales	89	119	120
Scotland	209	176	165
Northern Ireland	10	10	8
<b>United Kingdom</b>	<b>619</b>	<b>668</b>	<b>619</b>

Notes: \*Thousand hectares, Source: Department for Environment, Food and Rural Affairs (DEFRA), 5 July 2012

The cereals area has seen a similar decrease of 8% to 52 thousand hectares, while the vegetables area (including potatoes) has shown a slightly larger decrease of 13% over the year to 16 thousand hectares.

Temporary and permanent pasture land in conversion decreased from 19,628 thousand ha in 2009 to 5,816 thousand ha in 2011. But the majority of organic land registered a deep change between 2010 and 2011.

Table 3. Total (Organic and in-conversion land)

In-conversion	2009*	2010*	2011*
North East	33	35	31
North West	23	22	18
Yorkshire & Humberside	15	15	13
East Midlands	18	17	16
West Midlands	38	38	31
Eastern	18	19	17
South East (inc. London)	59	58	55
South West	175	188	171
England	379	392	351
Wales	125	123	123
Scotland	221	189	170
Northern Ireland	13	15	12
<b>United Kingdom</b>	<b>739</b>	<b>718</b>	<b>656</b>

Notes: \*Thousand hectares, Source: Department for Environment, Food and Rural Affairs (DEFRA), 5 July 2012

Figure 1 shows organic crop areas over time from 2004 to 2011. The graph shows that for all crop types shown, areas have been in decline since 2009, with cereals showing the greatest rate of decrease.

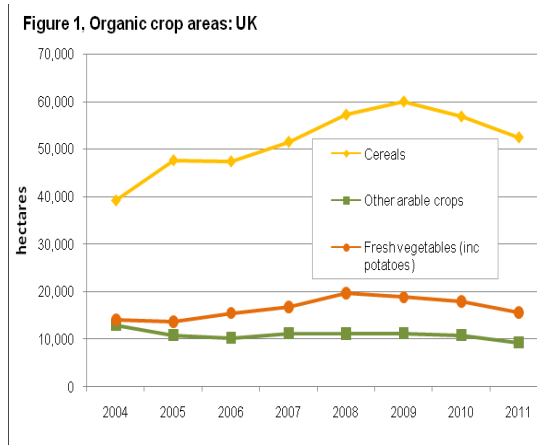


Figure 1. Organic crop areas in the UK

In-conversion land is mainly situated in the farms producing cereals, even though the surface in conversion declined from 6,538 thousand ha in 2009 to 1,175 thousand ha in 2011 (Table 4).

Temporary pasture showed a decrease of 7% to 116 thousand hectares.

Permanent pasture decreased by 9% to 435 thousand hectares.

Table 4. In-conversion land use in UK

In-conversion	2009*	2010*	2011*
Cereals	6 538	2 165	1 175
Other crops	2 065	690	432
Fruit & nuts	312	231	175
Vegetables (including potatoes)	1 613	516	270
Herbaceous & ornamentals	831	954	461
Temporary pasture	19 618	7 288	5 816
Permanent pasture <sup>(a)</sup>	82 719	35 712	24 402
Woodland	2 557	1 894	1 691
Unutilised land	3 186	1 344	2 493
<b>Total (Hectares)</b>	<b>119 441</b>	<b>50 794</b>	<b>36 914</b>

Notes: (a) Includes rough grazing. Source: Department for Environment, Food and Rural Affairs (DEFRA), 5 July 2012

Table 5. Organic land use in UK

In-conversion	2009*	2010*	2011*
Cereals	53 433	54 685	51 303
Other crops	9 120	10 159	8 889
Fruit & nuts	1 891	2 036	1 977
Vegetables (including potatoes)	17 270	17 436	15 395
Herbaceous & ornamentals	4 924	5 220	5 653
Temporary pasture	106 598	117 457	110 306
Permanent pasture <sup>(a)</sup>	413 040	443 307	410 543
Woodland	4 616	6 224	6 633
Unutilised land	8 376	11 027	8 375
<b>Total (Hectares)</b>	<b>619 268</b>	<b>667 551</b>	<b>619 073</b>

Notes: (a) Includes rough grazing. Source: Department for Environment, Food and Rural Affairs (DEFRA), 5 July 2012

In 2011, total organic area in UK accounted for 655,988 thousand ha, being by about 12 % smaller than in 2009, when it was 738,709 thousand ha ( Table 6).

Holdings structure pointed out that the largest number of holdings are dealing with organic farming covering about 53,634 ha.

In conversion there are 69 holdings preparing for organic agriculture.

And about 424 are in conversion or certified farms as practicing organic agriculture.

Most of organic holdings are dealing with cereal, potato and vegetable growing. Their

structure is the following one: 197 cereal holdings, 42 potatoes holdings and 51 holdings dealing with vegetable growing (Table 7).

Table 6. Total organic area (In-conversion & Organic)

In-conversion	2009*	2010*	2011*
Cereals	59 971	56 850	52 478
Other crops	11 185	10 850	9 321
Fruit & nuts	2 203	2 267	2 152
Vegetables (including potatoes)	18 884	17 952	15 665
Herbaceous & ornamentals	5 755	6 174	6 114
Temporary pasture	126 216	124 745	116 121
Permanent pasture <sup>(a)</sup>	495 759	479 019	434 945
Woodland	7 174	8 118	8 324
Unutilised land	11 563	12 371	10 868
<b>Total (Hectares)</b>	<b>738 709</b>	<b>718 345</b>	<b>655 988</b>

Notes: (a) Includes rough grazing. Source: Department for Environment, Food and Rural Affairs (DEFRA), 5 July 2012

There was mixed news for the UK organic livestock sector with sheep and pig numbers both showing increases on 2010, while cattle and poultry numbers both showed decreases. The sheep sector showed an increase of 18% to 1,162 thousand head, mainly due to large numbers of Welsh operators becoming fully organic. Organic pig numbers rose by 11% to 53 thousand head. Organic poultry numbers showed a large decrease of 27% to 3 million in 2011 as high feed and energy prices continue to increase the pressure on producers. Cattle numbers for the UK have fallen by 4% to 335 thousand head.

Cattle and poultry numbers have both decreased over the previous year with poultry numbers showing a sharp decline due to high feed and energy prices and uncertainty of changing feed regulations. Pig numbers have levelled out over the last couple of years.

The number of organic producer/processors has fallen again (by 5%) to around 6'900 at the end of 2011. All UK regions have shown decreases with Scotland and Yorkshire and the Humber both showing the largest percentage drop of 8%.

Table 7. Farm Structure Survey Organic Land Data

	Specification	Figures
Organically farmed area	Holdings	393
	Ha	53,634.22
Area under conversion to Organic farming	Holdings	69
	Ha	4,011.01
Area under conversion or certified Organic	Holdings	424
	Ha	57,645.23
Organic farming - Cereals	Holdings	7,993.24
	Ha	197
Organic farming - Potatoes	Holdings	42
	Ha	676.67
Organic farming - Fresh veg & Strawbs	Holdings	543.44
	Ha	51
Pasture and Meadow (exc. Rough Grazings)	Holdings	416
	Ha	47,497.32
Organic farming - Fruit & Berry	Holdings	*
	Ha	*
Organic farming - Other Crops	Holdings	70
	Ha	934.41

Source:

Scottish Government, RESAS Statistics (Agriculture)

Note: \* denotes that numbers have been withheld to prevent disclosure of information relating to individual holdings

Table 8. Farm Structure Survey Organic Livestock Data

	Specification	Figures
Organic farming Bovine animals	Holdings	211
	Heads	37,849
Organic farming-Pigs	Holdings	17
	Heads	4,527
Organic farming-Sheep and Goats	Holdings	180
	Heads	177,857
Organic farming - Poultry	Holdings	39
	Heads	171,585
Organic farming - Other animals	Holdings	0
	Heads	0

Source:

Scottish Government, RESAS Statistics (Agriculture)

\*Number of head

(a) unable to provide full historical data for sheep as there are some inconsistencies in the historical data

(b) "Other Livestock" includes goats, farmed deer, horses, camelids and any livestock not recorded elsewhere.

Source: Department for Environment, Food and Rural Affairs (DEFRA), Last updated 5 July 2

Figure 2 shows numbers of organic cattle, pigs and poultry over time from 2004 to 2011 (please note the dual axis due to the comparatively high numbers for poultry).

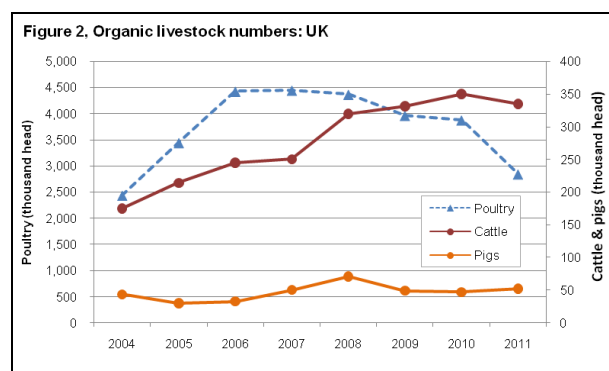


Figure 2. Organic Livestock numbers in the UK

Figure 3 shows the regional distribution of organic producers / processors in the UK. This clearly shows that South West region has the largest share of organic operators in the UK while the North East region contains the smallest number of organic operators. Regional distribution across the UK has shown very little change from 2010.

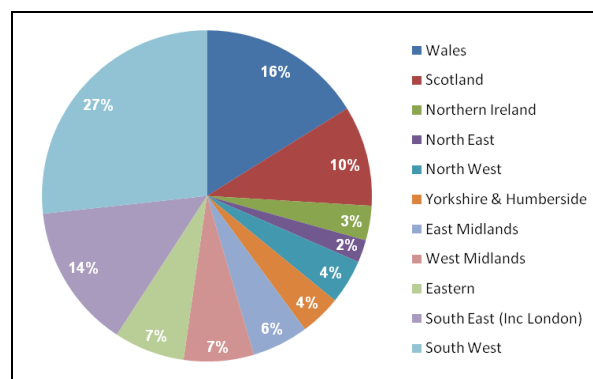


Figure 3. Number of organic producers/operators by UK regions in 2011

The market for organic products is generally buoyant and expanding. Retail sales of organic produce are now worth approx. £1.2 billion per year with considerable opportunity for import substitution through increasing home production. All the available evidence suggests that for the foreseeable future the UK organic market will continue to increase and many farmers and growers may be missing a good business opportunity if they do not give serious thought to organic production.

## CONCLUSIONS

Global sales of organic products in the United Kingdom continue to defy the economic downturn, growing in 2010 and with growth continuing into 2011.

The total area of organic land in the UK has shown a decrease of 9% between 2010 and 2011.

The cereals area has seen a similar decrease of 8%, while the vegetables area has shown a slightly larger decrease of 13% over the year.

Temporary and permanent pasture land make up the majority of organic land and therefore drive the change between 2010 and 2011, with temporary pasture showing a decrease of 7% permanent pasture decreasing by 9%.

The South West region has the largest share of organic operators in the UK while the North East region contains the smallest number of organic operators.

## ACKNOWLEDGMENTS

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## ANALYSIS OF THE PROCESS OF ORGANIC CERTIFICATION IN THE UNITED KINGDOM

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### Abstract

*Every product marketed under 'organic' must comply with a set of UK, European Union and international rules. These rules (also known as standards) assure the consumers that they bought original organic products able to be traced back all the way to the farm. Organic standards cover all of the aspects of organic food certification, including production and packaging, animal welfare, wildlife preservation and interdict all useless and dangerous food additives in processing organic foods. The British organic control bodies authorize individual organic operators. These are approved by DEFRA (The Department for Environment, Food and Rural Affairs). In order for a producer to have his merchandise marketed as organic, he must be affiliated to one of the control bodies and comply to its standards and requirements. The present article presents the certification control bodies in organic agriculture as well as the steps to be taken in the organic certification process within the United Kingdom.*

*Key words:* certification process, control bodies, DEFRA, organic standards

### INTRODUCTION

Organic food production in Europe is strictly regulated by an inspection, certification and labeling scheme. It is unlawful to call a food product 'organic' if it has not been inspected and certified by one of several organic control bodies (CBs).

If one wants to diversify into organic food, they will need to undertake a fundamental change in their farming, production and processing practices. For example, organic farming strictly limits the use of artificial chemical fertilizers and pesticides - they would need to use natural methods of pest control, as well as using crop rotation to keep the soil healthy.

It can take up to three years to become certified as an organic producer as per European Community organic food and farming regulations.

### MATERIALS AND METHODS

The article analyzes the procedures considered by the Government of the United Kingdom and the Certification Bodies by

following a set of key requirements set towards certifying organic farming.

### RESULTS AND DISCUSSIONS

Whilst there is plenty of information available to assist farmers in converting their land and managing it organically, the process of getting certified often seems quite complicated and confusing.

The labelling and marketing of organic food and feed products is controlled by EC Regulations 889/2008 and 1235/2008. Any person or organization intending to produce or process these organic products must be subject to an inspection and certification procedure by an approved inspection body. Anyone contravening these Regulations could be subject to prosecution by Trading Standards.

The following operations must be subject to the inspection and certification process:

- Farm production including arable and horticultural crops and livestock producing food intended for human consumption;
- Processing involving food preparation, prepacking and storage. This includes on-farm

processing such as dairy products, butchers shops, etc.;

- Organic products imported from countries outside the European Union, known as third countries;
- Animal feeds production;
- The re-labeling of products at any stage of the distribution chain.

Each production unit has to be registered and inspected. The area of land is specified down to the individual fields, OS/RLR numbers and areas. Only products from those fields may be marketed as organic. Each production enterprise, such as, cereals, dairy cattle and milk, vegetables etc must be licensed and only products from those enterprises may be marketed as organic. A named individual has to be responsible for the management of the organic unit.

Where the processing of products takes place on the farm, these must be included in the inspection and certification process. Where the farm's products are stored or processed at other premises, the premises used must also be inspected. This can include the drying or storage of organic cereals at another farm or grain store and the cold storage and washing of potatoes off site.

A number of organic CBs are allowed to certify organic businesses in the UK, including the production, processing and importing of organic products. CBs are licensed and controlled by the responsible authority in each EU member state. In the UK, Defra is the enforcing authority.

The approved certification bodies in the United Kingdom are:

- Organic Farmers & Growers Ltd (OF&G)
- Scottish Organic Producers Association (SOPA)
- Organic Food Federation (OFF)
- Soil Association Certification Ltd. (SA Cert)
- Biodynamic Agricultural Association (BDAA Demeter)
- Irish Organic Farmers' & Growers' Association (IOFGA)
- Food Certification (Scotland) Ltd.
- Organic Trust Limited
- Quality Welsh Food Certification Ltd.
- Ascisco Ltd (including processors).

Once the organic farmer has chosen a CB, the process is as follows:

- 1.He has to read their information pack thoroughly
- 2.Get the application pack and manual, which is likely to include their production and processing standards and application forms
- 3.Study the standards that apply to their farm to make sure that they will be able to meet them
- 4.Complete the relevant application forms - including the conversion plan - and return them to the CB's office, making sure they have provided all the required information.

Approved UK Certification Bodies	Logo	UK Code*
Organic Farmers and Growers Ltd		UK2
Scottish Organic Producers' Association		UK3
Organic Food Federation		UK4
Soil Association Certification Ltd		UK5
BDAA Demeter		UK6
Irish Organic Farmers' & Growers' Association		UK7
Food Certification Scotland Ltd		UK8
Organic Trust Limited		UK9
Quality Welsh Food Certification Ltd		UK13
Ascisco Ltd		UK15

Figure 1. Approved Certification Bodies in the United Kingdom

Undergo an inspection of the farm and/or processing unit/s:

1. Correct any shortcomings the inspector points out and if necessary agree to a further inspection
2. Receive a Certificate of Compliance and a schedule to it - listing everything their business is certified for - for public display and to give to customers who ask for it
3. Agree to undergo an annual inspection as well as spot or unannounced inspections
4. Agree to comply with the penalties imposed following the discovery of any infringements to the standards of their CB



5. Allow the taking of samples for analysis on a routine basis or where a problem is suspected, eg. contamination.

Once the farm is registered, the CB should notify Defra so that the farm is entered onto the national register.

DEFRA is the Government department responsible for overseeing certification of organic production within the UK and has delegated that role to organic certification bodies.



Figure 2. Logo of DEFRA (Department for Environment, Food and Rural Affairs)

The standards set by DEFRA conform to the minimum standards set by the International Federation of Organic Agricultural Movements (IFOAM).

The DEFRA UK Compendium of organic standards - set by the International Federation of Organic Agriculture Movements (IFOAM) - offers a baseline for all UK organic production and each certification body owns its own standards which are based on the Compendium.

Both Soil Association and SOPA standards in particular are higher than this baseline, though other certification bodies also have higher standards.

Organic Certification Bodies hold details of their operators which is mandatory under EU legislation. Defra (as the 'responsible body') is required to send an EU return each year that includes details of all certified organic operators.

Each Certification Body sends a list of their organic operators, along with crop areas and livestock numbers measured at a point in time

through the year during the annual on-farm inspections.

The organic Certification Bodies compile data specifically for Defra based on the annual on-farm inspections of their licensees. These inspections take place to allow the Certification Bodies to fulfill the organic control requirements as determined by the organic EU Regulations.

The conversion period is normally 2 years (or 3 years for perennial fruit or vegetable crops) but this can be reduced by up to 4 months (20 or 32 months) if records and a visual inspection prove that there has been no use of artificial inputs for the 4 months prior to the date of application.

Conversion can be done in stages or the whole farm can be converted at the same time. Many farms, particularly mixed farms have successfully converted the whole farm in one go. Alternatively staged conversion over a period of perhaps three or four years has the advantage of providing time to learn new techniques, finding out which system suits the farm best and spreading risks by testing the market slowly.

During the first 12 months of the conversion period, all crops must be sold as non-organic;

- Crops harvested after the first 12 months of the conversion period may be marketed under the label "Produced under conversion to organic farming".

There is a strong market for conversion cereals and legumes for stock feed and a developing market for conversion fruit and vegetables. Farm shops can also sell the produce of the farm under this label.

-Crops that were sown or planted into land that has achieved organic status can be sold as organic;

-Perennial fruit and vegetable crops can be sold as organic after the plant has been through 36 months of conversion;

-Grazing and forage crops harvested after the land becomes organic can be sold as organic.

## CONCLUSIONS

As one of the largest producers of organic food in the whole of Europe, the United

Kingdom has to comply to a set of rules controlled by EC Regulations.

Organic production rules in the UK are governed by European Regulation EC Regulations 889/2008 and 1235/2008.

Any person contravening these Regulations could be subject to prosecution by Trading Standards.

In the UK, there are various Certification Bodies which are licensed and controlled by the responsible authority in each EU member state.

The Certification Bodies (CBs) are allowed to certify organic businesses in the UK, including the production, processing and importing of organic products.

## **ACKNOWLEDGMENTS**

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## CARDOON, RENEWABLE SOURCE OF ENERGY

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### Abstract

*Cardoon (Cynara cardunculus) is a herbaceous perennial plant in the vegetable, artichoke, wild or garden, which belongs to the Compositae family (Asteraceae Compositae-and more precisely Cynara species) and is grown specifically for the production of biomass (solid bio fuel as a pellet, or solid and liquid bio fuel, bio diesel). In this paper I have tried to highlight the profitability and economic efficiency of growing of this plant. Production capacity exceeding 2 tonnes dry matter/1000mp. The yield depends on climatic conditions, adequate soil moisture, soil nutrients, and range from 1 to 3 t/1000mp, dry. Cardoon seed contains on average 24% oil (category: 19-32%), with the same qualities as the sunflower. Quantity of seed production to 480 kgs/1000mp, while ordinary productivities range 70 to 330 kg/1000mp, always depending on the total biomass production. Growing cardoon can replace traditional crops, partly by ensuring a good profit for the farmer (double the wheat and rapeseed) and bio fuel production with high energy content. Solid bio fuels (pellets, briquettes, artichokes, etc.) can reach the end-user, at prices up to 30-40% lower than the price of oil. Because cardoon is a perennial plant which grows once every 10-12 years, and preparing the ground and sowing it will be carried out at intervals so large (this plant is harvested annually), it is remarkable cost reduction efficiency of growing this plant. In addition to the obvious environmental advantages by producing green energy, growing artichokes garden preserves the soil covered for the most part of the year, thereby minimizing the risk of soil erosion and limit the pollution of soil and groundwater with agrochemical products, especially in areas with intensive agriculture, because it does not require additional fertilization and/or with the use of chemical fertilizers or pesticides.*

*Key words:* bio diesel, bio fuel, cardoon, pellet, plant energy

### INTRODUCTION

Currently, biomass is an important alternative energy source being entirely useful (M. Berca, 2006). It is available for use worldwide. Affordable cost and neutral character of the emissions of greenhouse gases make a promising biomass energy resource.

Given the biopedoclimatic particularities, in Romania there are favourable conditions for the cultivation of energy plants as raw material sources. 95% of biomass that is achieved is used directly for heat production. Almost 1/3 of the utilized agricultural area is uncultivated. Favoured fertile soil rich in humus and favourable climate conditions, energy plants have a high potential for cultivation. There is a great potential for investment in plantations with short term productivity by rotation.

Cardoon - *Cynara cardunculus* - vegetable is a herbaceous plant, perennial, belonging to

compositae family (Asteraceae, Compositae and accurate species *Cynara*), which is grown specifically for biomass production. It is also called wild artichoke or garden, in our country it is grown on small areas and chard leaves and leaf stalks that are eatable.

Cardoon cultivation in Romania as energy plant represents a new entry on the economic and environment market, and this is a remarkable progress in the development of agriculture, by the diversification of crops and achieving performance in these areas.

### MATERIALS AND METHODS

The main objective in this paper is to study morphological, biological and biochemical features of Cardoon in order to use it as power plant, as well as the environmental requirements to the major crop factors: light, temperature, water and soil. I tried to

emphasize the profitability and economic efficiency of the energy plant cultivation.

Cardoon development begins with the first rains of autumn, and continues (taking advantage of the rain) until the beginning of summer. Thus, the air section of the plant dries and it can be harvested dry to the end of summer. With the first rains of autumn it can be observed again a rapid development of cardoon, that covers entirely the ground in a few days.

The transition from winter to spring (temperature increases and sun appears), marks the next stage of plant development, the emergence of strains. This takes place about the middle of May, it extends in a fast way (up to 4 inches per day) and it can reach a height of up to 2.5 meters. At the same time, with extension of strain, the stem sessile leaves sessile create, deep-section interchangeable alternatively.

Stem growth in height ends with the first appearance of main inflorescence (calatidiu). Next, branches are appearing, their height varies from 0.5 to 1.2 meters. At the top of each branch is an inflorescence. Some small leaves, thick, thorny and divided form along the branches. The latter is characterized by high levels of nitrogen in their tissues ( $3.0-3.6 \text{ g N m}^{-2}$ ), contributing to increase plant photosynthesis and increase photosynthetic surface. Total number of flowers is a function of the variety of plant, soil and climatic factors, and of course the variety.

On an average, 10-15 buds are formed in a plant. They are gathered in a large inflorescence, spherical green one. Simultaneously with the formation of the final number of buds, flowering starts itself, characterized by the emergence of purple stamens, situated at the top of each inflorescence. The end of flowering, calatidii reached final size, following maturation, their colour change from green to golden yellow, top to bottom.

Once completed also this stage, white papus appear and the crop is ready for harvest (late August - mid September). After about a week of harvesting, crop begins to grow again (new branches leaves) and growth rate / Issue leaf

(petiole, deep-section), which grow from the root (2nd year), is typically 5-10 times higher than those from seeds (first year). Chard seed is dark green-brown.

Land cover rate is clearly faster than the first year and depends on soil moisture and air temperature (10-25 days). Usually from the root 1-4 plants burgeon again at the same time, that develop parallel and contribute to rapid soil cover.

Later, after rosette formation, each root will feed one, at most two plants depending on soil available nutrient components. Also, with the inevitable small losses during harvest, it is observed germination of new seeds, but these seedlings will eventually disappear because of the other plants.

In the first year of vegetation, the amount of biomass is usually  $1/3$  to  $2/3$  lower than that found in the second year. Cardoon is deep and woody roots and can reach a depth of 5 m, while the width of the root system can reach 2 m (Danalatos N. et al., 2008).

## RESULTS AND DISCUSSIONS

The optimum temperature for development Cardona (temperature below which plant / seed will not grow) is about  $8 - 6^{\circ}\text{C}$ . Seed germination temperature of  $15-20^{\circ}\text{C}$  lasts only 1-2 weeks, and it is recommended to sow in the second decade of august until mid-September (autumn sowing) and March-April (sowing spring).

The optimum temperature for plant photosynthesis is  $19$  to  $23^{\circ}\text{C}$ , while daily temperatures of around  $22^{\circ}\text{C}$  can be observed maximum plant growth in volume (April-May). Night temperature also plays an important role in the growth and development of Cardoon so high night-time temperatures ( $> 25^{\circ}\text{C}$ ) increase carbohydrate intake (weight loss).

Cardoon is very strong also at cold (snow, ice) provided that it enters a higher phenological stage. Total development stage rosette, the plant can withstand even at temperatures as low as  $-20^{\circ}\text{C}$ . In general, at temperatures  $< -5^{\circ}\text{C}$  it is observed bending leaves, which starts at the local stem rot which contains

large amounts of water. During periods of prolonged frost or heavy snow, there is a break stems and total destruction of biomass. With increasing temperature, the culture is to insert new leaves from the main root of the plant, arranged in rosette. Depending on the time of the event and highlight the phenomenon, the final output is reduced (10-30% if there is winter, up to 50% if it happens in March) Cardoon collection varies, based on the end use of culture as bio diesel or solid fuel.

The best time to harvest is when the 5% of calatidii fully opened, papus becoming visible. Harvesting late (more than 50% calatidii open) causes a decrease in seed production (due to shaking).

If seed for bio diesel, culture must be harvested in August, mid-September (9.12% seed moisture) using a common threshing machines by adding a suitable type of knife in front.

In the case of complete collection of dry biomass, the most suitable solution is to use a powered machine that collects all biomass and simultaneously creates large rectangular bales, weighing 400-500 kg/bale. This method is also the most economical and quality. At the same time, new types can be used for large presses that cut and link/collect biomass. Alternatively, the crop can be harvested with the use of equipment which is the usual way as quality, but less growth (biomass harvested weighs very little, approx. 100-150 kg / m<sup>3</sup>, compared with 200-350 kg/m<sup>3</sup> at large bales, increasing transport costs). (Danalatos N. et al., 2008).

Cardoon is demanding to light and is considered big day plant. The photosynthesis rate maximizes (50kg CO<sub>2</sub> ha<sup>-1</sup> h<sup>-1</sup>) to the total intensity of solar radiation above 600 W/m<sup>2</sup>.

Minimum interval of precipitation (from sowing or germination until the end of flowering, usually in May-June) should be at least 400mm, to avoid becoming a limiting factor in the availability of moisture.

Cardoon prefers slightly acidic soils to the alkaline, clay (pH 6.5 to 8.2), and heavy soils, acid completely are not recommended.

Since culture is perennial, land preparation and planting will occur once every 7 to 12 years. However, particular attention will be paid to care, since during preparation and sowing mistakes are irreversible and can decrease productivity and life of the culture.

In general, Cardoon sowing depth should not exceed 3 to 5 times of the largest seed dimension. Soil moisture on a normal seeding depth should be 2-3 cm, while on a soil surface moisture lost is sown deeper, to 4-6 cm.

Usually, the amount of biomass is due to the density per hectare. In the case of cardoon, which is a complex plant with many uses / industrial uses (both seed production and biomass), best density is 4-6 plants / m<sup>2</sup>. Distances between rows are adapted to mechanical equipment available to 70-75 cm. In many cases, MMB weight varies from 20 to 50 grams, depending on size. Sowing seeds will be selected so that MMB weight is > 35 grams.

Special attention must be given to the residual activity of certain herbicides from previous crops. Usually, problems may occur after growing oilseed rape, maize and sorghum, as well as active substances (eg atrazine, and so on). A good precedent is considered wheat.

Culture is affected by herbs, but only during the first stage, that is from sowing until full coverage of land (first year only).

Because Cardoon has a very deep and extensive rooting (up to 5m), it offers an advantage in the ability to absorb nutrients from deeper soil layers. Thus, the culture of cardoon has minimal fertilizer needs for the first 2-3 years after installation. There was a significant influence in increasing the production of fertilizers during the first 4-5 years of cultivation. In addition, the culture of cardoon produces a large amount of plant mass (up to 1000kg leaves/ha) during the first phenological stages, which leaves the ground. Leaves fall under physiological conditions is achieved when the nitrogen content of plant tissues is minimized (0.7 to 1.1%). That is, culture can only feed up to 8 kg nitrogen / sqm. On a clay soil texture and organic matter content approx. 3-7 units of nitrogen per year

are mineralized. Thus, the final absorption plant can reach up to 10-15 units of nitrogen. Nutrient uptake by plants depends also on the harvest, and the distribution of dry matter in shoots, leaves, seeds and so on, since different parts of the plant have varied nutrient content (eg seeds contain 3,2% nitrogen, while only 0.65% offspring). In this way, if harvesting takes place in August, when the crop is dry (humidity <15%), the number of nutrients will be removed (remobilisation of nutrients) unlike an early spring harvest green fodder (humidity > 60%).

In soils with high groundwater, water use additional roots, developing biomass (>3t/ha) needs optimum rainfall is 400mm/period of cultivation. 100-150 ml spring water irrigation enhances biomass production (and seed) by 40-50%.

So the Cardoon can be used as solid fuel (pellets or briquettes) for heating or electricity generation.

Production capacity exceeds 3.2 tonnes /1000square meters dry substance. The efficiency depends on climatic conditions, proper humidity soil nutrient availability in the soil, and varies from 1 to 3 t/1000mp, dry. Usually, the final output can be associated with the durum wheat (wheat production cardboard production of seed  $x = 4$ ). Energy efficiency depends on the distribution of biomass during harvest and of the dry substance and their heating capacity (Table 1).

Table1. Energy efficiency of biomass Cardoon

Class cardoon plant	Distribution to substance dry	Value Energy (MJ / kg)	
		maximum	minimum
Root+ branches	45%	17,67	16,47
Calatidii without seed	36%	17,26	16,01
Seed	19%	23,43	21,88
Total/ plant	100%	18,61	17,33

Dry matter distribution changes with time, with climatic conditions (especially temperature) and growing care (eg irrigation). On fertile soils, sufficiently watered, the proportion of seeds / biomass increases, increasing also the total energy of the plant, while on the field it may reach 12%. When calculating the total energy value is not taken into account and leaves, as is <2.1% of output

and usually destroy (friction) during the harvesting procedure. Biomass can be used to produce electricity entirely through processing into pellets and then used as fuel in furnaces, boilers or industrial waste (Arion V. et al., 2008).

Cardoon seed oil contains on average 24% (category: 19-32%), with the same quality as that of the sunflower. Raw can not be used as engine oil. Seed production quantity reaches 480 kg/1000mp, while normal efficiency is 70 to 330 kg/1000mp always based on total biomass production.

Production of bio-oil from seeds of cardoon is estimated at 0.878 t / ha on average, ranging up depending on way of creating the crops and on the plant age, between 0.713 and 1.190 t / ha.

In terms of biochemical values, Cardoon contains large amounts of sugars, acids, nitrogen and phosphorus.

## CONCLUSIONS

From the data presented above, we can deduce that this power plant located in Southern Romania finds favourable climatic and agro pedology conditions for its cultivation and it can be a source of plant material used for obtaining liquid or solid.

Cardoon cultivation may partially replace traditional crops, ensuring a good profit for the farmer (double compared to the current prices at wheat and rape, for example, 70 € / t dry biomass at the entrance to the factory) and bio fuel production with high energy. Solid bio fuels (cardoon pellets, briquettes, etc.) can reach the end user, at prices 30-40% lower than oil prices.

Reduce costs regarding the efficiency of cultivating this plant is obvious, because Cardoon is a perennial plant that grows every 10-12 years, and its soil preparation and sowing is done every so high (although this plant is harvested annually).

Besides producing green energy, growing cardoon keeps soil layer covered most of the year, eliminating the risk of soil erosion.

Cardoon cultivation limits the soil and ground water pollution with agrochemicals, especially

in areas of intensive farming because it requires no additional fertilization with chemical fertilizers or pesticides. Even in additional irrigation, cardoon uses minimal amounts of water.

Due to the minimization of soil works and cultivation practices, rest and enrich the soil with organic matter, cardoon leaves for the crops that will be sown later, well-structured soil, creating a rich humus and increased chemical characteristics.

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## ATMOSPHERIC AIR QUALITY IN CALARASI TOWN

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### Abstract

*The present paper seeks to highlight the appearance of air pollution in Calarasi region on the basis of the annual reports of the environment in recent years and of the integrated air quality management for Călărași (data are presented about current and future emissions and concentrations of pollutants) I tried to mark out the impurity of the atmospheric air from this area. Emission data interpretation was made on the basis of the inventory of emissions of pollutants in the air made for fixed and mobile sources in Calarasi town in recent years using the program Corinvent and Corinair emission factors, and imissions data were used to monitor the air quality monitoring network air quality. The index of the quality of the air showed the highest values in winter. There have been occasional instances of the limit provided by law for particulate matter PM<sub>10</sub>, Calarasi, or being the intense traffic, the topoclimate in summer periods with high temperatures and deficient pluviometric regime, but also because housing fuel winter warming solid. There major problems of environmental pollution of air quality in Calarasi town that falls within the limits imposed by the legislation in force. This is due especially to the fact that many industrial centres have been closed.*

**Key words:** air pollutants, air quality, emissions, imissions, impurity

### INTRODUCTION

The Air quality monitoring is of great importance in monitoring activity because the air is the most important environmental factor for the transport of pollutants is the medium in which their fastest transport takes place in environment.

The air pollution involves changing natural proportions presence of air or gas components in the atmosphere that does not exist normally or whose concentration exceeds certain limits (Enache L., 2007).

The air pollution is altering the physicochemical properties of atmospheric air by entering this environment substances or mixtures of substances foreign to the natural composition of normal air (in the form of solids or liquids, gases, steamers mineral or organic compounds, radioactive substances, microorganisms and so on, including in the form of heat).

Pollution is either local, the concentration of the substance emitted into the atmosphere is distributed in a certain area around the point of emission or regional in nature due to the

dispersion of pollutants in the atmosphere (Muntean I.O., 2004).

Their towns and industrial areas, and passageways, are the main gases responsible for the greenhouse (Berca M., 2006).

The importance of protecting this area located in SE Romania shows precisely what elements confer particular interest: the location on the Danube River, the opportunities of the border town positioning and the county transiting The Sun Highway, the beautiful scenery of the islands on the Danube, the fact that agriculture as the dominant industry in the county's economy is significantly influenced by environmental conditions.

### MATERIALS AND METHODS

In the county the responsibility for environmental protection is the Environmental Protection Agency.

Environmental activity is regulated by Law 195/2005 and constitutes an obligation of local authorities, institutions, businesses and individuals.

This paper aims to highlight ambient air quality in Calarasi town. For this purpose, the data were collected regarding the air quality in terms of pollutant emissions from different activities and data on ambient air quality. Emissions (emissions are pollutants discharged into the environment, which is manifested and measured starting at the source) data interpretation was based on emission inventory of air pollutants produced for fixed and mobile sources Calarasi the years 2009, 2010 and 2011 using Corinvent program and CORINAIR emission factors and the immission (immission - transfer of pollutants into the atmosphere by a receiver) were used for air quality monitoring data from the air quality monitoring network, using for comparison the corresponding limits presented by Law no. 104/2011. This law aims to protect human health and the environment as a whole, regulating measures to maintain ambient air quality.

CORINAIR methodology (Core Inventory of Air Emissions), updated annually and published on the website of the European Environment Agency, provides information on the types of emission sources in the atmosphere, they generate technological processes and associated emission factors, based on questionnaires received from traders territory.

The Air Quality Monitoring Network in Calarasi area consists of two automatic monitoring stations that are part of the National Air Quality Monitoring, equipped with advanced analyzers and apply reference methods required by European legislation. It has the following structure:

**CL1 station (traffic stop)** is located in Orizont area and monitors the impact of traffic on air quality, in order to highlight the level of pollution affecting the population. Pollutants monitored in this station are:  $SO_2$ ,  $NO$ ,  $NO_2$ ,  $NO_x$ ,  $CO$ ,  $PM_{10}$  gravimetric automatically,  $Pb$  (in  $PM_{10}$ ), benzene, toluene, o-xylene, ethylbenzene, m, p - xylene (on line).

**CL2 station (urban background station)** is located in the Municipal Stadium and monitors the level of pollution in urban areas, the influence of human settlements, without

being directly influenced by traffic or industry. Pollutants monitored here are:  $SO_2$ ,  $NO$ ,  $NO_2$ ,  $NO_x$ ,  $CO$ , ozone, lead (in  $PM_{10}$ ),  $PM_{10}$ , Benzene, Toluene, O-Xylene, Ethylbenzene, m, p - xylene (on line). Are also monitored and meteorological parameters (wind speed and direction, temperature, pressure, solar radiation, relative humidity, precipitation).

Apart from the two stations, the Environmental Protection Agency monitors air quality in the Romanian - Bulgarian border area by two automatic stations located in Chiciu area and the Sanitary Veterinary Directorate area equipped with analyzers, the performance analysis method is DOAS method (optical spectroscopy of Differential absorption). They provide the following monitoring gaseous pollutants:  $SO_2$ ,  $NO$ ,  $NO_2$ ,  $O_3$  (Environmental Annual Report, 2011).

The main activities leading to air pollution in Calarasi town are heat production in thermal power plants for commercial, industrial and residential extraction and distribution of fossil fuels, solvent use, road transport, agriculture and mobile sources (other than road).

Potentially polluting sources of  $NO_x$ ,  $SO_x$ ,  $CO_2$  and dust on air quality in Calarasi are: SC TENARIS SILCOTUB SA - Calarasi workstation (mill), SC SAINT GOBAIN GLASS SRL Romania (glass factory), SC COMCEH Calarasi (factory paper), SC Donal SRL Calarasi (mill), SC PREFAB SA Calarasi (building materials) and asphalt stations: SC ROADS AND BRIDGES SA Calarasi, SC ASTALROM SA Calarasi SP GREEN SPACES SA Calarasi.

Specific air quality index is a coding system to levels recorded for each monitored following pollutants: sulphur dioxide ( $SO_2$ ), nitrogen dioxide ( $NO_2$ ), ozone ( $O_3$ ), carbon monoxide ( $CO$ ), particulate matter ( $PM_{10}$ ).

The general index is established for each of the stations of the National Network Automatic Air Quality Monitoring as the greatest of specific evidence that pollutants monitored.

In order to calculate the overall index must be available at least 3 specific indices that

pollutants monitored. General and specific indices index are represented by integers between 1 and 6. (Environmental Annual Report, 2011).

The Integrated Air Quality Management is designed to ensure compliance with the limit values laid down by national legislation and international Calarasi and surroundings. It contains estimates of the evolution of pollutants by 2015.

The specific objectives of this program are: to identify areas where limit values are exceeded; quantify the contribution of different emission sources, defining series of measures which should ensure compliance with the limit values, monitoring and evaluation recommendations for improving air quality in the city in the future, defining responsibilities (Integrated Program Management Air Quality for the Calarasi, 2004).

## RESULTS AND DISCUSSIONS

Integrated Program Management Air Quality data are presented for the current and future emissions and concentrations of pollutants in Calarasi. Together, these data show that the limit values are exceeded now and they will probably be obsolete in the future, even after the implementation of existing plans to reduce pollution. These data also show that pollution sources are the most important.

By comparing data modelling software and data from the annual average for 2010 revealed the following:

Table 1. Comparing data modelling program with those obtained from the annual average

Analyzed substance	SO <sub>2</sub>	PM <sub>10</sub>	NO <sub>x</sub>
Estimates for 2010 (tons / year)	736,4	418	3960
Data obtained by analysis / 2010 (tons / year)	582,8	530	959,48

It can be seen from the table that the most important air quality problems are related Calarasi PM<sub>10</sub> emissions from solid fuel use in the residential sector. The air quality modelling showed that this significant problem is found not only in the centre of Calarasi, but also in neighbouring residential

areas. The other two pollutants monitored were below estimates ranged modelling program.

The general air quality index was achieved by averaging each month individually, and the results obtained are shown in Figure 1.

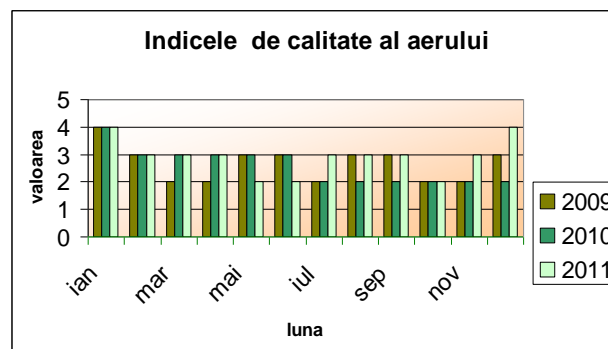


Figure 1. The evolution of the air quality index in 2009-2011

From Figure 1 it can be seen that the highest level pointers. were obtained in the winter months, December and January, which is due to the same particulate matter (PM<sub>10</sub>) arising from the use of solid fuels (wood, coal) to heat their homes.

Data collected from two monitoring stations in the city (according to Average Annual Reports: 2009, 2010, 2011) have revealed the following:

### A. Monitoring Station CL 1

a. **Determination of sulphur dioxide** - 1 hour averaging time revealed the following situation (frequency exceeded - 0%)

Table 2. Determination of SO<sub>2</sub>

Analyzed Element (mg/m <sup>3</sup> )	Year			Limit imposed the Order 592/2002
	2009	2010	2011	
SO <sub>2</sub>	6,13	9,58	24,11	350

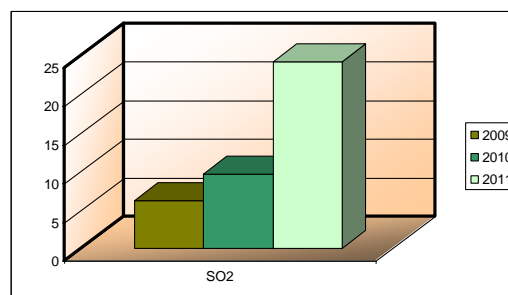


Figure 2. Evolution of SO<sub>2</sub> in 2009-2011

According to Figure 2, SO<sub>2</sub> emissions have greatly increased due to the opening of the new factory reopening Saint Gobain and improved Donasid steelworks. But it is an important and increasing traffic.

Sulphur dioxide (SO<sub>2</sub>) comes from heating the population that does not use gas, power plants, industrial processes (steel, refinery, sulphuric acid production), pulp and paper industry and to a lesser extent, emissions from diesel engines.

**b. Determination of nitrogen dioxide** - 1 hour averaging time revealed the following situation (frequency exceeded - 0%):

Table 3. Determination of NO<sub>2</sub>

Analysed Element (mg/m <sup>3</sup> )	Year			Limit imposed the Order 592/2002
	2009	2010	2011	
NO <sub>2</sub>	13,01	13,34	15,72	200

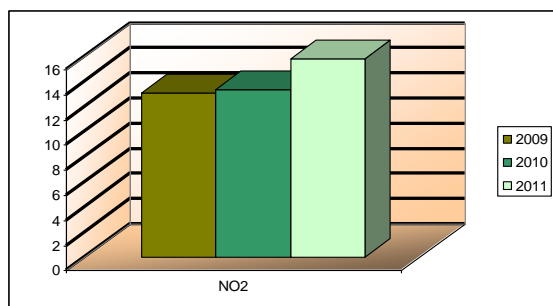


Figure 3. The evolution of NO<sub>2</sub> in 2009-2011

According to Figure 3, NO<sub>2</sub> emissions have increased slightly since 2009 and until 2011, due to increased traffic continuously.

Nitrogen oxides - NO<sub>x</sub>, NO<sub>2</sub> is formed especially in the combustion process when fuels are burned at high temperatures, but more often they are the result of road traffic, industrial activities, producing electricity.

**c. Determination of carbon monoxide** - 1 hour averaging time revealed the following situation (frequency exceeded - 0%):

Table 4. Determinations of CO

Element analyzed (mg/m <sup>3</sup> )	Year			Limit imposed the Order 592/2002
	2009	2010	2011	
CO	0,15	1,63	1,71	10

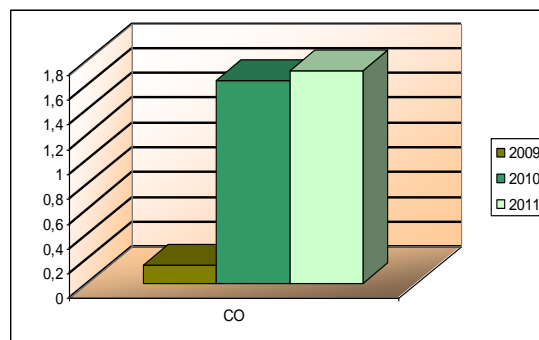


Figure 4. CO evolution during 2009-2011

In Figure 4 is shown the close connection between the CO and the growing number of vehicles in Calarasi town. Road produces the highest percentage of CO released into the atmosphere (about 85%). Amounts of CO (g) are produced by biomass burning, industrial processes and some biological activities. Carbon monoxide (CO) - is formed mainly by incomplete combustion of fossil fuels, iron and steel production, oil refining, road, air and rail.

**d. Determination of particulate matter** - 1 hour averaging time revealed the following situation (frequency exceeded - 0%):

Table 5. Determinations of PM<sub>10</sub>

Element analyzed (mg/m <sup>3</sup> )	Year			Limit imposed the Order 592/2002
	2009	2010	2011	
PM <sub>10</sub>	48,28	38,77	29,6	50

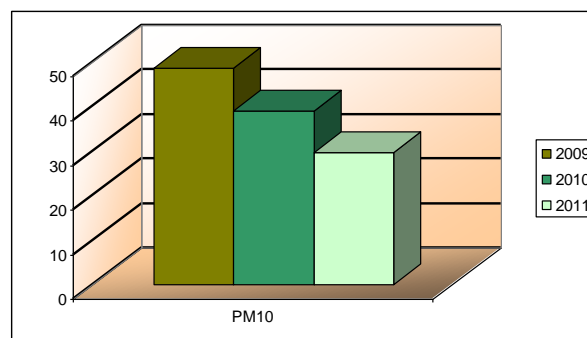


Figure 5. The evolution of PM<sub>10</sub> in 2009-2011

Figure 5 shows the decrease in the amount of PM<sub>10</sub> recorded in the three years. This is due to the installation of more and more thermal power stations and renunciation solid fuel domestic heating.

PM<sub>10</sub> particulate matters derive from the industrial activity, population heating, thermal power stations. The road traffic contributes to particulate pollution caused by car tires to stop them both and because of incomplete combustion.

### B. Monitoring Station CL2

a. **Determination of sulphur dioxide** - 1 hour averaging time revealed the following situation (frequency exceeded - 0%):

Table 6. Determination of SO<sub>2</sub>

Analyzed element (mg/m <sup>3</sup> )	Year			Limit imposed the Order 592/2002
	2009	2010	2011	
SO <sub>2</sub>	5,71	8,22	13,7	350

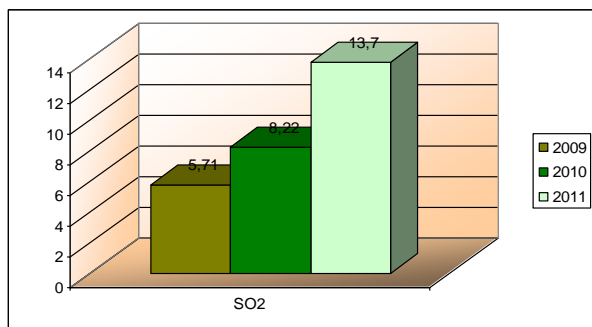


Figure 6. Evolution of SO<sub>2</sub> in 2009-2011

According to Figure 6, SO<sub>2</sub> emissions have increased dramatically in the past three years without becoming dangerous.

b. **Determination of ozone** - 1 hour averaging time revealed the following situation (frequency exceeded - 0%):

Table 7. Determinations of O<sub>3</sub>

Element analyzed (mg/m <sup>3</sup> )	Year			Limit imposed the Order 592/2002
	2009	2010	2011	
O <sub>3</sub>	62,77	55,31	51,56	120

According to Figure 7, ozone is constantly decreasing. Ozone is a gas emitted. The only source of air are chemical reactions. Eliminating ozone include chemical reactions (preferably with organic surfaces).

The air is harmful when inspired O<sub>2</sub> instead of its derivative called ozone. The effect of troposphere ozone is harmful photochemical

smog. Substances responsible for the formation of troposphere ozone are volatile organic compounds, NO<sub>x</sub>, and Freon-type substances.

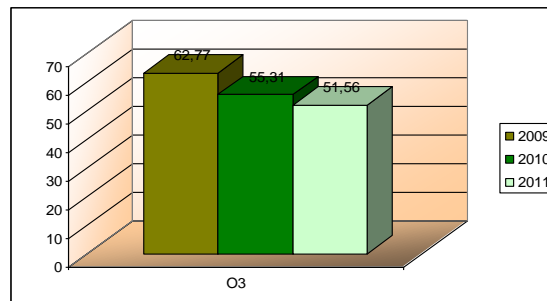


Figure 7. O<sub>3</sub> evolution in the period 2009-2011

## CONCLUSIONS

The application of the measures in the Integrated Air Quality Management Program Program in Calarasi area can lead to maintaining and improving the air quality in Calarasi town.

Exceeding of the daily values of particulate matter each year, recorded especially in cold periods is due to the north-east section of serious environmental problem areas: industrial area abandoned and vacant lots, being misused for waste disposal, housing in the area used for heating combustible solid or unconventional.

This situation will be resolved in the future by extending the natural gas network in the north and east of Calarasi town.

In the analysed period,, there was occasional exceeding of the limit laid down by Law 104/2011 for particulate matter PM<sub>10</sub> in Calarasi town, exceeding due to the heavy traffic (especially in the station CL-1-Orizont), local topoclimate in dry summer periods, but also due to heat houses with other fuels, except methane (especially in the representativeness of DSV station).

The air quality monitoring has improved slightly during 2009 - 2011 due to diminishing economic activities and programs of refurbishment and modernization at the level of industrial units and increasing the activity of the Environmental Protection Agency (increasing the number of inspections

at companies with activity that produces an impact on air quality).

In 2011, progress has been made in terms of air quality in Calarasi town (Environmental Annual Report, 2011):

- Economic operators in the city have limited air pollution emissions by measures included in the compliance programs in order to meet the requirements of BAT (for applying the best available techniques) and the limits imposed by environmental permits.

- Online monitoring of emissions by economic operators: SC TENARIS SILCOTUB and SC SAINT GOBAIN GLASS ROMANIA SRL.

- Reduction of particulate emissions from the production process at SC PREFAB SA Calarasi the installation of dusting equipment.

- Reducing heat consumption by rehabilitating 6 units of education in Calarasi town, by accessing the Environmental Fund.

- The local heavy transport was disposed on arteries that try to avoid the central area.

- The inner road infrastructure was improved in Calarasi municipality.

Due to the involvement of economic operators and local authorities, the issue of air quality in Calarasi town tends to improve.

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## THE IMPACT OF NATURAL RISKS ON AGRICULTURAL DEVELOPMENT OF THE REPUBLIC OF MOLDOVA

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### *Abstract*

Climate, topography and soil are natural conditions of basic agricultural yields. In general, Moldova has favorable climatic conditions and relief. Soils in the North have a high degree of fertility, while the central and southern regions are of average fertility. At the same time natural calamities such as droughts, late spring frosts, hail and floods have a destructive impact on crops. Climate instability is one of the main causes of unstable yields and is an inherent risk for agriculture of the country. More than that, most of the plots lose their natural fertility and require rehabilitation.

*Key words:* agriculture, climatic conditions, losses, risk

### INTRODUCTION

Processes and natural phenomena, although law-like, maintain randomness. Although appearing as a necessity in the evolution of the system, they are manifested as random, going from this point of view, in the sphere of chance and the unexpected sphere.

Natural risk is a function of the probability of damage and the likely consequences as a result of a specific event, it being understood as measure the size of a natural "threat".

The most part of the Republic of Moldova is situated in the sub-humid area with frequent droughts during the period plant vegetation, which is why it is critical to undertake adaptation measures of Moldovan agriculture to climate change.

Due to high dependence on climatic conditions, agriculture is the most vulnerable sector of the Moldovan economy to climate change. Climate instability is one of the main causes of yield unstable and is an inherent risk for the country's agriculture.

Climate changes are likely to adversely affect grain production, which plays a crucial role in ensuring food security. Normally, Moldova there is no shortage of basic foodstuffs, and in normal years are the means to ensure basic food for people. A constant problem, though, is very unhealthy and unbalanced diet, which many Moldovans prefer for economic or

cultural reasons. However, the present disastrous condition of agriculture is determined by a number of macroeconomic and structural policies. [4]

### MATERIALS AND METHODS

For revealing the problem was used literature, the National Bureau of Statistics of the Republic of Moldova to the Ministry of Agriculture, State Hydro Meteorological Service data and data derived from research conducted by the author. Based on accumulated data calculations were performed for analysis of the main crop productivity under the influence of drought, drought affected area, sum assured and level of crop insurance coverage against major natural hazards. For data interpretation collected and calculations made Analytical method was applied calculation method tabular and graphical method. In order to interpret the results of the analysis method was applied. To made conclusions the author have focused on the method of induction and deduction.

### RESULTS AND DISCUSSIONS

In the field of natural risks in agriculture are climate risks, environmental risks and biological hazards, represented in figure 1.

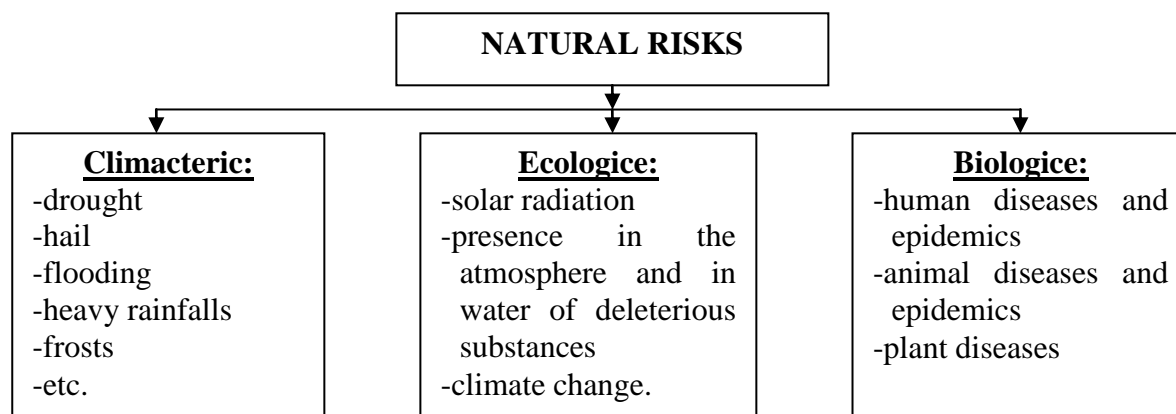


Figure 1. Classification of natural risks.

Source: elaborated by author

**Climate risks** – is the possibility of obtaining losses due to climatic changes. Any climatic risk phenomenon by way of manifestation, is a deviation from the multiannual average and the size of the deviation depends, therefore, and its consequences. Among climate risks shall be listed: drought, hail, torrential rains, floods, frost, freeze, heavy snow falls, ice, etc. Republic of Moldova being located in a climate with insufficient moisture of periodically subject to influence of particularly strong droughts (once in 50 years), strong droughts (once in 6 years), medium droughts (once in 4 years).

Among all climatic phenomena, the drought can be considered the most complex because their onset several factors namely rainfall, water supply plant available soil, humidity and air temperature, wind speed, and so on,

they the main climatic parameters that define the state during dry weather or drought.

Although droughts can register throughout the year, with the largest occurring in late summer and early autumn, in our country this phenomenon is repeated with a frequency of 3-5 years and includes generally south and center the country. Drought leads to losses (from 10 to 50%) of agricultural crops. Drying up of rivers and groundwater lowering may embarrass localities of drinking water supply.

In the last two decades droughts were reported more frequently, and they are becoming more intense. Thus, during the years 1990 - 2011 in the republic there have been 10 years (1990, 1992, 1994, 1996, 1999, 2000, 2001, 2003, 2007, 2011) with droughts of different intensity, which led to lower yields of agricultural crops.

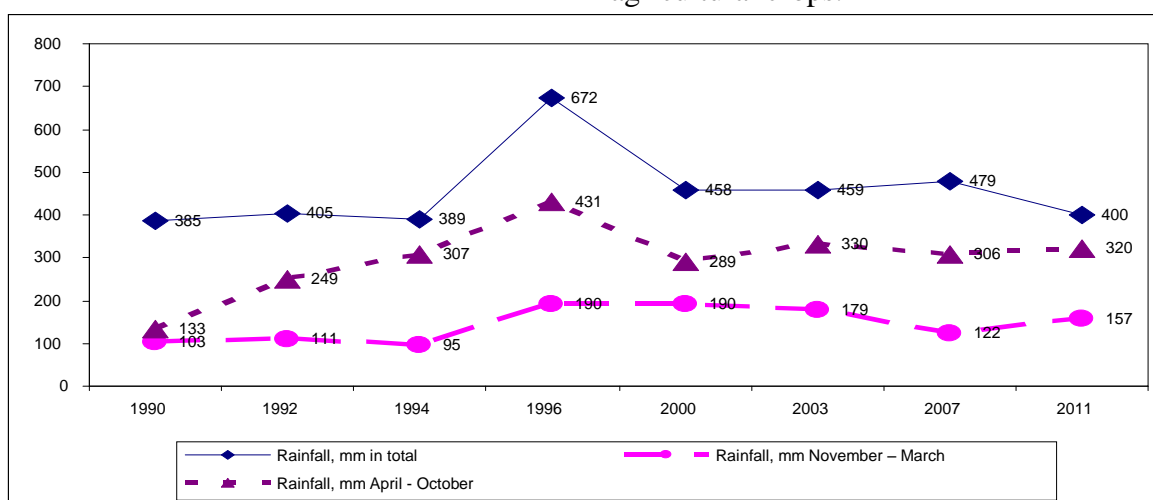


Figure 2. The amount of precipitation in the driest years in the Republic of Moldova  
 Source: elaborated by author based on data of the State Hydro Meteorological Service



The data presented in Figure 2 we observe that during the analyzed period the smallest amount of precipitation was recorded in 1994, followed by 2011.

Low amount of precipitation in the driest years in the past has influenced the yield per hectare change the main cereal crops in Moldova.

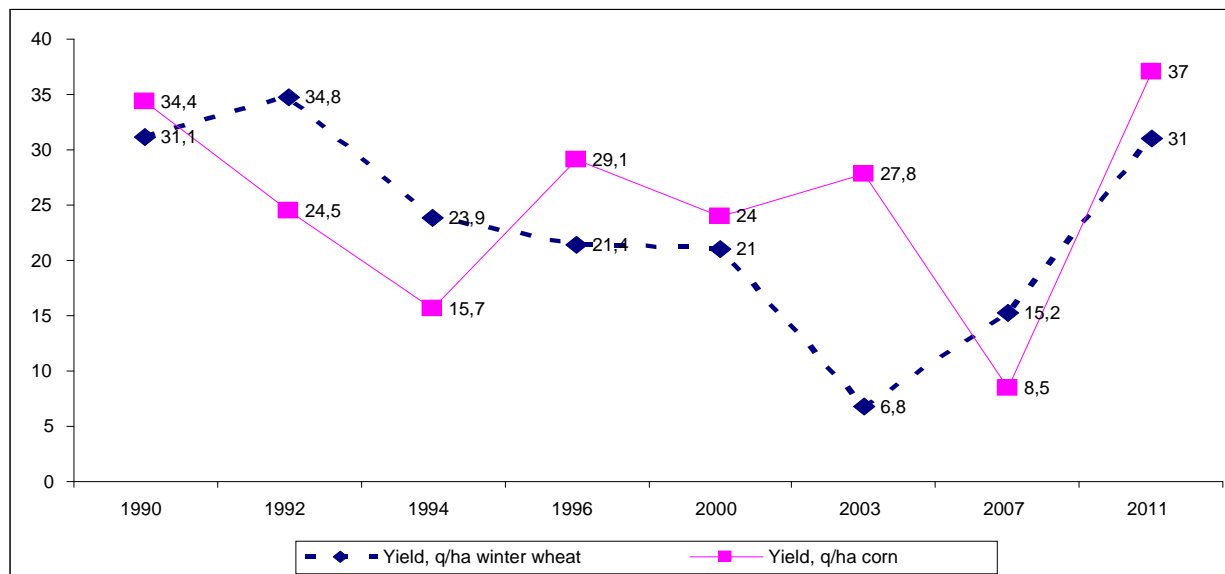


Figure 3. Yield per hectare of major cereal crops in the Republic of Moldova in the driest years  
 Source: elaborated by author based on data of the National Bureau of Statistics

The data presented in Figure 3 is observed that the low productivity of winter wheat in the driest years recorded in 2003, and the highest yield was recorded in 1992. The situation is different with regard to corn crop, the lowest yield was recorded in 2007 and the highest in 2011. Consequences of the drought intensity are determined both by the extent, timing, and

how the affected area. Droughts that comprise a surface area of up to 10% of Moldova's territory were assessed as local 11-20% are considered - large, 21-30% - very large, 31-50% - extreme and above 50% appreciate that catastrophic droughts, as it causes losses of national economy. Table 1 presents calculations for each season and year.

Table 1. Assessment area affected by drought on the territory of the Republic of Moldova

Years	Spring		Summer		Autumn	
	Occupied area,(%)	Type of droughts	Occupied area,(%)	Type of droughts	Occupied area,(%)	Type of droughts
1990	7	local	67	catastrophic	60	catastrophic
1992	27	extensive	60	catastrophic	40	extreme
1994	87	catastrophic	40	extreme	100	catastrophic
1996	68	catastrophic	49	extreme	44	extreme
2000	75	catastrophic	55	catastrophic	49	extreme
2003	86	catastrophic	61	catastrophic	26	very extensive
2007	78	catastrophic	77	catastrophic	-	-
2011	-	-	-	-	80	catastrophic

Source: elaborated by author based on data of the State Hydro Meteorological Service

By analyzing the data of Table 1 we see that for the Republic of Moldova in the spring

season prevails vast and catastrophic droughts in summer extreme droughts occur more

frequently and catastrophic droughts have a high frequency in autumn.

Thus, the droughts of 1994, 2000, 2003, 2007 and 2011 were rated as the worst in terms of intensity and catastrophic by surface area occupied.

The farmer to prevent any damage caused by natural hazards shall be necessary to ensure production at an insurance company.

Insurance schemes are a cost-effective way to spread risk over a long period of time and in a large number of people.

Table 2. Level of insurance coverage of agricultural crops against drought in the Republic of Moldova

Districts of the country	Covered surfaces, ha				Total
	Winter wheat	Winter rape	Winter barley	Sugar beet	
Drochia	-	70	35	-	105
Făleşti	-	-	-	45	-
Floreşti	170	-	70	-	240
Glodeni	100	100	100	-	300
Râşcani	396	-	-	-	396
Sângerei	1023	130	120	-	1273
Total	-	-	-	-	2314

Source: elaborated by author based on source [3]

Analyzing the data presented in Table 2 we see that hail risk insurance in Moldova is concentrated more in the north of the country, which has the largest share in the district of Sîngerei.

A more favorable situation in terms of security is recorded for the hail risk.

Hail is a climate risk, although rare, can produce in a short time of large proportions natural disasters, local or regional, depending on Cumulonimbus cloud path that has generated it.

Hail the type of atmospheric precipitation is composed of spherical particles or chunks of ice with the size from 5 to 55 mm and sometimes higher. In the area of the hail this dangerous phenomenon occurs most frequently in the country in July - august, affecting the northern, north - east and west areas, where the average per year are recorded two days with hail. Material damage caused by hail can be up to 2% of potential Gross Domestic Product. Being a phenomenon

whose maximum frequency is carried out during the warm season, hail capture agricultural crops in different stages of development, affecting the smooth running of the biological cycle. It is enough to hail one case in a critical stage of plant development for the whole harvest to be compromised.

The hail may have little effect, given its size and density of the fallen grains are smaller, shorter growing seasons and advanced stage of vegetation.

Moldovan agriculture losses caused by torrential rains and hail in 2011 exceeded 20 million lei (1.7 million dollars). According to the Civil Protection and Emergency Situations Service of MIA, for the whole country, rains and hailstorms have affected 5,100 hectares of sowing, 272 hectares of vineyards and 140 hectares of orchards.

Hardest affected localities were from Stefan Voda (Marianca Lower Copceac Slobozia Crocmaz, Carahasani, Cioburciu, Tudor, Purcari Ştefăneşti) and Ungheni (Costuleni and Mill Valley), where material damages constituted to 8,000,000 and respectively 6 million lei.

The largest share of total insurance in Soldanesti district holds an area of 2,823 hectares or 16.08% of the total, followed by Rascani district with a share of 15.17% and Edinet district accounting for 15.09%, other districts with a lower share in total, the lowest share being held by Donduseni district only 0.42%.

**Environmental risks** represent the possibility material losses as a result of the worsening state of the environment. Environmental risks manifest themselves in different ways: increased solar radiation, climate change, toxic releases to air and water. As a result, different mutations occurring living organisms, most often harmful to man, it reduces agricultural output quality. Reducing environmental risks requires huge material costs. This is a global problem and its solution takes only the competence of state.

Table 3. Coverage level of agricultural crops hail insurance in Republic of Moldova

Districts of the country	Covered surfaces, ha						Total
	Winter wheat	Winter rape	Winter barley	Orchards	Sugar beet	Other cultures	
Briceni	901	95	10	228	-	-	1230
Dondușeni	-	20	-	57	-	-	77
Drochia	850	294	89	-	551	429	2213
Edineț	1916	207	98	143	-	291	2655
Fălești	-	-	-	-	315	278	593
Florești	170	-	70	-	201	905	1346
Glodeni	100	100	100	-	-	15	315
Ocnîța	352	32	28	12	37	116	577
Râșcani	1336	230	49	246	45	763	2669
Sângerei	1023	130	120	105	-	159	1537
Soroca	1243	245	60	-	-	-	1548
Șoldănești	2082	319	302	-	20	100	2823
Total							17583

Source: elaborated by author based on source [3]

**Biological risks** represent the possibility of material losses related to the biological nature of living organisms used in agriculture. The size of risk influences: fulfilling complex of technological operations, compliance and retention terms for agricultural production. In addition, plants and farm animals suffering from diseases and pests.

Biological risks affecting the conditions of life and activity of people being endangered animals and plants and there also the danger of spreading the mass of infectious diseases, human life and health is endangered.

Epidemics and outbreaks are of biological risk category, which are seasonal, being favored by certain criteria (economically disadvantaged areas, the risk of transmission of pathogens increased due to climatic factors favoring environment in urban areas or in areas where permanent or seasonal).

Epidemics (the mass impaired of infectious diseases) arising from high activity in nature and among people of many pathogens of infectious diseases and in certain weather conditions or other circumstances (natural disasters, water pollution and air with viruses and bacteria, and radioactive chemicals, etc.) can be triggered in a particular area or across the country. The most common infectious diseases can be considered typhoid and paratyphoid diseases, acute intestinal diseases, viral hepatitis, diphtheria, cholera, plague, etc.)

Disease outbreaks (mass illness of domestic animals) in some areas of the country are recorded as swine fever, Newcastle's disease, etc.. Epizootic outbreak shall be a consequence of the high concentration of animals and birds in some households, along with neglect prevention diseases. Annual losses of livestock and poultry reach from 0.5 to 2% of the overall population of the country. Epiphytotic (mass impaired plant) - are possible practically every year and it is rather generally local. Their onset is a consequence of non-plant processing technologies and the use of chemical and biological substances. Total damage caused by epiphytotic can amount to 30-40% annually.

Epidemics and outbreaks have occurred in recent years almost the whole country without the surface areas affected to be sufficiently large or constant surface to define statistically significant. [1]

## CONCLUSIONS

Captivating conditions present climate conditions in Moldova are quite favorable for agriculture, even though the country has a shortage of moisture. At the same time during the last two decades climatic conditions became more unstable. During this period agricultural sector suffered severely because of droughts, soil erosion and wind, storms and heavy rains, hail, spring frosts and floods.

Order to face climate change need to apply modern agricultural technologies to increase production while protecting and enhancing the land resources in production. Application of modern agricultural technologies promotes the concept of optimizing and ensuring yields and profits.

For risk mitigation of droughts triggered in the agriculture are used multiple methods: irrigation, cultivation of drought-resistant plant species and application of use of fertilizers.

In order to increase of agricultural crops resistance in high thermal conditions and terms than moisture deficit in the soil productive, work is carried out to improve the selection and crop plants, leading to obtain hybrids with deeper root system, which can use reserve water from greater depths.

In the case of hail that affects agricultural regions, timely dissemination of weather forecasts warning radars developed based on meteorological information and satellite images, allow appropriate measures as prevent the formation of clouds and hail spray in them, some chemicals which causes rains before the formation of ice granules, demarcation of areas affected by this phenomenon and cultivating plants resistant to hail netting covering valuable agricultural plantations (fruit trees, vines etc.), farmland insurance against the risk of falls hail.

In order to reduce biological risks of contagious animal diseases is necessary disease prophylaxis and compliance with technologies and processing the plants, the use of chemicals and respecting the biological standards.

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## INTERNATIONAL TRADE WITH ONIONS

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### Abstract

*The paper refers to the global trade situation with onion, 2008-2010. Besides presenting the existing situation of the five units continents (Africa, America, Asia, Europe and Oceania) study shows worldwide level of imports and exports, as well as its contribution to the performing acts of international exchange. Quantitative aspects of trade are filled with values data, that allowed the preparation of trade exchanges for this product. The main importer (in quantitative terms) is represented by Asia, followed by Europe and at greater distance by the America, while the value of imports was dominated by operations performed in Europe, Asia and America - weights of 39.7, 38.1 and 18.6% respective (of the world total). Concerning the quantity, the major players on the market exports are represented by Asia and Europe. They have dominated the world market, achieving 45.6 and respective 30.8% of world exports. America ranks third with a share of 17.4%. In terms of value, world exports were dominated by Asia, Europe and America (33.5, 32.7 and respective 26.7%), with a downward trend in the share of Asia and increasing European weights and American (compared to the specific situation of the quantities exported).*

*Key words:* export, import, onion, trade balance

### INTRODUCTION

Onion is a vegetable species quite important in terms of its significance in the production of vegetables. Onion importance of culture derives from issues related to food, industry, increased productive activity, land use, labor resources, animal feed, exports and as a source of profit realization [3].

For achieving international trade prospecting the market plays an important role. **External prospecting** for import export of agricultural products and / or food must undergo several stages.

**The first stage is the stage of documentation and information.**

Information gathered aims inter alia: economic potential, production trends, investment and accumulation, agricultural development, etc.

**The second stage refers to the study of foreign market opportunities and key economic indicators analysis.**

**The third stage is considering the exploration (the study) itself of the foreign market.** To get a more complete picture on the external market information is collected strictly necessary, such as market structure,

family budgets, the power household purchasing, consumption and purchasing habits, local competition and other countries, the price system, the system of promotion and optimum forms of advertising; methods used for trade, trade discounts and commissions etc.

Stage four is for conclusions to be drawn on foreign markets studied, in which is presented an overall appraisal of it.

Finally, external market research ends with the decision-making phase in which they set goals for the export-import of goods and services and the concrete organizational forms of sales [2].

Regarding the agricultural exports, it should be understood as all commercial operations through plant and animal products - unprocessed or processed in varying degrees - are traded in foreign markets.

Factors that influence the export of agricultural products plant and animal are: - Internal market supply and demand of agricultural products - direct and indirect supply for industrial population; - Trends in demand and supply on the world market for agricultural products [1].

## MATERIALS AND METHODS

Carrying out the work involved documenting, through the use of the reporting statistical data [4]. In order to achieve the work was operated with a system of indicators to highlight specific trade in some agricultural products and recommended system used by the United Nations Food and Agriculture Organization - FAO.

So were collected quantitative data on the volume and value of imports and exports volume of onions made globally and for the five continents (Africa, America, Asia, Europe and Oceania). The paper tried to capture the world market and positioning Romania in terms of foreign trade with onions.

The data collected and analyzed, covers the period 2008-2010, are launched with the average period. Media was determined by computing the following equation:

$$A = \frac{X_1 + X_2 + \dots + X_n}{n}$$

## RESULTS AND DISCUSSIONS

Table 1 presents the evolution and structure of globally imports.

In the case of 2008, worldwide total imports reached 5916,9 th. tons, while the five continental units have achieved levels of indicator 20,700 th t Oceania - 0.3% 248,7 th. t Africa - 4.2% 798,5 th. t America - 13.5% 2095,9 th. t Europe - 35.5%, 2753,1 th. t Asia - 46.5%.

In Romania it is found an import of 32,6 th. t, which represented 0.6% of the global indicator.

For 2009, are noted the changes in the indicator stands from 19,9 th. t for Oceania, up to 3183,1 th. t in the continent of Asia (weights - in the structure - of 0.3 and 51.1%). The remaining units were recorded continental levels of: 304.0 th. tons Africa,

795.6 th. t America and 1929.0 th. tons Europe (4.9, 12.7 and respectively 31.0% in the structure indicator - 6231.6 th. tons). At national level the volume of imports was 21.5 thousand tons, volume that caused - compared to global situation a participation quota of 0.3%.

If we look at the specific situation of 2010 can be seen sequential volumes continental imports of onions, as follows: 3015.2 th. tons Asia, Europe 2260.5 th. tons, 922.2 th. tons America, Africa and 318,8 th. tons 23,6 th tons Oceania. Following these quantities, indicator structure includes weights of: 46.1, 34.5, 14.1, 4.9 and 0.4% for the continents, in the order shown above. Regarding Romania are observed a large amounts of 35,3 th. tons, which led to a level of 0.5% in the share of 6.5403 million tonnes of onion imported globally.

Based on the three temporal sequences, described above, was determined the average period which is characterized by an amount of 6229.6 th. tons imported onions. Indicator structure (Fig. 1) are as follows: 0.3% Oceania (21.4 th. tons), 4.7% Africa (290.5 th. tons), 13.5% American (838.8 th. tons); Europe 33.6% (2095.1 th. tons) Asia 47.9% (2983.8 th. tons). Regarding Romania's contribution to achieving global level indicator, average participation rate was 0.5% (Fig. 2).

Table 2 presents the onion exports and food aid carried out worldwide.

In 2008 the worldwide export of onions reached 6227.9 th. tons, a level which was attended, differentiated for the five continental units:

46.6 thousand tons Oceania, Africa 202.5 th. tons, 1125.6 thousand tons America, Europe 1798.7 thousand tons, 3104.5 thousand tons Asia. A result of these amounts the indicator structure is as follows: 0.7% Oceania, 3.2% African, 17.9% American, 28.7% Europe 49.5% Asia.

Table 1. Onions - World Imports (2008-2010) \*

Specification	2008		2009		2010		Average 2008 – 2010	
	Th. t.	Str. %	Th. t.	Str. %	Th. t.	Str. %	Th. t.	Str. %
Africa	248,7	4,2	304,0	4,9	318,8	4,9	290,5	4,7
America	798,5	13,5	795,6	12,7	922,2	14,1	838,8	13,5
Asia	2753,1	46,5	3183,1	51,1	3015,2	46,1	2983,8	47,9
Europa	2095,9	35,5	1929,0	31,0	2260,5	34,5	2095,1	33,6
Oceania	20,7	0,3	19,9	0,3	23,6	0,4	21,4	0,3
Total	5916,9	100	6231,6	100	6540,3	100	6229,6	100
România	32,6	0,6	21,5	0,3	35,3	0,5	29,8	0,5

\*<http://www.fao.org/>

Table 2. Onions - World Exports (2008-2010) \*

Specification	2008		2009		2010		Average 2008 – 2010	
	Th. t.	Str. %	Th. t.	Str. %	Th. t.	Str. %	Th. t.	Str. %
Africa	202,5	3,2	324,5	5,2	561,5	7,9	362,8	5,5
America	1125,6	17,9	1021,9	16,2	1284,3	18,0	1143,9	17,4
Asia	3104,5	49,5	2846,3	45,1	3039,8	42,5	2996,9	45,6
Europa	1798,7	28,7	2066,2	32,7	2205,3	30,9	2023,4	30,8
Oceania	46,6	0,7	51,1	0,8	48,4	0,7	48,7	0,7
Total	6277,9	100	6310,0	100	7139,3	100	6575,7	100
România	0,6	0,01	2,0	0,03	2,1	0,03	1,6	0,02

\*<http://www.fao.org/>

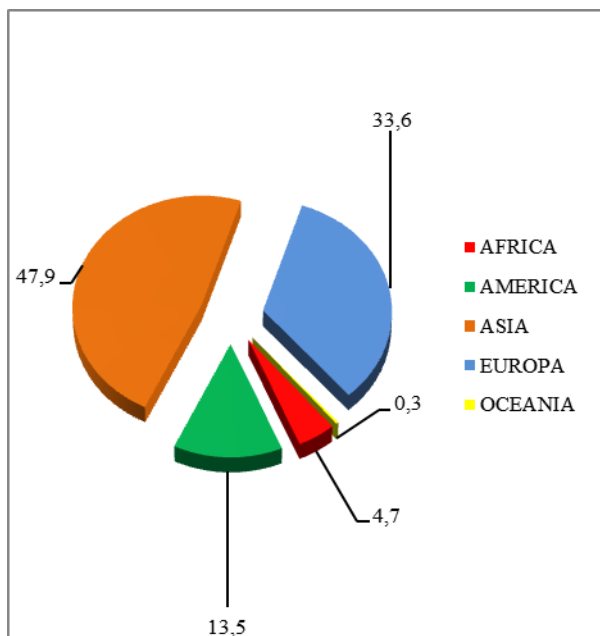


Fig. 1. The structure of world imports - period average (%)

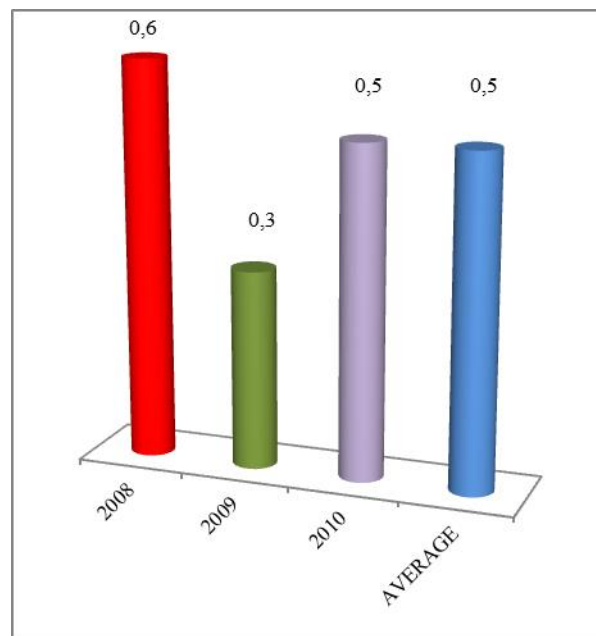


Fig. 2. Romania - share in global structure imports (%)

Romania has made quantitative export 0.6 th. tons onions, which represented only 0.01% of the global indicator.

If we look at the specific situation of 2009 can be seen limits of variation of the indicator, from 51.1 thousand tons in the case of Oceania, to 2846.3 th. tons in the Asian continent (weights of 0.8 and 45.1% respectively in the structure of the index). Rest of the world have achieved varying amounts of onions exported. So Africa recorded 324.5 th. tons - 5.2%, America 1021.9 th. tons - 16.2%, and Europe 2066.2 th. tons - 32.7%. For Romania exports were very low 2.0 th. tons, respectively 0.03% of the global indicator, level which reached 6310.0 th. tons.

The year 2010 is characterized by a total volume of exports of 7193.3 th. tons, volume to which the five continental units contributed variable. So, effectively, there were 3039.8 thousand tons quantities for Asia (42.5%), 2205.3 th. tons for Europe (30.9%), 1284.3 th. tons in the American continent (18, 0%), 561.5 th. tons for Africa (7.9%), 48.4 thousand tons in the Oceania (0.7%). Romania has sold only 2.1 th. tons, respectively 0.03% of the global indicator.

Based on the above, we determined the average period. It has reached 6575.7 th. tons, with the following structure (Fig. 3): 0.7% Oceania (48.7 th. tons), 5.5% Africa (362.8 th. tons), 17.4% American (1143.9 th. tons) Europe 30.8% (2023.4 th. tons) Asia 45.6% (2996.9 th. tons).

Romania recorded worldwide, a weight of only 0.02% of the total quantity of onions exported (Fig. 4).

Table 3 shows the trade balance of exchanges in the world achieved of the product onion.

For 2008 global trade balance was poor -31.5 million dollars, which is based on aspects of European deficit \$ -280.9 million. Rest of the world realized trade surpluses: \$ 6.0 million Africa, Oceania \$ 9.5 million, 17.0 million \$ 216.9 million \$ Asia and America. However covering European the deficit fails.

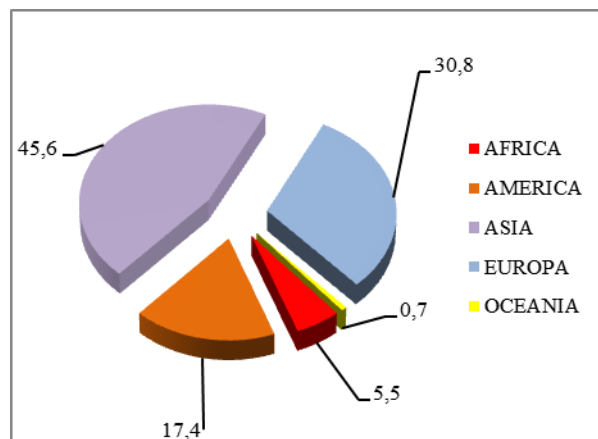


Fig. 3. Structure of world exports - average period (%)

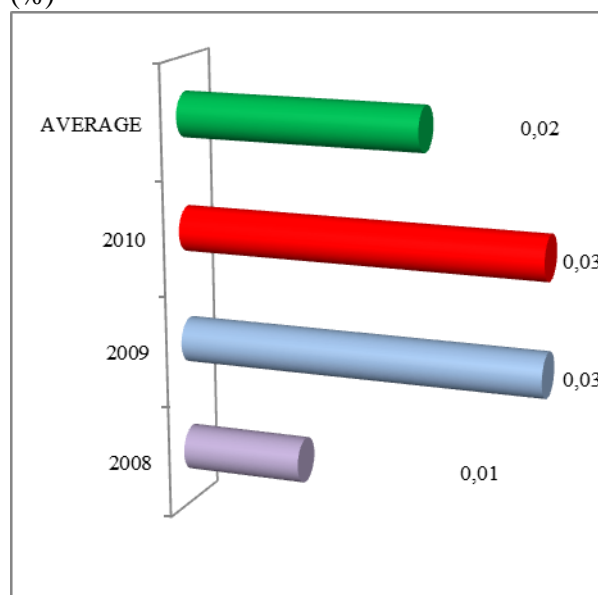


Fig. 4. Romania - share in global structure of exports (%)

In 2009, global trade balance deficit \$ -65.3 million, is determined by specific deficits Europe and Asia -116.8 million \$ respectively -231.3 million \$. Reducing the trade deficit, caused by the two continents, is achieved through specific surpluses Oceania, Africa and America + 9.4, respectively +118.5 and +154.9 million dollars.

If we look at the specific situation of 2010, we see that this is the only year with surplus (\$ 8.1 million) worldwide, which is determined by specific positive state of affairs for America, Africa and Oceania + 212.4, + 112.3 and respectively 6.8 million \$. However for the European continent and for Asia are recorded trade deficits: -164.2 -159.2 million dollars respectively.



Table 3. Onions - Trade balance global of exchanges, Mil. \$ (2008–2010)\*

Specification	2008			2009			2010			Average 2008 – 2010		
	Export	Import	±	Export	Import	±	Export	Import	±	Export	Import	±
Africa	65,5	59,5	+6,0	190,3	71,8	+118,5	205,6	93,3	+112,3	153,8	74,9	+78,9
America	662,3	445,4	+216,9	568,7	413,8	+154,9	750,0	537,6	+212,4	660,3	465,6	+194,7
Asia	744,5	727,5	+17,0	766,5	997,8	-231,3	983,4	1142,6	-159,2	831,5	956,0	-124,5
Europa	710,1	991,0	-280,9	705,1	821,9	-116,8	1016,1	1180,3	-164,2	810,4	997,7	-187,3
Oceania	23,6	14,1	+9,5	22,0	12,6	+9,4	23,4	16,6	+6,8	23,0	14,4	+8,6
Total	2206,0	2237,5	-31,5	2252,6	2317,9	-65,3	2978,5	2970,4	+8,1	2479,0	2508,6	-29,6
România	0,1	9,1	-9,0	0,6	6,0	-5,4	0,7	9,2	-8,5	0,5	8,1	-7,6

\*<http://www.fao.org/>

Determining the average period it can be seen (Fig. 5) its weak character (-29.6 million dollars), aspect determined by the following state of things: \$ 194.7 million America, \$ 78.9 million Africa, 8.6 million dollars Oceania, Asia \$ -124.5 million, \$ -187.3 million Europe.

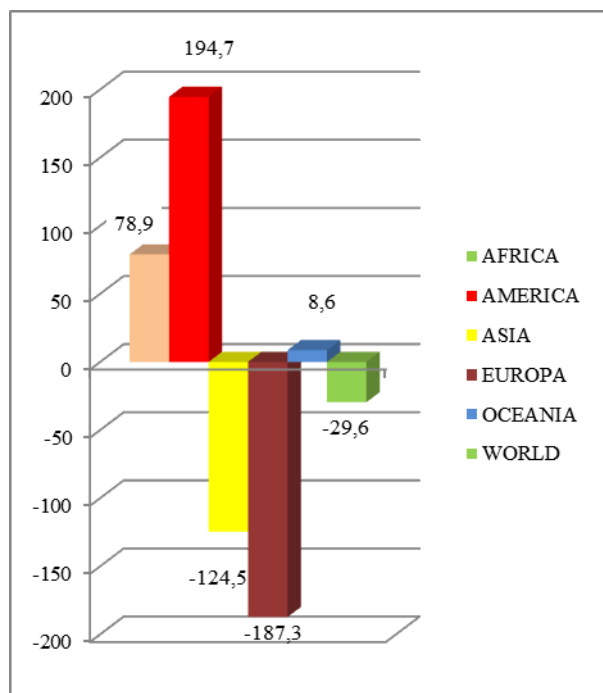


Fig. 5. Global trade balance - the average period (million \$)

For Romania (fig. 7) it can be seen that foreign exchange trade balance with onions, is strictly poor: \$ -9.0 million for 2008, \$ -8.5 million in 2010 - \$ 7.6 million for the period average, \$ -5.4 million in the year 2009.

Figure 6 presents the evolution of the trade balance for onions during the period analyzed (2008-2010).

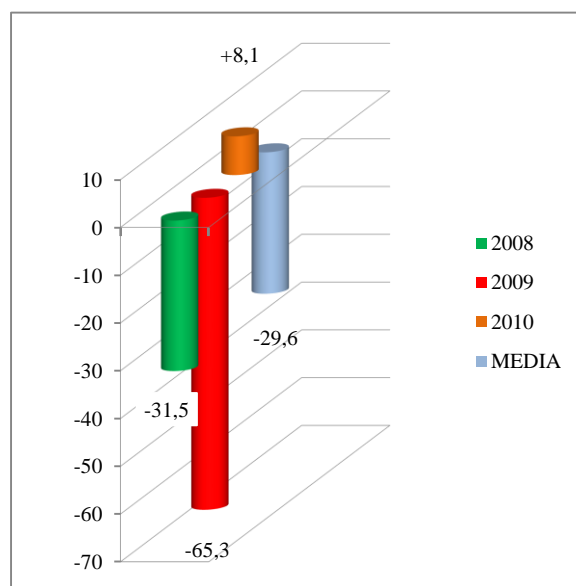


Fig. 6. Global trade balance - annual trend (million \$)

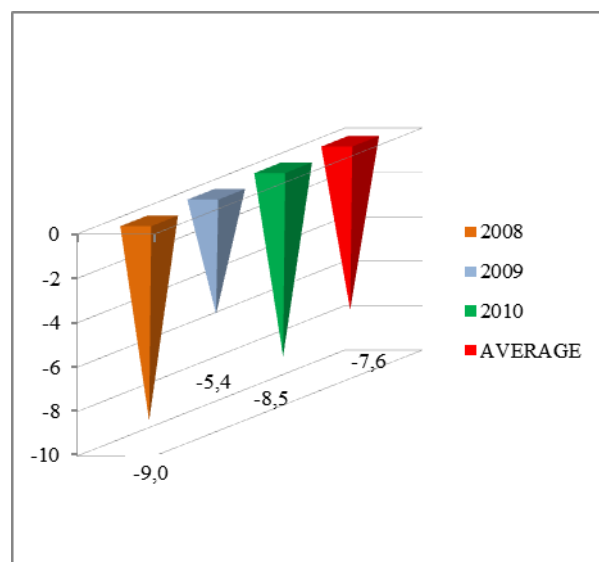


Fig. 7. Romania. National trade balance (million \$)

## CONCLUSIONS

Regarding import situation appear as following conclusions:

-the main importers represented by Asia followed by Europe and at largest distance by America - 47.9, 33.6 and respectively 13.5% (as compared quantitatively);

-the value of imports was dominated by operations carried out in Europe, Asia and America - weights of 39.7, 38.1 and respectively 18.6% (increased the weights over 5 and 6% in America and Europe compared to the quantities imported).

Therefore it can be concluded that the European and American markets transaction unit prices are higher than in the Asian markets;

-Romania is not a major player, in terms of imports, the global market share holding 0.5 and respective 0.3% of quantities imported values - aspect beneficial. Variation has been one uneven for the indicators during the period analyzed.

When referring to the export situation, there are a number of aspects, such as: -as compared quantitatively, the main actors are represented by Asia and Europe. They have dominated the world market, achieving 45.6 and respective 30.8% of world export quantity.

America ranks third with a share of 17.4% (situation somewhat similar to that of the quantities imported);

-quantities exported globally evolved upward, which is determined by developments in the Europe and Africa. For the rest of the world has evolved the indicator uneven, with some increasing trends for Oceania;

- in value terms, world exports were dominated by Asia, Europe and America (33.5, 32.7 and respective 26.7%), with a downward trend in the share for Asia and an increasing for European and American weighting (compared to the specific situation of the quantities exported);

-as for imports and exports Romania is not a major player in the global market (weighted average of 0.02% for both export volumes and values) - very unfavorable situation.

In terms of trade balance for onions, the situation existing global and national sequence is characterized by:

-the weak global balance phenomenon is contradicted only of the specific situation appeared in 2010 when appear a small surplus;

-analyzing the situation in each continent stands surplus situations specific to Africa, America and Oceania. They could not counterbalance the recorded consistent deficits, from Europe and Asia;

-Romanian trade balance is severely impaired, a phenomenon that stresses our country momentary inability to secure domestic consumption needs from their own production.

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## INTERNATIONAL TRADE WITH RAPESEED

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### Abstract

*The study takes into consideration the international trade situation of rapeseed worldwide. To highlight the situation are analyzed sequentially imports and exports in five units continents: Africa, America, Asia, Europe and Oceania. Applicability and interest increased for trade with this product is emphasized by references from Romania. The study takes into consideration 2008-2010. In terms of world imports and their structure is noted preponderance Europe and Asia in the quantities imported - 87.38% (both), the weights low enough for Oceania and Africa - 0.04 together. If we analyze the situation of exports is apparent fact that Europe remains, as in the case of imports, the main player on the market (48.11%), but not followed by Asia, but of America with a very close relative weight (44, 45%). Oceania owns more than 5% of world quantitatively of exports, while Asia and Africa have shares almost insignificant - 0.36 and 0.05% respectively. Regarding the situation of global trade balance exchanges for rapeseed can be seen a globally deficient character.*

*Key words:* deficit, export, rapeseed, surplus

### INTRODUCTION

Rape is important as industrial raw material in animal feed and in relation to agrotechnical-technologically [3].

To achieve international trade has prospecting an important role in. External market research imports and exports of agricultural and / or food must undergo several stages.

The first stage is the stage of documentation and information (economic potential, production trends, investment and accumulation, agricultural development and so on).

The second stage covers the **study of foreign market opportunities** and key economic indicators analysis.

In the third step is carried **out the actual exploration** (studying) for foreign market. Fair view of the foreign market is underlined by information such as market structure, family budgets, household purchasing power, consumption and purchasing habits, local competition and other countries, the price system, the promotion system and optimal forms of advertising, trading methods used, trade discounts and commissions etc.

The fourth step aims at establishing conclusions on foreign markets studied, which provides an overall assessment of it. Ultimately, external market research completed by stage of development and decision making, which sets goals for the export and import of goods and services, and concrete forms of organization of sales operations [2].

Exports of agricultural products is a part of the general export engaging national economy, aiming at the following objectives: participation in international division of labor; attract hard currencies, or foreign contribution, required for all businesses in agriculture.

Trading activity of plant and animals both domestic and export is very important and complex, requiring a level of professionalism appropriate to existing standards worldwide [1].

### MATERIALS AND METHODS

Carrying out the work involved documentation, through the use of reporting statistical data [4]. In order to achieve the work was operated with a system of indicators

specific for highlighting trade in some agricultural products and recommended, system used by the United Nations Food and Agriculture Organization - FAO.

Therefore were collected quantitative data on the volume and value of imports and exports volume of rapeseed performed worldwide for five continental U.S. (Africa, America, Asia, Europe and Oceania). The paper tried to capture the world market and positioning Romania in terms of foreign trade rapeseed.

The data collected and analyzed, covers the period 2008-2010, are launched with the average period. Media was determined by computing the following equation:

$$A = \frac{X_1 + X_2 + \dots + X_n}{n}$$

## RESULTS AND DISCUSSIONS

Table 1 presents the evolution and structure of global imports.

In the case of 2008 can be seen, worldwide, a total of 15,990.8 thousand tons imported, which was formed by continental actual contributions: 8391.1 thousand tons Europe - 52.48% 5129.8 thousand tons Asia - 32.07% 2462.2 thousand tons America - 15.39% 7.3 thousand t Africa - 0.05% 0.4 thousand t Oceania - 0.01%. Romania has made imports of 76.4 thousand t, which represented 0.48% of the global indicator.

In 2009 it finds for each continent, the existence of varying amounts of imports for rapeseed: 0.5 thousand tons Oceania, Africa 5.6 thousand tons, 1880.4 thousand tons America, Asia and 6745.9 thousand tons 9677.7 thousand tons Europe, which led to a global indicator of 18310.1 thousand tons. A result of these quantities, indicator structure was as follows: 0.01, 0.05, 10.26, 36.84 and 52.84% in Oceania, Africa, America, Asia and Europe respectively. If we analyze the positioning of Romania in the global context, there is a share of 0.39% in terms of quantity imported 70.5 thousand t.

In 2009 is observed total imports 17771.8 thousand tons to which have contributed variable every continent, as follows: Europe - 51.36% (9129.9 thousand tons), Asia - 36.16% (6427.0 thousand tons), America - 12.46% (2214.4 thousand tons), Oceania - 0.01% (0.3 thousand tons), Africa - 0.01% (0.2 thousand tons). For temporal sequence respective Romania has made imports of rapeseed 241.0 thousand tons, which represented - worldwide - a share of 1.36%.

Based on annual rates has been determined the period average which is distinguished by a general level worldwide - of the indicator - of 17357.7 thousand tons, with the following structure (Fig. 1): 0.01% Oceania (0.4 thousand tons); 0.03% Africa (4.4 thousand tons), 12.58% Americas (2185.7 thousand tons), 35.15% Asian (6100.9 thousand tons) Europe 52.23% (9066.3 thousand tons).

In the Figure 2 shall be presented the shares held by Romania, worldwide, in terms of quantitative import. Table 2 presents the rapeseed exports and food aid implemented worldwide.

For 2008 is noticed a level of indicator for the world of 15987.0 thousand tons, a level which consists of variables continental contributions: Africa 3.4 thousand tons - 0.02%, Asia 90.1 thousand tons - 0.56%, 530.8 thousand tons Oceania - 3.32%, 7150.6 thousand tons America - 44.73% 8212.1 thousand tons Europe - 51.37%. Romania exported 564 thousand tons rapeseed, which meant 3.53% of world level indicator.

If the continents were registered in 2009 levels of exports from 5.3 thousand tons, in the case of Africa, to 7926.2 thousand tons for America so that global indicator was 17121.5 thousand tons. Contributions percentage was 0.03% continental for Africa 0.35% Asia - 59.3 thousand tons, 7.14% Oceania - 1223.0 thousand tons, 46.19% Europe - 7907.7 thousand tons, 46.29% America. At world level Romania held 4.57% of the overall exports.

Table 1. Rapeseed - worldwide Imports (2008-2010) \*

Specification	2008		2009		2010		Average 2008 – 2010	
	Th. tones	Str. %	Th. tones	Str. %	Th. tones	Str. %	Th. tones	Str. %
Africa	7,3	0,05	5,6	0,05	0,2	0,01	4,4	0,03
America	2462,2	15,39	1880,4	10,26	2214,4	12,46	2185,7	12,58
Asia	5129,8	32,07	6745,9	36,84	6427,0	36,16	6100,9	35,15
Europa	8391,1	52,48	9677,7	52,84	9129,9	51,36	9066,3	52,23
Oceania	0,4	0,01	0,5	0,01	0,3	0,01	0,4	0,01
Total	15990,8	100	18310,1	100	17771,8	100	17357,7	100
Romania	76,4	0,48	70,5	0,39	241,0	1,36	129,3	0,75

\*<http://www.fao.org/>

Table 2. Rapeseed - worldwide exports (2008-2010) \*

Specification	2008		2009		2010		Average 2008 – 2010	
	Th. tones	Str. %	Th. tones	Str. %	Th. tones	Str. %	Th. tones	Str. %
Africa	3,4	0,02	5,3	0,03	15,7	0,09	8,1	0,05
America	7150,6	44,73	7926,2	46,29	7800,3	46,34	7625,7	45,81
Asia	90,1	0,56	59,3	0,35	28,6	0,17	59,4	0,36
Europa	8212,1	51,37	7907,7	46,19	7903,7	46,96	8007,8	48,11
Oceania	530,8	3,32	1223,0	7,14	1082,7	6,44	945,5	5,67
Total	15987,0	100	17121,5	100	16831,0	100	16646,5	100
Romania	564,0	3,53	782,2	4,57	1052,4	6,25	799,5	4,80

\*<http://www.fao.org/>

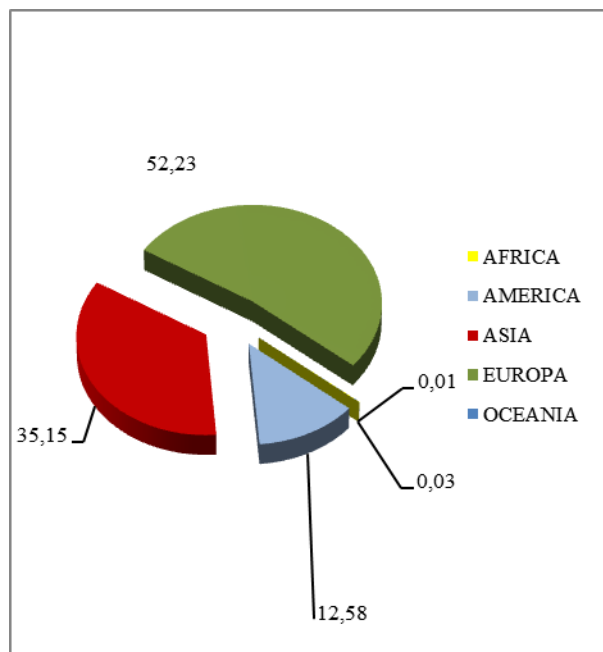


Fig. 1. The structure of world imports - period average (%)

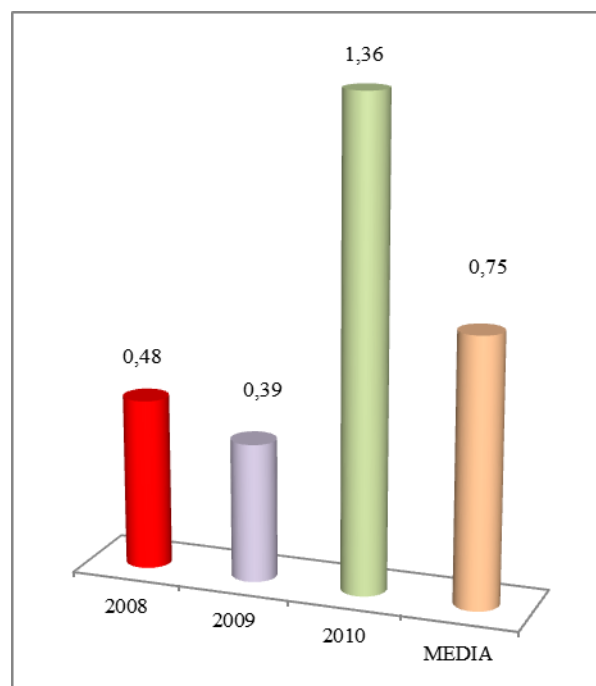


Fig. 2. Romania - share in global structure of imports (%)

If we look at the specific situation of 2010 can be seen that the main exporters were the United States and Europe - 7800.3 and 7803.7 thousand tons respectively (46.34 and

46.96%), Oceania recorded 1082.7 thousand tons (6,44%), while Asia and Africa have been low levels of indicator - 28.6 and 15.7 thousand tons (0.17 and 0.09%). In the global context Romania held 6.25% of total exports - 1052.4 thousand tons.

Average of the period presented a global volume of the indicator of 16646.5 thousand tons, in whose structure (Fig. 3) continental contributions are found: 0.05% Africa (8.1 thousand t), 0.36% Asian (59.4 thousand t), 5.67% Oceania (945.5 thousand t), 45.81% Americas (7625.7 thousand tons) Europe 48.11% (8007.8 thousand tons).

In Romania the average share in the world exports quantitative rapeseed was 4.80% (Fig. 4).

Table 3 shows the trade balance of exchanges worldwide made for rapeseed. Global of exchanges trade balance with rape in 2008 was poor -749.6 million dollars, this situation is caused by surpluses recorded for America and Oceania - 2331.4 and 295.0 million dollars respectively, and specific deficits remaining continents: -1.0, -312.0 and -3063.0 million dollars in Africa, Europe and Asia.

In case of 2009 the trade balance maintains its weak character (\$ -848.9 million), determined by specific deficits in Africa, Asia and Europe (-1.5, -2954.7 and respectively -773.1 million dollars). As in the previous year (2008) the balance has been in surplus for Americas and Oceania - 2343.9 and 536.5 million dollars respectively.

When referring to the situation in 2010 can be seen that only two continents appear commercial balance deficient - Asia and Europe (-3,122.6 million \$ respectively -602.9 million \$), while the surplus character is specific to Africa, Oceania and the Americas + 2.7, 472.2 respectively 2422.3 million \$. Therefore we discuss a global trade balance deficit (\$ -828.3 million).

At the level of average period (Fig. 5) shows a trade balance deficit (\$ -808.9 million), a situation that is based on continental levels: \$ 2365.9 million in America, 434.6 million \$ specific Oceania, Africa \$ -0.1 million, \$ -

562.7 million for Europe, \$ -3,046.8 million in Asia.

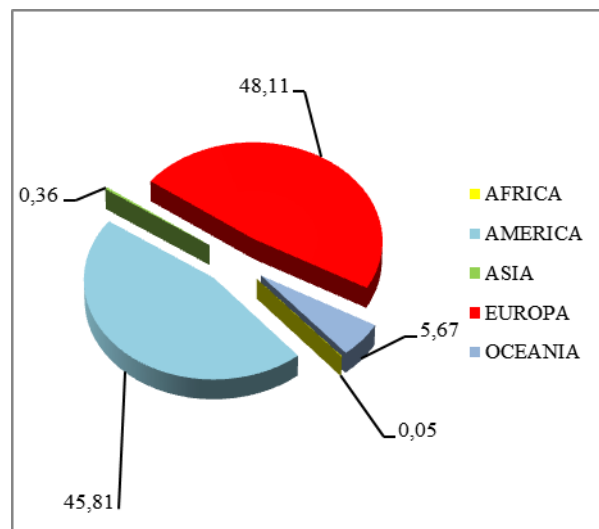


Fig. 3. Structure of world exports - average for the period (%)

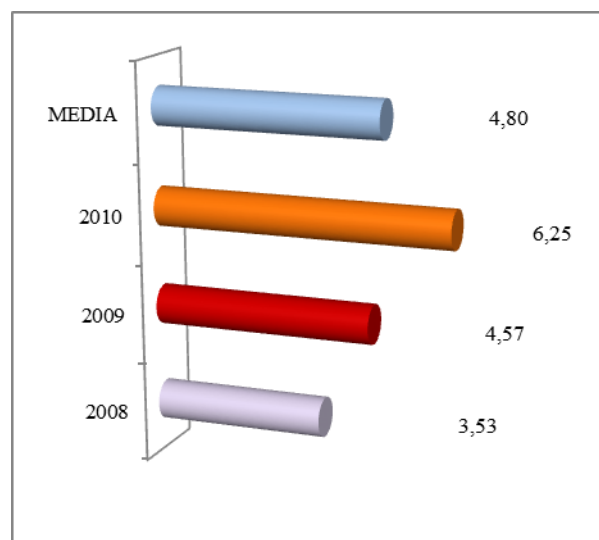


Fig. 4. Romania - share of global structure exports (%)

Figure 6 shows the evolution in time of global trade for rapeseed.

At the national level can be seen that the trade balance rapeseed is strictly surplus, convenient aspect. Is surplus occurs throughout the program period (fig. 7): \$ 309.3 million in 2008, \$ 272.4 million in 2009, \$ 326.3 million for 2010, 302.7 million dollars for the period average.

Table 3. Rapeseed - The trade balance of world trade, Mil. \$ (2008–2010)\*

SpecificaTION	2008			2009			2010			aVERAGE 2008 – 2010		
	export	import	±	export	import	±	export	import	±	export	import	±
Africa	2,3	3,3	-1,0	1,2	2,7	-1,5	3,6	0,9	+2,7	2,4	2,3	-0,1
America	3835,2	1503,8	+2331,4	3182,2	838,3	+2343,9	3454,3	1032,0	+2422,3	3490,6	1124,7	+2365,9
Asia	50,6	3113,6	-3063,0	23,5	2978,2	-2954,7	11,8	3134,4	-3122,6	28,6	3075,4	-3046,8
Europa	4854,9	5166,9	-312,0	3288,3	4061,4	-773,1	3543,3	4146,2	-602,9	3895,5	4458,2	-562,7
Oceania	296,0	1,0	+295,0	537,8	1,3	+536,5	473,0	0,8	+472,2	435,6	1,0	+434,6
Total	9039,0	9788,6	-749,6	7033,0	7881,9	--848,9	7486,0	8314,3	-828,3	7852,7	8661,6	-808,9
România	362,0	52,7	+309,3	311,6	39,2	+272,4	443,2	116,9	+326,3	372,3	69,6	+302,7

\*<http://www.fao.org/>

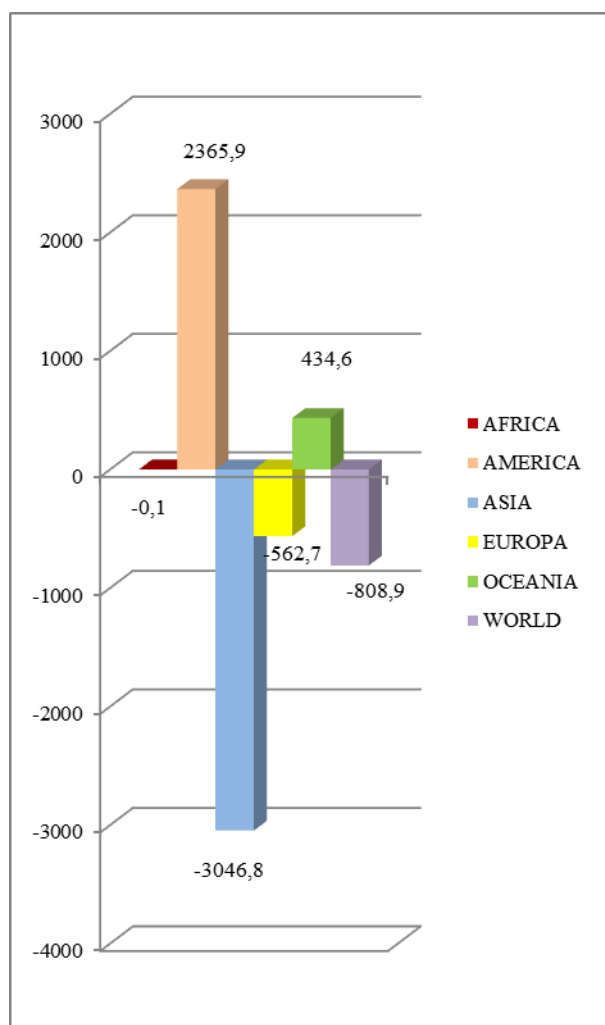


Fig. 5. Global trade balance - the average period (million \$)

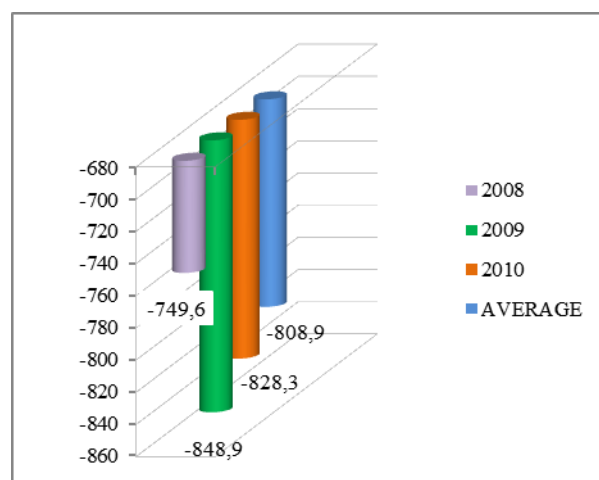


Fig. 6. Global trade balance - annual trend (million \$)

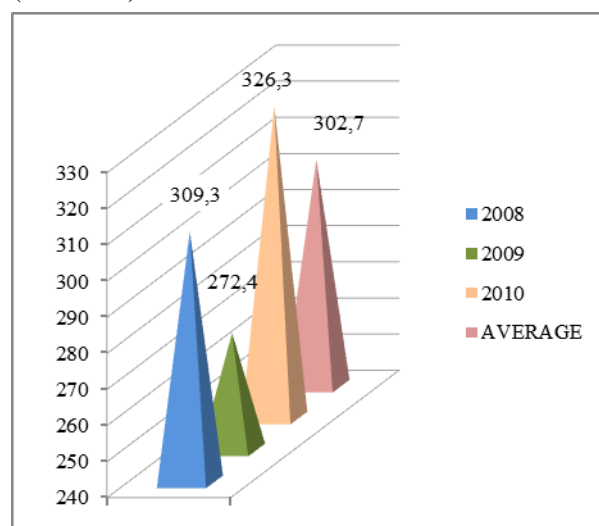


Fig. 7. Romania. National Trade Balance (million \$)

## CONCLUSIONS

### In terms of world imports and structure stands:

-prevalence Europe and Asia in the quantities imported - 87.38% both weights low enough Oceania and Africa - 0.04 together;

-Romania is considered an operator of attention, making 0.79% of total world imports;

-overall imports have evolved unevenly various obvious trends manifested in Africa (decrease certain, consistent indicator). For other areas or countries there are striking variations accompanying unevenness trend - decline for America, growth for Asia, Europe and the world generally. For Romania, the trend is definitely fluctuating.

If we analyze the situation exports can draw the following conclusions:-Europe remains as in the case of import, the main controller on the market (48.11%), but it is not followed by Asia, but of America with a very close relative weight (44.45%). Oceania has more than 5% of the world tonnage of exports, while Asia and Africa have almost insignificant share - 0.36 and 0.05% respectively;

-the indicator evolves unevenly, but at a general global level indicate a tendency of growth situation which appears in Oceania and America. Europe is developing sinuous with declining trends and for Africa recorded a strictly upward trend; -Romania achieved 4.80% of world exports of rapeseed, and for the period under review progress indicator is strictly increasing, something beneficial - especially given that imports develops unevenly;

Regarding the situation of global trade exchanges with rapeseed may notice the following situations: global-balance is strictly deficient, both as average and sequentially.

This situation is due to the deficit in Asia and Europe and less specific deficit of the African continent;

-Oceania is one of the few entities that have a surplus balance, otherwise one except America;

-national, we can say that the situation is favorable, the permanently nature of the

balance surplus;generally, the trade balance has evolved unevenly across all entities analyzed.

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## EVOLUTION OF ORGANIC AGRICULTURE IN ROMANIA AND ITS IMPORTANCE IN SUSTAINABLE RURAL DEVELOPMENT

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### *Abstract*

*Organic farming uses sustainable production systems, diversified and balanced to prevent environmental and harvest pollution. In this paper I wish to highlight the opportunities arising from the practice of sustainable agriculture and the efficient management of natural resources in Romania. Sustainable rural development can be achieved with the transition from subsistence agriculture to organic agriculture by building and strengthening competitive small and medium enterprises in rural areas. For this we analyzed empirical data provided by the Ministry of Agriculture, Forests and Rural Development and the National Institute of Statistics. The analyzed period covers the years 2006-2011. The organic food market in Romania is contoured by statistical methods and the opportunities and limitations incurred by those who choose this form of exploitation.*

*Key words:* evolution, organic agriculture, Romania, sustainable rural development

### INTRODUCTION

Harmony between the rural economy and the environment has a simple solution – organic farming. Just as we can say that agriculture is the backbone of the rural economy (Oțiman P.I., 2006), we can equally say that organic farming is the key component of any sustainable rural development program.

Organic farming is subject to regulation (EC) no. 834/2007 of 28 June 2007 on organic production and labeling of organic products, organic farmers combine the best environmental practices, ensuring a high level of biodiversity, are concerned about the preservation of natural resources, applying high standards on animal welfare and using a production method involving only natural substances and processes. Thus, the organic production method plays a dual societal role, as it on one hand provides for a specific market responding to consumer demand for organic products, and on the other hand, delivers public goods contributing to environmental protection, animal welfare and sustainable rural development.

Consumers are the engine of organic food markets and the demand for organic products

is justified by the need for food safety, health, food fears (mad cow disease, bird feed contaminated with dioxin, carcinogenic food additives). Also, consumers of organic products satisfy their need for authenticity of the product, flavor and a return to traditional values (Oțiman P.I., 2006).

Environmental protection is a concern for many organic product consumers, who must know that their product selection should have as a key element the place of origin. Additionally, it must be a local and certified manufacturer, because a green product made elsewhere in the world would pollute through transportation.

Traceability and transparency are essential marketing tools for organic production (Toncea I., Toncea A.V., 2010).

### MATERIALS AND METHODS

In order to characterize the evolution of organic agriculture in Romania the following indicators were used: the number of registered farmers in organic agriculture divided on regions, total land fund by use, surfaces used in organic farming by category of use.

The period analyzed in this study was 2006-2011.

The data, collected from the Ministry of Agriculture and Rural Development, the Department of Statistics and the Ministry of Agriculture and Rural Development, have been statistically processed and interpreted, building the trend line and setting up the forecast based on the 2014-2016 period.

## RESULTS AND DISCUSSIONS

The land fund (Table 1) of Romania is a wealth that organic farming can highlight.

Table 1, Total land fund, by use (end of year), thousand hectares

	2005	2006	2007	2008	2009	2010
Total area of the land	23839,1	23839	23839,1	23839	23839	23839,1
Agricultural area	14741,2	14731	14709,3	14702	14685	14635,5
Arable	9420,2	9435	9423,3	9415,1	9423	9405
Pastures	3364	3334	3330	3333	3314	3288,8
Hayfields	1514,7	1525	1531,4	1532,4	1528	1529,7
Vineyards and vine nurseries	221,1	223,7	218	214,5	215,4	213,4
Orchards and tree nurseries	218,2	213,4	206,6	207,3	205,2	198,6

Half the land is owned by persons without legal personality, with an average area of 2.29 ha (Table 2). The scattering of parcels is a major problem for conventional agriculture. Organic agriculture can transform this disadvantage in business but requires investments (organic certification costs), proper management (managing the conversion from conventional to organic agriculture, observing food chain traceability, quality certification, representation and social and environmental realities, maximizing profits through multi functionality), technical knowledge (respect for the organic agriculture principles through: soil fertility management, management of plant and animal protection, food production and the processing of agricultural and food products) and clever marketing (development of marketing strategies with an emphasis on the market and new technologies, compliance with labeling legislation; although it is forbidden to write on the label GMO, pesticides, ionizing radiation-free products, processors may use the expression: organic farming standards prohibit their use, because during this

technological chain organic products can be contaminated, so the legislation allows max. 5% GMO). A farmer requires at least 0.30 ha of vegetable crops to receive the subvention for organic agriculture and must comply with the regulation on animal welfare. Parallel production (conventional - organic) is not prohibited, livestock farmed conventionally can be kept on the same holding provided that they are clearly separated and from different species (Toncea I., Toncea A.V., 2010).

Table 2, Agricultural holdings, agricultural area in use and agricultural area in use as an average per agricultural holding, by legal status of agricultural holdings, year 2007

	Agricultural holdings-total	Agricultural area	Average agricultural area (in hectares) per agricultural holding
Agricultural holdings – total (number)	3931350	13753046,5	3,5
Individual agricultural holdings	3913651	8966308,55	2,29
Units with legal status	17699	4786737,94	270,45

Government Decision number 759/2010 specifies the conditions of eligibility and payments for quality agricultural products in the organic farming sector:

Beneficiaries of organic crop production:

- to have in use at least 0.30 ha of farmland, filled with culture, annual, perennial crops or permanent pasture and meadow;
- to be registered, in each year for which they seek specific support, with the Ministry of Agriculture and Rural Development, an organic farming producer;
- to conclude a contract with an inspection and certification body, accredited within the European Union and approved by the Ministry of Agriculture and Rural Development;
- to have a document, in accordance with the European legislation on organic production and labelling of organic products with regard to organic food production, labelling and control, which can be called a certificate of

conformity / master certificate / certificate confirming the conversion, to indicate the status of farms in conversion year 1, year 2, year 3, culture and area, issued by the inspection and certification organism contracted.

e) to have no debts to the state budget or local government

Beneficiaries of livestock production species: birds, cattle and sheep / goats and beneficiaries of beekeeping must have a certificate of conformity / master certificate / certificate confirming the conversion, to indicate the status of farms in conversion year 1, and the number of animals, or as the case may be, the number of bee families, issued by the inspection and certification organism contracted and comply with paragraphs b, c, d, e; as for land area owned, it must comply with the conditions of high standards on animal welfare, with a maximum number of animals per hectare equivalent to 170 kg N / ha / year.

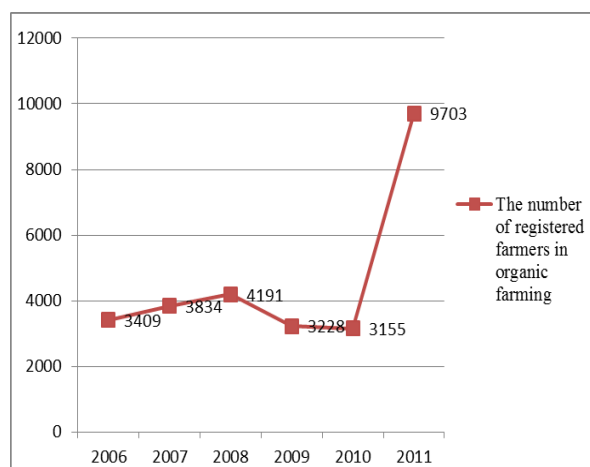


Figure 1. Evolution of operators in organic farming, Romania

The number of registered farmers in organic farming was constant between 2006 and 2010, but the surprise came in 2011 when their number tripled. I believe that the explanation of this phenomenon lies in clarifying specific aid rules, the conditions of eligibility and payments for quality agricultural products in the organic farming sector being presented in Government Decision number 759/2010; also, there are counties where the number of organic producers is very high, which is

explained by the effect generated by the example of others farmers from organic farming enterprises that have been successful.

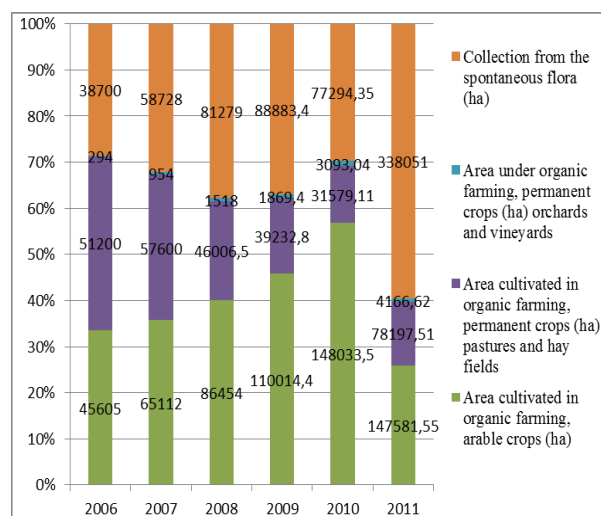


Figure 2. Evolution of the area cultivated in organic farming, Romania

The conversion period for plant production, livestock and beekeeping is: 2 years for annual field crops; 3 years for perennial crops and plantations; 2 years for grassland and fodder crops; 12 months for beef cattle; 6 months for small ruminants and pigs; 6 months for dairy animals; 10 weeks for poultry for meat production, bought at the age of 3 days; 6 weeks for poultry for egg production; 1 year for bees, if the family was purchased from conventional apiaries.

Additional annual payment / holding for each category 2012/2013: vegetal production and livestock, species and size of the farm and the ceiling set are listed below; the amounts are an encouragement that will lead to an increase in the number of organic producers.

Table 3, Manufacturing plant: annual crops, perennial crops, permanent pastures (pastures and meadows) in conversion:

Category	Holding size	Additional annual payment Maximum / farm-Euro-
1	0,30-5 ha	1500
2	5,1-20 ha	2300
3	21-50 ha	2900
4	51-100 ha	3400
5	over 100 ha	3800

A processor of organic products may collaborate, on average, with 49.89 Romanian organic producers and a retailer may collaborate, on average, with 80.66 Romanian organic producers.

Table 4. Livestock in conversion:Poultry

Category	Holding Size	Additional annual payment Maximum / farm-Euro
1	Less than 500 heads	1500
2	Over 500 heads	3000

Table 5. Livestock in conversion:Cattle

Category	Holding size	Additional annual payment Maximum / farm-Euro
1	Less than 20 heads	800
2	Over 20 heads	2000

Table 6. Livestock in conversion:Ovines / goats

Category	Holding size	Additional annual payment Maximum / farm-Euro
1	Less than 20 heads	500
2	21-100 heads	1500
3	Over 20 heads	3500

Table 7, Livestock in conversion:Beekeeping

Category	Holding size	Additional annual payment Maximum / farm-Euro
1	0-50 families	750
2	51-100 families	850
3	Over 101 families	950

Table 8, The total ceiling allocated for additional annual payments

Sectors for which support is given	Allocated annual ceiling (€)
Plant production	3,139,000
Animal production	959,000
Total	4,098,000

The number of importers is 1.8 times higher than that of the exporters, and exporters of organic products may collaborate, on average, with 744.6 Romanian organic producers. This data reveals large discrepancies between the number of producers in different counties,

and also reveal large discrepancies between the high number of organic producers in counties, such as Suceava (3196) and Bistrita Nasaud (2320), and the small number of retailers in these counties. Large urban areas have a significant lack of retailers, for example in Bucharest, with a population of over 3 million inhabitants, there are only 21 registered retailers, but none of the large urban agglomeration benefits from the necessary infrastructure in retailers of organic products.

It is obvious that we need more organic processors, as organic products will be capitalized with a higher added value, and available for a longer period by means of processing, yet the shelf life periods are lower than those for conventional products as the list of permitted preservatives is strictly restricted. It is obvious that we need a marketing strategy for organic products, as the number of retailers is small (Table 9) and the variety of organic products is small in supermarkets. A solution would be the direct contact between consumers and producers (farmers), which brings a significant advantage for both sides in terms of price, exchanging knowledge and improving the cultural level.

The organic food production shall pursue the following general objectives: it establishes a sustainable management system for agriculture that observes nature's systems and cycles and sustains and enhances the health of the soil, the water, plants and animals and the balance between them; it contributes to a high level of biological diversity; it makes responsible use of energy and the natural resources, such as water, soil, organic matter and air; it observes high animal welfare standards and, in particular, meets the animals' species-specific behavioural needs; it aims at producing products of high quality, a wide variety of foods and other agricultural products that respond to consumers' demand for goods produced by the use of processes that do not harm the environment, human health, plant health or animal health and welfare.

By achieving these objectives of organic food production presented in Council Regulation

(EC) No. 834/2007 of 28 June 2007 on organic food production and labelling of organic products and repealing Regulation (EEC) No 2092/91, the basis of sustainable rural development shall be established.

Table 9. The structure of manufacturers, processing units, retailers, exporters and importers of organic products by county

Counties of Romania Year 2011	Manufacturers of organic products	Processing units of organic products	Retailers of organic products	Exporters of organic products	Importers of organic products
Alba	68	3	4	*	1
Arad	92	9	10	1	*
Arges	33	4	2	*	*
Bacau	124	6	7	*	*
Bihor	30	6	1	*	*
BistritaNasaud	2320	1	*	*	*
Botosani	321	3	1	*	*
Braila	44	3	1	*	*
Brasov	36	2	1	*	1
Bucuresti	7	16	21	*	3
Buzau	18	3	*	*	*
Calarasi	48	8	*	*	*
CarasSeverin	604	*	2	*	*
Cavasna	66	1	1	*	1
Cluj	149	5	2	*	*
Constanta	86	8	2	*	*
Dambovita	16	4	*	1	*
Dolj	12	*	*	*	*
Galati	71	3	*	*	1
Giurgiu	32	4	*	3	*
Gorj	14	3	3	*	2
Harghita	14	1	1	*	*
Hunedoara	194	4	2	*	1
Ialomita	94	4	3	2	2
Iasi	715	4	*	*	1
Ilfov	3	7	13	*	5
Maramures	78	3	5	2	1
Mehedinti	23	12	*	*	*
Mures	257	5	4	3	3
Neamt	31	3	1	*	*
Olt	14	3	4	*	*
Prahova	29	7	2	*	*
Salaj	252	1	*	*	*
Satu Mare	35	1	*	*	*
Sibiu	94	5	5	*	*
Suceava	3196	4	*	*	*
Teleorman	101	6	*	*	*
Timis	63	17	15	1	*
Tulcea	204	8	6	*	*
Valcea	15	2	1	*	*
Vaslui	23	3	*	*	*
Vrancea	54	2	*	*	2
<b>TOTAL</b>	<b>9680</b>	<b>194</b>	<b>120</b>	<b>13</b>	<b>24</b>

## CONCLUSIONS

Considering the announcement of programs that will support and transform familiar agriculture from subsistence to market agriculture, various European financing programs aimed at rural individuals' qualification, easy access to information via the Internet and through various regional organisms, the organic sector will continue to witness a constant annual evolution.

The market niche that is now organic farming can turn into Romania's chance to impose on the market in an area that allows farmers to live in a clean environment with beautiful rural landscapes and biodiversity and provides them with a decent living by means of the capitalization on organic agricultural products, their price being higher than that of conventional products.

## ACKNOWLEDGMENTS

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## DIRECTIONS AND CHALLENGES IN GLOBAL AGRICULTURE

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### *Abstract*

*The development of global agricultural market has been at the forefront of professional studies. Expert opinions have quite differing views as to whether the world's food production will be able to supply the huge demand of growing population. This scientific paper provides a general overview of global agricultural directions, including views on whether agricultural productivity increases will be able to keep with food demand increases and price trends. The scientific paper has focused on the present state of the agricultural market and on the analysis of the key factors defining the tasks of the agricultural sector in the near future, with a special attention to the case of Republic of Moldova.*

**Key words:** globalization, market, technology

### INTRODUCTION

At the end of the 20<sup>th</sup> century, extremely significant changes occurred in the global agriculture; the accelerating technical development modified the economic processes. At the moment, the world's population is more than seven billion people and their daily food supply must be provided. Moreover, it is a widely accepted view that according to the UN estimates this figure will reach nine billion by the year 2050. Consequently compared with the present figure, by 2050 there will be three billion more of human beings and this number equals the total number of population of the globe in 1950s. In the forthcoming decades the boost of population growth will be triggered by the underdeveloped regions. However, the center of this situation will be shifted from China and India to Africa. The African continent in itself will contribute to half of the total population growth according to the calculations (Sippel et al. 2011).

Another reason for the problem is that not only the population will grow in the following forty years but the standards of living and the people's income. On the basis of the above mentioned facts, it is clear that the global demand for food products will double in the following decades and it is also means

challenges for the agriculture (along with mechanization).

### MATERIALS AND METHODS

At the basis of this scientific paper served the information from the Statistics National Bureau of Republic of Moldova, Ministry of Economy of Moldavian Republic, different groups of national and international experts and also our own researches in this domain, were applied the following methods: selective, comparison and tabular methods.

### RESULTS AND DISCUSSIONS

On the directions and challenges in global agriculture influence a group of factors that defines the future.

For many decades, the main agricultural products have had decreasing relative price levels, but in the recent period (since 2002) the global agricultural price levels have been increasing (Table 1).

After a relatively steady trend, there were drastic price increases in 2008 and 2010, something that was not typical of agricultural markets earlier. The decade's long trend reversed what had been previously suggested that the relative food prices showed a decreasing tendency and that consequently the global prices followed the global changes in

trends with regional specialties. According to experts the food prices started to go up because there was a boost in demand for food products that contained a higher level of

added value and for more processed food products as well of a significant increase in the population of the Earth.

Table 1. Annual real food price indices (2002 – 2004= 100)

Year	Food price index	Meat price index	Dairy price index	Cereals price index	Oils price index	Sugar price index
2000	93,1	98,7	98,3	87,7	69,9	119,5
2001	99,1	102,4	113,6	91,8	71,7	130,1
2002	96,6	96,2	88,4	101,5	93,5	105,1
2003	97,7	96,7	95,1	98,1	100,8	100,5
2004	105,1	106,3	114,7	100,5	104,9	95,1
2005	109,7	112,4	126,6	96,8	96,9	131,2
2006	116,6	109,1	117,8	112,0	103,5	192,9
2007	139,6	110,0	186,7	146,7	149,5	125,7
2008	164,6	126,3	180,9	195,9	187,2	149,6
2009	135,0	114,3	121,7	149,4	129,8	221,3
2010	158,3	130,0	171,2	156,0	165,9	258,0
2011	200,2	155,3	194,0	217,1	221,9	324,5
2012	194,8	162,1	179,4	204,2	219,5	304,4

Source: [FAO, 2012]

According to the latest published figures by the United Nation's Food and Agriculture Organization (Agricultural Outlook, 2011), the global food prices showed a slight decrease in April 2011. The reason for the previous price increase was higher prices of vegetable oils and cereals and the global price drop was due to the decline in cereal and sugar prices.

In numerous supply fields, the available land for agricultural activities is more and more limited and the production must be expanded on less and less developed areas which can be describes as having productivity and a higher risk or unfavorable weather conditions. This means that significant investments are needed in order to boost productivity, so that the agriculture will be able to meet the growing demand in the future.

In the future, the environmental problems are more likely to happen more and more often and in a more and more severe way. A decrease of environmentally damaging effects of intensive production methods must be achieved with increasing efforts. Providing a sustainable agricultural production is a major challenge. Consequently, there is a higher demand for the development of environmentally friendly agricultural

technologies all over the world as well as for the more emphasized vindication of the requirements of sustainable agriculture.

Beside the human consumption, the competition for fodder livestock and for raw materials for the bioenergy production is getting to be more and more significant. The incentive to grow non – food crops has become in the forefront in agriculture (Agricultural Commodity, 2011). The raw materials for energy production are not only biomass but also oilseeds and cereals. The fast growing prices and decreasing reserves of fossil fuels are making the opportunities of energy production in agriculture more precious.

In relation to the agricultural production in the future and the possible tendencies in the agricultural markets, important factors are the biotechnological opportunities, the development of bioenergetics, the increase in arable and cultivated lands, the growth of irrigated areas and the level of environmental damages caused by agricultural production capacities.

#### **Republic of Moldova**

The accelerated development of the world economy and globalization has had a significant influence on the agriculture. The global trends have reached Moldova,



irrespective of whether these influences are positive or negative. The Moldavian agricultural development cannot be separated from these tendencies. The most important factors are the enhancement of the competitiveness of the agricultural and food industry and the application of supportive measures. All these must be evaluated in environmental, production quality and sociological dimensions. One of the most crucial problems of Moldavian agriculture is the adaptation to the modified circumstances.

The implementation of market economy has not been finished, this process is still happening. Another important task is the creation of an efficiently operating institutional system, the foundation of legal frames, setting up the protection of quality. The future of the Moldavian agriculture calls for a significant enhancement of efficiency, productivity and competitiveness.

In order to better understand the investment conditions of the Republic of Moldova and to make evident some possibilities for investments, let us emphasize the reasons why Moldova needs investments:

1. its own investment potential is very low, insufficiency of internal resources in the private sector;

2. the need to integrate the Republic of Moldova into global economy on favorable terms;

3. create a competitive environment with the participation of foreign investors, raising the competitiveness of the national products;

4. having a big number of businesses which register loss, respectively having debts to the state budget. Their privatization and further sale to foreign investors will create a new business culture and the principle that a business must be profitable. Otherwise the society does not benefit from having such a company;

5. the need to implement in the Moldovan economy advanced technologies and economic know-how which becomes possible given the interest of foreign investors.

The search for business opportunities based on improvements in the production and sales' efficiency requires adjustments and necessary

investments. There are two crucial issues that determine the level of actual investments. Closely related is the issue of financing. For a small open economy like Moldova, foreign direct investments are crucial for the development, as they bring not only capital but also modern technologies, managerial and marketing oriented know-how.

## CONCLUSIONS

The main findings from the study are summarized as follows. In order to enhance competitiveness of Moldavia's products the following actions are needed:

-improving the competence of farmers and people who will ensure a more efficient farm management (need for improved training, consulting and information services)

-improving competitiveness of farms in terms of achieving the promotion of investment as well as the technological and scientific progress, reducing production costs, achieving a compliance with the EU standards

-modernization and changes in the processing and sales of agricultural products.

As a recommendation, in order to enhance perspectives of Moldavia's agricultural sector, it would be good to improve the living standards of rural population and to develop competition in agricultural production. In the EU market regulations of production are based on following principles: abolishment of any restrictions on trade between the EU countries, mechanisms that contribute to stabilization of producer unit prices of agricultural products, domestic market defense from competition of third countries products, financing of agricultural holdings from a unique fund consisting of contributions from participants.

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## CONSIDERATIONS REGARDING THE DEVELOPMENT OF ORGANIC AGRICULTURE IN THE WORLD, THE EU-27 AND ROMANIA

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### Abstract

*The paper aimed to analyze the development of organic agriculture in the world, the EU and Romania, based on the statistical data for the period 2006-2010 and the index, share and comparison methods. Organic agriculture covers 34.04 Million ha at world level, of which 26.99 % in Europe and 32.08 % in Oceania. The largest areas in organic agriculture are in Australia, Argentina, the USA, Brazil, Spain, China and Italy. At world level, there are 1.6 million organic producers, over 63 % operating in Africa and Asia, especially in India, Uganda and Mexico. In 2010, organic food sales accounted for Euro 44.5 Billions of which 50 % in Europe. In the same year, the organic agriculture area increased by 20 % in the EU-27 and reached 9.01 million ha and continues to grow, representing 5.10 % of agricultural land. The largest areas in organic agriculture are in Spain, Italy, Germany and France. In the EU-27 there are 219,290 organic producers of which 40 % in Italy, Spain, Germany and Austria. In 2010, Romania's area in organic agriculture was 300,205 ha, 2 times higher than in 2006. A number of 10,253 organic operators were registered in 2010, representing 4.67 %, of the EU number. The main organic products are cereals, vegetables, wine, honey, dairy products, representing a chance for Romania's export on the EU market.*

**Key words:** EU, organic agriculture, Romania, trends, world

### INTRODUCTION

Organic agriculture especially is an alternative to traditional agriculture especially to the intensive one, aiming to assure food safety and health, environment protection, plant and animal welfare [4]. It supposes the elimination of chemicals use in agriculture, the assurance of Nitrogen into the soil by bacteria intensified activity, the use of manure and compost, reduction of excessive mechanization with a benefic effect on the physical soil properties [9].

On the other hand, organic agriculture is disadvantaged by the low productivity, higher production cost, but which could be compensated by a higher price for "green food" [7, 8].

Organic agriculture has more and more supporters at international level both in the developed and developing countries, being regulated by principles and standards.

The EU has firmly sustained organic agriculture within C.A.P. and National Action

Plans of each member state, creating the institutional framework and standards which regulate the relationship between agriculture, environment, plant and animal welfare and human health.

Organic food market is continuously developing due to the increased demand justified by consumers perception that organic food is healthier and more friendly with environment than conventional food [13].

The research results have pointed out an increased consumption of organic food due to its nutritive value, taste, quality, lack of synthetic residues, but also due to the modern consumer's diet change and pure curiosity to test organic food [10,11], the wish to cover dietary needs and live a healthy life [2].

In this context, the paper analyzes organic agriculture development in the world, EU and Romania in order to point out the major trends regarding organic agriculture areas, the main countries where organic agriculture is practiced, organic operators and market

development based on the statistical data and information provided by official authorities.

## MATERIALS AND METHODS

In order to set up this paper, the following specific indicators were used: organic agriculture area at world level and its distribution by regions and in the top 10 countries, number of operators involved in organic agriculture and their distribution by country, world market development based on organic food sales and consumption value, organic agriculture area and number of organic operators in the EU-27 and Romania. The empirical data collected from various information sources were processed using Index, Share and Comparison methods, pointing out the growth or decline and also shares and the results allowed the adequate interpretation and the identification of the major trends.

## RESULTS AND DISCUSSIONS

### Organic agriculture at world level\

The organic agricultural land has been continuously increasing and in the period 2000-2010 it doubled its figure from 14.89 million ha in the year 2000 to 37.04 million ha in the year 2010. In 2010, the largest organic agricultural surfaces were in Oceania (32.80 %), Europe (26.99 %) and Latin America of world organic agricultural land (Table 1).

The highest growth of organic agricultural land was registered in Asia (46.33 times) and Africa (21.60 times) and between 2.14 and 2.50 times in Latin America, Europe and N. America.

Table 1. Evolution of world organic agricultural land by region in the period 2000-2010

Region	2000		2010		2010/2000
	Million ha	%	Million ha	%	%
Africa	0.05	0.36	1.08	2.91	2,160.00
Asia	0.06	0.40	2.78	7.50	4,633.33
Europe	4.50	30.22	10.00	26.99	222.22
L.America	3.91	26.25	8.39	22.65	214.57
N.America	1.06	7.11	2.65	7.15	250.00
Oceania	5.31	35.66	12.14	32.80	228.62
Total world	14.89	100.00	37.04	100.00	249.42

Source: Organic World, 2012, [17]. Own calculations

**Organic agriculture** is practiced in 160 countries of which 45 are in Europe. The share of organic land of the world agricultural area is very small, accounting just for 0.9 %.

**In 2010, the top 10 countries** with the largest organic agricultural land, in the decreasing order of their share in the world organic land, were: Australia, Argentina, the USA, Brazil, Spain, China, Italy, Germany, Uruguay and France, whose share together accounted for 72.60 % (Table 2).

The figures show that about 48.93 % is kept by the first three countries: Australia (32.39 %), Argentina (11.28 %), and the USA (5.26 %). Compared to 2009, in 2010 a number of 10 countries registered the highest growth of organic agricultural land: France, Poland, Spain, Bolivia, Turkey, Czech Republic, Portugal, Sweden, Germany and Macedonia.

Table 2. The top 10 countries with the largest organic agricultural land in 2010

Country	Organic Agricultural Land (million ha)	Share in world organic agricultural land (%)
Australia	12.00	32.39
Argentina	4.18	11.28
USA	1.95	5.26
Brazil	1.77	4.77
Spain	1.46	3.94
China	1.39	3.74
Italia	1.11	3.75
Germany	0.99	2.67
Uruguay	0.93	2.51
France	0.85	2.29
Total	26.63	72.60
Total world	37.04	100.00

Source: FIBL/IFOAM Survey 2012 [19]. Own calculations.

Taking into account the share of organic agricultural land in the total agricultural land in each country, 10 countries are situated in the first positions in the world as follows: Falkland Islands, Liechtenstein, Austria, Sweden, Estonia, Switzerland, Czech Republic, Latvia, Slovakia and Italy (Table 3). From the shown figures, one can notice that 7 countries have more 10 % organic land. Also, other 18 countries have between 5 to 10 % organic land and 63 countries have less 1 % organic agricultural land.

In the period 2000-2010, the number of organic producers increased 5.33 times from 0.3 million in the year 2000 to 1.6 million in 2010.

Table 3. The top 10 countries with the highest share of organic agricultural land in total agricultural land in 2010

Country	Share of organic land in agricultural land (%)	Country	Share of organic land in agricultural land (%)
Falkland Islands	35.9	Switzerland	11.4
Liechtenstein	27.3	Czech Rep.	10.5
Austria	19.7	Latvia	9.4
Sweden	14.1	Slovakia	9.00
Estonia	12.5	Italy	8.7

Source: Organic World, 2012, [17]

Most of them were in Africa (34 %) and Asia (29 %), but also in Europe (18 %) and Latin America (17 %) (Table 4). Taking into consideration the organic agricultural land, 34.04 million ha, and the number of 1.6 million producers, this means that the average size of organic farm is about 21.27 ha. The highest number of organic producers is in India, Uganda, Mexico, Ethiopia, Tanzania, Peru, Turkey, Italy and Spain. The first three countries India, Uganda and Mexico have together 44.83 % of the world organic producers (Table 4).

Table 4. World organic producers in 2010

Share of organic producers by region (%)		Share of the top countries in the number of world organic producers (%)	
World number of organic producers = 1.6 million			
Region	Share (%)	Country	Share (%)
Africa	34	India	25.00
Asia	29	Uganda	11.78
Europe	18	Mexico	8.05
Latin America	17	Ethiopia	7.69
Nord America	1	Tanzania	5.33
Oceania	1	Peru	2.80

Source: FIBL/IFOAM Survey 2012 [19]

In 2010, the global turnover coming from marketed organic food and beverages accounted for Euro 44.5 billions, of which almost 90 % was carried out in the Northern hemisphere [15].

In 2010, global market of organic products turnover was 3.3 times higher than in 2000 (Euro 14.83 billions). The top 10 countries contributing together by 87.48 % to the world organic food sales are the USA, Germany, France, United Kingdom, Canada, Italy, Switzerland, Japan, Austria and Spain (Table 5).

Table 5. The share of the top 10 countries in the world organic food sales in 2010

Country	%	Country	%
USA	45	Italy	3
Germany	14	Switzerland	3
France	8	Japan	2.24
United Kingdom	4	Austria	2.21
Canada	4	Spain	2.03

Source: OTA's Organic Industry Survey, 2012 [21]

According to Organic Trade Association Industry Survey, the most dynamic growth of organic food sales was registered in Germany, the sales of organic food increased 2.93 times from Euro 2,050 millions in the year 2000 to Euro 6,020 millions in the year 2010. In the USA, the sales growth was 3.09 times higher than in 2010 (USD 26,708 millions) compared to the year 2002 (USD 8,635 millions). The value of organic food consumption, that is the expenditures paid by consumers in 2010 have continuously increased and varied from a country to another. A number of 10 countries are in the first positions based on the value of organic food consumption: Switzerland, Denmark, Luxembourg, Austria, Liechtenstein, Sweden, Germany, the USA, Canada and France (Table 6).

Table 6. The top 10 countries in the world based on the value of organic food consumption in 2010

Country	E/capita	Country	Euro/capita
Switzerland	153	Sweden	86
Denmark	142	Germany	74
Luxembourg	127	USA	65
Austria	118	Canada	57
Lichtenstein	100	France	55

Source: OTA's Organic Industry Survey, 2012 [21]

Also, in 2010, the highest share in the world organic food consumption was registered by Denmark, Austria, Switzerland, Sweden, USA, Germany, Luxembourg, the Netherlands, Canada and France, which together totalized 41 % (Table 7).

Table 7. The top 10 countries in the world with the highest share in the value of organic food consumption in 2010

Country	%	Country	%
Denmark	7.20	Germany	3.50
Austria	6.00	Luxemburg	3.30
Switzerland	5.70	Netherlands	2.70
Sweden	4.10	Canada	2.50
USA	4.00	France	2.00

Source: OTA's Organic Industry Survey, 2012 [21]

### Organic farming in the developing and transition countries

One third of world organic agricultural land, that is 12.5 million ha, are in the developing and transition countries, the most of land being situated in Latin America, Asia and Africa. The top 10 developing countries having the largest organic agricultural land are: Argentina, Brazil, China, Uruguay, India, Turkey, Mexico, Ukraine, Uganda and Peru. In these countries there are about 1.3 million producers, meaning that the average size of an organic farm in 9.61 ha, much smaller than the world average.

### Organic agriculture in the EU

The organic agricultural land in the EU increased by 34.44 % in the period 2006-2010 from 6.7 million ha in 2006 to 9,016 million ha in 2010. In 2010, about 5.10 % of the EU agricultural land was in organic farming and the surface is continuously increasing in many EU member states (Table 8).

In 2010, the largest organic agricultural surfaces were in Spain (1,456 million ha), Italy (1,113 million ha), Germany (0.990 million ha), France (0.845 million ha), United Kingdom (0.699 million ha), Austria (0.543 million ha), Poland (0.521 million ha), Czech Republic (0.448 million ha) and Sweden (0.438 million ha), whose share together in the EU-27 organic agricultural land was 73.51 %.

In the period 2006-2010, the highest growth of organic agricultural land was noticed in Bulgaria (5.46 times), Poland (2.28 times), Spain (1.97 times), Sweden (1.94 times), Romania (1.69 times), Belgium (1.67 times), Czech Republic (1.59 times), Estonia (1.54 times), France (1.52 times). However, in Italy, the Netherlands and Portugal, organic agricultural land declined by 3 %, 4.53 % and, respectively, 6.16 %.

Table 8. Organic agricultural land in the EU

Country	2006		2010		2010/2006
	ha	%	ha	%	%
Austria	477,802	7.12	543,605	6.02	113.77
Belgium	29,308	0.43	49,005	0.54	167.20
Bulgaria	4,692	0.06	25,648	0.28	546.63
Cyprus	1,979	0.03	3,575	0.03	180.64
Czech Republic	281,535	4.19	448,202	4.97	159.19
Denmark	138,079	2.05	162,903	1.80	117.97
Estonia	72,886	1.08	112,972	1.25	154.99
Finland	144,667	2.15	169,168	1.87	116.93
France	552,824	8.24	845,442	9.37	152.93
Germany	825,539	12.30	990,702	10.98	120.00
Greece	302,264	4.50	309,823	3.43	102.50
Hungary	122,765	1.83	127,605	1.41	103.94
Ireland	39,947	0.59	47,864	0.53	119.81
Italy	1,148,160	17.12	1,113,740	12.35	97.00
Latvia	150,016	2.23	166,320	1.84	110.86
Lithuania	96,718	1.44	143,644	1.59	148.51
Luxemburg	3,630	0.05	3,720	0.04	102.47
Malta	20	0.00	24	0.00	120.00
Netherlands	48,425	0.72	46,233	0.51	95.47
Poland	228,009	3.39	521,970	5.78	28.92
Portugal	214,242	3.59	201,054	2.22	93.84
Romania	107,578	1.60	182,706	2.02	169.83
Slovakia	120,410	1.79	174,471	1.93	144.89
Spain	736,938	10.981	1,456,670	16.15	197.66
Sweden	225,431	3.36	438,693	4.86	194.60
United Kingdom	605,706	9.76	699,638	7.89	115.50
EU 27	3,706,401	100.00	9,016,093	100.0	134.44

Source: FIBL/IFOAM Survey 2012 [18,19]

The most numerous organic producers were in Italy (41,807) and Spain (27,877) in 2010. In 2006, the average size of organic farms in the EU-27 was 34 ha, compared to 11.9 ha in average per conventional farm. In 2010, an organic farm had in average 41 ha compared to 13 ha in conventional agriculture [9].

In Denmark, France and Luxembourg, the average size of an organic farm was smaller than in conventional agriculture, while in most of the EU countries the average farm size in organic farming is higher than in conventional agriculture.

In 2010, the EU-27 registered 219,290 organic producers of which 10 % in Italy, 10 % in Spain, 10 % in Germany and 10 % in Austria, while 1 % was recorded in each of the following countries: Bulgaria, Belgium, Hungary, Portugal, the Netherlands, and Slovakia. In the period 2006-2010, the number of the EU organic producers increased by 22.2 %. The highest growth was registered by Bulgaria (2.2 times), Czech Republic (2.6 times), Poland (1.2 times), and Sweden (1.1 times).

The EU organic farmland represented 90 % of organic agricultural land in Europe. Spain,

Italy, Germany and France are situated in the top 10 countries based on this criterion. Also, Austria, Sweden, Estonia, Switzerland, Czech Republic, Latvia, Slovakia and Italy are situated among the top 10 countries in the world based on the share of organic land in total agricultural land.

Germany, France, United Kingdom, Italy, Austria and Spain are among the top 10 countries based on organic food turnover.

Also, Denmark, Luxembourg, Austria, Sweden, Germany and France are among the top 10 countries concerning consumers' expenditures for organic food.

**Organic agriculture in Romania** has been developed in the recent years and mainly after the country access into the EU in 2007, when the legislative and institutional framework has had to align to the requirements.

Organic agricultural land has increased 2.2 times from 135,799 ha in 2006 to 300,005 ha in 2011 of which the surface cultivated with cereals represented about 53 % grass land and meadows 29.82 %, orchards and vineyards 1.52 % and wild collection 15.66 % (Table 9). In 2011, in Romania a number of 10,253 operators were involved in organic agriculture, 3 times more than in 2006 (Table 9). Most of them are small farmers, having

subsistence farms of 3-20 ha or breeders of 3-5 cows, 55-100 sheep or 10 bee families. In 2012, the number of organic operators was 26,736, 2.6 times higher than in 2010 of the total number of organic operators, 26,390 are agricultural producers, 32 agriculture units, 103 processors and 211 traders.

About 33 % of organic agricultural land in Romania, that is 100,000 ha is arable land, representing about 1 % of arable land at country level. In 2011, organic agriculture contributed by 10 % to the increase of arable land. This was due to the financial support offered by the EU and government in relationship to the cultivated surface and crop, and livestock. The livestock grown in organic production system has declined for all the species, except goats, whose number increased 9.3 times, poultry whose livestock increased 5 times and bee families which doubled their number in the period 2006-2010 (Table 10). The decline of livestock was due to the lack of organized selling markets for organic products, high production costs, a relatively similar selling price as for the conventional agricultural products [9].

The average farm size in organic farming was 29.26 ha in 2011 compared to 39.83 in the year 2006.

Table 9. Evolution of the number of organic producers and agricultural land in Romania, 2006-2011

	M.U.	2006	2007	2008	2009	2010	2011	2011/2006 %
No of organic operators	No	3,409	3,834	4,191	3,228	3,155	10,253	300.00
Organic agricultural land, of which:	ha	135,799	182,594	215,258	239,999	259,946	300,005	220.91
Cereals	ha	45,605	65,112	86,454	110,014	148,034	158,825	348.26
Permanent crops grassland and meadows	ha	51,200	57,800	46,007	39,233	31,579	89,489	174.78
Permanent crops-orchards and vineyards	ha	294	954	1,518	1,869	3,039	4,589	1560.88
Wild collection	Ha	38,700	58,728	81,279	88,883	77,294	47,102	121.71

Source: Organic Agriculture in Romania, 2011, [16] Own calculations.

In 2011, 914.08 ha of which 511.04 ha in conversion and 403.04 ha organic certified surface belonged to organic vegetable growing. In 2011, organic vegetables productions accounted for 1,566.67 tones of which 11 tons (cauliflower, broccoli,

cabbage), 88.76 tons other vegetable such cereals, lettuce, endives, spinach, asparagus, chicory etc, 653.2 tons tomatoes and cucumbers, 504.08 tons beans and peas, 294.8 tons carrots, garlic, onion and 14.41 tons other vegetables.

Table 10. Livestock in organic production system, Romania, 2006-2010

	2006	2007	2008	2009	2010	2010/2006 %
Cattle	11,365	6,985	7,567	8,145	5,358	47.14
Dairy cows	8,236	4,889	4,297	4,303	2,332	28.31
Pigs	1,652	1,174	416	603	320	19.37
Sheep	86,180	59,680	121,175	51,470	18,883	21.91
Goats	117	215	4,296	4,738	1,093	934.18
Poultry	4,300	4,320	6,080	9,400	21,580	501.86
Bee families	30,796	37,260	52,599	59,414	64,836	210.53

Source: EuroStat, 2012, [20].

Organic fruits are produced on 3,149.41 ha orchards of which 1,538.8 ha for seed fruits, 240.19 ha for fruit bushes, 128.84 ha nut trees and 55.63 ha almond and nut trees.

Organic cereals (wheat and maize) and honey are the most important agricultural products besides vegetables and fruits. Romania is a major supplier of raw materials, being advantaged by the existence of fertile land suitable for organic farming. The share of the main organic products achieved in Romania is presented in Table 11.

Table 11. Processing of organic agricultural production in Romania

Agricultural product	%	Agricultural product	%
Fruits and vegetables	20	Dairy products (cheese, butter etc)	4
Tea, forest fruits, aromatic and spices herbs	19	Grain mill products	3
Bakery products	13	Meat and meat products	3
Grains, oilseeds, protein crops	10	Animal feeds	3
Vegetable oils	5	Wines from organic grapes	2

Source: Organic Agriculture in Romania, 2011, [16]

The organic food channels are represented by local specialized markets, e-commerce, supermarket and other channels. About 80 % of organic food is sold in supermarkets, 10 % of organic food consumption is represented by local products and 90 % products are imported compared to Poland where imports represent just 30 % and Czech Republic 40 % [12].

Organic food is preferred by more and more Romanians but the amount purchased is limited by low income/family, taking into account that organic food price is 20-30 % higher than conventional food.

The reasons why organic food is consumed in Romania are its special taste, proximity to the purchase place, and curiosity [6].

Organic agriculture lead to increased production cost because of the lower productivity but this disadvantage could be compensated by a higher price at delivery and an increased gross margin [3].

The increased demand for organic food on the domestic market and mainly on the European one has stimulated Romania's export of organic food. If in 2009, the value of bio food export was Euro 80 millions, in 2010 it reached Euro 100 millions and in 2011 Euro 200 millions.

The most required bio products for export are grains of cereals, honey, berries, cheese, wines and bread products.

The main beneficiaries of the Romanian bio products are Germany, Austria and Belgium [1,5].

In 2010, 135,600 tones of organic products were exported, accounting for Euro 100 millions. The main exported products were cereals, oilseeds and proteical seeds, forest fruits, processed milk products, honey and sunflower oil. The main beneficiaries were Germany, Austria, Switzerland, the Netherlands, Italy, France and Denmark.

Organic agriculture is deeply stimulated by special programmes established by C.A.P[14]. Romania's organic farming received Euro 3 millions in 2011 and other Euro 4.5 billions in 2012 from the program of organic conversion. The financial support varies according to land surface and number of livestock. For vegetal production, farms could get Euro1,500 farms with 0.3-5 ha, Euro 2,300 for farms with 5.1-20 ha, Euro 2,900 for farms with 21-50 ha, Euro 3,400 for farms with 51-100 ha, Euro 3,800 E for the farms over 100 ha.



In the animal sector, poultry farmers could get Euro 1,500 for 500 poultry stock and Euro 3,000 for over 500 heads, cattle breeders could get Euro 800 for raising less than 20 heads and Euro 2,000 for more than 20 cattle; sheep and goats breeders could get Euro 500 for growing less than 20 heads, Euro 1,500 for 21-100 heads and Euro 3,500 for more than 100 heads.

The beekeepers could receive Euro 750 E for keeping between 1-50 bee families, Euro 850 for 51-100 bee families and Euro 950 for apiaries larger than 100 bee families.

Also, from National Plan for Rural Development, farmers could benefit of payments for certifying organic farmland as follows: Euro 162 per ha for arable crops, Euro 335 per ha for vegetables, Euro 393 per ha for orchards, Euro 393 per ha for vineyards and Euro 270 per ha for medicinal and spicy herbs.

## CONCLUSIONS

Organic agriculture is an extremely dynamic sector both at world, European and Romania's level. The increased demand for organic food has stimulated the growth of organic agricultural land, livestock, production and trade with organic products.

The EU is one of the largest organic food producers and consumers. Romania has excellent conditions mainly its fertile soil to develop organic agriculture and increase export on the EU market. For this reason, the future strategy should be focused on the continuous growth of organic land, higher food quality, improvement of organic processes and domestic consumption as well as to extend export. The financial support is extremely important to strengthen and accelerate the development of organic farming in Romania.

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## CONSIDERATIONS REGARDING THE E.U. ROLE IN THE WORLD GRAPE PRODUCTION

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### Abstract

*The paper aimed to analyze the EU-27 position in the world grape production based on the data collected from FAO Stat data base for the period 2000-2008, using the index and share methods. The EU-27 is the most important vine cultivator and grape producer in the world. With its 3.5 million ha planted with vine, it accounts for 90.21 % of Europe's area of vineyards and 48.14 % of the world vine area. In 2008, the EU-27 produced 25.1 million tones grapes placing it on the top position and contributing by 41.56 % to the world production. The top European countries: Italy, Spain, France, Germany and Romania achieved 21.8 million tones grapes, representing 86.98 % of the EU-27 and 32.96 % of the world grape production. Italy, Spain and France are among the top 10 grape producers in the world. As a conclusion, even thou the EU-27 planted area decreased by 8.24 % and its grape production declined by 16.16 %, the EU-27 continues to remain the main grape producer in the world.*

**Key words:** EU-27, grape, production, trends, vineyards area

### INTRODUCTION

Grapes are among the most attractive and preferred fruits. They are consumed both as such, but also as grape just, wine, jam, jelly, seed extract, raisins, sultanas, vinegar and seed oil. [1].

They have a benefic effect on the human body due to their chemical composition rich in sugar, antioxidants, minerals, vitamins etc [4]. Grape consumption assures the protection of blood vessels, the decrease of cholesterol level, it has an antioxidant effect because of its poly-phenols (mainly resveratrol) which have a strong effect against free radicals and cancer [2,3,5,6,7].

Grape demand is increasing but demand/offer ratio is unbalanced because of the production decline during the last 30 years [3].

Grape production varies from a country to another in close relationship to climate and soil conditions, vine cultivars and varieties, plantation surface and grape yield [1].

In this context, the present paper aimed to analyze the EU position of role in the world

grape production taking into account the surface of vine plantation, and grape yields.

### MATERIALS AND METHODS

The paper was set up based on the data collected from FAOStat data base for the period 2000- 2008 in order to comparatively analyze the status of vine plantations' area at world level and in the top cultivating countries, world grape production, its distribution by continent and in the top producing countries. Also, the data for the same years were collected for the EU-27 as a whole, but also by each member state regarding: vineyards surface and grape production in order to identify the major changes along the time and the position of the EU-27 and of its important grape producers in the world.

The primary data have been statistically processed using the index, share and comparison method, common procedures for such an analysis and the obtained results have been interpreted.

## RESULTS AND DISCUSSIONS

### Vine cultivated area at world level

At world level, vine plantations occupied 7,473,020 ha in 2008, by 2.54 % more than in the year 2000. In largest cultivated area is situated in Europe, which accounts for 53.54 % of world vine planted surface. On the 2<sup>nd</sup> position is situated Asia with 26.90 % of world vine planted area. On the next positions are coming South America (7 %), North America (5.19 %), Africa (4.89 %) and Oceania (2.48 %).

In the period 2000-2008, the surface of vine plantations registered a decline in Europe (-8.87 %) and North America (-0.55 %) and increased in South America (+21.49 %), Asia (+21.09 %) and Africa (+18.39 %) (Table 1).

In 2010, the total surface planted with Vitis species reached 7,586,600 ha, showing an average growth of 2 % per year.

Table 1. World area planted with vine and its distribution by continent

Continent	2000	2008	2008/2000 (%)	The share in the world area in 2008 (%)
Europe	4,375,574	3,987,500	91.93	53.54
Africa	308,624	365,400	118.39	4.89
North America	390,482	388,345	99.75	5.19
South America	430,861	523,478	121.49	7.00
Asia	1,660,357	2,010,600	121.09	26.90
Oceania	120,820	196,697	162.79	2.48
Total world	7,286,718	7,472,020	102.50	100.00

Source: FAOStat, 2011 [8]. Own calculations

**The top 10 countries regarding the planted area with vine** totalized 7,472,020 ha in 2008, by 2.54 % more than in the year 2000. Their vine surface represented 69.39 % of the world area in the year 2008.

The share of planted area in the world vine surface by country was the following one: Spain 14.84 %, France 10.90 %, Italy 10.54 %, China 9.30 %, Turkey 6.46 %, USA 5.06 %, Iran 3.71 %, Portugal 20.98 %, Argentina 2.93 %, Chile 2.58 % (Table 2).

In the period 2000-2008, the area planted with vine has registered a decline in Italy (-9.70 %), France (-5.38 %), Spain (-5.03 %) and Portugal (-4 %), but it has increased in China

(+144.20 %), Chile (+22.95 %), Argentina (+16.88 %) and Iran (+5.32 %).

In 2010, the top producers of grapes for wine making, in the decreasing order according to the planted area were: Spain (1,175 thousand ha), France (864 thousand ha), Italy (827 thousand ha), Turkey (812 thousand ha), USA (415 thousand ha), Iran (286 thousand ha), Romania (248 thousand ha), Portugal (216 thousand ha), Argentina (208 thousand ha), and Chile (184 thousand ha).

Table 2. The top 10 countries in the world based on the area planted with vine (ha)

Country	2000	2008	2008/2000 (%)	The share in the world area in 2008 (%)
Spain	1,167,700	1,109,050	94.97	14.84
France	860,979	814,697	94.62	10.90
Italy	872,730	788,100	90.30	10.54
China	786,128	698,730	244.20	9.35
Turkey	535,000	482,780	90.23	6.46
USA	383,016	378,770	98.89	5.06
Iran	263,692	277,740	105.32	3.71
Portugal	231,959	222,700	96.00	2.98
Argentina	187,740	219,440	116.88	2.93
Chile	156,859	192,870	122.95	2.58
Total Top 10	4,945,803	5,184,877	104.83	69.39
Total world	7,286,718	7,472,020	102.54	100.00

Source: FAOStat, 2011[8]. Own calculations

Therefore, 5 European countries: Spain, France, Italy, Romania and Portugal are among the top countries regarding the surface planted with vine in order to produce wine.

**The surface planted with vine in the EU-27** accounted for 3,597,437 ha in the year 2008, when it was by 9.24 % smaller than in the year 2000. In 2008, it represented 90.21 % of the vine planted area in Europe and 48.14 % of the vine planted area at world level. In the period 2000-2008, the share of the EU-27 in the Europe's planted area with vine increased from 89.59 % in 2000 to 90.21 % in the year 2008 (Table 3).

At world level, the share of the EU-27 planted area with vine declined from 53.79 % in the year 2000 to 48.14 % in the year 2008.

In the EU-27, there are important cultivators of vine with a long tradition, also some other countries with medium-sized surfaces cultivated with vine and also countries with very small or no cultivated areas with vine

(Denmark, Estonia, Finland, Ireland, Latvia, Lithuania, Poland and Sweden).

The planted area with vine declined in most of the EU-27 countries. The highest decrease was noticed in: Belgium (- 85 %), Slovakia (- 46 %), Greece (-30 %), Malta (-40 %), Romania (-25 %), Hungary (-15 %), Cyprus (- 22 %). The only countries where the planted area with vine registered an increase were Czech Republic (+ 45 %), Luxemburg (+6.95 %), Slovenia (+4.33 %) and the Netherlands (+20 %) (Table 3).

Table 3. The area planted with vine in the EU-27 (ha)

Country	2000	2008	2008/2000 (%)	Share of the EU-27 in 2008 %
Austria	48,082	45,622	94.88	1.26
Belgium	65	10	15.38	0
Bulgaria	111,207	110,816	99.64	3.08
Cyprus	18,410	13,590	78.31	0.37
Czech Republic	11,236	16,300	145.06	0.45
Denmark	-	-	-	-
Estonia	-	-	-	-
Finland	-	-	-	-
France	860,979	814,697	94.62	22.64
Germany	101,546	99,700	98.18	2.77
Greece	124,790	86,800	69.55	2.41
Hungary	88,672	75,776	85.45	2.10
Ireland	-	-	-	-
Italy	872,730	788,100	90.30	21.90
Latvia	-	-	-	-
Lithuania	-	-	-	-
Luxemburg	1,309	1,400	106.95	0.03
Malta	317	190	59.39	0
Netherlands	40	48	120.00	0
Poland	-	-	-	-
Portugal	231,959	222,700	96.00	6.19
Romania	247,500	187,038	75.57	5.19
Slovakia	17,531	9,600	54.76	0.20
Slovenia	15,335	16,000	104.33	0.44
Spain	1,167,700	1,109,050	94.97	30.82
Sweden	-	-	-	-
United Kingdom	809	700	86.52	0.09
EU-27	3,920,217	3,597,437	91.76	100.00
Share of the EU-27 in Europe (%)	89.59	90.21	-	-
Share of the EU-27 in total world (%)	53.79	48.14	-	-

Source: FAOStat, 2011[8]. Own calculations

In 2008, the top 10 countries in the EU-27 regarding the planted area with vine were: Spain, whose share in the total EU-27 area of vineyards was 30.80 %, then on the 2<sup>nd</sup> position comes France (22.63 %), on the 3<sup>rd</sup> position Italy (21.89 %). The cultivated area with vine in these three countries accounted

for 2,711,847 ha, representing 75.38 % of the EU-27 area and 36.29 % of the world area planted with Vitis species. The countries coming on the next positions are: Portugal (6.18 % of the EU-27 area planted with vine), Romania (5.19 %), Bulgaria (3.07 %), Germany (2.76 %), Greece (2.41 %), Hungary (2.10 %) and Austria (1.26 %).

All these top 10 countries in the EU-27 had together 3,540,299 ha representing 98.41 % of the EU-27 planted area with vine. If one considered all the 5 countries situated on the top positions, their vine surface accounted for 3,121,585 ha, representing 86.77 % of the EU-27 and 41.77 % of the world planted area with vine.

**World grape production** increased by 2.85 % from 64.4 million tones in the year 2000 to 66.2 million tones in the year 2008. The highest contribution to the world grape production was given by Europe, 41.56 %, and Asia, 27.86 %. The other continents had a smaller contribution in the year 2008: South America 10.80 %, North America 10.14 %, Africa 6.37 % and Oceania 3.27 %. In 2010, world grape production reached 68,311,466 tones according to FAO Statistical data, of which 71 % was used for producing wine, 27 % as fresh fruit and 2 % as dried fruit ( Table 4).

Table 4. World grape production by continent (Tonnes)

Continent	2000	2008	2008/2000 (%)	Share in the world in 2008
Europe	22,575,639	27,547,816	84.56	41.56
Africa	3,216,066	4,226,063	131.40	6.37
North America	7,037,548	6,720,882	95.50	10.14
South America	5,671,506	7,158,301	126.21	10.80
Asia	14,536,278	18,466,090	127.03	27.86
Oceania	1,391,480	2,151,790	154.64	3.27
Total world	64,428,517	66,270,742	102.85	100.00

Source: FAOStat, 2011[8]. Own calculations

**The top 10 countries in the world** produced together 46.2 million tones grapes in the year 2008, by 7.01 % more than in the year 2000. Their production represented 69.82 % of the world grape production in 2008. The hierarchy, in the decreasing order, and the contribution of each country to the world grape production in the year 2008 was the following one: Italy (16.84 %), China (15.63

%), USA (14.34 %), Spain (12.86 %), France (12.27 %), Turkey (8.46 %), Argentina (6.28 %), Chile (5.18 %), Australia (4.22 %) and South Africa (3.87 %) (Table 5).

In the year 2010, the contribution of various countries to the world grape production, 63,311,466 tones, was the following one: China 12.67 %, Italy 11.40 %, the USA 9.11 %, Spain 8.94 %, France 8.56 %, Turkey 6.23 %, Chile 4.03 %, Argentina 3.83 %, India 3.31 % and Iran 3.30 %. One can notice China's fast increase of the area cultivated with vine and grape production. This country succeeded to come on the 1<sup>st</sup> position, regarding grape production.

**Grape production in the EU-27** decreased by 16.16 % from 29.9 % million tones in the year 2000 to 25.1 million tones in the year 2008. However, the situation is different from a country to another. Grape production registered a decline in countries such as: Belgium (-89 %), United Kingdom (-24 %), Bulgaria (-20 %), Cyprus (-68 %), France (-27 %), Greece (-32 %), Hungary (-17 %), Italy (-13 %), Luxembourg (-8 %), Portugal (-27 %), Romania (-23 %), Slovakia (-13 %), Slovenia (-17 %) and Spain (-9 %). Therefore, this was the main factor determining the decline of grape production in the EU-27. But grape production increased in a few countries: Austria (+31 %), Czech Republic (+46.8 %), Germany (+4.9 %), Malta (+2.75 %), and the Netherlands (+6 %).

Table 5 .Top 10 producing countries of grapes in the world (Tones)

Country	2000	2008	2008/2000 (%)	Share of the EU-27 in 2008 %
Italy	8,869,500	7,793,300	87.86	16.84
China	3,373,216	7,235,656	214.50	15.63
USA	6,973,800	6,639,920	95.21	14.34
Spain	6,539,810	5,951,580	91.00	12.86
France	7,762,580	5,678,500	73.15	13.27
Turkey	3,600,000	3,918,440	108.84	8.46
Argentina	2,459,860	2,910,640	118.32	6.28
Chile	1,899,940	2,400,000	126.31	5.18
Australia	1,311,380	1,956,790	149.21	4.22
South Africa	454,730	1,791,640	394.00	3.87
Total top 10	43,244,916	46,276,466	107.01	69.82
Share of the Total world (9%)	67.12	69.82	-	-

Source: FAOStat, 2011[8]. Own calculations

Also, countries like Denmark, Estonia, Finland, Ireland, Latvia, Lithuania, Poland and Sweden could not give any contribution to the EU grape production because of the lack of vine plantations as imposed by climate conditions (Table 6).

**The top 10 grape producers in the EU-27 are:** Italy on the 1<sup>st</sup> position with a share of 31.03 % in the EU-27 production, Spain on the 2<sup>nd</sup> position with a contribution of 23.70 %, on the 3<sup>rd</sup> position is France with 22.61 %. These 3 countries together contributed by 77.34 % to the EU-27 grape production in the year 2008.

Table 6. Grape Production in the EU-27 (Tones)

Country	2000	2008	2008/2000 (%)	Share of the EU-27 in 2008 %
Austria	303,940	399,163	131.32	1.58
Belgium	800	90	11.25	-
Bulgaria	451,474	363,539	80.52	1.44
Cyprus	110,768	35,976	32.47	0.14
Czech Republic	66,937	98,323	14.688	0.39
Denmark	-	-	-	-
Estonia	-	-	-	-
Finland	-	-	-	-
France	7,762,580	5,678,500	73.15	22.61
Germany	1,360,900	1,428,780	104.98	5.68
Greece	1,251,460	852,900	68.15	3.39
Hungary	683,641	570,502	83.45	2.27
Ireland	-	-	-	-
Italy	8,869,501	7,793,300	87.86	31.03
Latvia	-	-	-	-
Lithuania	-	-	-	-
Luxembourg	18,357	16,900	92.06	0.06
Malta	1,306	4,898	375.03	0.01
Netherlands	100	106	106.00	0
Poland	-	-	-	-
Portugal	1,045,030	763,000	72.94	3.03
Romania	1,295,300	996,023	76.89	3.96
Slovakia	59,371	51,617	86.93	0.20
Slovenia	126,650	105,719	83.47	0.42
Spain	6,539,810	5,950,580	91.00	23.70
Sweden	-	-	-	-
United Kingdom	1,400	1,064	76.00	0.09
EU-27				
EU-27	29,950,224	25,111,980	83.84	100.00
Total Top 10	29,564,536	24,797,287	83.87	98.74

Source: FAOStat, 2011[8]. Own calculations

On the 4<sup>th</sup> position was placed Germany with 5.68 % and on the 5<sup>th</sup> position Romania with 3.96 %. The first 5 countries contributed all together by 86.98 % to the EU-27 grape production in the year 2008. In the same year, their grape production represented 21.8 million tones which accounted for 32.96 % of the world grape production.

Also, on the next 5 positions are situated Greece (3.39 %), Portugal (3.03 %), Hungary (2.27 %), Austria (1.58 %) and Bulgaria (1.44 %) as other important producers in the EU-27. Taking into consideration all these 10 top grape producers, their production accounted for 24.7 million tones, representing 83.87 % of the EU-27 production (Table 6).

## CONCLUSIONS

The EU-27 is the most important grape producer in the world. Its area planted with vine accounted for 3.5 million ha, representing 90.25 % of the vineyards area in Europe and 48.14 % of the vine planted area in the world.

Four EU countries: Spain, France, Italy and Portugal had together 2.9 million ha vineyards, representing 39.18 % of the world planted area with vine, placing them among the 10 top vine cultivators in the world.

The EU surface cultivated with vine decreased by 8.24 % in the period 2000-2008, with a negative influence on grape production and its contribution to the world production accounted for 25.1 million tones, being by 16.16 % smaller than in the year 2000.

The general trend was a decreasing one in the most important producing countries in the EU. The top 5 EU-27 grape producers are: Italy, Spain, France, Germany and Romania, whose production totalized 21.8 million tones,

contributing by 86.98 % to the world grape production.

Three countries: Italy, Spain and France are among the 10 top producers of grape in the world. As a conclusion, the EU plays and will continue to play a very important role in the world grape production as long as it has a long tradition and high performance in producing grapes, a large market and a favorable demand/offer ratio.

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## IMPROVING THE CARST MELEDIC PLATEAU FOR DEVELOPING ECO-TOURISM IN THE BUZAU COUNTY

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### Abstract

From a touristic point of view, the Buzau County is situated among the first five counties on a national level. During the past years, various territorial development initiatives have been finalized such as: roads, water supply and sewage systems, Roman castrums, spa resorts, touristic and agro-touristic board and lodging etc, that have increased the number of tourists attracted by the tourist attractions of the county. The hereby theme undertakes to study one of the most beautiful areas in the country which is very little known by tourists in the same time. This is the 'Meledic carst plateau' in the Buzau County. The aim of this study is to calculate the costs needed for improving the Meledic Carst Plateau for developing eco-tourism in the Buzau County. The first part of the study analyzes the present situation in the area, while the next part shows what we would like to improve and finally, the cost calculation of such an environmental initiative, regardless of who is going to substantiate it: non-governmental organization, local authority, private legal entity, etc.

**Key words:** Meledic Carst Plateau, eco-tourism, environmental initiative, improvement

### INTRODUCTION

The Meledic carst plateau is situated in Mânzălești village, the Buzău county in the Curve Sub-Carpathians, in the upper hollow of the Slănic river (tributary stream of the Buzău river), between the Slănic river (in the south), the Jgheab brook (in the eastern part), the Meledic brook (to the north) and the Salty brook (in the western part). The Meledic plateau is situated 600 m high and it is made up of clays and slates on the brackish treacle of a salt massif.

### MATERIALS AND METHODS

#### Present Situation

The salt caves in Mânzălești form a necklace comprising: the cave in the Meledic plateau (the most important), the caves in the Jgheabului hollow integrating 35 big recesses out of which 26 are situated in the Meledic plateau (Image 1) and 9 in the Jgheabului hollow. The caves have a large diversity of shapes followed by a fascinating polychromy comprising immaculate white, yellow, pink, red, brown, grey. Stalactites go up to 1.5 m long and 30 cm thick on the bottom, often

changing their position from vertical to peaks arranged in broken line (aberrant stalactites). Stalagmites are short, only a few centimetres high and about 8 cm on the bottom. The scientific value is complemented by the existence in this area of the turtle and the scorpion in a mild climate area.

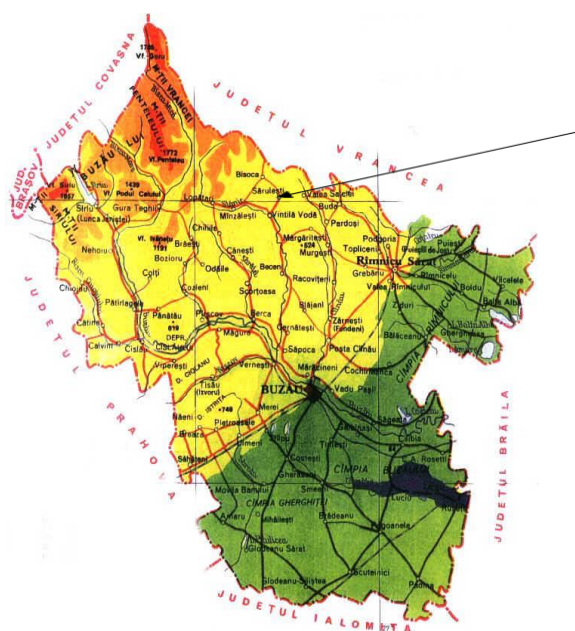


Fig.1. Location of the Meledic Carst Plateau



Photo 1 – The Meledic Carst area

The slopes of the Meledic plateau have deep canyons of 5-6 m, 0.5 to 3 m wide and slope failures of 2 m.

A marvellous place, perfect for those who are looking for relaxation.

Presently, the plateau in the Lacul Mare area (Big Lake area), under the property of Mânzălești village local authority, is occupied by the Meledic touristic complex which comprises 5 wooden lodgings, a dry toilet, a mess room with kitchen, a food store, a natural camping area, a stone fireplace, a platform for artistic events with an unfinished building, ground level designed for tiring rooms and platform enclosures.

On the natural slope of the glade in front of the platform, there are several rows of wooden benches for the spectators.

Annually, this is the location of the Slănicului festival that has reached its 39<sup>th</sup> edition, a cultural event that attracts thousands of visitors.

In the northern part of the lake, on a forest hidden plateau, there is the Meledic board and lodging, the only bed and breakfast place in the area. Just between the board and lodging and the glade where there is the touristic complex, there is a marked tourist track stretching to the north and driving you through the forest to three of the most important caves in the area, situated on the bottom of some sinkholes with fallen and insecure banks.

## RESULTS AND DISCUSSIONS

Proposals sight the improvement and modernization of the tourist complex under

local authority's property, as well as making some tourist tracks for visiting the carst plateau.

The following improvement works will be carried out in the touristic complex area:

- The existing 5 wooden lodgings will be de-allocated due to serious ageing, as well as the dry toilet close to the border of the lake;

- The un-finished ground level building behind the shows platform will be consolidated, re-compartmentalized and modernized, turning it into a tourist center with the following tasks:

- exhibition area with information desk – tourist information and shop for selling promotional items, maps and tourist guides, souvenirs and local handicrafts, administrative building and toilets for men and women tourists. The building will have a wooden framing roof and bolter cover, with a traditional, rustic aspect;

- There will be built a covered terrace on wooden frame on the western part of the existing mess room, oriented towards the lake (with a capacity of 30 seats) and toilets for both men and women, customers of the restaurant.

- There will be arranged a camping area in the eastern part of the glade, in the southern part of the visitors' centre, made up 14 wooden lodgings with 2 beds and a covered terrace, a camping platform with 7 lanes with 4 tent places, 4 double fireplaces, a pavilion for toilets and showers for both men and women where there will be a septic tank close by, BIOSYSTEM type;

- There will be a parking for 35 cars in the access area, between the mess room and the camping platform;

- There will be alleyways paved with concrete decorative ecologic tiles leading to all envisaged buildings in order to direct the traffic and to protect the landscape and flower improvements which will fill the areas between buildings.

The value of works and investment are presented in Table 1 and 2.

Table 1. Estimation of the Carst Meledic Plateau site works

	Name	Value on work category Lei
	<b>I – Constructions and installations works</b>	
1	Beds	
2	Constructions:resistance (foundations, resistance structures) and architecture (outdoor encasing, compartmentalisations, finishing works)	949,871.85
3	Insulation	
4	Electric installations	
5	Sanitary installations	
6	Heating, ventilation, air-conditioning installations, fire-fighting, TV radio, intranet	
7	Gas supply installations	
8	Telecommunications installations	
	<b>TOTAL I</b>	<b>949,871.85</b>
	<b>II. Fittings</b>	
1	Fittings, installations and technological equipments	
	<b>TOTAL II</b>	
	<b>III. Procurement</b>	
1	Technological units and equipments	
2	Transport units and equipments	
3	Facilities	74,210.10
	<b>TOTAL III</b>	<b>74,210.10</b>
	<b>TOTAL I+II+III</b>	<b>1,024,081.95</b>

Source: National Tourism Research and Development Institute- INCDT, Bucharest, Pre-feasibility study regarding the tourist furnishing and re-furbishing of some caves, pp. 143

## CONCLUSIONS

During the past years, the touristic potential of the Buzau County has increased due to territory improvement initiatives in the tourist attractions area. There have been modernized the access ways to the tourist attractions that are unique both in Europe and worldwide, that is: the Muddy volcanoes, the oil mine in Sărata Monteoru, the living fires, as well as those to the wine yard, fruit-growing and spa resorts, monasteries, etc.

Following the territory improvement initiatives analyzed in the hereby study, presently too little known by tourists, this will lead to increasing the visitors number in the Buzau county.

Table 2. General estimation regarding the necessary costs for carrying out the furnishing of the Carst Meledic Plateau investment

	Name of the costs chapters and sub-chapters	Value (RON)
<b>CHAPTER 1 Costs for land acquisition and furnishing</b>		
1.1	Land acquisition	0
1.2	Land furnishing	0
1.3	Environment protection furnishings	0
	Total sub-chapter 1.3.	0
	<b>Total chapter 1</b>	<b>0</b>
<b>CHAPTER 2 Costs for design and technical assistance</b>		
2.1	Ground studies (topography, lighting)	25,000
2.2	Getting authorisations, agreements, permits	0
2.3	Design and engineering	49,868
2.4	Organizing the public bid procedures	6,000
2.5	Consulting	7,480
2.6	Technical assistance	14,960
	<b>Total chapter 2</b>	<b>103,308</b>
<b>CHAPTER 3 Costs of the basic investments</b>		
3.1	Constructions and installations	949,872
	3.1.1 Construction works and electric installations for furnishing	949,872
3.2	Mounting, technological units	0
3.3	Units, technological and functional equipments with mounting	0
3.4	Units without mounting and transport equipments	0
3.5	Furnishings	74,210
	<b>Total chapter 3</b>	<b>1,024,082</b>
<b>CHAPTER 4 Other costs</b>		
4.1	Site organisations	28,496
	4.1.1 Construction works	28,496
	4.1.2 Additional costs to site organisation	0
4.2	Commissions, duties, legal shares, financing costs	12,719
	4.2.1 Commissions, duties and legal shares	12,719
	4.2.2 Credit cost	0
4.3	Various, unpredictable expenses	56,370
	<b>Total chapter 4</b>	<b>97,585</b>
<b>CHAPTER 5 Expenses for bringing into operation</b>		
5.1	Training of the operation personnel	0
5.2	Technological tests	0
	<b>Total chapter 5</b>	<b>0</b>
	<b>TOTAL GENERAL</b>	<b>1,224,975</b>

Source: National Tourism Research and Development Institute- INCDT, Bucharest, Pre-feasibility study regarding the tourist furnishing and re-furbishing of some caves, pp. 146

The scenario presented by us has the following advantages:

- *On an economic level*, this will lead to the increase of the exploiting level and capitalizing the natural tourist resources;
- *On a social level*, this is aiming for improving people's living standard in the areas where tourism is developing;
- *On an ecological level*, this is aiming to recycling and avoiding the degradation of the

environment where the tourist activity takes place.

Following these aspects, we suggest establishing some priorities in furnishing and re-furnishing this objective for a tourist purposes, the selection criteria being the value of the investment, the amount of the tourist traffic, the importance of the attraction from the tourist resources point of view and the novelty and originality characters of the tourist destination. This way, by applying these criteria to the studied objective, we can come to the conclusion that the carst Meledic plateau represents a non-capitalized area, which is unique on a national level, amazing landscapes, inedited, easily accessible, fairly low investment value, without requiring underground investments.

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## TRENDS OF THE RURAL LABOUR MARKET AND AGRICULTURAL HUMAN POTENTIAL EVOLUTION UNDER THE INFLUENCE OF DEMOGRAPHIC PHENOMENA IN THE REPUBLIC OF MOLDOVA

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### *Abstract*

*The main objective of this investigation was to study the correlative aspects in the evolution of demographic phenomena, labour market in the rural space and human potential from agriculture in the Republic of Moldova. As methodological tools there were used the economic analysis, synthesis, generalization, concretization and reasoning. As a result of our research there have been highlighted correlative trends of the demographic phenomena and basic indicators of the labour market in the rural areas. Also, it was analyzed the human potential from agriculture, underlying the same trends in its evolution, as in the evolution of the labour market in the rural space. The main conclusion of the investigation consists in the need to develop more effective mechanisms to solve the demographic problems especially in the rural areas of the Republic of Moldova, thus being also created prerequisites to improve the negative phenomena manifested in the evolution of human potential from agriculture.*

**Key words:** vegetable, price volatility, commercialization, supply chain

### INTRODUCTION

It is well known that human resources have an important role in any activity. Agriculture, as a branch with a series of specific features, involves an increasing role of these resources. Referring to the agriculture of the Republic of Moldova and taking into consideration the low mechanization level of the work processes, we conclude that this is another argument in favour of the major significance of labour resources. Under the above mentioned facts we can say with certainty that the problems of labour market evolution in the rural areas, a market that provides the necessary labour force for a certain branch, represents a priority of the trend to create adequate conditions for a sustainable agriculture.

### MATERIALS AND METHODS

As material for the present investigation the authors used demographic data from certain studies on the demographic and labour market evolution in the rural areas, exposed in the Situational Study of the Rural Labour Force,

including its study by gender (Harbu et al., 2010), the edition of the National Bureau of Statistics of the Republic of Moldova "Labour Force in Moldova. Employment and unemployment" (2012), Labour Market Forecast, 2012 prepared by the Ministry of Labour, Social Protection and Family of the Republic of Moldova in cooperation with the National Agency for Employment, as well as recent statistics on the demographic phenomena, labour market evolution in the rural areas and human potential from agriculture, being analyzed the period 2001-2012.

The investigation was accomplished using the following methods: analysis, synthesis, generalization, and reasoning.

### RESULTS AND DISCUSSIONS

Evolutionary trends of the labour market are determined by several factors. Among them a special role is given to demographic phenomena. Multilateral studies on the evolution of Moldova's population revealed a number of serious demographic problems, such as reduced number of people, because of

lower birth rates and increased mortality, increased process of population ageing and, consequently, the ascendancy of the median age and growth of the demographic dependency rate. Thus, examining correlatively the evolution of the total population and by areas (Table 1) we can conclude that in the period 2000-2011, there is a reduction tendency of all categories of the

analyzed population (Statistical Yearbook, 2011; Labour force in the Republic of Moldova. Employment and unemployment, 2012). Meanwhile, since 2007, the trend of rural population reduction is greater than the total population and urban population, and this is also confirmed by the lower level of the dynamics index.

Table 1. The evolution of Moldova's population by areas

Year	Total population		Urban population		Rural population	
	Thousand inhabitants	Dynamics index, %	Thousand inhabitants	Dynamics index, %	Thousand inhabitants	Dynamics index, %
2000	3644,1	-	1514,2	-	2129,9	-
2001	3635,1	0,998	1486,4	0,982	2148,7	1,009
2002	3627,8	0,998	1485,2	0,999	2142,6	0,997
2003	3618,3	0,997	1484,1	0,999	2134,2	0,996
2004	3607,4	0,997	1477,9	0,996	2129,5	0,998
2005	3600,4	0,998	1476	0,999	2124,4	0,998
2006	3589,9	0,997	1469,8	0,996	2120,1	0,998
2007	3581,1	0,998	1478	1,006	2103,1	0,992
2008	3572,7	0,998	1476,1	0,999	2096,6	0,997
2009	3567,5	0,999	1476,1	1,000	2091,4	0,998
2010	3563,7	0,999	1476,1	1,000	2087	0,998
2011	3563,7	1,000	1481,7	1,004	2078,7	0,996

Examining another parameter of the rural population, the median age (Figure 1), we can conclude about its dynamic growth.

Thus in the period 2001-2011, it increased by 2,9 years (Statistical Yearbook, 2011; Labour force in the Republic of Moldova. Employment and unemployment, 2012).

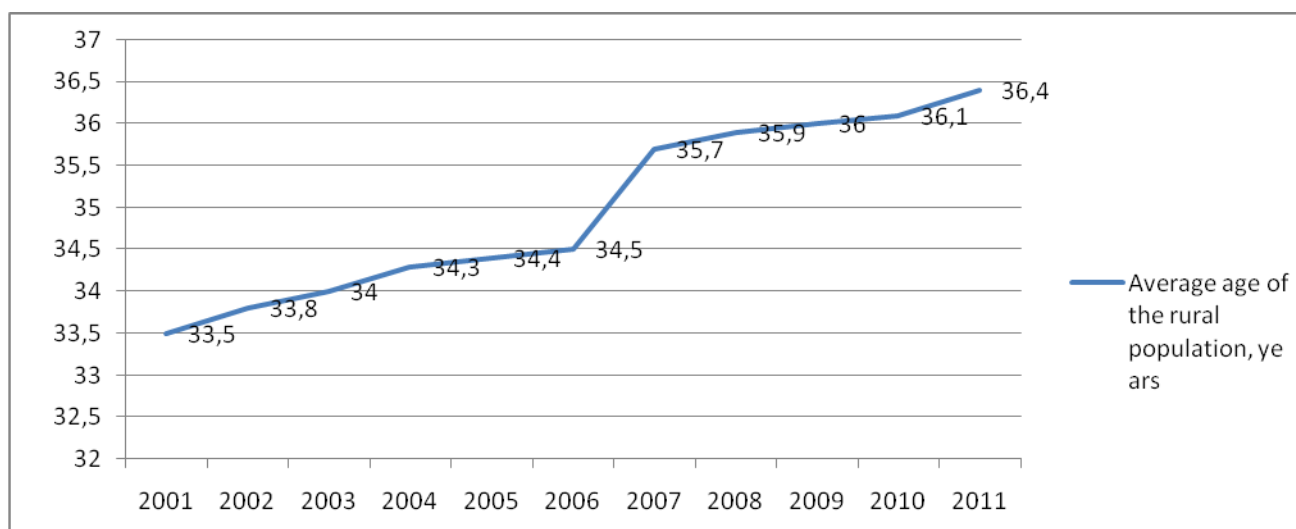


Figure 1. Average age evolution of Moldova's population from the rural areas

Already the dynamic growth of the average age of rural population represents a reason to conclude about an unfavorable demographic situation. The situation becomes even more alarming after the analysis of the population ageing coefficient, an indicator expressing the number of persons aged 60 years and more

per 100 inhabitants. Thus, analyzing Figure 2 (Statistical Yearbook, 2011; Labour force in the Republic of Moldova. Employment and unemployment, 2012), we can mention a positive dynamics of this indicator in the period 2001-2005 and the increase of this coefficient in the next period.

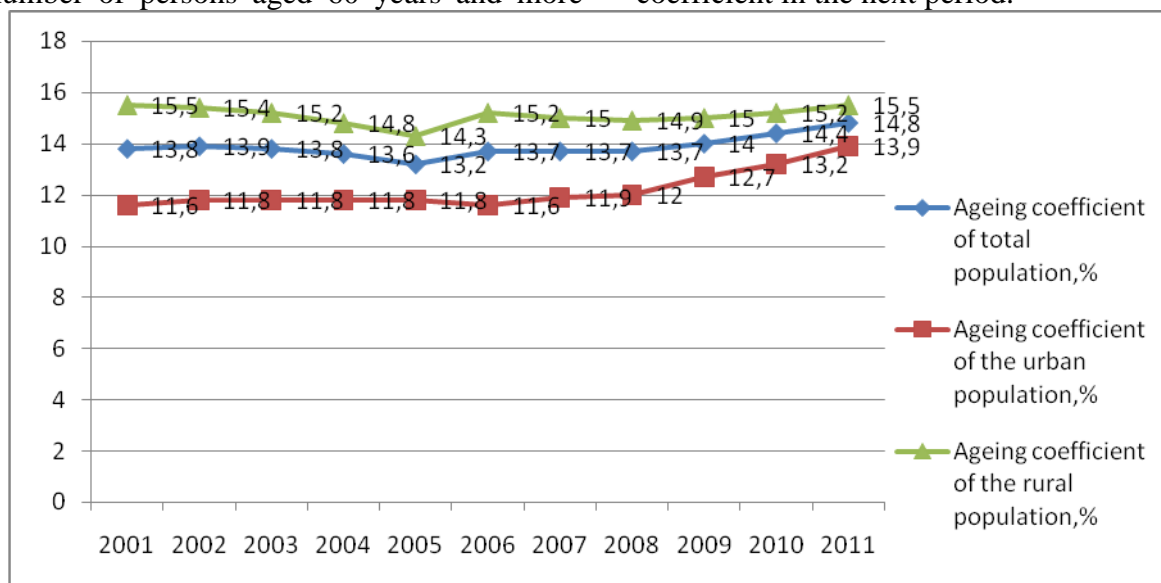


Figure 2. The evolution of population ageing coefficient in the Republic of Moldova in the period 2001-2011

Also, we noticed that the population ageing process is more intense in the rural areas. It should be mentioned that the critical limit of this coefficient in most European countries is considered 12%. Therefore, if in 2011 the ageing coefficient of total population in the Republic of Moldova exceeded the average one of the European countries by 2.8 percentage points, the rural population ageing coefficient exceeded it by 3.5 percentage points.

It is obvious that population reduction and ageing affect the labour market both quantitatively and qualitatively. Examining the data from Table 2 (Harbu et al., 2010).

Labour force in the Republic of Moldova. Employment and unemployment, 2012) we observe a continued reduction of the economically active and employed population in the rural areas, accompanied by a reduction of the activity and employment rates. As a result, in 2011, the economically active rural population was by 299,5 thousand people less than in 2001, while the employed population reduced in the same period by 307,8 thousand

people. Simultaneously, there was noticed a reduction of the activity and employment rates, respectively, by 21,3 and 21,7 percentage points.

The negative trends manifested in the evolution of the labour market in rural areas undeniably affect the human potential from agriculture. Performing a correlative study on the evolution of the number of employed rural population and rural population involved in agricultural activities, we found out that during 2001-2011 the employed rural population reduced by 307,8 thousand people, while the number of those employed in agricultural activities reduced respectively by 410,2 thousand people.

Higher reduction rate of the human resources involved in agriculture compared with the reduction of total employed population from rural areas can be more clearly elucidated graphically (Figure 3) and can be explained by the impact of several factors, including the motivation.

Referring to the reduction of the number of population employed in agriculture in the

Republic of Moldova, it is quite difficult to give it an exact rating.

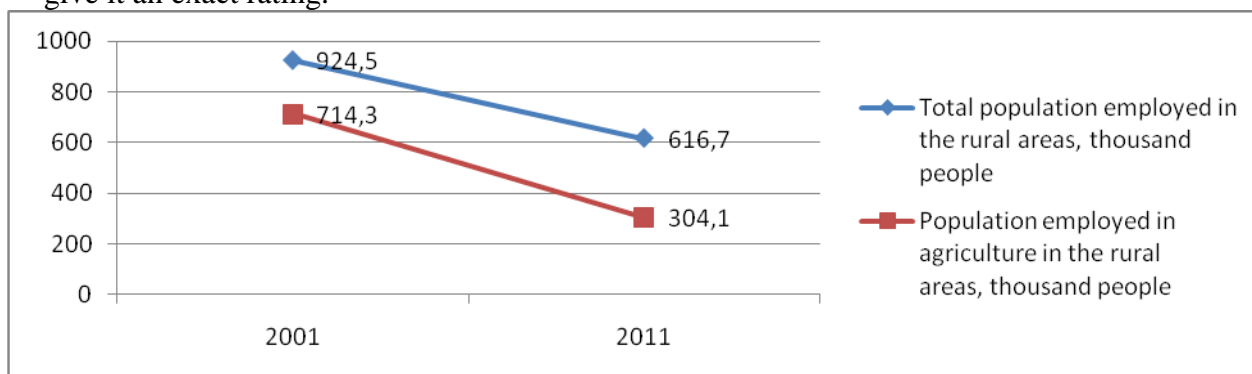


Figure 3. Dynamics of employed population and population involved in agricultural activities in the rural areas in the period 2001-2011

Thus, in 2011, 27.5% (323,000 persons) out of the total Moldova's population were employed in agricultural activities, while the EU average of people employed in agriculture was of 5%. Nevertheless, according to a survey conducted by the Ministry of Labour, Social Protection and Family of the Republic

of Moldova in cooperation with the National Agency for Employment (2012), approximately 17.1% of the agricultural economic units declare that they have labour force deficit.

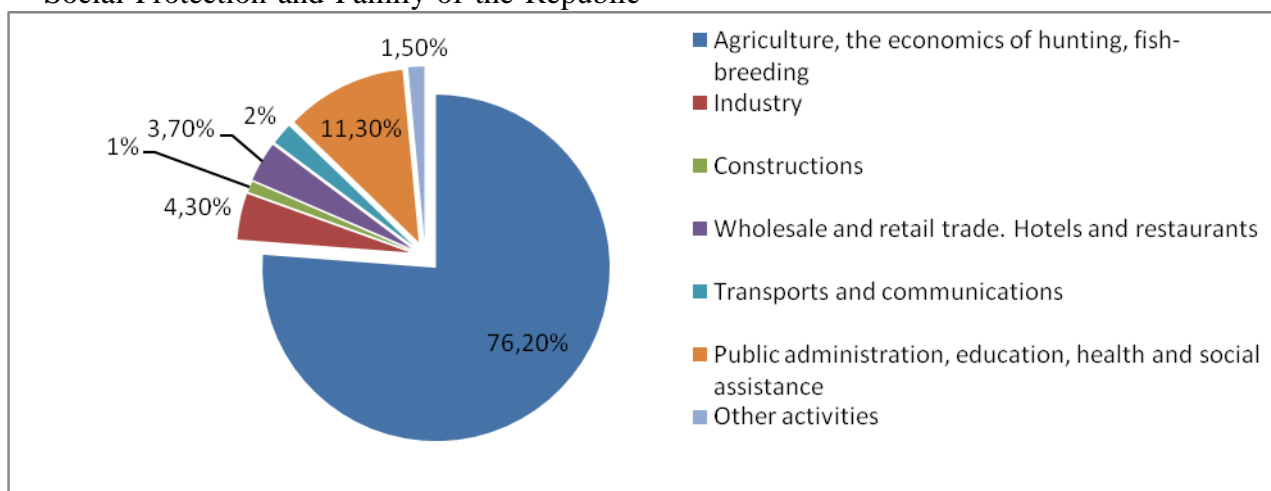


Figure 4. Structure of employed rural population by economic activities in the year 2000

The withdrawal of labour force from the agricultural sector would be justified if the redundant human potential would get involved in other rural activities. The comparative analysis of the structure of rural employment by economic activity in 2000 (Harbu et al., 2010) and 2011 (Labour force in the Republic of Moldova. Employment and unemployment, 2012) shows, however, that if the share of employment in agriculture in this period fell by 26,9 percentage points, the share of employment in other economic sectors (industry, construction, trade,

transport etc.) increased by only 11 percentage points (Figures 4,5).

Therefore, there was a decrease of the staff employed in the branches able to contribute to the gain of economic benefits. Based on the mentioned above, we can say with certainty that the reduction of the human potential from Moldova's agriculture represents, at present, a serious problem and can not be justified with analogous trends from the European countries.



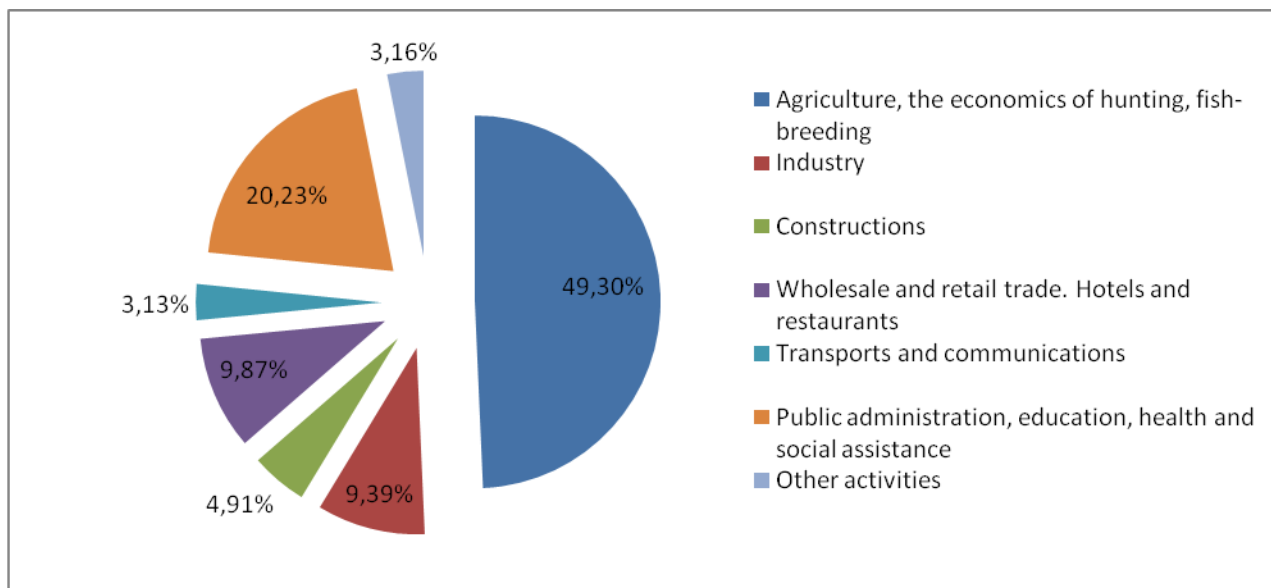


Figure 5. Structure of employed rural population by economic activities in the year 2011

Simultaneously, we noticed that along with the decrease and ageing phenomena of the employed rural population, there is a reduction of the intellectual potential from

agriculture, fact confirmed by data presented in Figure 6.

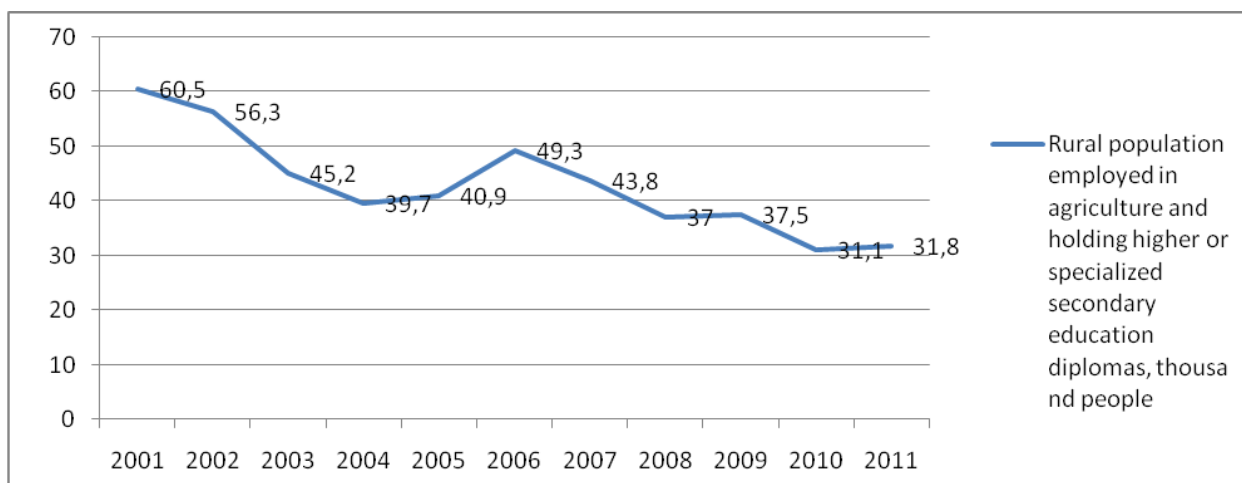


Figure 6. Evolution of the rural population employed in agriculture holding diplomas of higher or specialized secondary education in the Republic of Moldova in the period 2001-2011

According to data presented in Figure 6 (Statistical Yearbook, 2011; Labour force in the Republic of Moldova. Employment and unemployment, 2012) in 2001, 60,5 thousand people holding higher and specialized secondary education diplomas were employed in agriculture, while in 2011 their number decreased almost 2 times, falling down to 31,8 thousand people. Another unfavorable trend manifested in the evolution of human resources from agriculture in the analyzed period is the phenomenon of human potential

ageing as a natural consequence of the employed rural population ageing (Statistical Yearbook, 2011; Labour force in the Republic of Moldova. Employment and unemployment, 2012). Therefore, in 2001, out of the total rural population employed in agriculture 397,5 thousand people (55.6%) were aged between 15-44 years and 316,9 thousand people (44.4%) were aged 45 years and more (Figure 7), while in 2011, the share of people aged 45 years and more was higher,

constituting 50,9% of the total number of people employed in agriculture (Figure 8).

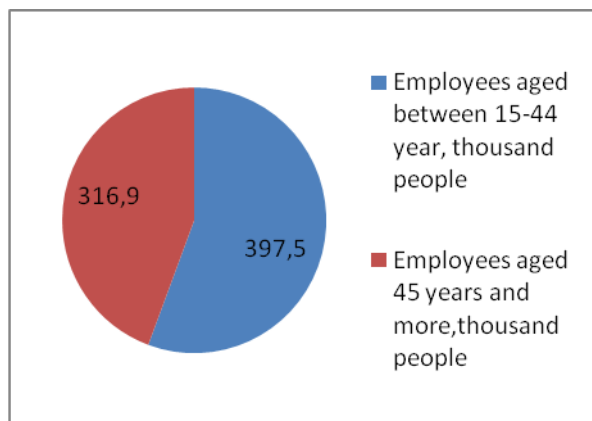


Figure 7. The share of age groups of the rural population employed in agriculture in the year 2001

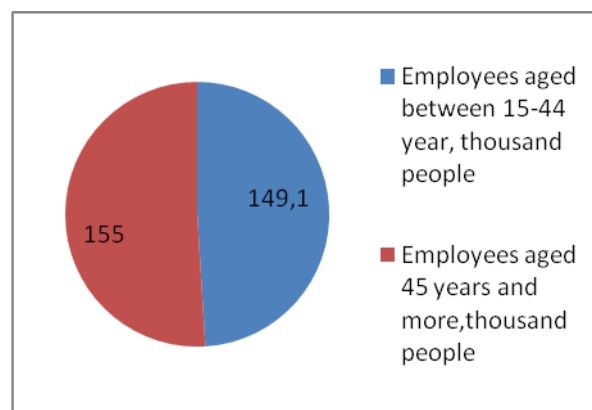


Figure 8. The share of age groups of the rural population employed in agriculture in the year 2011

## CONCLUSIONS

Negative demographic phenomena that also occurred in the Republic of Moldova in the last decade manifested with greater intensity in the rural areas.

Therefore, along with the reduction of the rural population number, there is an increase of the medium age and hence, of the population ageing coefficient.

Simultaneously, the rural labour market gets affected, fact argued by the reduction of the active and employed population and by the activity and employment rates.

Among the problems that occur in the rural labour market evolution and that have caused major human potential deficit in agriculture, we can mention the following:

- Reduction of the number of people employed in agriculture;
- Increased share of workers aged 45 years and more (human potential ageing);
- Reduction of the number of workers holding higher and specialized secondary education diplomas.

Without diminishing the significance of the motivational factor in the evolution of human resources in agriculture, it is obvious that demographic phenomena have a significant impact on the human potential of this branch; impact caused by the trends in the rural labour market dynamics.

Based on the above mentioned facts, it is necessary to develop more effective mechanisms to solve the demographic problems especially in the rural areas of the Republic of Moldova, thus creating prerequisites for the improvement of negative phenomena manifested in the evolution of human potential from agriculture.

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## AGRICULTURAL LAND MARKET AS A TOOL OF SUSTAINABLE DEVELOPMENT OF RURAL AREAS IN THE REPUBLIC OF MOLDOVA

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### **Abstract**

*The paper has two main applications: it represents a model for pricing – which might be used by investment funds, or other organizations interested in agricultural land acquisitions; the interest is in buy/sell transactions - a financial mechanism could be created to facilitate these transactions. For example, the creation of a Land Bank or to attract land banking investment funds, which would have the goal to improve the transaction system, develop financial tools necessary for increasing efficiency, improving financial structure. This study explores the historical transactions and specifics of the land market in Republic of Moldova and how it is affected by social indicators in rural areas.*

**Key words:** financial instrument, land bank, land market, linear regression,, transaction prices

### **INTRODUCTION**

Since its independence in 1991, the land market has a tendency to be used mostly for agricultural purposes.

Generally, any market is driven by two fundamental forces: supply and demand. In a market economy, these forces establish the market price, which creates the basis for buy-and-sell transactions. These fundamentals also apply in the land market. Usually the land market can be used in the following activities: Industrial, Construction (residential/commercial), Agricultural (farming).

In the market economy, land is considered an economic good which is sold and purchased on the market of production factors. The well-functioning of the land market implies that there exists a land price which indicates the monetary value necessary to transfer ownership of a piece of land from one individual/legal entity to another individual/legal entity, through the sell-purchase document.

Agricultural real estate seems to draw less interest from developed economies as commercial real estate is considered more profitable. However, for country in transition like Republic of Moldova, the question of land market is of primordial interest.

Regarding the land market for agricultural purposes, the fundamentals remain the same. The demand is driven by consumers - farmers, in our case, but also by potential investors such as private individuals, public institutions, joint stock companies, private-public cooperation, corporate farmers, investment funds (which are currently not present in the Republic of Moldova). The investors are driven by incentives, different from the farmer's production goal: urban spaces absorption from a longer-term perspective, leasing the land, speculative motives, and change in land usage (for example, from agricultural to residential). On the other side, the supply is constituted of existing landowners and in some cases state ownership.

The market price of land is the result of the interaction between supply and demand for land, determined in the negotiation between sellers and buyers, each of them looking to get the most from the transaction (CIMPOIEȘ, 2008). The factors determining the level and the evolution of land prices can be limited to:  
-Supply and demand of land – the natural limitation of the quantity of land available makes the supply rigid, it being not sensitive to price variation. As a consequence, land prices evolve proportionately to the demand,

to the number of people willing to invest in agriculture.

-The possibility to use land alternatively: agriculture, forestry, construction, industry.

-The interest rate – buying a piece of land is an investment. As a consequence, if the interest rate is higher than the efficiency expected from using that piece of land, the investor would rather deposit his money in a bank, thus influencing the demand for agricultural land.

-The increase in the demand for agricultural products determines an increase in the demand for agricultural land, thus increasing their prices.

Given the fundamental market model, when these forces meet, the land market price is created. In developed, well-functioning market economies, this price is also considered the optimal price, which governs an effective buy-and-sell transaction system. This allows for the market value to be usually equal to the investment value ( $MV = IV$ ) and most of the participants to be marginal.

This study aims to discover this optimal land price, and the casual factors which influence this price. But, it is adapted to an economy in a transition period, such as Republic of Moldova. Since it has an under-developed economy, the market mechanism is ill-functioning. This means that the market value is almost never equal to the investment value ( $MV \neq IV$ ), and the majority of participants are described as intra-marginal. As a consequence, the system for buy-and-sell transactions is broken and ineffective. The market is also described by an imperfect competition.

Generally, there are several specific features attributable to a country, or a group of similar countries. In this context, the most important features for the Republic of Moldova are:

-According to local experts, the “real” transaction prices are not declared, especially when the transacted area is of significant size. This fact is related to the whole ill-functioning system of public administration, cultural values, corruption and other factors. This effect spreads in all sectors of real estate. As a result, the official records of transaction at the

Cadastral Agency in Moldova do not reflect the real market prices mainly due to evasion of taxes, low level of trust in associations, decrease the transaction commissions.

-Although the holding of landowners comprise on average several parcels of land, they prefer to view them as a single one. This signifies that transactions regard not to a single parcel, but all of them. The landowners would prefer to sell all of their parcels.

-The land reform created a lot of independent, small landowners (as previously explained). But the reform lacked a proper mechanism for land usage. The major reasons for not developing the land are: insufficient labor, lack of finance, non-profitable activity and lack of machinery (CIMPOIEȘ et al., 2009).

-While the legislation provides opportunities for foreign investors in land for residential or commercial use, the law on land for agricultural use has several drawbacks. Currently, the investors can be only residents of Republic of Moldova, with no partnerships with foreign institutions or foreign capital. This creates considerable obstacles for land development. Combined with an inefficient and ineffective land usage, the whole land market system has remained at an early development phase for many years. The developed countries can afford this strategic reasoning, while an economy in transition has nothing but to gain from opening more its land market.

## MATERIALS AND METHODS

The investment cycle of the land real estate market has four phases. Each stage could be analysed as a separate investment described by its specific timeframe, risks/return and costs. Although the phases might overlap, the value might be added at each of them (DRESCHER, 2001).

The stages are the following:

1. Land in its raw form – the investment opportunity is based on purchasing land which is not designated for any development and holding it until demand creates a development opportunity. The usual holding period is from four to six years. The risks are related to public policy, significant economic

disturbances, and demographic shifts. The return is mostly based on land appreciation (BARRY,1980).

2.Pre-development and approval – represents purchasing land and entitle it through necessary legislative procedures for a specific project/use. Respectively, the land might be sold or developed after entitlement. The costs for this stage could be high. Most of the expenses concerns obtaining approvals, attorney fees, engineering. The timeline for this phase depends on each country, and varies from six months to several years. The return, or the value added, should include not only the original cost of land, but also the costs associated with approval and a profit for taking the risks.

3.Development – this stage usually involves purchasing the land (with already obtained permits) and start development/construction. It also includes obtaining pre-lease agreements or pre-sales. The period is shorter than other phases, from 6 months up to 2-3 years. However, there are a lot of required expenses, such as: marketing campaign, expertise fees, environmental and architectural studies, human resources and overhead expenses. An important step is to manage well the risks, which comprise market downturns, public policy changes, and tenant/lessee risks. The return varies mostly on market conditions and country's specifics.

4.Income Generation – represents purchasing the land from previous phase (development), an asset which generates stable cash-flow. The maintenance costs are the main expenses. The risks are related to market conditions, and general factors which influence the real estate market. The return depends on the sector of the real estate.

Any investment can be evaluated using the fundamental NPV model, which also applies in the land market. However, the period between pre-developed and growing phases of land dynamics is considered long-term. Also, it is very difficult to estimate the future income and discount rates associated with a particular parcel of land. Too many uncertainties make any model unreliable as

the expectations are completely subjective (KING,1994).

The land market in Moldova could be considered in undeveloped phase. Thus, the investment opportunities are great. Several statistics about comparable countries demonstrate this fact: the average price for 1 hectare of land was 10.3 thousand MDL (in 2008) in Moldova representing almost 675 EURO, which is much lower than the average price of a hectare of land in many other European countries. For example, the average price of land for 1 hectare (in Euro):

Netherlands – 14.800, France – 8300, Belgium – 8500, Slovakia – 6000, Russia – 2000, while **Moldova** – only **675**. However, the 675 Euro per hectare is the average price for the whole Republic. The situation is completely different when looking at prices close to urban areas, especially Chisinau, the capital.

The state policy regarding land development, which currently functions only through re-parcelling projects, has proven to be inefficient. After the re-parcelling pilot project, which was implemented with the help of the World Bank in 6 rural communities from the Republic of Moldova, the number of land parcels has been reduced from 7200 to only 5500 at the cost of approximately 1 million US dollars. The amount spent is excessive when comparing to the modest results that have been achieved. Also, the high transaction costs and non-economic incentives can reduce the dynamic of the land market. This is why it is necessary to examine other, more efficient ways of land development, which have been successfully implemented in other countries.

In order to accelerate the development of land market, an important financial and management tool is proposed, by introducing a new player on the land market in Republic of Moldova. **Land banking** is apparently an important mechanism present in many European countries for improving the whole system of land markets. This player has a significant contribution in several aspects of the land market: improving the planning and development, a more reliable transaction

system, higher liquidity and financial resources, more available information (CIMPOIEȘ, 2011).

*There are 3 main categories of land banks:*

**I. Land banks a developer.** This category is mainly used by private investors, when it is necessary to change the land usage of a land plot. Thus, the main goal is to offer an efficient transition mechanism. It is possible for the new activities to be related to commercial real estate (from agricultural to urban), town expansion, nature, recreation, etc. This land banking system can also be used in reconstructed areas. The rotation of the used land takes place more in the suburbs of the big cities. This category is also linked to the practices called speculations. Someone buys land with the goal that the planned areas of the municipalities will allow changing the destination of the land after a period of time. Usually, the land value surges when the main activity changes from agricultural to commercial (construction). As a result, it is considered one of the most profitable investments in the world. When someone sells the land at the right time, he gains a profit. Thus, in this case, the land banking is an opportunistic investment. The state can also use this instrument to make sure that its goals will be attained.

**II. Land banking as financial instrument.** The land bank offers the possibility to lease land for a long period of time to farmers or other organizations for preserving the landscape. It is long-term mechanism to finance the land. The land bank functions as a financial instrument due to insurance of different payments for a long period of time.

**III. Exchange land banks.** The land bank represents a mechanism through which land is bought to be temporarily kept for the subsequent exchange of land. This form of land bank has already been practiced for a long time. The bank owns land which is then exchanged with land in proximity to that of other land owners, in order to be used more efficiently. Traditionally, this kind of banks operates only in areas of agricultural land consolidation. Also, these institutions operate in rural areas and in areas concerned with

green spaces. For this kind of land bank, the exchange of land is quick, diminishing the need for the financial aspect (KARAFOTAKIS, 2006).

The analysis is based on primary and secondary data. The main source of data is the survey performed between 2007 and 2009 by the team of the State Project<sup>1</sup>, financed by the Academy of Sciences of Moldova. Additional information is taken from the National Cadastral Agency (State Registry) and the National Bureau of Statistics.

The survey data comprises the general characteristics of the landowners. The total number of respondents is 1617. The information collected was from 3 communes in Republic of Moldova: Sadova – Calarasi District, Braviceni – Orhei District and Doina – Cahul District.

The information from survey includes questions about characteristics of the landowner, the economic activity, buy-and-sell transactions, leasing, family, the issues with land and other.

The following general information is included in the survey about the landowner:

- Age of the landowner – could provide some explanations in buy-and-sell transactions and leasing;
- Family members – usually, developing countries, the family composition relates to farm labor;
- Education – could have implications on the income of the respondent;
- Income of the landowner – this variable includes his personal wage and extra-income from non-land activities.

Economic data about parcels of land owned comprises the following:

- Parcel size;
- Household area;
- Used area;
- Leasing information;
- Reasons for not using the land;
- Reasons for not leasing-in and leasing-out the land;
- Reasons for buying land;

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<sup>1</sup>The State project on land consolidation 08.814.08.01A, financed by the Academy of Sciences of Moldova.

-Paid price for purchased land.

Data about resources used regarding the owned land consists of:

-Number of employees – including family members and seasonal workers;

-Fixed assets used in the last 3 years;

-Expenses or investments concerning the owned land.

The variables mentioned above could provide some factors that influence the land value or the buy-and-sell transactions. Several of these variables are used for a descriptive and regression analysis in order to have a deeper understanding from the landowner's perspective.

For the application of the regression model data only from Calarasi District, commune of Sadova are selected. The number of parcels of land is 199, which represents the number of included observations. Each landowner can have more parcels of land, while the total number of owners is 45. The primary data used regards the economic characteristics of parcels of land and its owners (CIMPOIEȘ et al., 2009).

The regression model uses 3 main components:

1. The endogenous variable

2. The explanatory or exogenous variables

The choice of the endogenous variable is not necessarily the actual price in currency. Generally, in under-developed market economies a more abstract measure of real estate appraisal could be considered (actually it is encouraged). The main reason is that the transaction prices registered at the Cadastral Agency are not the „real” prices, as the participants try to bilk taxes or other commissions.

In this case, the endogenous variable is chosen an *equivalent measure of value (EMV)* which represents a more abstract notion of value – and is defined by a utility level. It is characterized by a coefficient measure, which can be transformed into the actual market prices by multiplying with another average national (or regional) coefficient. It will be denoted as **EMV** for this study.

The next step is description of exogenous variables, which define the causal factors. For

the purpose of data description, these variables are limited to the ones which indicate significant contribution (higher than 10%) to the coefficient of determination  $R^2$  of the econometric model.

The following exogenous variables are considered:

**I. Farm Area** -calculated in hectares (ha). One hectare is equivalent to 10000 square meters. This variable is included because it is assumed that the parcel size (in units) affects the land value.

**II. Income**-calculated in Moldovan lei (national currency). It represents level of income of the respondents, the landowners. It seems obvious to include this variable as it affects the land price.

**III. Investments**-calculated in lei. It represents an important variable because this is the amount of expenses concerning land maintenance.

**IV. Number of employed personnel** -denoted in number of persons, usually including the owner and his family, and seasonal workers. It seems logical to include this variable because of the different productivity levels and specific agricultural production.

## RESULTS AND DISCUSSIONS

There are several significant factors that affect the value of the parcels of land in buy-and-sell transactions. For example, *the land area* should positively affect land value. The shape of the parcels is also an important factor. Usually, square parcels of land have an advantage over those shaped like a polygon. For example, a rectangle with a width of 2 meters and a length of 1 kilometre, which has been assigned according to cadastral law, has a considerable disadvantage in land transactions. The location of the parcel of land is another factor among other significant factors like roads, means of production processing and storage.

*The owner's income (or family capital)* is a psychological factor that also influences the price of the transaction. Wealthy people that do not directly depend on the land's income want a higher price and are not willing to

agree for a lower one. Also, remittances (which are very representative of Republic of Moldova), negatively affect the balance between supply and demand of agricultural land. These sources of finances could be used to invest in land from a longer-term perspective. This factor is expected to affect positively transaction prices.

*Labour* that cultivates the land consists of family members and employees. Family members usually work throughout the whole

year, while the employees are hired seasonally. Consequently, it is believed that there exists a negative correlation between the number of employees and the price. Thus, the need for a higher number of employees will negatively affect the price. This can also be explained work style, level of productivity and so on.

*Expenses (investments)* include mechanical work, taxes, rent payment or payment in-kind, medical and social insurances.

Table 1. Descriptive statistics for variables describing the leasing market, average for 3 years, 2007-2009

Specification	Units	Total Survey	Lease-out	Lease-in
Age of landowner	Years	56	60	52
Age of wife/husband	Years	53	54	44
Family members	Nr.	3	2	4
Total Area	ha	2,43	1,98	4,98
Number of parcels	Nr.	5,39	6,00	5,22
Lease payment	MDL/ha	2070	2144	1765
Expenses	MDL	6640	2645	7523
FamilyIncome, total	MDL	15138	12328	16721
Number of respondents	Nr.	1617	383	94

Source: own calculations

It is expected that this factor will negatively affect the price of land.

In leasing operations and the sale-purchase transactions, there are factors that indirectly affect the land value. These factors have been thoroughly described in the survey conducted by ASM.

The main reasons for leasing land:

- Distance (land is far from owner's home);
- Soil quality;
- Technological process;
- Access to necessary means of production – fertilizers, seeds, equipment
- Lack of money – financial resources for carrying out work;
- Labor insufficiency – due to active population's migration from villages;
- The negative effects of land reforms – administration issues

Main difficulties in purchasing of land:

- Nobody in the close proximity of the buyer is willing to sell land – for many landowners it is the only mean of existence and thus they have no motivation to sell;
- Lack of information – there are no efficient methods of communication or institutions;

-The prices in the land market are not public (everyone feels like is being tricked), which moves the price from its real value;

- Legislative aspects which affect the transaction;
- Transaction costs are too high, and in some cases can be equal to the price of the land;
- Too many owners with small parcels of land – need to negotiate with a lot of owners;
- Lack of financial resources for buying;
- Sellers impose exaggerated conditions.

However, the value of the land is most importantly influenced by the distance from a strategic point. In our case - the distance from the centre of the village (primaria). Land adjacency is also a significant factor.

The leasing transactions are an important part of any land market. The table 1 presents descriptive statistics for variables describing the leasing transactions included in the survey in all 3 communes. The numbers in the table are the average of 3 years, from 2007 to 2009. The numbers were analysed from the leasing perspective, and factors which might influence the transactions. Thus, the



households were classified in 2 categories: lease-in and lease-out participants. Also, the average of the total survey is provided. Out of the total number of

respondent, only 24% prefer to lease-out at least a part of owned land, while only 6% prefer to lease-in.

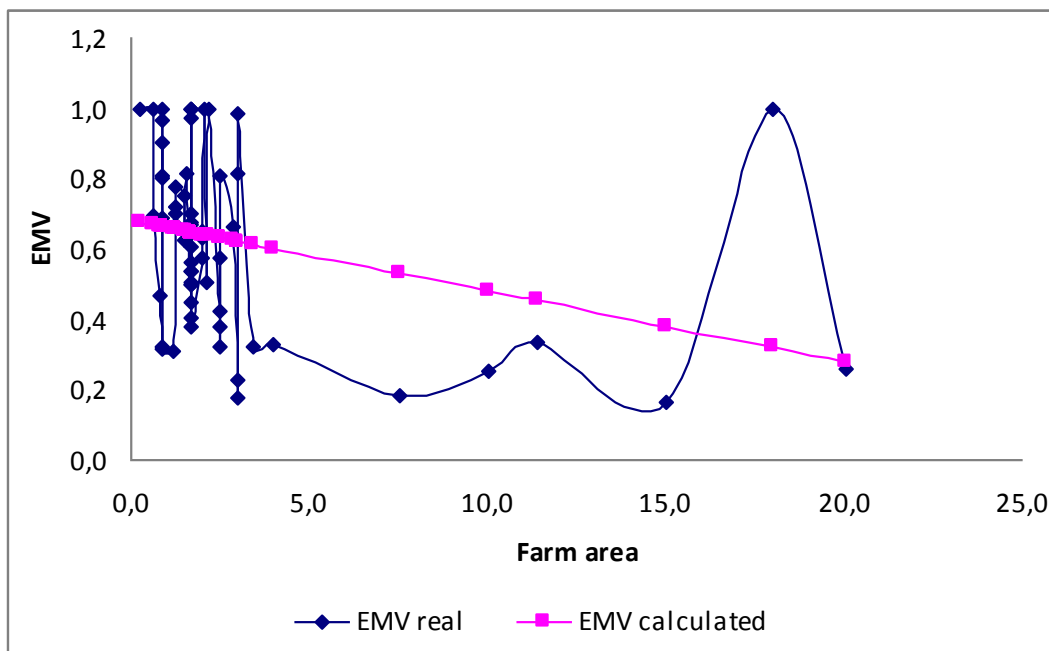


Figure1. The correlation between farm size and land value

The majority of landowners have between 5 and 6 parcels, which means that the land market is highly fragmented. It can be observed that the average value for both categories is almost the same, which signifies that the number of parcels owned does not determine the participation in the lease transactions. A more pronounced difference can be examined from the size of owned parcels. Respectively, the smallest landowners prefer to offer their land for rent, while the larger landowners prefer to lease-in more land. The difference is significant – 2.4 ha relative to almost 5 ha.

Another distinctive feature regards the age, family composition and human resources. The research of these variables reflect that families which lease-in land are on average younger than those who lease-out. Thus, the average age of the lessee is 52 years old compared with 60 years old of the lessor. The same conclusion can be reached concerning the his/her wife or husband. The number of family members plays also an important role. The lessees families are usually more numerous than the

families of lessors. These results confirm the expected ones and also the situation in other countries: younger and more numerous families prefer to own (or cultivate) more land than older families with less working capacity.

Another important indicator of leasing is the payment. The difference in result can be explained by a random insignificant error, with the average payment representing approximately 2000 MDL.

The dependency between area of parcels of land and land value can be evaluated using the total numbers from survey, which offers the possibility to calculate the trend according to a simple linear regression:

$$Y = a_0 + a_1 X$$

In Figure 1, are presented the real and estimated values in the commune of Sadova, Calarasi District.

The table 2 presents the same linear regression model for other communes from the survey. According to table 2, the mean value of EMV in available data is 0.672. It represents a high indicator (the range is from 0 to 1). The decreasing trend of EMV with

increasing surface area is specified for 3 regions. For example, for the Orhei District – which is described by high degree of land fragmentation, the estimated coefficient is the highest of -0.146.

Main results interpretation directs us to value land using various characteristics specific for **the real estate market.**

Location plays the primary role in land appraisal due to two main reasons: proximity to favourable or strategic places, and spatial dependence between characteristics of adjacent real estate assets, which should not be ignored.

Table 2. Estimated coefficient for other regions

Commune/District	EVM	Coefficient estimates		Standard Errors	t- Student
		a <sub>0</sub>	a <sub>1</sub>		
Sadova	0.622	a <sub>0</sub>	0.680	0.038	17.705
		a <sub>1</sub>	-0.020	0.008	-2.483
Orhei	0.679	a <sub>0</sub>	1.072	0.058	18.550
		a <sub>1</sub>	-0.146	0.020	-7.365
Cahul	0.734	a <sub>0</sub>	0.901	0.104	8.660
		a <sub>1</sub>	-0.083	0.045	-1.856

Source: Own calculations

This study uses distance from village centre (primaria), which integrates a broader notion of the location component. Usually, it comprises closeness to infrastructure, human resources, storage, household, roads and other. The result of the empirical study shows that the value of land decreases by almost 8% for each kilometre further from the primaria. It is worth noting that this result does not apply for strategic regions, such as the urban sprawl near the capital, where sellers ask for 1 ha of land with agricultural designation as much as 2.4 million MDL<sup>2</sup> (or 155,000 euro), which is an excessive price compared to the average “official” transaction price of 10301 MDL (665 euro/ha). According to the National Cadastral Agency, the average offer price for 1 ha of land in Moldova was actually 8,000 euro in 2011, but it includes only the published offer prices in various local magazines, newspapers or internet.

Also, the literature suggests employing various *explanatory variables*, which might

be divided using different approaches. This study uses the economic characteristics of land and its owners such as: *area, family income, investments and labour* (CIAIAN, 2006).

*Income* is represented as the personal wage of the owner. It is specific for developing countries and constitutes mostly a psychological effect. Someone with a lower wage is more willing to sell his land for a lower

price (which is demonstrated in this study, coefficient of +0.004). This result also affects the rental prices, especially when the owners don't have the means to use land themselves. From the land development perspective, this factor can be improved by facilitating the buy-and-sell transactions using appropriate support system from the public administration and different management and financial tools, such as land banking (discussed in the introductory part) or land owners associations.

As for the *area*, results (coefficient of -0.022) show that consolidated land is cheaper to purchase. However, it should be noted that

<sup>2</sup> 1 Euro = 15.5 MDL

there are several specific features in Moldova which influence this variable. For example, usually for large transacted areas the participants declare officially much less than transacted real prices (due to tax evasion). Another interesting observation is that given all other factors equal, the consolidated land from Northern regions is relatively cheaper than land from the Central and Southern regions.

Also, *investments (coefficient of -0.056)* play a significant role in land pricing as high land maintenance costs combined with many bureaucratic obstacles negatively influence the land market dynamics.

There are several significant factors that affect the value of the parcels of land in buy-and-sell transactions. For example, *the land area* should positively affect land value. The shape of the parcels is also a factor. Usually, square parcels of land have an advantage over those shaped like a polygon. For example, a rectangle of 2 meters in width and a length of 1 kilometre, has a considerable disadvantage in land transactions. The location of the parcel of land is another factor among other significant points like roads, means of production processing and storage (LIVANIS, 2006).

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affect the price. This can also be explained by the work style, level of productivity and so on.

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In leasing operations and the sale-purchase transactions, there are factors that indirectly affect the land value.

The main reasons for leasing land are (CIMPOIEȘ, 2010):

- Distance (land is far from owner's home);
- Soil quality;
- Technological process;
- Easy access to necessary means – fertilizers, seeds, equipment;
- Lack of money – financial resources for carrying out work;
- Labor insufficiency – due to active migration of rural abroad;
- The negative effects of land reforms – administration issues;

Main difficulties in purchase of land are:

- Nobody in the close proximity of the buyer is willing to sell land – because for many it is the only mean of existence and thus they have no motivation to sell;
- Lack of information – there are no efficient methods of communication or institutions;
- The prices in the land market are not public (everyone feels like is being tricked), which moves the price from its real value;
- Legislative aspects which affect the transaction;
- Transaction costs are too high, and in some cases can be equal to the price of the land;
- Too many owners with small parcels of land – need to negotiate with a lot of owners;
- Lack of financial resources for buying;
- Sellers impose exaggerated conditions.

However, the value of the land is most importantly influenced by the distance from a strategic point. In this case - the distance from village hall. Land adjacency is also a significant factor.

## CONCLUSIONS

It is of no surprise that the land market in an economy of transition, as Republic of Moldova, is described by a buy-and-sell transaction mechanism functioning ineffectively and low land values due to poor efficiency. However, the statistics suggests improving land dynamics. The land development can favour several stakeholders, such as investors, government, citizens. This study is performed mostly from the investor's perspective and can have two main applications.

Firstly, the model discovers the significant variables which influence land value. It represents a pricing model, which might be used by investment funds or other organizations interested in the land market. For example, investors interested in purchasing cheaper land should look for low-income land owners, low maintenance expenses, larger parcels of land, and further away from the town hall.

Secondly, there exist financial and management tools to improve the land market dynamics. A financial mechanism, like a land bank could be created to facilitate these transactions. Another option would be attracting land banking investment funds, which would have the goal to improve the buy-and-sell transaction system, develop the financial tools necessary for increasing efficiency, improving the financial structure and others.

There are several ideas that might be studied in future research: replicate this study for land with different destinations, change or add other explanatory variables, describe the urban pressure effect in a strategic region.

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## ISLAMIC AND CONVENTIONAL AGRI-FINANCING IN PAKISTAN

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### Abstract

*The purpose of this paper is to find out the financial agri-products that have been offered to farmers in Pakistan by different Islamic financial institutions (banks) and conventional banks as well. This research paper will discuss the financing facilities in agriculture sector provided by the Islamic Banks and Conventional Banks in Pakistan. All agricultural financial products that are offered by all financial institutions will explain in detail. The main purpose of these agri-financial products is to facilitate the farmer to develop and manage their agricultural projects. We used documents analysis of financial institutes as a methodology in this research paper and we have also conducted some personal interviews with the managers of the some selected Islamic Banks and Conventional Banks.*

**Key words:** agri-financing, agribusiness, Islamic Banking, Pakistan

### INTRODUCTION

Pakistan is an agricultural country and agriculture sector is one the largest sector with highest contribution in Pakistan's economy. Agriculture is the second largest sector in Pakistan; it contributes 21 % of Gross Domestic Product (GDP), and by providing 45 % employments to labor force in Pakistan agriculture sector is the stands largest employer (Economic Survey of Pakistan 2012). In Pakistan 62 % of total population is directly or indirectly connected with agriculture sector as a source of income and livelihood. Finance has influential role in the agriculture sector; and Pakistani agriculturists are frequently lacking the agri-credit which is essential to perform the agricultural activities. The State Bank of Pakistan (SBP) is aware that for sustainable growth in agricultural sector; agricultural credit is essential; SBP putting all their efforts for the enlargement

and encouragement of agri-credit in Pakistan at reasonable rates.

Despite its so much importance for society and country the Agriculture sector showing decline growth in the past twenty years, according to the Federal Bureau of Statistics the overall growth rate and performance of agriculture is decline as Table 1 show the decreasing the pattern of agriculture growth over the past twenty years.

Table 1. Past Growth & Performance of Agriculture sector in Pakistan

YEARS	PERCENTAGE
1960-69	5.10
1970-79	2.40
1980-89	5.40
1990-99	4.40
2000-10	3.20

Source: Federal Bureau of Statistics

Adams and Fitchett (1992) disclosed that the cash constraint is always related with agriculture sector. Historically, financial institutions are reluctant to lend to small farmers due to their inability to provide collateral, higher default risks and high transaction costs associated with small loans. Coleman (2006) recognized that the higher interest rates in agricultural loans are not suitable solution of the agri-credit problem.

India has offered subsidized interest rates in the agricultural credit to farmers. The study of Binswanger et al (1995) finds that the income and the agricultural productivity of the farmers has increased as the financial institute's incased the formal agri-credit.

A study (Diagne and Zeller, 2001) in Malawi revealed that the financial institutes (Saving banks, Rural Banks and Cooperative Societies) are giving loans to those households who has diversified income and diversified assets portfolios; and these households when decided to approach the financial institution for loan they don't gave importance to the interest rate.

The main purpose of the agri-credit in Pakistan is to hire the labor, purchasing inputs and fertilizers. A study conducting on the performance of ZTBL found that with the increase of 10 % in agri-credit; there is only 1% change in the productivity and production cost (Khandkar and Farooqee, 2003).

Van Zyl et al (1995) observed that in the developing countries the informer lenders are playing a fundamental role in the stipulation of agri-credit households. More than 33 percent of total funds that has been exploited in informer credit dealings originally came from the formal sources of credit. The informal credit markets charged almost 19% interest rate; on the other hand formal lending markets charged only average 14 to 15 percent interest rate (Aleem, 1990).

The research work (Bhalla, 1976) in the district Haryana (India) finds that the agricultural labor workers scrounge the spending items from the shopkeepers and they repaid their loan through providing the labor work to landlords less than the market wage rates. The local shopkeeper adjusted their accounts with the

landlords by purchasing the agri-products later sold it back to the labor workers.

Overall the literature review finds that farmers can increased their agricultural efficiency, income and productivity; if they received agri-credit timely. Because of the formal credit unavailability the farmers guided towards the informal credit lenders (private brokers and money lender) which incriminate not only more interest rate than in the formal market but also tie the agri-farmers to trade their agri-crops to them at lower market rates.

## MATERIALS AND METHODS

For this research paper we have selected one Islamic and four conventional banks offering agri-financing in Pakistan; the name of these banks: Meezan Bank, Bank Alfalah Limited, Bank of Punjab (BOP), Habib Bank Limited (HBL), United Bank Limited (UBL).

The data has been collected mainly from the websites of these banks and some data collected through personal interview.

We used documents analysis (DA) of financial institutes as a methodology in this research paper and we have also conducted some personal interviews with the managers of the some selected Islamic and Conventional Banks.

In this section we will discuss the financing facilities of each financial institute for agricultural purpose; their products and its specification; the mark-up rate and mode of financing are the main points.

### Meezan Bank

The first Islamic agri-financing in Pakistan is provided by the Meezan Bank; the largest Islamic bank of Pakistan. Meezan bank facilitate their agri-customers with fully Shraiah compliant agri-financing. Meezan Bank under the Marabaha financing agreement will sell the seeds and pesticides to their agri-customers.

The Meezan Bank is scheduling to enlarge the range of agri-financing facility to over the Pakistan and Bank has already made a wide-ranging Agri-Financing Policy in which the detail of all procedures of this agri-scheme is mention.

Following Islamic agri-products are offered by Meezan Bank:

*-Meezan Tractor Aasaan*

Objectives: To complete the necessary requirement of Tractors for farmers.

Tenure: 3 to 5 Years

*-Meezan Agri Aasaan*

Objectives: To provide agri-financing options to farmers on a fast track source with utmost alleviate and ease.

Tenure: 1 to 2 Years

*-Meezan Fasl Aasaan*

Objectives: To supply agri-financing to farmers for purchasing of input after the specific date in future farmer will provide the supply of goods.

Tenure: Max. 18 months

### **Bank Alfalah**

Bank Alfalah providing all types of agri-financing (Bank Alfalah Zarie Sahulat) to farmers and corporate entities that has been engaged in Agricultural sector e.g. (production, marketing, processing, and exporting). Bank Alfalah observed following eligibility criteria while lending agri-finance to farmers. These guidelines are given by State Bank of Pakistan (SBP). The applicant is an individual /entity must full fill following criteria for getting the agri-credit from Bank Alfalah.

-The applicant must not be defaulter of any financial institute in Pakistan.

-The agri-credit applicant must have to provide appropriate securities and agri pass book which has been acceptable to the any bank.

-The applicant must be a Pakistani.

-Age should be in between 18 to 65 (age relaxation to upper limit can be given).

-Additional criteria can be enforced on each application basis (State Bank of Pakistan).

Bank Alfalah's Agri-Scheme offers agri-finance facilities to both activities (farming and non-farming) production and agri-project expansion purpose as well. Bank Alfalah is offering wide range of agri-products to the farmers to increase their agricultural income and production (Bank Alfalah Official Website).

-Alfalah Paidawari Agri-Scheme

-Alfalah Musalsal Agri-Scheme

-Alfalah Tractor and Transport Agri-Scheme

-Alfalah Machinery & Equipment Agri-Scheme

-Alfalah Aabpaash Agri-Scheme

-Alfalah Islah-e-Araazi Agri-Scheme

-Alfalah Poultry Agri-Scheme

-Alfalah Dairy & Livestock Agri-Scheme

-Alfalah Fisheries Agri-Scheme

-Alfalah Silos/ Storage Agri-Scheme

-Alfalah Marketing Agri-Scheme

-Alfalah Agri Industrial Agri-Scheme

-Alfalah Bills /Guarantee Agri-Scheme

-Alfalah Lease Agri-Scheme (Bank Alfalah Official Website)

The tenure of all of these financing products is 3 to 5 years and the mark-up\interest rate is in between 14 to 15 percent.

### **Bank of Punjab (BOP)**

The Bank of Punjab has first bank in Pakistan to provide some innovative agri-products to farmers. BOP providing wide range of agri-financing which follow as under.

*-Kissan Dost Running Finance Facility*

To provide short-term agri-facility to the self cultivators/resident farmers i.e. owner or tenant or owner and tenant, for the purchase of farm inputs (Seeds, fertilizers, pesticides, fungicides etc).

This is running finance facility and farmer must have up to 50 Acres of land. The rate of mark-up is 18 % and maximum limit of the loan is 2,000,000.

*-Kissan Dost Lease Finance Facility*

The scheme has been designed to provide financial assistance to farmers for purchasing of agri-machinery/implements.

The farmer should have minimum 5 and maximum 50 Acres of land to apply this facility. The maximum total amount of loan is 10 Million and 18 % is the mark-up rate. The tenure of the loan is 3 to 5 years,

*-Kissan Dost Green House Finance Scheme*

To encourage the farmers to establish the Green Houses in order to increase the productivity and meet the growing demand of vegetables at affordable prices.

Type of Green Houses: Metallic or Bamboo construction. To get this facility the farmer must have some suitable land to establish the Green House.

The maximum amount for Green Houses is Rs. 25 Million and 18 % is the mark-up rate.

**-Kissan Dost Livestock Development Scheme.**The main purpose of the Kissan Dost Livestock Development scheme is to encourage the dairy farmers to establish the dairy farms to meet the growing demand of dairy products at reasonable rates.

For the eligibility the farmer should have some past experience of the dairy farming. The maximum amount of the loan is Rs. 50 Million and 18 % is the mark-up rate. The tenure of the loan is 5 years.

#### **Habib Bank Limited**

Habib Bank Limited has the largest branch system in Pakistan and more than 800 HBL branches have providing the agri-financing to the farmer across the Pakistan. HBL's vast branches network ensure that the farmers of rural areas have easily excess the agri-financing facilities. HBL is providing the agri-financial services through the specialized department name as ZaraiBanking. ZaraiBanking providing the small scale loans (Small Farmers) as well as large scale institutionalized loans to expand the economic and agricultural growth of the country.

The agricultural finance facility provided by HBL ZaraiBanking facilitates the agri-farmers to put these loans to purchasing the quality seeds, pesticides, agricultural machinery and fertilizers etc. The agri-financing of HBL offering these agri-products: Crop Inputs, Farm Implements, Tobacco, Tractors/Agricultural Vehicles, Livestock, Fish Farming, Poultry, Group Lending.

The tenure of these loans are between the 1 to 3 and 3 to 5 years. The rate of mark-up is 18 to 20 percent.

#### **United Bank Limited (UBL)**

United bank is the 2nd largest bank of Pakistan (in terms of branches) is providing the agricultural credit facility to the farmers in all over the Pakistan; especially in the rural and remote areas. UBL offers two types of agri-loans i.e. Farms loans and Non farm loans. UBL's agri-financing is accessible to the farmers for all kinds of crops across Pakistan. The main objective of agri-financing is to assistance to the farmers for the

purchasing Agri Inputs i.e. Seeds, Pesticides, Fertilizers, hiring of labor etc.

Forms loans are further divided into the two categories:

**-Production Loans:** NIACF (Revolving Credit Scheme) and NIADF (Demand Finance Production);

**-Development Loans:** Land Development, Equipments and Machinery; Tractor & Vehicle Finance

Non forms loans are divided into three sub categories i.e.: Fisheries Financing, Poultry Financing, Livestock Financing.

## **RESULTS AND DISCUSSIONS**

The above mention materials of these agri-financing schemes (Islamic and Conventional) we can easily interpret that there is lack of Islamic agri-financing facility in Pakistan; Meezan Bank is the only Islamic bank to offer Islamic agri-products to in Pakistan. This study was concerned to role of Islamic and conventional banking in agriculture development so the data gathered through primary source. Our population of interest was all the bank holders in Pakistan. Islamic banking increases the satisfaction level of farmers because they are trying to avoid Riba (Interest) and Islamic banking already working under this approach with these practices. There is an extensive discussion in literature on the influence of Islamic banking in agriculture sector for examples guidelines provided by State Bank of Pakistan about Islamic modes and practices which can help farmers in their agriculture activities. The mark-up rate of most of the Conventional Banks is in between the 15 to 20 percents; but when we interviewed some bankers (with some of the bankers we have personal relations) and we got to know that mostly banks charges 23 to 28 percent rate of interest in agri-loans products.

## **CONCLUSIONS**

Agricultural is the back bone of the economy of the country and but in under-devolved countries e.g. Pakistan the farmers are always short of finances and due to unavailability of



agri-loans, the used low price and lower quality seeds and in consequences the production and growth of the farmer are also lower and per acre yield of the agri-land also on lower side. This study identified the factors affecting the relationship between the Islamic & Conventional Banking and agricultural growth in Pakistan. This paper finds that the role of banking in the agricultural sector is affected by different variables like need of working capital, terms of financing, irrigation system, and effective use of finance, change in technology, low and uncertain yield and target price changes.

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## EFFECT OF MICRO FINANCE ON POVERTY REDUCTION OF SMALL SCALE FARMERS OF PAKISTAN

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### Abstract

*This study revealed the impact of micro finance with regard to poverty alleviation, employment generation opportunities, upraise in the standards of living of the small farmers of Pakistan along with the access of such finances and their financial cost. Small farmers often rely on the loans and finance from the formal and informal sources of finance. There is low rate of sustainability in the micro finance sector. These schemes remain for a small time period. Another challenge is that there is a need of replicable and scalable model. There is also a requirement of formalization of informal credit source which count for higher. There is high need of reducing the ambiguities in obtaining the credit from these sources. With respect to agriculture, the proportion of finance should be increase with the proportion to its contribution to the economy. The data for this study has been collected through a self-structured questionnaire and respondents are small farmers who are availing the micro finance facility for any source; informal, formal or semi – informal. The data collected form 150 respondent from Sahiwal and Multan Region. The data has been analyzed through regression and correlation method with the use of SPSS for checking the relationship and impact of micro finance on the living of poor and employment generation. This paper also concluded that the financial cost of such finances is having significant role on the success of such schemes. The research is a contribution to the financial sector to set their focus according to the quality and quantity of micro credit to the agriculture sector.*

**Key words:** agriculture, microfinance, Pakistan, small farmer

### INTRODUCTION

Micro finance has its roots in achieving a very important objective of poverty alleviation which is the most important economic aspect of any economy and poverty is observed all over the world. Poverty is not demonstrated but practiced. Low income restricts the poor to fulfill their immediate desires. Sometimes, poor are unable to provide education, better health services and good quality food. Mostly this situation is observed in rural areas because there is seasonal employment which restricts these poor to obtain their desires because they are attached to the agriculture sector for employment.

Agriculture sector is a fundamental and very central sector and plays vital role in Pakistan's economy. It currently contributes 21% to GDP. The growth of the sector is 3.1% in 2012 as compared to 2.4% in 2011. It generates employment for 45% of the country's labor force and 60% of country side population depends upon this sector for

livelihood. It has crucial significance for food security, breeding and overall economic growth and contribute a significant role for alleviation of poverty. But unfortunately farmers have not enough finance to use innovative technology which is essential for achieving high productivity. If considering the cost of production in agriculture sector, major ingredients includes the electricity cost and the fertilizer cost, the prices of both have increased more than 100% in last two years. For the purpose, GOP and SBP provide agriculture loans at low cost to boost up this sector and all the farmers meet the needs of the crops timely and get a high level of productivity.

Currently 26 commercial and microfinance banks, with around 3,900 agriculture designated branches, are facilitating farmers by extending agriculture credit throughout the country. Following are the banks which include ABL, HBL, MCB, UBL, two specialized banks are; ZTBL, PCBL, and 14 private domestic banks. Five MFBs are also providing funding to this

farming community. Financing is provided for the purpose of growing crops, livestock, poultry, fisheries, orchards, forestry, nurseries, horticulture and sericulture.

ACAC has billed cumulative agriculture credit distribution goal of Rs. 285 billion for 2011-12; out of the over-all amount of agricultural credit distributed; Rs. 195.1 billion was distributed by Commercial Banks, Rs. 70.1 billion by ZTBL, Rs. 12.2 billion left to the Microfinance Banks and Rs. 7.6 billion was distributed to the PPCBL(Hafeez, 2012).

A large population is dependent upon the agriculture sector, while there are problems of illiteracy, poverty and seasonal employment which causes some problem and requires immediate solution, as in the economic survey 2011-12 announced that more than 60% population lived in rural areas, and literacy rate in Pakistan is 57% while in rural areas it is 48 % which is less than the national level. It requires attention so that the literacy should be increased up to the national level. This sector absorbed 45% of the employment; we have only 18 million hectares useable land, if we have ample resources, the employment level can increased more than this. Furthermore, CPI is 12.4% which decrease the purchasing power of the inhabitants that ultimately cause a decrease in the standard of living.

Today's crucial problems are unemployment, illiteracy, lower level of standard of living, low per capita income and high inflation rates in the economy. Every country either developed or underdeveloped wants to eliminate these problems from their economy because these factors affect the economy severely and destroy the whole economy because these problems decrease the economic cycle time period. As agriculture sector is very crucial and now GOP and SBP is working for the development and growth of the sector to achieve the stable economy and highly competitive raw material for the other sectors of the economy from the agriculture.

Poverty is the conditions where inhabitants of the economy are unable to meet their basic requirements. It causes afore mentioned problems along with the psychological problems and uplift the unethical behaviors in

the society (Durrani, Usman, Malik, & Ahmad, 2011). 28% of rural area population is categorized as poor (Jaffari, Saleem, Abideen, Kaleem, Malik, & Raza, 2011). Micro financing is easy because it has fewer restrictions to obtain loans from institutions e.g. farmers can easily attain this facility by providing a personal guarantee and his CNIC's copy for obtaining loan from the Khushali Bank. Micro financing is helpful in reducing poverty. SBP is not just focusing on providing the targets but also provides tools and better policies for MFIs and MFBs so that they can easily communicate to each other and provided better loaning facilities to their customers. SBP requires from these banks e.g. product innovation, MIS, usage of new technology, branding, good credit rating of MFIs, return and risk manuals, providing planning and implementing techniques and training to their employees as well the borrowers so that they can gain high profits from their investments. SBP announces the objectives of the MFIs and MFBs are training and capacity building, and enhance the literacy programs in these specialized funds are invested with the help of \$20 million by the GOP which helps in increasing the lending capacity of the banks and easy access to finance by the lower income families. Also SBP provide £ 10 for ISF from 2008 to 2012 through FIP to strengthen the micro finance institutes (SBP, 2013). How are MFIs' equity increased? The obvious answer to the question the equity investment through investing indirectly from mutual funds or directly from private investors and communication flow towards customer in better way which attracts the poor, small entrepreneurs and commercial investors (O'Brien, 2006).

The benefits of micro finance are (a) income generation prospects (b) enhanced community physical infrastructure in the underserved areas and (c) greater economic integration of women in the country (Shirazi & Khan, 2009).

“Microfinance Institution means an institution, which extends micro credit and

allied services to the poor through sources other than public savings and deposits”

“Microfinance bank means an institution licensed by State Bank under Microfinance Institutions Ordinance 2001 to establish and operate as microfinance bank” (Microfinance Institutions Ordinance 2001, 2013).

Microfinance institutes are providing loans to poor who are unable to obtain loans from traditional banking system (Jaffari, Saleem, Abideen, Kaleem, Malik, & Raza, 2011).

Poverty is the situation where poor are unable to meet their basic necessities of life such as food, shelter and clothe etc. (Shirazi & Khan, 2009). The main basic element of poverty is the high population in the country further Kalirajan and Sing (2009) argued that the country with sustainable agriculture growth has high degree of poverty alleviation. Because most of the population lived in rural areas all over the world, and mostly poverty is related to the rural where land lord and other giants dominate the poor, if the poverty is reduced in the rural areas means economy is reducing a large proportion of poverty from the society.

Ahmed (2010) found that instead of having high poverty ratio micro finance increase the living standards and helpful in decreasing that poverty level in Bangladesh. Although the country has high poverty but microfinancing provides support to those poor which work hard and increase their standard of living, and the most viable financier in the sector is Grameen Bank of Bangladesh. It is viable to gain loans from friends and family members easily than financial institutions in Tanzania which is helpful in increasing the business prospectus (Satta, 2004). Poverty alleviation (Adjei, Arun, & Hossain, 2009), (Aideyan, 2009), (Rahim & Rahman, 2010), (Kalirajan & Sing, 2009) and (Chirwa, Mvula, Namata, & Zgovu, 1999) is major concern in Bangladesh through aid, foreign funding and foreign direct investment which decrease the poverty and enhance the employment which ultimately increase the standard of living of the inhabitants of the country (Mashreque, 2012). Microfinance is helpful in increasing social capital and share the economy's risk by

increasing employment and opportunities both in male and female and affects the environment by increasing education (Schrieder & Sharma, 1999). Senanayake Premaratne (2006) provided three dimension of microfinance; (i) it affects the financial structure of the economy because it is working under the central bank of the economy and follow the rules and regulations to achieve sustainable growth in the country, (ii) it provides loans to poor which reduce the poverty in the country, and (iii) as it becomes the part of the economy's developmental infrastructure which affects the economy so it works in such a way which is helpful in achieving growth and development in the economy. Poverty alleviation is dependent upon the per capita income, performance of the economy, foreign remittances, public administration and growth of the economy, also stated that the corporate governance is important for the well performance of the microfinance institutes (Ashta & Fall, 2012). Microfinance is an efficient way to reduce poverty through education, health and infrastructure. They also found that competition enhanced which decrease the lending to typical poor but helpful in achieving sustainable economic environment (Hermes & Lensink, 2007). Dusuki (2008) stated that the microfinance is an emerging trend in traditional system and Islamic microfinancing reducing the cost of borrowing as well as the cost of processing which increase the borrowing power and effective usage of borrowed finance alleviate the poverty from the economy. Poverty alleviation is not just only concern of the government or financial institutions but also the attitude and behavior of the society counts a lot, without the society there is no concept of economy. Most of the people has an intention to obtain loan for non-payment which ultimately ruins the basic purpose of borrowing that amount and ultimately microfinancing meaningless because the amount is not invested, when not invested, it will never get prosperity and cause a bank default (Nkamnebe & Idemobi, 2011). Borrowers should invest the money for the

purpose they obtain which flourish the prosperity in the economy and decrease the poverty.

Muslim world faces vicious poverty cycle, low economic growth and development and high unemployment rates (Dusuki, 2008) Islamic microfinancing provides different schemes such as Musharikah, Modarabah, Qarz-e-Hasana and Ijara etc. these schemes having high potentials for small investors and poor to increase their lifestyle with high standard of living and ultimately decrease the poverty in the economy. These are very effective techniques in assets building of the economy because these are cheap sources for capitalization of assets for any firm or individual (Rahim & Rahman, 2010). This financing system resolves the problem of heavy collateral and reputation of the credit worthiness of poor but still the problem of trust exists because the lender is unable to the intentions of the borrower although he has stated the specified objective for getting the loan (Dusuki, 2008). Mushrikah resolve this problem upto maximum level because the lender become the partner in the business.

Historically in India giants provided loans to farmers and other rural inhabitants on the basis of mortgage and charge heavy interest fee on loans (Mashreque, 2012), after nationalisation the perspective changed, rural credit provided by the banks at lower cost to achieve sustainable environment (Shah, Rao, & Shankar, 2007), and (Senanayake & Premaratne, 2006). Countryside is very crucial to Indian Government and Reserve Bank of India provide heavy microfinance facility to reduce the poverty in the countryside areas of the country. For the purpose, many tools and techniques are applied to gain prosperity in rural areas which ultimately increase the living standards by reduction in poverty. Reserve Bank of India establish soft policies for the microfinance sector so that they can provide loans to the rural inhabitants of the society (Akoijam, 2013). Type of microfinance institution also affects the poverty reduction such as NGO-MFIs and Islamic Banking has high preference in this

scenerio, while MFIs and MFBs are lagged behind due to cost of capital and borrowing procedures. Recently, micro financing is an effective tool used by under developed and developing countries to reduce poverty, so in Asia it is very effective as compared to Latin America (Zeller & Johannsen, 2008).

The important factor of financial cost is not considered in evaluating the effects of microfinance in agriculture sector, it is considering because it affects the borrowing power and borrowing decision of the customer. Financial cost includes the interest rates, processing costs and hidden financial charges. This study provides an insight to MFIs and MFBs in evaluating their customers, further helpful for the academic teachers and students, and researchers.

#### **Hypothesis:**

Null Hypothesis: Micro Finance has no impact on Poverty Reduction

Alternate Hypothesis: Micro Finance has impact on Poverty Reduction

#### **MATERIALS AND METHODS**

Present study is used to check the Effect of Micro Finance on Poverty Reduction of Small Scale Farmers in Pakistan. It is considered to be a most important that we have a prior knowledge about the topic before we conduct a descriptive research. Keeping this thing in mind we have reviewed previous studies conducted related to our topic. Structured questionnaire bases on the variables selected from previous studies have been used to collect data from the respondents. The structure questionnaire distributed among 150 small scale farmers of Multan and Sahiwal regions of Pakistan. From 150 respondents 125 completely filled questionnaires returned those are further used for analysis purpose. Regression and correlation techniques used to analyze the data using SPSS 19.0.

#### **RESULTS AND DISCUSSIONS**

To check the relationship among different variables we used **regression and correlation methods**.

Results from Table 1 suggest that there is significant ( $p < 0.05$ ) positive correlation

among micro finance and standard of life. And micro finance has a less significant correlation with the other variables like purchase power of the community and the cost factor. When we look upon the relationship among the dependent variables then we find that there is a significant

( $p < 0.05$ ) positive correlation among purchasing power of the consumer and the standard of life. The table further suggests that there is no significant relationship among other dependent variables.

Table 1. Correlation

		Micro finance	Standard of Life	Puchasing Power	Cost
Micro finance	Pearson correlation	1			
	Sig.(2-tailed)				
	N	125			
Standard of Life	Pearson correlation	0.673**	1		
	Sig.(2-tailed)	0.000			
	N	125	125		
Purchasing Power	Pearson correlation	0.328	0.585**	1	
	Sig.(2-tailed)	0.109	0.002		
	N	125	125	125	
Cost	Pearson correlation	0.340	0.255	0.054	1
	Sig.(2-tailed)	0.096	0.220	0.799	
	N	125	125	125	125

**Regression.** To check the impact of independent variable on dependent variable we used regression method. Keeping in mind that there are more than one dependent variable we used multivariate tests.

Table 2. Multivariate Tests

Source	Dependent Variable	F	Sig.
Microfinance	Standard of Life	19.047	.000
	Purchasing Power	2.781	.109
	Cost	3.016	.096

To check the impact of Micro finance upon the dependent variables like standard of life, Purchasing power and the cost factor we used regression method. Results from this regression are shown in table 2. The results indicates that Microfinance have significant positive impact on standard of life. There is no significant relationship among the purchasing power but microfinance has little impact on cost factor. This indicates that if microfinance provider at lower cost to the small scale farmers in Pakistan it will help them to get more finance to invest in agriculture sector of Pakistan.

Purpose of present study is to explore the impact of micro finance on poverty reduction in Pakistani perspective. our results reveals that microfinance have a significant impact upon the peoples standard of life which shows that firstly peoples will manage their basic necessities and then they move forward toward standard of life. Results from our study shows that microfiche contributes toward maintain the standard of life for farmers. From this we can see that our null hypothesis is rejected and alternate hypothesis is accepted which shows that micro finance have positive impact on poverty reduction in Pakistan.

Shirazi& Khan, (2009) found that poverty is the situation where poor are unable to meet their basic necessities of life such as food, shelter and clothe etc. our results reveals that microfinance have a significant impact upon the peoples standard of life which shows that firstly peoples will manage their basic necessities and then they move forward toward standard of life. Results from our study shows that microfiche contributes toward maintain the standard of life for farmers in Pakistan. From this we can draw a result that with the improvement of standard

of small scale farmers in Pakistan we can reduce the level of poverty in the country. We can further say that it is an element in Pakistan economy which can positively contribute toward poverty reduction in country. Results further reveals that the cost is consider being a significant factor in micro finance. From this we can say that as firms providing micro finance to farmers decrease their cost of processing, interest and some other financial cost it will lead farmers to get more finance.

## CONCLUSIONS

In concluding remarks we can say that the micro finance is significant way to reduce level of poverty in Pakistan if it is provided at lower cost. Farmers living in Pakistan will move toward micro finance if it is available to them at lower cost. When farmers get money with the help of microfinance it will improve their living standards as well as it will add significant positive results to economy.

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## INVESTMENTS AS A GROWTH FACTOR OF ECONOMIC EFFICIENCY IN THE PRODUCTION OF GRAPES IN THE REPUBLIC OF MOLDOVA

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### Abstract

*Viticulture occupies an important place in the agriculture of the Republic of Moldova. Vine is grown in all development areas of the country and is characterized by various economic efficiency. In this article there are considered the indicators of economic efficiency of grapes and there are determined the ways as to improve the situation in viticulture. As a result, viticulture needs investments and first of all in order to increase the productivity of vine. This would allow reducing the cost to product unit and the growth efficiency of production of grapes. In recent years, winemakers have invested money in planting young vineyards and in particular grape of mass varieties.*

**Key words:** economic efficiency, investments, viticulture

### INTRODUCTION

Republic of Moldova is associated with the grape production and winemaking. Wine sector is fairly considered to be strategic for national economy, occupying about 25% of the agricultural exports. Wine sector needs support in its development in order to meet the international market requirements. Wine sector can be divided into the following links:

- Grape production (technical varieties and varieties of table grapes);

- Grape processing (gross wines, ordinary wines, high quality wines, sparkling wines, strong wines, cognac and grape juice making). First link presented by the national viticulture is extremely important, as it provides income for farmers and supplies the grapes processing companies with raw material. Selling of wine products and fresh grapes on international markets brings revenue in the state budget.

This article examines the development and production efficiency of grapes in the Republic of Moldova in terms of goods-producers categories and also on the basis of the developing regions. The made analysis was carried out for the period 2000-2011, specifying the period until the wine sector's crisis, during the crisis and the post-crisis period.

### MATERIALS AND METHODS

In order to examine the evolution of viticulture in the period 2000-2011 there were analyzed the surface of vineyards, including by their sort and on groups of species; indicators of economic efficiency of grapes production. The analysis was made by the type of producers-goods of grapes, by development regions and regarding the Republic of Moldova as a whole. The analysis included four periods, each of them having three years. Averages were calculated for the period before the crisis (I period - 2000-2002; II period - 2003-2005,) the third period of crisis (2006-2008) and fourth post-crisis period (2009-2011). Data from the National Bureau of Statistics of the Republic of Moldova were compiled. Methods of average values, comparison, monographic study, economic analysis and synthesis were applied.

### RESULTS AND DISCUSSIONS

In recent years national viticulture has faced some problems that hinder the development of the branch. One of the most important is the lack of a national strategy of the state program on the restoration and development of

viticulture and winemaking. The program adopted for the period 2002-2020 is not already actual, because conditions have substantially changed. The mentioned program was directed to the Russian traditional market of wines selling, which now has become one unstable. In this connection, the directing of sales to other markets occurs. Furthermore, in the country, at the moment there is no administrative body of the wine branch. Subsidizing the planting of new vineyards was made freely, at the request of economic agents, but without taking into account the strategic objectives of sector's development.

This article will present the analysis of viticulture's development during the period 2000-2011. The reviewed period is divided into four periods.

Table 1. The place of agriculture in the structure of agricultural lands in households of all categories from the Republic of Moldova

Indicators	Average for the period			
	2000-2002	2003-2005	2006-2008	2009-2011
1.Surface of agricultural land – total, thousand ha	2538,7	2522,7	2507,4	2499,1
2.Surface of perennial plantations, thousand ha	313,8	298,3	302,5	299,5
3.Surface of vineyards, thousand ha	156,2	155,3	157,3	150,1
4.Share of vineyards in agricultural lands,%	6,2	6,2	6,3	6,0
5.Share of vineyards perennial plantations, %	49,8	52,1	52,0	50,1

Source: Calculations made by the author [2]

Data from Table 1 show us that in those 11 examined years, all three indicators of surface decreased: of agricultural lands with 1.6%, of perennial plantations with 4.6%, of vineyards with 3.2%. The share of vineyards in the structure of agricultural land remains practically constant but slightly decreasing.

Vines occupy a half of the surface in the structure of perennial plantations. Here it can be noted that if during 2000-2005 there had been shown an increase in the share of vineyards in the structure of perennial plantations vines with 2.3%, in relation with the stable development of the wine sector, in the period 2006-2011, a contrary situation takes place - vineyards share is decreasing with 1.9%, which is the consequence of the crisis from the wine sector in 2006-2008. Farmers, in this way, reacted to sharp restrictions for the export of alcohol (made from grapes) in the Russian Federation. It is interesting to examine the position of viticulture in agricultural production.

Table 2. The place of crop production in the agricultural production in households of all categories in the Republic of Moldova (comparable prices), %

	Average for the period			
	2000-2002	2003-2005	2006-2008	2009-2011
Agricultural production – total	100,0	100,0	100,0	100,0
Crop production	69,7	69,1	67,3	67,3
Of which:	29,8	25,6	18,2	18,5
cereals				
sugar beat	3,0	2,2	2,6	1,6
sun flower	4,6	6,0	6,2	7,0
potatoes	7,7	6,5	5,3	5,2
Vegetables and melon cultures	5,7	5,8	7,6	7,6
Fruits and berries	3,7	6,0	4,0	4,3
grapes	10,0	11,6	15,2	15,0
other cultures	5,2	5,4	8,2	8,1

Source: Calculations made by the author [2]

The results presented in Table 2 show that although the share of crop production in agricultural production decreased in the period 2009-2011 by 2.4 pp in comparison with the period 2000-2002, it still occupies 2/3. Grape production increased by 5.0 pp in the fourth period in comparison to the first and ranks the second place in the vegetable production structure, giving way to cereals. Considering that viticulture's potential is even greater, in the future it will be realized in case of strategic development of the wine sector.

Analysis of the current state of viticulture requires the examining of the surfaces occupied by vineyards, global production and production per hectare.

Table 3. Indicators of viticulture development in the Republic of Moldova (all categories of households)

	Average for the period			
	2000-2002	2003-2005	2006-2008	2009-2011
1.Surface of vineyards, thousand ha	156,2	155,3	157,3	150,1
2.Of which with harvest	146,7	140,3	136,0	132,5
3.Share of vineyards with harvest, %	93,9	90,3	86,5	88,3
4.Global production of grapes, thousand tonnes	616,7	627,1	566,5	587,2
5.Production of vineyards with harvest, %	42,1	44,4	39,1	42,9

Source: Calculations made by the author [2]

Surface of vineyards in the Republic of Moldova decreased in recent years with 6,1 thousand ha, or by 3.9%. Share of vineyards with harvest was also reduced. But this decrease has a more substantial value and constituted 14,200 ha, or by 9.7%. This change took place after scrapping old vines and planting young vines during the period 2002-2010. According to the Ministry of Agriculture and Food Industry during 2002-2010 there were reversed about 18 thousand hectares and planted about 30 thousand hectares [4. p 21]. We mention the low efficiency of the vineyards area. Level of harvest per hectare is small enough for the soil and climate conditions of the country. Database provided by the National Bureau of Statistics gives us the following information on the grape yield per 1 hectare: in the years 1980-1995 grape production per hectare consisted in averaged 69.4 quintals. In 1982, from this period, the highest yield per republic was recorded - 95 quintals, in 1984 - 1975 quintals. Average yield per hectare in the years 1985-1989 constituted 59.8 quintals, but here, because of severe frosts (1985) the average yield per hectare was recorded - 39 quintals. In the remaining years of the period 1985-1989 production per hectare has decreased below the level of 60 quintals. But since 1990 the average yield in the country is recorded below the level of 55 quintals per hectare, regardless of weather conditions. Failure to comply the grape production technology due to insufficient funds to new owners of vine surfaces caused substantial reduction of vineyards efficiency.

Continuing the analysis of Table 3, we can mention that the decrease in total vineyard surface, and especially with harvest and the low level of yield of grapes per hectare caused a decrease in the global grape production by 29.5 thousand tons, or by 4.8 % in the period 2009-2011 related to the period 2000-2002.

According to statistics, on January 1, 2012 the surface of vineyards amounted to 147,300 ha, of which 128,400 ha amounted the vineyards with harvest. Most of the surface (95%) is in a private property and only 5% are in the public property. Viticulture is practiced in different categories of households.

Table 4. Distribution of vineyards surface on categories of households in the Republic of Moldova, %

Categories of households, producers of grapes	Average for the period	
	First period 2006-2009	Second period 2009-2011
1.Agricultural enterprises	26,5	21,3
2.Farms with the surface of land of 10-50 ha	6,3	7,3
3. Small producers	67,2	71,4
of which:		
3a) Farms with the surface of land up to 10 ha	40,3	42,8
3b) Households	27,0	28,5
4. Total per Republic of Moldova	100	100

Source: Calculations made by the author [2]

The information presented in Table 4 shows that about 2/3 of the vineyard areas are concentrated in the category of small producers, whose share on average for the period 2009-2011 increased by 4.2 pp to the average of the years 2006-2008.

From the category of small producers, around 60% of the vineyards belong to farm households (farms) with the land surface up to 10 hectares and 40% belong to households. Share of agricultural enterprises in average for the period 2009-2011 decreased by 5.2 pp in comparison to the average of the years 2006-2008. We believe that agricultural enterprises in this way reacted to the crisis in the wine sector in 2006-2008. Commodity market of instability of alcoholic products and beverages caused the reduction of vineyards surface by 10.6 pp in 2011 compared to 2006, which meant 18 900 ha per Republic. Category of small producers increased the vineyard

surface by 4.1 thousand hectares, of which households (farms) with the surface up to 10 hectares increased by 2.8 thousand ha, and households-with 1,3 thousand ha. Although households (farms) with the land surface of 10-50 ha increased insignificant their share in the total area of vineyards (only by 1.0 pp), we draw attention to the fact that in 2011 this share reached 12%, increasing by 4.9 pp compared to 2006, or with 6,5 thousand ha. Increase of vineyard surface in this category and in the category of small producers is explained by those that these grape producers planted new varieties of table grapes, considering that selling fresh grapes is less risky than technical variety grape production.

Table 5. Qualitative characteristic of the vineyard surface in agricultural enterprises from the Republic of Moldova

Indicators	Average for the period	
	First period 2006-2008	Second period 2009-2011
I Surface of vineyards, total, thousand ha	41,7	34,3
of which: technical varieties	36,1	29,4
table varieties	5,6	4,9
II Surface of vineyards with harvest, total, thousand ha	34,0	28,8
of which: technical varieties	29,1	25,1
table varieties	4,9	3,7
III Share in the total surface:		
of technical varieties	86,7	85,6
of table varieties	13,3	14,4
IV Share of surface with harvest – in the total	81,6	83,7
of which: technical varieties	80,7	85,2
table varieties	87,4	75,7

Source: Calculations made by the author [2]

The data from Table 5 show that during the last six years, the area of vineyards in agricultural enterprises decreased by 7.4 thousand ha, ie 17.8%. Surface of vineyards with harvest also decreased by 5.2 thousand ha, or by 15.2%, but on the other hand, the share increased by 2.1 percentage points. In the surface of vineyards from agricultural enterprises the technical varieties are predominant, although in their surface evolution there was a steady decrease. During the period 2006-2011 the area of technical varieties decreased by 10.8 thousand ha, or by

28.6%. And if in the crisis period (2006-2008) this decrease was 2,7 thousand ha (4.5%), in the second period (post-crisis) rates of reduction are more significant; 5,2 thousand ha (16.1 %). The share of technical varieties in the total area decreased by 1.1 pp.

Surfaces of table varieties vineyards in agricultural enterprises also decreased in the considered period. In total, in 2011, the surface of table grapes decreased by 1.2 thousand ha compared to 2006; in the years of crisis, the reduction was 1,3 thousand ha, but in 2009-2011 there is an increase of 0.2 thousand hectares, or by 4.2%. Share of table grapes surface decreased by 1.8 pp in 2008 compared to 2006 and increased by 2.6 pp in 2011 compared to 2009. Also, there is mentioned the decrease of vineyards with harvest of table varieties: in this post-crisis period it reduced by 11.7 pp than the average for 2006-2008. On the one hand we have an increase of the surface of table varieties vineyards, on the other hand reducing the surface of those with harvest. This phenomenon is explained that in the post-crisis period, new varieties of table grapes were planted in agricultural enterprises.

Table 6. Qualitative characteristic of vineyard surfaces in farms with the surface of land up to 10 ha in the Republic of Moldova

Indicators	Average for the period	
	First period 2006-2008	Second period 2009-2011
I.Surface of vineyards, total, thousand ha	63,4	64,3
of which: technical varieties	54,4	54,9
table varieties	9,0	9,4
II.Surface of vineyards with harvest, total, thousand ha	62,4	62,1
of which: technical varieties	53,5	53,3
table varieties	8,9	8,8
III Share in the total surface, %:		
of technical varieties	85,8	85,3
of table varieties	14,2	14,7
IV Share of surface with harvest – in the total, %	98,5	96,5
of which: technical varieties	98,5	97,1
table varieties	98,8	93,2

Source: Calculations made by the author [4]

The data from Table 6 show that farms with land surface up to 10 ha had an increase of vineyard area in average for 2009-2011 in comparison with the period 2006-2008 with 0.9 thousand hectares, or by 1.4 %, while in

2011 it recorded the lowest value throughout the considered period. Technical varieties occupy in the structure of vineyards a share as large as in agricultural enterprises and supports minor changes over the years 2006-2011. Surface of table varieties as a whole represent a non-substantial growth, with 0,3 thousand ha (or with 4.4%), increasing the share in the structure of vineyards by 0.6 pp. Share of vineyards with harvest, as a whole, is very high and is reduced in the second period related to the first by 2.0 pp. Decrease of this share in technical varieties is only 1.4 pp and 5.6 pp at table varieties.

Table 7. Qualitative characteristic of the vineyard surface in rural households from the Republic of Moldova

Indicators	Average for the period	
	First period 2006-2008	Second period 2009-2011
I Surface of vineyards, total, thousand ha	42,4	42,8
of which: technical varieties	37,6	37,9
table varieties	4,8	4,9
II Surface of vineyards with harvest, total, thousand ha	40,2	40,2
of which: technical varieties	35,9	35,9
table varieties	4,3	4,3
III Share in the total surface, %:		
of technical varieties	88,7	88,6
of table varieties	11,3	11,4
IV Share of surface with harvest – in the total, %		
of which: technical varieties	95,2	94,6
table varieties	90,9	89,0

Source: Calculations made by the author [4]

Based on the data presented in Table 7, we can mention that the surface of vineyards in the category of small producers – rural households increased with 2.7 thousand ha or by 6.7% in 2011 compared to 2006. At vineyards of technical varieties this increase made 2,3 thousand ha (6.4) and at table varieties 0,4 thousand ha (8.9%). The structure of vineyards in the period under review has not registered substantial changes: the share of technical varieties and table grapes remains basically at the same level. All this can be said about the share of surface with harvest and the entire vineyard surface as a whole in households, and both on groups of varieties. The exception is 2006, where the share of vineyards with harvest is higher than in other years with 3.0 to 3.5%.

Generalizing the analysis from Tables 5,6,7 we conclude that the crisis from the period 2006-2008 caused the reduction of potential in the wine sector within the agricultural enterprises. Farms, as a whole, have registered an increase and households have not changed significantly.

Development trends in viticulture's potential have reflected on the grape production.

Table 8. Evolution of grape production in the Republic of Moldova and the structure of production under the aspect of categories of producers

Indicators	Average for the period	
	First period 2006-2008	Second period 2009-2011
Global production of grapes, thousand tonnes	566,5	587,2
Share in the global production, %:		
a) agricultural enterprises	20,8	19,3
b) farms with the surface between 10-50 ha	0,9	06
c) Small producers: farms with the surface up to 10 ha	43,8	37,2
d) rural households	34,5	42,8

Source: Calculations made by the author [4 and 2]

From data of Table 8 there is observed that global production of grapes in the post-crisis period (2009-2011) increased by 3.7%. Examining the structure of grape production, it can be noted that rural households produce about a fifth of the country's total grape production. In the first period, the share of agricultural enterprises records a steady increase, in the second period, it decreases sharply in 2010 and 2011 and returns to the level from 2008.

Small producers provide 78.3% in the first period and 80% in the second period of grape production in the country. Farms with the surface up to 10 hectares of land had a higher weight in 2006-2008 than the rural households. But in 2009-2011, the share of households shrines stable and in this period, the leading position in the global production of grapes is occupied by the rural household category, which gradually increased from 35% in 2006 to 43.8% in 2011.

There is interesting the efficiency of grapes production that will be examined on the types

of producers just according to the indicator yield per ha, in quintals.

Table 9. Dynamics of average yield of grapes per hectare in terms of categories of producers, quintals

	Average for the period	
	First period 2006-2008	Second period 2009-2011
Total in the Republic of Moldova	39,1	42,9
Agricultural enterprises	30,8	35,2
farms with the surface between 10-50 ha	30,3	25,6
Small producers: farms with the surface up to 10 ha	39,8	35,2
rural households	48,6	62,6

Source: Calculations made by the author [4 și 2]

Data from Table 9 show that the economic efficiency of the surface of vineyards in the second period increased overall in the Republic of Moldova, including in agricultural enterprises and households. Average harvest of grapes per hectare increased in the country with almost 10%, in agricultural enterprises with 11.40% and in rural households with 29%. Also farms with the surface of lands up to 10 hectares experienced a decrease in average yield per hectare almost with 12%, and farms with 10-50 hectares of land decreased their efficiency by 16%.

The best results on average harvest per hectare are obtained by households. This category of small producers in each of the years from the examined period registered the maximum yield. The average yield in households is greater than in the whole country with 24% in the first period, and with 46% in the second period. In dynamics, the yields of grapes per hectare increased in the rural households by 56% in 2011 compared to 2006.

Grape production efficiency is characterized not only by the average yield per hectare. Production obtained is to be marketed and to provide the manufacturer with a certain profit and expected return.

Due to the lack of objective information on costs and sales income per category of households (farms) and rural households is not possible to examine such indicators as unit

cost, unit profit, production cost, the unit price at these types of producers. Indicators of economic efficiency of production and marketing of grapes will be considered under the category of agricultural enterprises.

Table 10. Indicators of economic efficiency of grapes in agricultural enterprises from the Republic of Moldova

Indicators	Average for the period			
	2000-2002	2003-2005	2006-2008	2009-2011
Yield per ha, quintals	37,64	39,39	30,78	35,15
Cost of 1 quintal of sold grapes, MDL	118,38	180,76	225,73	221,25
Average price for sale of 1 quintal, MDL	169,97	271,90	260,77	260,92
Calculated profit, MDL: a) 1 quintal of sold grapes	51,59	91,14	35,04	39,67
b) 1ha from which grapes were sold	1941,64	3590,17	1078,67	1394,28
Level of profitability, %	43,57	50,42	15,52	17,93

Source: calculated by the author on the basis of „Specialized forms on the activity of agricultural enterprises for the period 2000-2011”

Economic efficiency of grapes production in agricultural enterprises was growing up during the crisis of wine in the Republic of Moldova. Although the cost of one quintal of grape sold in 2003-2005 increased by 52.7% from 2000 to 2002, the average selling price increased by 60%, which resulted in obtaining a profit per quintal with 76.7% higher and the increase of profitability by 6.85 pp. During the crisis period (2006-2008) a substantial decrease in all grape production efficiency indicators has taken place: productivity of surface with harvest decreased compared to the previous period by 22% and the cost of a grape quintal increased by 24.9 %. These negative changes caused a decrease in profit per quintal 2.6 times and decreased the profitability by 34.9 pp. In the post-crisis period (2009-2011) harvest per hectare increased by 14.2% in comparison with the average from 2006-2008, the cost per 1 quintal of grapes fell slightly (2%) and the average selling price remained at the level of the previous period. These non-essential

changes have led to the growth of profit per 1 quintal with 13.2% and of profitability by 2.41 pp. However, in 2009-2011 economic efficiency indicators of grape production remains at a low level compared to the years before the crisis.

Although the territory of the Republic of Moldova is not so great, however, soil and climate conditions for growing grapes differ in developing regions: North, Chisinau, Central, South, Gagauzia. Respectively, the economic efficiency of grape production will be specific for each region of development.

Table 11. Economic efficiency of grapes in the Republic of Moldova in terms of development regions

Indicators of development regions	Average for the period			
	2000-2002	2003-2005	2006-2008	2009-2011
1. Productivity of vineyards with harvest, quintal per ha, Chisinau	56,02	63,22	53,89	58,47
North	19,58	23,74	21,28	19,67
Centre	36,40	38,64	29,52	32,18
South	39,16	39,18	31,97	33,98
Gagauzia	36,24	39,01	24,02	25,42
2. Cost of 1 quintal of sold grapes, MDL, Chisinau	102,0	150,42	206,63	202,30
North	122,41	158,11	242,28	250,50
Centre	111,30	178,70	219,32	226,99
South	123,24	185,13	226,86	228,53
Gagauzia	117,86	181,19	242,14	218,63
3. Average price of sale of 1 quintal of grapes, MDL Chisinau	164,53	202,89	223,18	228,41
North	127,98	200,22	216,60	280,64
Centre	151,91	242,21	235,03	230,67
South	179,87	289,29	285,73	295,80
Gagauzia	170,55	282,49	254,02	234,80
4. Profit per 1 quintal of sold grapes, MDL Chisinau	62,53	52,47	16,55	26,11
North	5,97	42,11	25,68	30,14
Centre	40,61	63,51	15,71	3,68
South	56,63	104,16	58,87	67,27
Gagauzia	52,69	101,30	11,80	16,17
Level of profitability, % Chisinau	61,30	34,88	8,01	12,91
North	4,55	26,63	10,60	12,03
Centre	36,49	35,54	7,16	1,62
South	45,95	56,26	25,95	29,44
Gagauzia	44,71	55,91	4,91	7,40

Source: calculated by the author on the basis of „Specialized forms on the activity of agricultural enterprises for the period 2000-2011”

Comparative analysis of grape production efficiency in developing regions allows us to make the following conclusions:

- The lowest economic efficiency of grapes is present within the companies from the Northern development region. During 2000-2008 all indicators of economic efficiency of grapes record low values. In average for the period 2006-2008, the grape production in this region was unprofitable.

- Chisinau region is a leader in productivity of vineyards with harvest. Here are obtained per hectare from 2.5 to 3.5 more production than in the North, with 1.5 to 2.3 times more than in the Centre, South and Gagauzia. Respectively in Chisinau there is the lowest level recorded at cost per quintal. But the average selling price gives up to this indicator from Central region, South and Gagauzia. Calculated profit on a quintal of grapes was the greatest in the period 2000-2002 and in subsequent periods decreased sharply, continuing a lower value in 2009-2011 almost 2.5 times compared to 2000-2002. The same trend is observed in the evolution of profitability. Here the difference between the average of the years 2009-2010 and 2000-2002 being 48.39 pp.

Although in the Central development region conditions for growing vines practically do not differ from the Chisinau area, there is an very weak economic efficiency in the production of grapes. Productivity of vineyards with harvest and the cost of 1 quintal of grapes is 6.1 to 18.8% higher than in Chisinau area. Trading price of 1 quintal of grapes is also above its level in the years 2003-2011 in the Chisinau area, but the growth rate of selling price is much lower than the growth rate of cost per 1 quintal. This situation has caused a low level of profit per 1 quintal of sold grapes, especially during the period 2009-2011. Grape production profitability during the crisis and post-crisis period is very low. Grape production efficiency in the Central development region is very small in the last two examined periods. In development regions South and Gagauzia situation is diverse, although both are in the southern part of the country. Economic efficiency indicators of production of grapes have evolved diverse. Thus, the average yield per hectare of vineyard with harvest ranks the

second place, being lower than the Chisinau region. The cost of 1 quintal is also greater than in the central areas and increased in the fourth period in comparison with the first with 85.4%. But the sales price of grapes in the South area is more expensive than in Chisinau and Centre with 30-40%. South region is on the first place according to the amount of profit on 1 quintal of sold grapes and also according to the profitability of grapes. Also, we note that the values of grapes profitability in the period between 2006-2011 are 1.5 to 2.1 times lower than in 2000-2005.

In the Gagauzia region, economic efficiency of grapes in 2000-2005 was close to its level in the South area. But in the period 2006-2011 there has been a substantial decrease in productivity of vines with harvest, it decreased in comparison to 2000-2005 with almost 30%. Cost of 1 quintal increased in average by 54% and although the average selling price increased by 8%, profit on a quintal of sold grapes decreased 4 times in comparison with the period 2000-2002 and 6-7 times from the period 2003 - 2005, accounting for one of the lowest values in agricultural enterprises from the Republic of Moldova.

Table 12. Production of grape vine cuttings in agricultural enterprises from the Republic of Moldova, thousand pieces.

Indicators	Average for the period			
	I 2000- 2002	II 2003- 2005	III 2006- 2008	IV 2009- 2011
Total in the Republic of Moldova	2303	5440	6358	3918
Regions of development: Chisinau	434	1857	3125	961
North	60	24	-	117
Centre	686	1613	1387	2174
South	975	1777	1716	636
Gagauzia	148	169	130	30

Source: calculated by the author on the basis of „Specialized forms on the activity of agricultural enterprises for the period 2000-2011”

All these factors have resulted in an exceptional low level of the level of profitability of production and marketing of grapes in the development region of Gagauzia.

Viticulture's development depends to a large extent on the situation from the wine sector.

Vine cuttings production was increasing during the period 2000-2008. During the third period, vine cutting were produced 2.7 times more than in the first period in the Republic of Moldova, but the crisis has caused the decrease in wine production in 2009-2011 to 1.6 times compared to period 2006-2008. Vine cuttings production structure in terms of development regions in recent years shows that in the last period 55% are produced in the Central region, 24% in Chisinau and 16% in the South, while in the first and third periods, South occupies the leading position, followed by Centre, Chisinau and Gagauzia.

Overall, vine cuttings were produced in all categories of agricultural enterprises from the Republic of Moldova: in 2007 - 7100 thousand pieces; in 2008 - 3600 thousand pieces; in 2009 - 6900 thousand pieces; in 2010 - 3400 thousand pieces; in 2011 - 4900 thousand pieces. Moldovan viticulture aims at planting seedling vineyards with no viruses. The share of seedlings without viruses in 2006-2009 made up 81-91%, in 2010 - 66%, in 2011 - 41% (at technical varieties). Decrease of this share is explained by the fact that the state does not provide sufficient financial resources to clean the planting material.

Currently, there are over 60 agricultural enterprises in the breeding ground licensed to produce seedlings, of which only about 30 are still operating. The total area of rootstock vineyards amounted to 740 hectares, including only 40 hectares from the "basic" category. Rootstock vineyard area accounts for about 930 hectares, 20 hectares from the "basic" category. In order to produce qualitative seedlings, it is necessary to increase these surfaces.

The state subsidizes the vine plantations as follows:

- a) table grape varieties – 30 thousand MDL per hectare.
- b) wine grape varieties - 25 thousand MDL per hectare.



c) Plantations - stock and rootstock mother, biological category "basic" - 50 thousand MDL per hectare [5]

However, given the high potential of viticulture farms have planted new vineyards, making more investment in the renewal of the surface.

Table 13. Investments of agricultural enterprises in planting of vineyards in the Republic of Moldova

Indicators	Average for the periods			
	I 2000- 2002	II 2003- 2005	III 2006- 2008	IV 2009- 2011
1.Surface of planted vineyards, ha Total in the Republic of Moldova	1356	2232	5175	4199
Regions of development: Chisinau	165	482	1386	672
North	10	59	40	66
Centre	289	390	1076	1058
South	725	993	2163	1843
Gagauzia	167	313	510	560
2.Expenditures for planting vineyards, thousand MDL Total in the Republic of Moldova	9163	33417	86128	64225
Regions of development: Chisinau	2206	10454	26425	16602
North	31	231	647	747
Centre	2159	4885	20167	19560
South	4000	14200	31823	21988
Gagauzia	767	3647	7066	5328
3. Expenditures for planting vineyards per 1 ha, MDL Total in the Republic of Moldova	6757	14972	16643	15295
Regions of development: Chisinau	13369	21689	19066	24705
North	3100	4278	16175	11318
Centre	7470	12526	18743	18487
South	5517	14300	14712	11930
Gagauzia	4593	11652	13854	9514

Source: calculated by the author on the basis of „Specialized forms on the activity of agricultural enterprises for the period 2000-2011”

Analyzing data on planting new vineyards, we can mention that during 2000-2011, 38886 ha were planted within the agricultural enterprises.

The data from table show that the annual average area of planted vineyards is the maximum in the third period (of crisis) and is followed by the fourth period (post-crisis). According to the Agency for Payments and Intervention in Agriculture data, table varieties are the overwhelming part of the plantings. The largest share of new vineyards plantations is hold by the agricultural

enterprises from the South development region (in the first period - 53.5%; in the second period - 44.5%; in the third period - 41.8% and in the fourth period - 43.8%). The same trend persists in the structure of investment on development regions. Draws attention the fact that there have been increased investments per hectare of planted vineyards: in total, in agricultural enterprises from the Republic of Moldova they increased 2.3 times from the fourth to the first period. On development regions this increase differs: in the North, whose share in planting vineyards is insignificant - 3.6 times; in the Centre - 1.8 times; in the South - 2.5 times and in Gagauzia - 2.1 times.

## CONCLUSIONS

National strategy for Sustainable Development of the agro industrial complex of the Republic of Moldova (2008-2015) states that modernization of the agricultural sector and modernization of production capacity of the agi-food complex can be made only on the basis of substantial investments, whose total necessary updated number, in accordance with some preliminary estimates, exceeds sum of 4.0 billion EUR. In the agro-industrial complex, an important place is occupied by the wine sector, which has a high potential to solve many social and economic problems such as rational use of human resources, particularly in rural areas, increase of competitive products exports (alcoholic beverages, fresh table grapes varieties, juices, grape seed oil, etc.) assurance of revenue for people employed in the sector and for companies that grow and manufacture vine, payments to the state budget following the successful economic activities. Moldova's viticulture deserves a special attention in terms of the made investments, as the mentioned problems will be solved more successfully in case if this branch provides the necessary production quantities and of a high quality. Investment activity in the wine sector must necessarily include viticulture. However, investment activity in any other branch starts from the retrospective analysis of the object

that has to be the receiver of investment resources for development.

Viticulture from the Republic of Moldova has a good potential for development, but at the moment it is not fully realized. Economic efficiency of grapes production is quite small. A major part of the vineyards are in possession of small producers, although they are characterized with higher efficiency, yet they do not have sufficient financial resources. Viticulture needs investments as in planting of new vineyards, both in conducting various technological operations of vineyards care. And in this regard, parcelling of the vineyard area which takes place at small producers is an obstacle that hinders investment promotion. Agricultural enterprises in recent years increase the surface of planted vineyards and in particular of table grapes. Planting costs per hectare are also increasing: their value in the last six years has reached 1,000 EUR.

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## THE NEED OF DEVELOPING THE INVESTMENT OF WINE-MAKING IN THE REPUBLIC OF MOLDOVA IN ORDER TO ENTER THE EUROPEAN MARKET

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### *Abstract*

*Wine-making in the Republic of Moldova is an industrial sector with high growth potential. But in recent years the sector has undergone drastic changes. In order to harness the potential of the wine-making we need to invest in improving the quality of wine products, to develop new products, to enter new markets. In order to achieve these objectives in the country it is developed the restructuring program of the wine sector with financial support of the European Investment Bank.*

*Key words:* evolution, milk production, NW Region, Romania, trends

### INTRODUCTION

The wine-making sector has a special importance for the Republic of Moldova since it may be characterized by a rather high potential. Products from this sector may be competitive and may assure substantial incomes for the public budget and contribute to economic stability in the country. At the same time, development of the wine-making sector provides work places in the rural localities, this being extremely important for the Republic of Moldova, from the social point of view. Operation of wineries brings incomes as a result of grapes processing and commercialization of alcoholic beverages and other foodstuffs. Still, for the last ten years, some problems have appeared in the wine-making sector and their settlement needs great investments into development of all component parts of this sector. These problems include:

- natural risks and limited possibilities to reduce them through application of high-performance technologies and appeal for the insurance companies' services;
- insufficient information base of producers in viticulture and wine-making. There is no

register of viticulture areas in the Republic of Moldova but in the Wineries Register, there are only enterprises having a license for alcoholic beverages production and commercialization. That's why in the Republic of Moldova, where the wine-making sector is considered a strategic one, there are no exact data on vineyards situation and activity of enterprises-producers from the wine-making sector;

- licensing of wine-making production in the existent mode throws back development of the wine-making sector since licensing puts forward certain requirements, realizations of which needs great investments. License value is rather high for small producers. The procedure of grapes planting projection is also rather expensive.

All these and many other problems, as well as the ways of their settlement, should be reflected in a Policy of wine-making sector development that has not been elaborated yet, at the present stage.

### MATERIALS AND METHODS

To examine the situation in the wine-making sector of the Republic of Moldova, there has

been analyzed production of alcoholic beverages, their share in the country export, and number of wine-making enterprises in the Republic of Moldova, including production of green wines at the agricultural enterprises.

The analysis has been carried out for four periods, each of them making 3 years. There have been calculated average meanings for the pre-crisis period of the wine-making sector (period I – 2000-2002, period II – 2003-2005), crisis period (period III – 2006-2008), and post-crisis period (period IV – 2009-2011). For this purpose, data from the National Bureau of Statistics, Agency for Interventions and Payments in the Agriculture, and Ministry of Agriculture and Food Industry have been processed. There have been applied the methods of average values, comparison, monographic study, economic analysis, and synthesis.

## RESULTS AND DISCUSSIONS

The wine-making sector is a part of the agro-industrial complex in the Republic of Moldova. Agro-industrial complex plays an important role in the national economy.

From Table 1 one can observe that though the share of the agro-industrial complex in principal indicators had been decreasing within 2000-2011, it still remained rather big and made about a half a GDP of the country and of the total export value. The value of the agro-industrial complex products and export value had grown up in their average within 2009-2011 by the factor of 2-1 if compared with the average value of 2000-2002. The share of rural population had remained constant within the period examined.

In the agro-industrial complex structure, there is distinguished agriculture and foodstuffs and beverages industry, where production of alcoholic beverages had made 15.1% within period I, achieved the maximal value within 2003-2005 – 20.3% and slided to 8.2% in 2006-2011.

The fact that alcoholic beverages production had been growing in 2000-2005 gives evidence of interest of the business sphere in high potential of the wine-making sector.

Table 1. Place of the agro-industrial complex in the national economy of the Republic of Moldova

	Average annual value for the periods			
	I 2000- 2002	II 2003- 2005	III 2006- 2008	IV 2009- 2011
1. Gross domestic product, mln. lei	19209	32434	53677	71484
2. Total export, mln. US dollars	561.2	955.4	1327.2	1680.4
3. Total population, thousand people	3635.6	3608.6	3580.6	3562.8
4. Including rural one	2140.4	2129.4	2106.6	2085.7
5. Value of the products made in CAI, mln. lei	13990.4	21166.3	25076.4	30070.4
6. Export of the agro-industrial complex products, mln. US dollars	354.0	529.1	532.2	760.8
7. Share of the agro-industrial complex in the GDP, %	72.8	65.3	46.7	42.1
8. Share of the agro-industrial complex in the total export, %	63.1	55.3	40.1	45.2
9. Share of the rural population, %	58.9	59.0	58.8	58.5

Source: calculation of the author based on [7]

Table 2. Structure of the agro-industrial complex in the Republic of Moldova, %

	Average annual value for the periods			
	I 2000- 2002	II 2003- 2005	III 2006- 2008	IV 2009- 2011
I. Agriculture	60.3	54.9	57.2	61.3
II. Foodstuffs and beverages industry	36.0	42.9	41.2	36.5
of which:	0.8	3.3	2.1	1.7
- production of distilled alcoholic beverages				
- wine-making	14.3	17.0	8.2	6.5
III. Tobacco goods production	3.3	2.0	1.4	2.1
IV. Perfumery and cosmetic goods production	0.4	0.2	0.2	0.1
In total – agro-industrial complex	100	100	100	100

Source: calculation of the author based on [7]

But embargo introduced by the Russian Federation – principal market of alcoholic beverages commercialization – caused reduction of the wine-making share in the agro-industrial complex structure.

Table 3. Evolution of the number of enterprises from the agro-industrial complex industry in the Republic of Moldova

	Annual average value			
	I 2000- 2002	II 2003- 2005	III 2006- 2008	IV 2009- 2011
Agro-industrial complex industry, in total	350	320	1547	1508
of which: foodstuffs and beverages industry	336	307	1517	1488
- production of distilled alcoholic beverages	10	13	19	19
- wine-making	136	128	154	130
Share of the enterprises-producers of alcoholic beverages:	41.7	44.1	11.2	9.8
- the agro-industrial complex industry				
- in the foodstuffs and beverages industry	43.5	45.9	11.4	10.0

Source: calculations of the author based on [7]

During the period examined, the number of enterprises from the agro-industrial complex industry had substantially increased and the greatest part of them represents the foodstuffs and beverages industry. As for the wine-making sector, the average number of enterprises had grown up insignificantly within 2009-2011, in comparison to the average number of 2000-2002 (only by 2.1%). The biggest number of enterprises worked in the wine-making sector in 2006: 166 of them produced wine and 19 of them produced distilled alcoholic beverages. Still, during the crisis (2006-2008), the number of wineries had been decreasing step-by-step and by 2011, their amount had reached the number of 146. The modifications mentioned had provoked reduction of the wineries share in the agro-industrial complex industry from 43.5-45.9 in the years before the crisis (2000-2005) to 10 in the post-crisis period (2009-2011).

Analysis of the structure of the wine-making enterprises in the Republic of Moldova under aspect of the forms of ownership allows us drawing a conclusion that circa 2/4 of active enterprises are privately owned. The share of private enterprises had insignificantly decreased during 2009-2010 (by 2.8 p.p.) in comparison to 2006-2008. The share of the state ownership was practically at the same level. Its reduction in 2006-2008 is explained

only by the fact that 2 state enterprises were registered in 2008, in comparison to previous years.

Table 4. Structure of the enterprises having the principal type of activity "Wine-making", according to the forms of ownership, %

	Annual average value		
	I 2003- 2005	II 2006- 2008	III 2009- 2010
State ownership	2.2	1.8	2.0
Private ownership	75.4	76.6	73.8
Mixed ownership	3.8	2.9	2.0
Foreign ownership	2.2	2.3	4.0
Ownership of foreign joint-ventures	16.4	16.4	18.2
In total	100	100	100

Source: calculations of the author based on the data of the Statistical Yearbook [7]

Table 5. Structure of the enterprises having the principal type of activity "Wine-making", according to the organizational-legal forms

	Annual average value		
	I 2003-2005	II 2006-2008	III 2009-2010
Individual enterprises	0.3	0.2	-
Closed joint-stock companies	20.2	17.5	18.4
Opened joint-stock companies	29.3	30.7	28.7
Limited liability companies	48.5	50.0	51.3
Production cooperatives	0.3	0.6	0.7
State enterprises	0.2	1.0	0.9
In total	100	100	100

Source: calculations of the author based on the data of the National Bureau of Statistics

From the table data, it is observed that a half industrial enterprises from the wine-making sector of the Republic of Moldova work as a limited liability companies and their share in the total number had been growing during 2003-2011. A great part of enterprises work as joint-stock companies but their share had been reducing from 49.5% in average during 2003-2005 to 47.1% in average during 2009-2011. The share of other organizational-legal forms is insignificant and do not exceed 1.0%. Alcoholic beverages production shall be examined further.

The value of production indicators in the wine-making sector of the Republic of Moldova has absolutely decreased in all groups of products.

Table 6. Production of alcoholic beverages in the wine-making sector of the Republic of Moldova (mln. dal)

Groups of products	Annual average value for the periods			
	I 2000- 2002	II 2003- 2005	III 2006- 2008	IV 2009- 2011
Divin	565.5	887.6	588.8	494.3
Sparkling wines	537.7	909.3	505.0	581.3
Natural grape wines	13.6	29.5	15.7	12.2
Wines of Porto, Madeira, Sherry, Tokay, etc.	N/A	3051.6	1003.8	931.5

Source: calculations of the author based on the data of the Statistical Yearbook [7]

Maximal production indicators had been reached during 2003-2005. In 2005, there was produced: divin – 1189.8 mln. dal, sparkling wines – 402, natural grape wines – 36.3, wines of Porto, Madeira, Sherry, Tokay, etc. – 3237.9 mln. dal.

Although a great part of restrictions for export to the Russian Federation were annulled in 2008, not all producers recovered the market lost. That’s why, during 2009-2011, production in the group of divins and natural sparkling wines had been under the level of the annual average value in the first period.

Production of alcoholic beverages at the agricultural enterprises from the Republic of Moldova is of some interest. Pursuant to the statistical data, agricultural enterprises had produced green wine and grape wine.

Analysis of wine products at the agricultural enterprises shows that this category of economic entities produces more green wine that is to be sold to wineries; production of green wine at the agricultural enterprises had been growing up during the period before the crisis in the wine-making sector (i.e., 2000-2005).

During the crisis period (2006-2008), production of green wine at the agricultural enterprises had reduced by the factor of 4.2 in comparison to the second period. During post-crisis years (2009-2011), production of green wine had increased by 57.7% in comparison to the previous period but, if compared to the average value of 2003-2005, it was lower by the factor of 2.7.

Analysis of the structure of green wine production under the aspect of developing regions shows us that the leading position

within the first period had been held by the developing region of South (46.7%) followed by Center (40.7%).

Table 7. Production of green wine and grape wine at the agricultural enterprises from the Republic of Moldova, ths. Dal

Indicators	Annual average value			
	I 2000- 2002	II 2003- 2005	III 2006- 2008	IV 2009- 2011
1. Total production of green wine in the Republic of Moldova	1429.5	2684.2	634.1	1000.3
of which, developing regions are: Chisinau municipality	15.6	90.0	230.0	236.7
North	8.0	0.3	0.7	2.4
Center	582.0	1713.3	113.7	589.3
South	668.7	192.9	284.8	167.7
Autonomous Territorial Unit of Gagauzia	155.2	687.7	4.9	4.3
2. Total production of grape wine in the Republic of Moldova	3394	923.6	152.6	73.0
of which, developing regions are: Chisinau municipality	154.4	275.5	146.8	70.0
North	7.2	0.8	0.2	0.7
Center	80.5	500.1	0.2	0.2
South	83.9	31.1	5.3	2.1
Autonomous Territorial Unit of Gagauzia	13.9	116.2	0.1	-

Source: calculations of the author based on the “Specialized form sheets for activity of agricultural enterprises for 2000-2011”

Within the second period, the region of Center had had 63.8% and the Autonomous Territorial Unit of Gagauzia had had 25.6%. Within the third period, the region of South had been at the first place (44.9%) followed by Chisinau municipality – 36.3%.

Within the last period, the region of Center had produced 58.9% of green wine and Chisinau municipality – 23.6%.

As for production of grape wine, there had appeared a trend for growth within 2000-

2005, as well as in production of green wine. But, if average production of green wine had increased within 2003-2005 by the factor of 1.8 if compared to the average value of 2000-2002, production of grape wine had grown up by the factor of 2.7. Within the third (crisis) period, production of grape wine had reduced by the factor of 5.4 and had been continuing to reducing during the post-crisis years (2009-2010) and had constituted the lowest value from the whole period examined. Within the pre-crisis years (2000-2005), grape wine had been mostly produced in the central regions (45.5% – Chisinau municipality and 23.7% – Center within period I and, respectively, 30% and 54% within the second period). Within periods III and IV, 93-95% had been produced at the agricultural enterprises from Chisinau municipality.

Export of alcoholic beverages in the total export of the Republic of Moldova will be examined further.

Table 8. Position of alcoholic beverages in the total export of the Republic of Moldova

Indicators	Annual average value			
	I 2000- 2002	II 2003- 2005	III 2006- 2008	IV 2009- 2011
Total export, mln. US dollars	561.2	955.4	1327.2	1680.4
Export of alcoholic beverages, mln. US dollars	164.0	276.5	169.1	169.1
Share of alcoholic beverages in the total export, %	29.2	28.9	12.7	10.1

Source: calculations of the author based on the data of the Statistical Yearbook [7]

It is observed from the table data that the total export in the Republic of Moldova had been continuously growing and increased by the factor of circa 3 within the fourth period if compared to the first one. But the export of alcoholic beverages within the crisis (third) and post-crisis (fourth) period had been at the level of 2000-2002. Respectively, we have a permanent decrease of the share of alcoholic

beverages in the total export. In 2011, the value of the export of alcoholic beverages constituted 177.7 mln. US dollars but in 2005, the Republic of Moldova exported alcoholic beverages valuing to 313 mln. US dollars. In the CIS countries, in 2011, there were sold products by 4% less than in 2010 but in the EC countries, sales grew up by 16%. This growth made 30% in the quantitative values this meaning that the selling prices were lower than in 2010. The share of exports to the CIS countries constituted 77.6% in 2011 and it made 13.7% in the EC countries. In 2010, this correlation constituted 84.6% and 11.7%. Alcoholic beverages are exported to 52 countries. The leading position is held by the Russian Federation, Belarus, Ukraine, Kazakhstan, and Poland.

The trend for growth of alcoholic beverages export to the European market is a positive moment, although the Russian market is also very important for local wine-makers. It is necessary to make an accent on quality of alcoholic beverages produced of grapes, in order to increase sales in these markets. Realization of this problem needs substantial investments.

In our opinion, development of investment activity shall be oriented towards:

- Provision with raw materials of the enterprises that process grapes, as well as increase of efficiency of grapes products.
- Modernization of grapes processing technologies in the course of wine productions.

With regard to provision of the wine-making sector with high-quality raw materials, it should be mentioned that vineyards in the Republic of Moldova shall be renewed. At the present moment, circa 40% of wines are produced of European species (*Vitis vinifera*) and 60% are made of *Vitis labrusca* and direct hybrids of producers. The last species do not possess high-quality characteristics and products of *Vitis labrusca* are forbidden in Europe. During the last years, products of species of local and international grapes have been discussed. Nowadays, international species having priority in the Republic of Moldova are: Cabernet-Sauvignon, Merlot,

Shardoneu, and Sauvignon-blanc. But local wine-makers manifest interest to local specific and original species (Feteasca, royal Feteasca, Raza neagra – black ray, etc.). Wines made of these species may be presented to the international markets and form the image of original Moldavian wines.

The state contributes to renewal of vineyards through subventions in various proportions, depending on species characteristics.

In 2002, the “Program of Reestablishment and Development of Viticulture and Wine-Making in 2002-2020” was launched.

The Program mentioned (1) stipulates planting new vineyards by the end of this period over the area of 325 hectares. By 2010, planting 39.2 thousand ha had been foreseen. But in reality, by the end of 2010, the area of new vineyards had made 29.94, i.e. by 9.26 thousand ha or 24% less. Within 2002-2005, 10.58 thousand ha had been planted, i.e. the volume stipulated in the Program had been exceeded by 11.5% and within 2005-2010, 18.9 thousand ha had been set out, this hardly exceeding the half of the areas of new plantations stipulated in the Document, by 3.9 thousand ha.

The State granted financial aid, making partial subventions to vineyards planting, in order to stimulate economic agents to invest into implementation of the “Program of Reestablishment and Development of Viticulture and Wine-Making in 2002-2020”. [2]

For this purpose, there had been gathered monetary funds from entrepreneurs dealing with production, processing, commercialization and/or import of wine products, on the basis of taxes stipulated in Law on Vineyards and Wine no.57-XVI of March, the 10<sup>th</sup>, 2006: grape wines (natural and special ones) – 3.0 lei/dal; divins – 20.0 lei/dal; brandy and other grape beverages – 20.0 lei/dal. The state partially subsidized planting those 18.7 thousand ha of grape vine from sources collected in such a way. [1]

Since 2010, a special fund of subventions for agricultural producers has been formed in the State Budget, this fund foreseeing concrete measures for stimulation of investments into

certain spheres, including creation of multiyear plantations, as well.

Table 9. Allocation of state subventions for setting out vineyards within 2004-2009

	2004	2005	2006	2007	2008	2009	Total
Area presented for compensations	3.7	3.9	3.3	2.9	2.8	2.1	18.7
Accepted sum of compensations, mln. lei	86.7	87.4	83.8	71.7	71.5	50.6	451.7
Savings in the Fund, mln. lei	26.6	82.1	34.9	39.7	43.3	29.9	256.5
Allocated sum of compensations for planting, mln. lei	26.4	79.9	58.5	100.7	85.3	50.5	401.1

Source: data of the Ministry of Agriculture and Food Industry [8]

Table 10. Amount of financial aid for creation of vineyards

Destination	2010 (3)	2011 (4)	2012 (5)
1. Table grapes	30000 lei/ha	30000/ha	30000/ha
2. Wine grapes	-	20000/ha	25000/ha
3. Source and rootstock plantations, biological category “Base”	40000/ha	50000/ha	50000/ha

Source: Regulations Regarding the Way of Use of the Assets from the Fund of Subventions for Agricultural Producers, for 2010, 2011, 2012 [3; 4; 5]

Pursuant to the data of the Agency for Intervention and Payments for Agriculture, in 2010, 496.37 ha of grape vine were planted and the sum of subvention paid constituted 12.7 mln. lei. In 2011, the area of vineyards (table grapes) reached 511.7 ha; the area of technical grapes reached 41 ha and the sum of subvention granted made 16.5 mln. lei. In 2012, 991 ha were set out and the sum of subvention granted constituted 16.2 mln. lei. [9]

Subventions granted by the state for creation of vineyards cover only 13% of total investments.

As for modernization of grapes processing technologies for wine making, it should be mentioned that, although many enterprises have already implemented modern equipment and facilities, at the same time, many enterprises need modern technological lines for wine bottling. Some enterprises do not



have such lines, others have old lines. There is a necessity for renewal of grapes processing lines and of refrigerating installations. Wineries do not have equipment for used water treatment since, in the opinion of the wineries' managers, such equipment does not have an influence on wine quality and there are other priorities in investment of financial resources. Besides this, local wine-making is distinguished by the fact that many necessary resources are purchased in other countries and this is reflected in the acquisition prices and later – in prices for commercialization of products yielded.

Wine-making in the Republic of Moldova shall be modernized and settlement of this problem needs considerable investments. To grant a financial aid, the European Investment concluded a contract with the Government of the Republic of Moldova for a loan amounting to 75 mln. Euros designated for realization of the "Program of Wine-Making Sector Restructuring" (PWMSR).

The goal of the Program is to contribute to reforming of the country's wine-making sector and to promote production of wine with a protected origin name (PON) and protected geographical indication (PGI).

The objectives of the Program are:

- Restructuring of the wine-making sector and related industry (production of packages, labels, etc.);
  - Improvement of quality and consistence of wine produced in the Republic of Moldova, from the vineyards quality to final packing and products supply;
  - Diversification of the country's markets of commercialization through assurance of authenticity of the wine products yielded.
- The financial products of the Program offered to the Final Users are:
- Credits granted through intermediary of the Commercial Partner Banks;
  - Leasing of wine-making equipment and production facilities realized by the Consolidated Union for Implementation and Monitoring of the Program of Wine-Making Sector Restructuring;
  - Financial guarantees granted by the CUIM PWMSR;

- Investments into the shareholders' capital realized by the CUIM PWMSR.

The Program has been implemented and monitored through intermediary of the Consolidated Union for Implementation and Monitoring of the Program of Wine-Making Sector Restructuring (CUIM PWMSR). Crediting from the EIB sources is being carried out with the help of Commercial Partner Banks that assume all financing risks and are controlled by the Director of the Crediting Line within the framework of the Ministry of Finances.

Economic agents with any organizational-legal form shall be considered eligible users if:

- they are registered in conformity with the legislation in effect of the Republic of Moldova and possess all necessary authorizations allowing realization of economic activity;
- they maintain accounting records, draft and present standard financial reports in due time;
- their activity is based on the private ownership or public ownership;

The eligible users shall be classified according to the following groups:

- grapes processors (possess grape vine/technical grapes plantations and produce grapes, technical species of grapes, raw materials and unbottled wine);
- wineries (primary processing of grapes and production of unbottled wine);
- wineries (wine treatment – raw material and bottling);
- wineries with the with complete production cycle;
- viticultural enterprises (possess grape vine/technical grapes plantations and produce grapes and raw materials);
- greenhouse enterprises (producers of viticultural plantlings);
- enterprises from related sectors (producers of packages for wine bottling, labels, corks, etc.)

The users that contribute to processing of wine with the protected geographical indications (PGI) and/or protected origin name (PON) shall present the proofs confirming that they respect the quality

standards in the course of production of wine with PGI, regulated by the Association of Producers of Wines with PGI.

To be considered eligible, the grapes processors and viticultural enterprises shall possess or obtain the status of member of the Regional Association of Producers of Wines with PGI (RGPW with PGI) before obtaining a credit.

The viticultural enterprises producing technical grapes shall conform to the technological requirements for grapes production in accordance with the "Task Book of the "Regional Association of Producers of Wines with PGI", referring to production of wines with the protected geographical indications.

Eligible activities shall be also considered those ones related to:

- reuse and renewal of the equipment from the existent wine-making enterprises and those ones from related industries;

- enhancement of activities of the existent enterprises through mounting the bottling lines; creation/renewal of the quality control laboratories;

- research and development (that may include commission fees, development costs and gross salaries that are directly associated with components of research, development, and innovation of activity);

- creation of distribution networks in the domestic and foreign markets, except for the CIS markets (acquisition of goods and/or trade marks, operational costs and human resources costs);

- acquisition of licenses, shares, production and other rights granted by the public entities;

- creation of small enterprises in the rural zones (such as a wine cellar, chateau);

- other types of activity contributing to development of the wine-making sector.

The Program offers the following conditions of financing:

1) 50% of the project sum shall be financed from the EIB sources, the other 50% shall be financed from own sources, from bank credits, loans from financial non-banking institutions and grants obtained from donors.

2) Financing terms shall make up to 10 for the EIB sources and up to 4 for other sources.

3) The interest rate for a user shall not exceed 6.01%.

4) The maximal sum of financing from the EIB sources, for an Investment Project, shall make 5 mln. euros for enterprise reequipping, 2 mln. euros for vineyards restructuring, 600 thousand euros for financing medium- and long-term current assets. 25 thousand euros shall constitute a minimal sum for any viticultural activity.

The principal advantages of the Program are:

- Long terms of crediting;
- Big grace period;
- Big investment sums allocated for implementation of a project;
- Exemption of all customs taxes and excise duties, VAT on import of equipment/services that will be purchased in conformity with the investment project accepted within the program framework;
- Application of zero rate of VAT on purchase, in the country territory, of goods, equipment, facilities/services from local suppliers, necessary for implementation of the investment project. [11]

## CONCLUSIONS

The wine-making sector has high growth and development potential. Development of the wine-making sector needs significant investments. State subventions stimulate investments into planting new vineyards. There are new possibilities of crediting for sector development through intermediary of the Program of Wine-Making Sector Restructuring.

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[10][www.MAIA.md](http://www.MAIA.md).

[11]<http://winemoldova.md>, <http://mf.gov.md>



## EFFECTS OF TOURISM ON THE ROMANIAN ECONOMY

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### *Abstract*

*Over the past six decades, tourism has experienced continued growth and diversification to become one of the largest and fastest growing economic sectors in the world. Over time, more and more destinations have opened up and invested in tourism development, turning modern tourism into a key driver for socioeconomic progress. According to the European Union's Statistic Office, the global economic crisis has affected the tourism in Romania. The purpose of this research is to evaluate the economic impact of tourism in the case of Romania, focusing on the effects of Travel & Tourism on the economic impact with the next key factors: Gross domestic product, direct and total contribution; employment, direct and total contribution; by visitor exports and investment, for the year 2012, with estimates and forecast for the years 2013 till 2023.*

**Key words:** *employment, GDP, Travel & Tourism, visitor export*

### INTRODUCTION

Romania has a real touristic potential to practice all forms of tourism existing in the world, at this time. Thanks to, first, his relief well diversified and the climatic conditions, many forms of expression can become real tourist travel brands in Romania. It remains only to improve other factors like: economic, ethnic, socio-political, which have a direct impact on the human condition.

In the monumental work "Encyclopedia of Romania", published in 4 volumes in Bucharest, in 1943, by the National Printing Office in Volume 4, Chapter "Tourism in Romania", Valeriu Puscariu considers grazing and carriage (*păstoritul* and *cărăușia*) "are ancient forms of Romanian tourism"(p. 195).

In a famous work, "The Shorter Oxford English, Dictionary" published in 1950, tourism is defined as "...theory and practice of field trips, the trip being for pleasure" and the tourist as "... the one who makes one or more tours, especially the one who does this for recreation; the one who travels for pleasure or for cultural purposes, visiting different interesting places for their objectives, landscape or others alike."

With her natural resources it holds, biodiversity of flora and fauna unique in Europe, Romania is among the countries with the most diversified tourism products. It is still a largely agricultural country, with a generous rural area, offering wonderful scenery and opportunities for rural tourism development.

In Romania there is a third of Europe's natural springs and 117 localities that have natural therapeutic factors, the most important being water and mud. Cultural heritage is remembered that our country is held, with 30 monuments included in the UNESCO World Heritage list, including wooden churches of Maramures, painted churches of Moldavia and dacian fortresses from Orăștie Mountains. Also in cultural heritage are recorded over 6,600 nationally important monuments and 670 museums. Are just some of the attractions of Romania, which may play an important role in the Romanian economy by attracting foreign tourists (Figure 1).

Travel & Tourism can be a catalyst for improving livelihoods throughout the country and has been identified as a hub in the National Development Plan for the period 2007-2013.

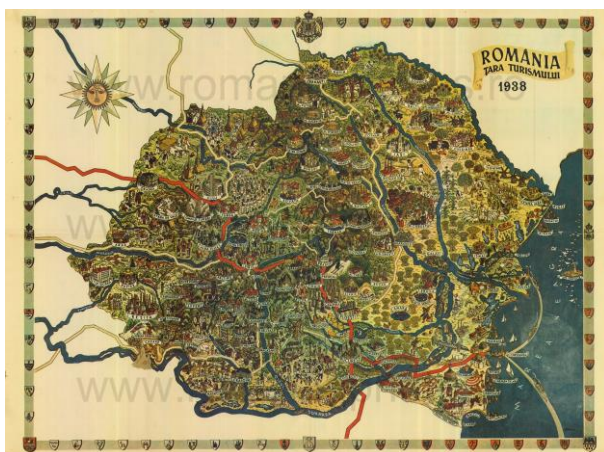


Figure 1. Romanian tourism map in 1938

Travel & Tourism can be a catalyst for improving livelihoods throughout the country and has been identified as a hub in the National Development Plan for the period 2007-2013.

This recognition of the potential contribution of the tourism industry, is a step in the right direction, although there is still a lack of awareness of Travel & Tourism's (T&T) economic value and potential of travel and tourism segment among all levels (government and population).

## MATERIALS AND METHODS

To measure the economic effects of tourism, on the Romanian economy, we used the World Travel & Tourism Council (WTTC) key factors: direct contribution to GDP, direct contribution to employment, total contribution to GDP, total contribution to employment, visitor exports and investment, for the year 2012 and forecast for 2013 and a long term forecast for the next ten years also, 2013-2023.

## RESULTS AND DISCUSSIONS

Today, tourism is one of the largest industries in the world. The question is: why so many developed and less developed countries make huge efforts to develop tourism and why so many regions and cities struggle to provide facilities to attract visitors from home and abroad?

The answer is very simple, since tourism has a great potential to bring prosperity and wealth, creating a high added value.

For many developing countries tourism is one of the main sources of foreign exchange income and the number one export category, creating much needed employment and opportunities for development.

Travel & Tourism has an inherent capacity to diversify the Romanian economy, stimulating entrepreneurship, especially SME's, to catalyze investment, creating large numbers of sustainable jobs and by helping social development in the local communities.

In general, both sectors, government and private, are opened to tourism development.

Researchers and academics on the one hand, but also the tourism operators support the idea that tourism is a tool for economic growth.

According to the Statistic Office of European Union, the global economic crisis affected Romania as well, which doesn't have a stable market economy, the economy is based on consumption and credits.

The direct contribution of Travel & Tourism to GDP was 9 billion RON corresponding to 1.5% of total GDP for the year 2012.

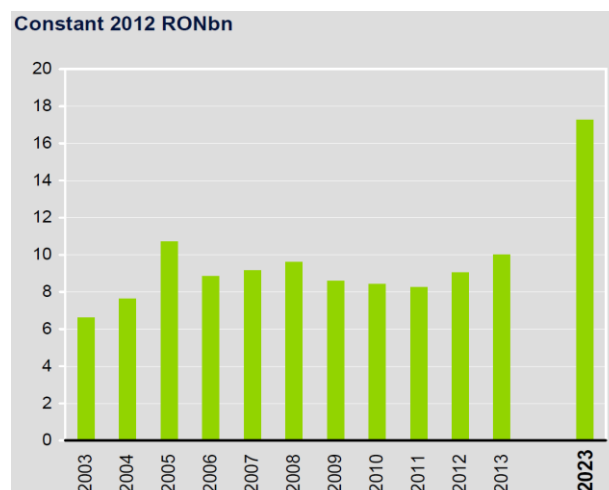


Figure 3. Country rankings: Absolute contribution, 2012, Travel & Tourism Total Contribution to GDP

Direct contribution to GDP = GDP generated by industries that deal directly with tourists, including hotels, travel agents, airlines and other passenger transport services, as well as the activities of restaurant and leisure industries that deal directly with tourists.

It is forecast to rise by 10.6% in 2013, and to rise more, by 5.6% every year, from 2013 to 2023, reaching 17.3 billion RON in 2012, in constant 2012 prices (Figure 2).

In the year 2012, the total contribution on T&T to GDP was 30.5 billion RON (5.1% of GDP), ranking Romania on the position 62 out of a total of 184 countries worldwide, with 8.8 USD billion dollars, in absolute contribution (Figure 3).

Travel & Tourism's Total Contribution to GDP	2012 (US\$bn)
5 Italy	206.9
<b>World Average</b>	<b>52.3</b>
21 Austria	50.8
27 Greece	38.9
49 Czech Republic	17.1
53 Hungary	13.8
54 Croatia	13.8
<b>62 Romania</b>	<b>8.8</b>
66 Bulgaria	6.9
73 Slovakia	5.4
99 Albania	2.7

Figure 3. Country rankings: Absolute contribution, 2012, Travel & Tourism Total Contribution to GDP

Total contribution to GDP = GDP generated directly by the Travel&Tourism industry plus its indirect and induced impacts.

Related to relative contribution, the total contribution of T&T to GDP placed Romania, with 5.1% of GDP on the position 155. The Country rankings: real growth for 2013, placed Romania on the position 76, with 4.3% growth and the forecast is to rise by 5.8% pa to 56.1 billion RON in 2023, moving Romania on the position 30 (Figure 4).

T&T directly supported in 2012, 193.000 jobs, representing 2.3% of total employment. It is expecting to rise by 7.3% for 2013 and by 0.7% every year to 223.000 jobs (2.8% of total employment) in 2023 (Figure 5).

In 2012, the total contribution of T&T to employment, including jobs indirectly supported by the industry reached 479.000 jobs of total employment (5.7%). The forecast is to rise by 3.1% in 2013 (494.000 jobs) and to rise by 1.1% pa, reaching 551.000 jobs in 2023, representing 6.8% of total employment.

Travel & Tourism's Total Contribution to GDP	2013 - 2023 % growth pa
26 Croatia	5.9
<b>30 Romania</b>	<b>5.8</b>
47 Albania	5.3
<b>World Average</b>	<b>4.2</b>
139 Greece	3.3
141 Slovakia	3.3
160 Austria	2.6
161 Hungary	2.6
171 Italy	2.0
172 Bulgaria	1.9
176 Czech Republic	1.7

Figure 4. Country rankings: Long term growth, 2013-2023

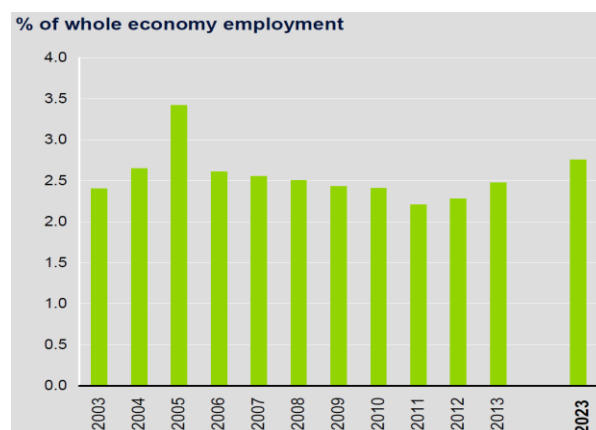


Figure 5. Romania: Direct contribution of Travel&Tourism to employment

Total contribution to employment = numbers of jobs generated directly in the Travel&Tourism industry plus its indirect and induced contributions (Figure 6).

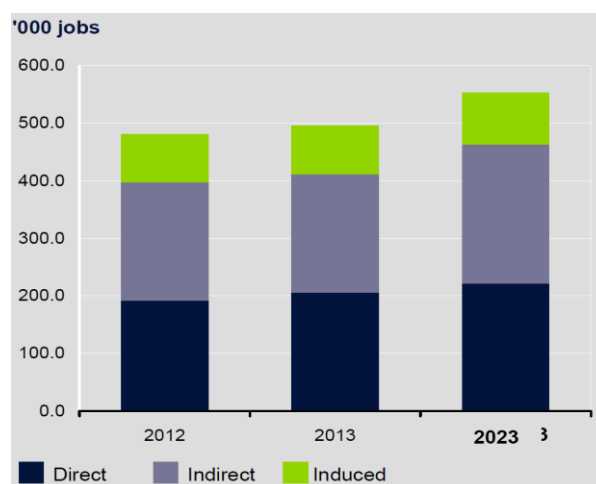


Figure 6. Romania: Total contribution of Travel&Tourism to employment

Visitor exports generated 7.4 billion RON (3.1% of total exports) in 2012. It is expected to rise by 13.2% in 2013 and grow by 6% every year, from 2013 to 2023, to 15.1 billion RON (Figure 7).



Figure 7. Romania: Visitor exports and international tourist arrivals

Travel & Tourism investment in 2012 was 12.8 billion RON (7.4% of total investment). The forecast for 2013 is negative. It should fall by 0.2% in 2013 and will rise by 6.8% pa to 24.5 billion RON in 2023 (7.7% of total).

## CONCLUSIONS

The global tourism industry is in growing but, at a different rate, for a certain period of time and, generates economic growth of countries in which it is developed.

For Romania tourism remains the economic sector that has most valuable potential for development but, unfortunately, still untapped enough, always remaining a source of attraction for investors as well as foreign tourists.

Also, a huge advantage of Romania is the natural and cultural potential of great diversity and harmoniously distributed in the territory, which also allows the practice of all forms of tourism.

Looking forward in, in future, the forecast is more than positive, we hope that Romanian tourism will start developing and reach the a better position in 2023 (same as the forecast)

on world ranking: GDP, employment, visitor exports and investment.

## ACKNOWLEDGMENTS

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## TOURISM PHENOMENON IN THE POST-CRISIS ECONOMY

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### Abstract

*Tourism is an important economic activity in most countries around the world. Tourism industry is recognized as a sector which support and sustain economic growth. For many developing countries, and not only, tourism is one of the main sources of foreign exchange income and the number one export category, creating much needed employment and opportunities for development. Viewed as an export industry of three G's: get them in, get their money, and get them out, tourism has assisted many developing countries to move away from a dependency on agriculture and manufacturing. In 2012, the total impact of the tourism industry contributed with 9% of global GDP, having a value of over 6.6 trillion US dollars and 260 million jobs. Over the time, various methods and instrument were developed with the aim of measuring tourism contribution to economic growth of a country, namely input-output analysis, computable general equilibrium, tourism satellite account, econometric models, survey techniques and so on. For each of this instrument an important amount of data are necessary in order to comprise the economic growth induced by tourism.*

**Key words:** *economy, employment, GDP, impact, Travel & Tourism*

### INTRODUCTION

After four years from the eruption of the global financial crisis, the world economy is still struggling to recover. During 2012, global economic growth has weakened further.

Even so, more significantly, tourism has emerged as a distinct and well-defined national economy for many countries. As a nice activity to spend the leisure time, has established itself as a service activity in various areas adjacent to it. Characterized by mobility and adaptation to the demands of both, the demand and the supply, is, from this point of view, the most dynamic sector and, in addition, the most important generator of jobs, acting as a stimulating global economic system, engaging and stimulating production of other areas.

Tourism is an attractive tool for economic development, specifically in the developing world.

Viewed as an export industry of three G's: "get them in, get their money, and get them out", tourism has assisted many developing countries to move away from a dependency on agriculture and manufacturing (Tooman, 1997).

### MATERIALS AND METHODS

The article analyzes the tourism industry in the post crisis-economy after macroeconomics indicators: GDP (direct and total contribution), employment (direct and total contribution), visitor exports and investment for the year 2012.

### RESULTS AND DISCUSSIONS

The Travel & Tourism industry has outperformed the global economy in 2012 – growing faster than manufacturing, retail, financial services and communications.

The international tourist arrivals (overnight visitors) grew up significantly in the last 60 years.

In the 1950's, 25 million tourists travelled internationally. Starting from 1960's, the number of tourists started to grow significantly reaching 69 million tourists travelling internationally, 165 million tourists in 1970's, 278 million tourists in 1980's, 440 million tourists in 1990's. The year 2000 has ended with 678 million tourists travelled internationally. International tourist arrivals grew by 4% in 2012 surpassing a record 1 billion tourists globally for the first time in history. Asia and the Pacific saw the highest growth of all regions with 7% more international tourists. With an additional 39 million tourists, international arrivals reached 1.035 billion, up from 996 million in 2011 (Figure 1). Strongest month was March (+6%) and weakest month was July (+1%). In the same year, around five billion tourists of seven billion from world total population, traveled domestically within their own countries.

Demand held well throughout the year, with a stronger than expected fourth quarter.

Despite ongoing economic challenges, the growth of international arrivals worldwide is expected to continue in 2013 at a similar to slightly slower pace (+3% to +4%) and in line with UNWTO's long-term outlook Tourism Towards 2030, which projects an average growth of 3.8% per year between 2010 and 2020.

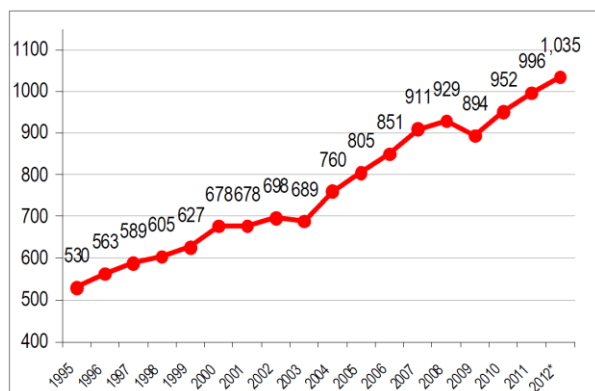


Fig. 1. World: Inbound Tourism International Tourist Arrivals (million)

The year 2012 demonstrated again the resilience of the Travel & Tourism industry in the face of continued economic turmoil, as economic growth slowed and was even negative in key global markets.

The direct contribution in 2012 of Travel & Tourism to GDP was 2,056 billion USD which represents 2.9% of total GDP. The forecast is to rise by 3.1% in 2013, and to rise by 4.4% every year, during the period of 2013-2023, reaching 3.249 billion USD in 2023 (in constant 2012 prices).

This primarily reflects the economic activity generated by industries such as hotels, travel agents, airlines and other passenger transportation services (excluding commuter services). But it also includes, for example, the activities of the restaurant and leisure industries directly supported by tourists (Figure 2).

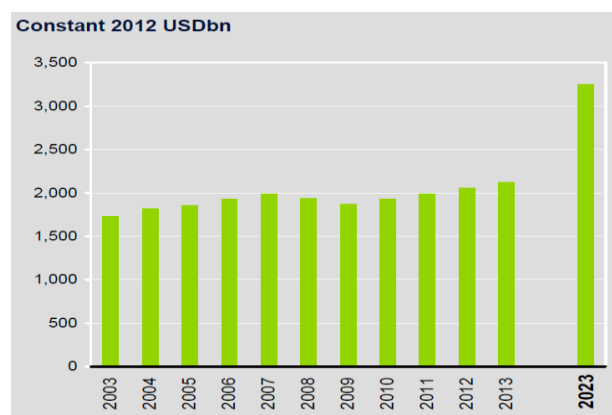


Fig. 2. World: Direct contribution of Travel & Tourism to GDP

The total contribution of T&T to GDP was 6,630 billion USD representing 9.3% of GDP in 2012. The forecast is to rise by 3.2% in 2013, and every year with 4.4% till 2023, to 10,507.1 billion USD.

The total contribution of Travel & Tourism includes its 'wider impacts' (the indirect and induced impacts) on the economy.

The 'indirect' contribution includes the GDP and jobs supported by:

- T&T investment spending (eg: purchased of new aircraft, construction of new hotel)
- Government "collective" spending (eg: tourism marketing and promotion, administration, security services, resort area security services, etc.)

-Domestic purchased of goods and services by the sectors dealing directly with tourists (eg: purchased of food and cleaning services by hotels, of fuels and catering services by airlines, IT services by travel agents). The 'induced' contribution measures the GDP and jobs supported by the spending of those who are directly or indirectly employed by the Travel & Tourism industry (Figure 3).

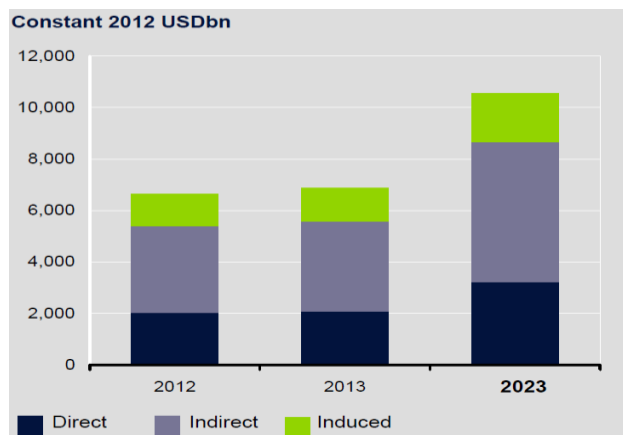


Fig. 3. World: Total contribution of Travel & Tourism to GDP

For the 2012, T&T directly supported more than 101 million jobs representing 3.4% of total employment. The expectation is to rise with 2% every year till 2023, when it's estimated to reach 125 million jobs. This includes employment by hotels, travel agents, airlines and other passenger transportation services (excluding commuter services). It also includes, for example, the activities of the restaurant and leisure industries directly supported by tourists (Figure 4).

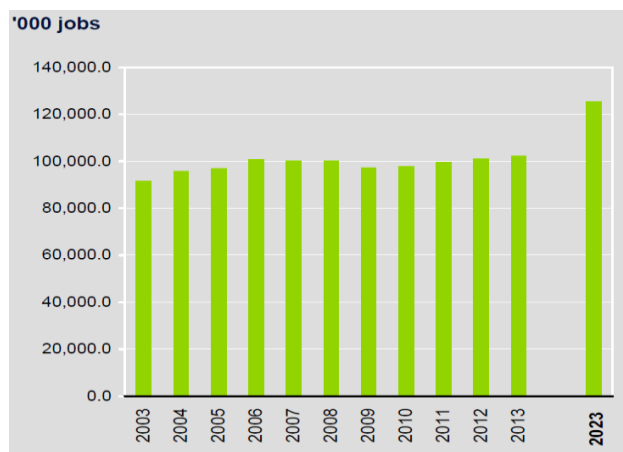


Fig. 4. World: Direct contribution of Travel & Tourism to Employment

The total contribution of T&T to employment, including jobs indirectly supported by the industry was 8.7% of total employment, 261 million jobs. For the period 2013-2023, is expected to rise by 2.4% pa to 337,819,000 jobs in 2023, 9.9% of total employment (Figure 5).

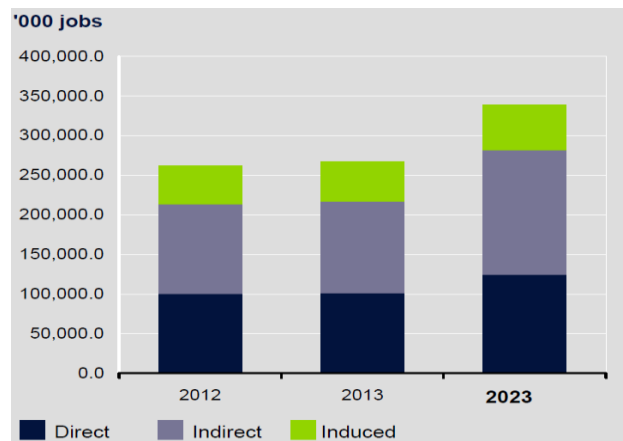


Fig. 5. World: Total contribution of Travel & Tourism to Employment

Visitor exports are a key component of the direct contribution of T&T, generating 1,243 USD bn in 2012, representing 5.4% of total exports. The forecast is to grow by 3.1% in 2013 and by 4.2% pa, from 2013 to 2023, to 1,934.8 USD bn (Figure 6).



Fig. 6. World: Visitors exports and international tourist arrivals

The investment in 2012 for Travel&Tourism was 764 bn USD, representing 4.7% of total investment. The forecast is positive, to rise by

5.3% during the next ten years, reaching 1,341.4 bn USD in 2023 (Figure 7).

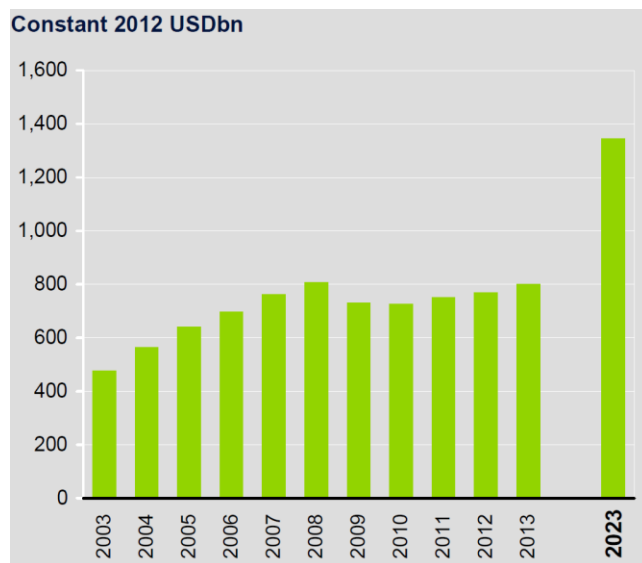


Fig. 7. World: Capital investment in Travel & Tourism

In the last 63 years, the international tourist arrivals had problems in only one year, when the growth has been negative, registered in 2003: -2% compared to 2002, from 702 decreasing to 691 million international tourist arrivals and one year when the growth registered was 0, in 2001, compared with 2000.

## CONCLUSIONS

Despite the fact that world economy is struggling to recover after four years from the global financial crisis, Travel & Tourism's contribution to GDP grew for the third consecutive year in 2012, creating more than 4 million new jobs. Also, the number of international tourist arrivals (overnight visitors) grew by 4%, reaching more than one billion in 2012, for the first time in history.

## ACKNOWLEDGMENTS

This research work was carried out with the support of Project POSDRU/CPP107/DMI1.5/ S/76888 Program, SOP Human Resources Development from 2007 to 2013.

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## RURAL TOURISM IN ROMANIA - A MARKETING PERSPECTIVE

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### Abstract

*The development of national tourist brand is one of the priorities of the Ministry of Regional Development and Tourism. The project on branding Romania is EU-funded, within the Regional Operational Program (ROP) 2007-2013. Out of the different evaluation point of views - qualitative research in source markets and domestic market, project's team opinions, branding project research on the attractiveness / competitiveness, 6 tourism key product of Romanian tourism have been identified, one of them being Countryside & Rural Tourism. The paper aimed to present an analysis of the Countryside and rural tourism from a marketing perspective bearing in mind that, in order to reach the target set by the Romanian National Tourism Development Masterplan 2007-2026, of increasing the number of visitors at 9,7 milion in 2016, a marketing plan will be implemented. The average yearly growth of the arrivals number for the countryside and rural sector for 2011-2015 will be 25%.*

**Key words:** competitiveness, countryside and rural, marketing, tourism product

### INTRODUCTION

The first step of the tourism brand project was the Image and potential analysis. Two research methods were used by TNS. Qualitative research – in depth interviews, (91 were conducted) with an average length of 37 minutes and focus groups ( 2 were conducted with Romanian key players of the tourism industry) and stakeholders, tour operators, travel agents and opinion leaders (tourism and non tourism related) opinions were surveyed both in Romania and in the source markets, on eight source markets + Romania. The eight source markets are Austria, Germany, France, Italy, UK/ Ireland, Russia and USA  
Quantitative research - a total of 10.881 computer assisted telephone interviews were held, that is, 1.200 per market. Travellers were surveyed in Romania, people who took a holiday trip in the last 3 years, in the source markets, people having travelled abroad for holidays in the last 3 years.

### MATERIALS AND METHODS

In order to set up this paper, first of all it was proceeded to the analysis of the actual situation of rural tourism regarding: product profile, external environment, competitive position. Then there were established the goals and the main development guidelines, marketing goals, targeted needs, segments and portofolio, main distribution strategy and positioning for distribution.

### RESULTS AND DISCUSSIONS

#### Situation analysis

#### Product profile

Countryside and rural tourism takes place in rural areas or settlements, countries and places with natural attractions, hills, rainforest, small seaside villages, springs, rivers and lakes, etc. The basis of a countryside and rural vacation is an accommodation service complemented by additional services/facilities relying on the

local lifestyle, cultural and natural resources. For the purposes of this research, the Countryside and rural sector is vacation within rural areas. In this definition the following activities are not included: sport tourism, adventure tourism, religious tourism, golf or ski resorts tourism.

The Countryside and rural sector ( around 18 million trips) can be structured into two main markets, defined in terms of ways of using its resources: Countryside lifestyle: The main motivation is to live intensely all aspects of the rural lifestyle and Active countryside holidays: Use of the rural space for the practice of activities which can be related to physical activity and/or edutainment.

The consumer

There is not a single profile for the Countryside and rural tourist, however, according to the MINTEL report about Rural tourism in Europe (2007), the most typical socio - demographic characteristics are: between 35 and 44 years old, with no gender difference, middle social class and with a medium/high or high income level. The most relevant features associated to the consumer profile by product market:

#### ***External environment***

Market trends

Countryside and rural tourism will continue to grow but, as customers are more experienced and well travelled, they are demanding new and different ways of experiencing this kind of holidays.

Specific trends of the Countryside Sector

Rise of Internet as a source of information, creation of opinion and mean of booking, increase of self organization of trips by customers, tendency to late booking vacations, preference to split holidays during the year - instead of one holiday travellers choose several short breaks, consumers are demanding higher quality experiences, more demand for higher standards of quality in accommodation, dining, transport etc in rural areas, increasing interest for meeting local people and understanding traditions, increasing demand for authenticity and uniqueness

#### ***Competitive position***

Key countryside and rural destinations

Countryside and rural tourism offers are present almost everywhere in Europe. There are several destinations offering this type of tourism, however most of them focus a great part of their marketing efforts in targeting the domestic market rather than the international ones. However, there are few destinations that have reached mature status in this sector, having structured an attractive and developed product to draw international markets.

Romanian Countryside and rural product snapshot

Although the rural tourism in Romania has registered some growth, it presents a significant potential which is not sufficiently exploited. According to the new law, the agro tourism pensions are structures with a capacity of up to 8 rooms functioning in the houses of the citizens or in independent buildings, which offer the tourists accommodation in special arranged places and facilities for preparing and serving the meal, and also the possibility to perform household or cottage activities. Moreover, the owner carries out at least one activity which is related to agriculture, animal care, cultivation of different types of plants, orchards or carries out a handicraft activity, in a workshop where one can make different hand-made objects. The rural and regional tourism from Romania will benefit in the period 2007-2013 from almost 500 million Euros, through the European Regional Development Fund. The following accommodation structures will be able to benefit from these structural funds:hotels, motels, tourism pensions, camping places, huts, and hotels for young people. The maximum period for implementing a project is 23 months. In the case of the accommodation structures the total cost of a project has to be between 200.000 Euros and five million Euros, and for tourism leisure structures the costs of the project have to be between 200.000 Euros and 20 million Euros.

Romania has a rich and mostly unspoiled natural landscape: natural and national parks, mountains, lakes, forests, fauna sanctuaries, etc.; providing a diverse sort of experiences

for travellers looking for enjoying a unique natural and rural environment. Landscape's beauty and uniqueness that gives Romania its competitive advantage, supported by active environment preservation to keep it. Tourist can experience different scenarios, climates, colours, gastronomies, etc excellently preserved through centuries. Local traditions and daily life in typical villages (village square, church, traditional houses, etc.). Traditional customs and the local open festivals take place across all Romanian regions throughout the year. The gastronomy of Romania offers a wide range of dishes and recipes that are not still recognized enough by international travellers. Romanian food and wine is currently the main complementary offer of the Countryside and rural tourism sector, contributing to enrich the overall experience. Countryside and rural tourists are increasingly looking for experiencing the destination and getting involved in the rural local life. In that sense, hospitality of Romanian people is an important factor.

The opportunities that destinations could exploit to successfully compete in the Countryside sector come from four possible sources:

Opportunities for Countryside and rural sector:

Unsatisfied needs:

-Internet is by far the most used source of information by Countryside and rural travellers. However there is a considerable lack of online information available regarding options of international Countryside holidays

-The opportunity consists in organizing and commercializing the countryside and rural tourism destination offer through oriented and specific travel portals

Emerging needs:

-There is a growing trend of travellers more and more interested in holidays that involve discovering, learning and participating in local traditions and lifestyle, rather than just lying on the beach or taking coach tour

- For this reason the opportunity consists in combining quality accommodation in a unique landscape with high value experiences based

on local traditions, culture and lifestyle that can satisfy visitors' needs

New segments:

-New segments of travellers with a motivation to travel to rural areas are emerging, such as single adults, divorced, aged couples and groups of friends with special interest among others

-The opportunity is to create products and experiences adapted to these new segments, to their needs and interests, such as soft tours for older couples, packages for singles, or custom made experiences for those groups with a special interest.

Competitor's mistakes:

-Many destinations rely on the basic attractiveness of natural resources not developing high value experiences for visitors

-For many travellers the simple observation of nature in a passive way is a satisfactory experience, but it does not provide long lasting memories in the visitors' minds

-In order to face this situation, the opportunity consists in taking advantage of the available resources to develop really fascinating experiences making the visitor an active protagonist and not just a spectator.

Threats for Countryside and rural sector

New competitors: there is a great probability that many countries of Central and Eastern Europe will develop Countryside and rural tourism offers, since they are new destinations offering still unexploited rural environment and competitive prices

Rivalry among competitors: the great number of competitors trying to attract international Countryside and rural tourists is a threat for those destinations that do not stay up to date on the changes of the demand, the new requirements of the customers or the development of new products; this can cause a loss of competitiveness, and in the long run, a loss of market share

Other threats that can affect the Countryside offer of a destination are: overexposing/crowding; overdeveloping; lack of environmental culture by the locals; lack of sustainable planning; loss of authenticity; excessive regulations and bureaucracy; pollution of natural settings

Strengths & weaknesses for Romania: analysis of the sector gaps.

Strengths of Romania: richness of rural landscape (mountains, rivers, forests, fauna, etc.); the countryside still preserves the traditional and authentic Romanian character (lifestyle, hospitality, customs, local events, etc.); typical rural lifestyle (picturesque villages, olive oil, wine routes, etc.); diverse cultural offer in rural areas (history, music, religion etc.); excellent local gastronomy; excellent attitude of local stakeholders towards tourism development

Weaknesses of Romania: Romania is not recognised as a Countryside and rural destination; lack of know how and training of tourism players in rural areas; lack of organization of the Countryside and rural offer; lack of partnership among small enterprises (network, co-marketing, etc.); quality of a great share of the accommodation, not complying with international standards; insufficient and inadequate accessibility and supporting infrastructure; not enough offer of activities involving traditions, culture and lifestyle in rural areas, lack of organized and clear information available online on Romanian countryside leisure options; lack of information in other languages rather than Romanian (maps, directions, etc.).

### **Development goals and Guidelines**

#### ***Marketing goals***

The European countryside sector is characterised by a great number of destinations with a consolidated position in the market and by many new destinations that are emerging with competitive offers.

Romania has the basic resources to have success in this sector. However, the Countryside and rural tourism industry still needs to consent and implement a marketing plan able to address the great issues that are affecting the sector, which are the following:

1. To organize and standardize the rural offer
2. To take advantage of its unique tourist attractions to enrich the Countryside and rural offer
3. To increase awareness of Romania as a Countryside and rural destination thus increase the market share of this product in

overall tourism of Romania from 1% to 2% in next five years Romania has the opportunity to create a powerful Countryside and rural offer based on a differentiated concept, related to the most notorious features / attributes of the Country: natural heritage, unspoilt landscape, character and traditions (lifestyle, hospitality, customs, etc.), picturesque villages and so on. The European countryside sector is characterised by a great number of destinations with a consolidated position in the market and by many new destinations that are emerging with competitive offers. Romania has the basic resources to have success in this sector. However, the Countryside and rural tourism industry still needs to consent and implement a marketing plan able to address the great issues that are affecting the sector, which are the following:

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For that reason, the market goal for the Countryside and rural tourism of Romania is to Establish Romania as a countryside and rural destination by:

- a) developing the product based on experiences and rural lifestyle
  - \* Improve general Organisation
  - \* Increase quality and specialization of tourist services
  - \* Development of countryside and rural experiences
- b) increase the presence on internet and in intermediaries' portfolio
  - \* Encourage on line direct booking
  - \* Create a sales support system



\* Develop a trade recommendation program  
 c) transmit an image of destination for authentic rural experiences

- \* Improve the awareness among targets
- \* Enhance on line Information
- \* Focus communication on specialized trade

**Targeted needs, segments and portfolio**

A key decision of the marketing plan is the identification of the targets: which segments of the demand should be attracted. The strategic targets for the Countryside and rural sector of Romania are defined considering the following aspects:

- Quantitative volume; Evolution; Average spending; Adequacy to the Romanian offer;

Table 1. The target groups for Countryside and rural tourism

What are they looking for?	*Escaping from city pressure and unwinding *Discovering and learning *Experience local culture, traditions and hospitality
When do they travel?	Mainly in Spring and Autumn
What do they want to visit?	Alternative and unexploited Countryside and rural Destinations
How do they book?	*Through Internet, directly to the rural accommodation networks *Mainly with less than one month in advance
What are their sources of information?	*Internet *Friends recommendation *Travel agency

Source: Authors, 2011

**Main competitors' targets**

In terms of socio demographic profile, the greatest segment of the sector is composed by people between 35 and 55 years old, travelling with their family, in couple or in a group of friends. When referring to couples and groups of friends, the most appropriate target groups for Romania are the "Double Income No Kids" and "Empty Nesters", increasingly looking for escaping the daily life to experience the remoteness of the countryside and to meet local people and traditions. Furthermore, their level of expenditure is higher than other segments. Additionally, and considering that a great segment of the sector is composed by

families, Romania should also attract them, who are looking for family friendly environments where to experience rural traditions and a healthy lifestyle. With a "creative" mindset, non-routine standard of living and forward-thinking attitudes: when travelling, they prefer to elude crowded destinations.

- Searching for authenticity, for intimacy, for nostalgia – a desire to "go home".

- Searching for human contact, for conviviality.

Business Portfolio of Romania's Countryside and rural sector The attractiveness/competitiveness methodology is a useful tool, in order to define the product market in which to focus the efforts of development; it considers:

- The attractiveness of the product markets, based on the volume of present demand, its prospected evolution and the profitability of the sector: average tourists' expenditure, extension of the tourism season, geographical concentration of markets, etc.

- Curious with rural lifestyles or reaffirming traditional values.

- Desiring to practice learning experiences (riding a horse, observing farm practices, visiting old villages, cooking etc.)

- Health conscious (a desire for home-grown food and healthy lifestyle).

- Desiring to discover unspoiled landscapes, nature and so on.

-The competitiveness, resulting by the 5 competitive forces (rivalry among destinations, threats of new entrants and substitute products, bargaining power of the demand and of the suppliers) and by the accomplishment of the sectors' key success factors by the Romanian supply. Product development strategies should be directed mainly to the enhancement of the competitiveness:

- Improve the general organisation - to help the "family run" establishments on aspects such as tourism know how, promotion, positioning or quality standardization. Clusters should be created to structure thematic areas based on unique concepts (heritage, nature, traditions, gastronomy, etc.).

- Increase quality and specialization of tourist services - increase and standardize the overall quality of the rural tourism offer. On one hand, the institution of special labels aims to improve the quality of accommodation, activities, restaurants and other related services. On the other hand, the creation of human resource programmes has the objective of enhancing the quality of services provided by the Countryside entrepreneurs and human resources in terms of skills, languages knowledge, quality and customer attention culture.

- Development of Countryside experiences - The creation of a set of Romanian Countryside and rural experiences is crucial to improve the product and the value offered to the customer: learn the daily work of a farmer, the elaboration process of honey, traditions.

***Distribution strategy and positioning for distribution***

As Internet and travel agencies are the main booking channels for Countryside and rural tourism, specific strategies have been identified to increase the presence on the web and in the portfolios of intermediaries.

1. Encourage on line direct booking - The Romanian rural sector should facilitate information and direct bookings through internet by the customers. Within this frame, a uniform system for allowing reservations and a system to organize the vacation (“do-it-yourself travel kit”) should be developed, incorporating the latest technological applications to facilitate the travel planning of the potential independent.

2. Create a sales support system - The rural sector of Romania needs to increase the sales by tourism intermediaries in source markets, therefore a series of actions should be designed utilising the potential of internet and other new types of technology systems to facilitate the commercialization by the trade.

3. Development of a trade recommendation programme - With the aim of making the intermediaries suggest Romanian countryside and rural offers to their customers more often and carefully, a recommendation programme should be developed, by organizing fam trips and by offering benefits and advantages to

encourage them to become specialists in selling the “Countryside Romania”.

Positioning of the product for market and distribution.

Out of the positive attributes that this product sector gives, it is important to uniquely position this product in customers / clients' minds as well as in the mind of business trade (intermediaries).

Table 2. Key differentiating factors for product

Intangible Attributes	*Authenticity of the place and people. *Mixing with locals *Learning /education experience *Holiness of some sites *Spirituality *100% religion *Mystery	Emotional benefits	Safety *Authentic *Back to the roots *Romantic *Different and innovative *Original
Tangible Attributes	*Heritage mostly in rural areas *Villages full of history, folklore and culture *Agriculture (2/3) country territory *Ancient traditions remain and can be experienced through music, festivals, food, people *Landscape and mountain scenery *Warmth and hospitality of people	Rational benefits	Escape & relax *Natural education and cultural edification *Reflexion * Belonging and socialisation * Satisfaction

Source: Authors, 2011

Positioning of countryside and rural product for the customers: relaxing and enjoying the slow pace of increasingly disappearing simple life with natural grown food, time for the family and more social contacts due to interesting excursions and activities.

Positioning of countryside and rural product for the intermediaries: Romanian product for countryside and rural product is for travellers that look to enjoy friendly and still authentic rural lifestyle in one of the most rural countries of Europe.

***Sales objectives:***

For the period 2011-2015, Romania plans to increase the number of arrivals with an average yearly growth of 25%, the number of overnights, by 20% yearly and as market share to achieve in 2015 2% of total Romanian tourism traffic.

## CONCLUSIONS

In 10 years from now, Romania is aiming to become quality tourism destination being globally competitive in selected products/experiences. In achieving this, Romania is using Tourism as a steward and promoter of key natural and cultural values of Romania

Countryside and rural tourism is one of the 6 products selected within the tourism brand creation, providing good options for growth on the basis of the assessment of attractiveness and competitiveness of the Romanian tourism products.

When speaking about reaching the market requirements for this product, Romania scores well at richness of the rural landscape, gastronomy and rural lifestyle and not so well at infrastructure and communication.

The marketing goal for Romania for Countryside and rural tourism is to establish Romania as a destination for Countryside and rural tourism, increase awareness and its market share in the next 5 years from 1% to 2%.

In order to achieve this goal, a special operational marketing plan for this sector will be drawn and implemented by all the stakeholders in tourism.

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## MODERNIZATION OF THE AGRICULTURAL SECTOR IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT IN THE REPUBLIC OF MOLDOVA

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### *Abstract*

*This paper focuses on the links between agricultural modernization and sustainable development, looking in particular at the impact of the structural changes over the rural livelihoods. In order to achieve this, there were used the following research methods such as: analysis of the economic indicators, methods of comparative analysis, assessment of the public policies' impact on the rural development. The agricultural sector in the Republic of Moldova is based on extensive farming and is insufficiently adapted to market economy conditions. There is a growing understanding in the country that the rural economy is not confined to the agricultural sector, but embraces the broad spectrum of needs of all rural people including living standards, economic activities and natural resources. The situation is associated with the major risks related to the structural changes that may affect the countryside and the economy as a whole such as: a) migration and uncontrolled urbanization, b) lack of professional qualifications and adaptability of the population in the rural areas, c) inadequate use of the natural resources. Rural economy, employment issues, natural resource management and also goals and circumstances of the agricultural production have changed considerably. At the same time, academia and civil society are aware that the new paradigm of modernization must begin both with the agricultural technologies and the people. Its novelty is that in the combination of financial, economic and technological policies for agriculture, new components to be introduced, like policies aimed at improving human capital in agriculture and environmental protection. The paper contains conclusions and proposals on modernization of agriculture and diversification of non farm activities in rural areas.*

*Key words:* agriculture modernization, diversification, human resources, sustainable development

### INTRODUCTION

The world has witnessed spectacular increases in agricultural output during the twentieth century, particularly in its latter half. This achievement is mainly ascribed to the improved agricultural practices leading to higher productivity of land and labour. The contribution of extensive cultivation has not been significant of late. Bringing more land area under agriculture is becoming more and more difficult in most countries. Since prosperous agriculture is considered to be the most crucial base for economic development particularly in the less developed countries, the only viable option for them is to continue to enhance the productivity of land and labour in agriculture. Increased productivity in agriculture has been achieved in several parts of the world mainly by modernizing agriculture. Modernization consists largely of

using improved seeds, modern farm machinery such as tractors, harvesters, threshers, etc., chemical fertilizers and pesticides in an optimal combination with water. The main aim of the paper is that it focuses on the links between agricultural modernization and sustainable development, looking in particular at the impact of the structural changes over the rural livelihoods. Its novelty is that in the combination of financial, economic and technological policies for agriculture, new components to be introduced, like policies aimed at improving human capital in agriculture and environmental protection.

### MATERIALS AND METHODS

In order to achieve a comprehensive analysis of the studied problem, the following research methods were used, such as: analysis of the

economic indicators, methods of comparative analysis, assessment of the public policies' impact on the rural development, etc. The made calculations are based on the data provided by the National Bureau of Statistics, Ministry of Economy, Ministry of Agriculture and Food Industry, etc.

## RESULTS AND DISCUSSIONS

Agriculture is a predominant activity in most developing countries. As economic growth and development take place, importance of agriculture tends to decline according to the famous hypothesis. The declining share of agriculture is, however, a slow phenomenon and is felt only over a relatively long time horizon. The implication is that growth of total income exceeds that of agricultural income over a long time.

Sustainable development has three principal dimensions: economic growth, social equity and protection of the environment. Underlying the economic dimension is the principle that society's well being would have to 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, fulfill 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.

Global transformation and modernization of the agri-food sector faced many challenges over time. Countries with economies in transition faced with complex processes of transformation of political and economic systems. In these countries, the liberalization of exchange rates and prices, and privatization of farms and enterprises caused a collapse of the system of vertical coordination and significant disturbances in the agricultural branch. Disruption in relations between farmers, input suppliers and food companies also resulted in severe constraints faced by many farms in accessing essential inputs such

as feed, fertilizer, seed, capital, etc. Also, in many countries with economies in transition, privatization and market liberalization led to a decline in the supply of inputs and credit to farms and disrupted agricultural activity of several state-controlled institutions, agricultural and consumer cooperatives and processing enterprises.

In the case of the Republic of Moldova, the results of the reforms have still not reached the initial expectations. The agricultural sector in the Republic of Moldova has not yet been recovered from the decline in production and productivity, which occurred during the '90s. Currently, the Republic of Moldova remains dependent on agriculture, which has a contribution with about 12% to GDP.

Table 4. The share of agriculture in the nominal GDP

Year	GDP nominal (million MDL)	Share of agriculture in GDP (million MDL)	Share of agriculture in GDP (%)
2002	22556	4 729	21,0
2005	37652	6 158	16,4
2006	44754	6 474	14,5
2007	53430	5 316	10,0
2008	62922	5 524	8,8
2009	60430	5 110	8,5
2010	71849	8 557	11,9

More than 30% of the country's working population is employed in agriculture and food sector, which reflects the situation characteristic for the countries with an insufficient regional development, when the major territory of the country is characterized by a predominance of unproductive and low-paid agricultural work. Agriculture is divided into two distinct sectors: the commercial and subsistence agriculture. The vast majority of people engaged in agriculture work in small and medium non-trade farms.

The share of agriculture in GDP and the employed workforce is continuously decreasing in relative terms, and the last one even in absolute terms. Meanwhile agriculture continues to grow in absolute terms and provides growth for the entire economy. Structural changes thus involve a net transfer of resources from agriculture to other sectors of the economy in the long term.

There is a common view on many of the mechanisms leading to agricultural and economic development. The first is the ability of agriculture to create jobs and enhance the welfare of the rural population by increasing agricultural productivity. These relationships are seen through input-output relations that link the industry sector with the agricultural one through the production of raw materials used by the industry, ensuring access to food, delivery of job places on one side and on the other side, the agricultural sector capacity development to serve as a market for sale of industrial products.

The agricultural sector in the Republic of Moldova is based on extensive farming and is insufficiently adapted to market economy conditions. There is a growing understanding in the country that the rural economy is not confined to the agricultural sector, but embraces the broad spectrum of needs of all rural people including living standards, economic activities and natural resources. The situation is associated with the major risks related to the structural changes that may affect the countryside and the economy as a whole such as: a) migration and uncontrolled urbanization, b) lack of professional qualifications and adaptability of the population in the rural areas, c) inadequate use of the natural resources. Agriculture by its nature is a risky activity. For this reason it can have negative effects on agricultural income, food security, capacity of development and attracting investment, and competitiveness of the sector.

The main factors that determine the size, quality and stability of the agricultural production in the Republic of Moldova are the agricultural and climate conditions of the territory, especially the lack or surplus of humidity, caused mainly by the actual changes of the climate.

In the Republic of Moldova, risks in agriculture are aggravated due to a variety of factors:

- Insufficient financial resources in an underdeveloped economy
- Infrastructure of protection against natural hazards is underdeveloped at the local level

-The insurance sector is at an early development stage

-Reduced capacity of agriculture to adapt

-Lack of coordination and division of responsibilities between the institutions involved in natural hazards mitigation

-Insufficient public awareness and of policy makers.

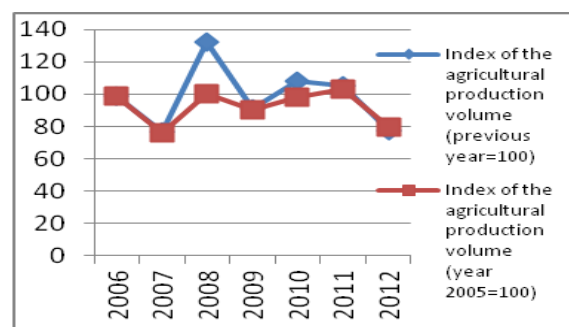


Fig. 1. Index of agricultural production volume

Rural economy, employment issues, natural resource management and also goals and circumstances of the agricultural production have changed considerably.

In the Republic of Moldova there is a lack of funds needed for the sustainable development of rural areas. Also, there is no institution responsible for creating conditions for the development of rural areas and their development policies are dispersed.

At the same time, academia and civil society are aware that the new paradigm of modernization must begin both with the agricultural technologies and the people.

The last discussions organized by the Ministry of Agriculture and Food Industry have succeeded with the general vision materialized through the goal regarding the improvement of quality of life in rural areas by effective use of rural resources and potentials based on agriculture for the sustainable development of Moldova.

It is necessary the institutional strengthening for the implementation of these provisions, through the empowerment of the ministry of Agriculture and Food Industry.

Importance of the issue of modernization of agriculture in the Republic of Moldova led to the need to identify risk management tools for farmers proposed for implementation in

Moldova to ensure the sustainable development of the sector. An important factor for sustainable development in terms of modernization is the availability of labour force in rural areas. 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.

Reducing the importance of income from agriculture has also generated social and psychological changes. Thus, the prestige of agricultural occupations fell abruptly. From the total number of graduates from higher education institutions, only about 3% of the specialties are related to agriculture. Such trend is observed in secondary special professional institutions, which have significantly reduced the number of students from the agricultural specialty.

There are two ways to refer to urbanization. One of them states that the urbanization process is mainly related to the demographic aspect; the second one – sees urbanization as a socio-economic phenomenon that can be seen as a process of infiltration of the countryside by non-farm activities. [3]

Migration in urban areas and abroad in search of a job place is seen as a real alternative to agricultural activities in terms of providing a stable source of income for families from the rural area in Moldova.

Magnitude of migration in Moldova has increased dramatically in the last decade. During this period the working age population declined rapidly as a result of migration and other demographic processes. According to the National Bureau of Statistics, about 300 thousand people of working age are working abroad or looking for a job. According to some estimates, the total number of migrants, including unofficial migrants, amounts to about 700 000. Most migrants come from rural areas, reflecting the necessity for the sustainable socio-economic development of rural communities in Moldova.

As a result of migration from rural areas, and changes in attitude towards agricultural

activities, professional level of the rural population is decreasing, despite the fact that the general level of education remains quite high. Thus, the majority of the rural population can be characterized by low professional skills and adaptation, which can not meet the growing demands of the labor market.

This creates an uncertain situation in rural economic development planning.

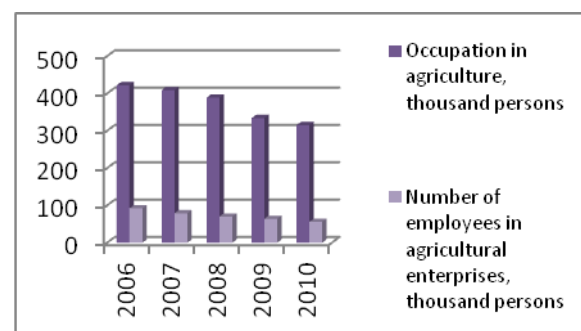


Fig. 2. Use of labour force in agriculture in the Republic of Moldova

Use of human capital has a strong connection with the improvement of the environmental protection of the agriculture, which is a prerequisite of modernization. Modernization of the agriculture and agricultural systems requires the implementation of policies in order to achieve a comprehensive result in the area of improving the agricultural productivity as well as environmental equality.

One of the proposes consists in the fact that human capital development is essential for improving environmental protection, modernization and resource conservation in agriculture. The public sector must play a central role in the development of this human capital.

New technologies evoke responses that are difficult to anticipate. It is thus essential to maintain proper incentives (e.g., taxes on the use of polluting inputs, setting prices of resources at their social opportunity costs, establishing clear property rights) in order to ensure that anticipated improvements in environmental protection, modernization of agriculture and resource conservation from the introduction of new technologies are actually achieved.



Agricultural policies such as price supports, input subsidies, and tariffs on imports are important causes of environmental and resource degradation in many countries. A reform in agricultural policy is necessary to improve environmental protection and resource conservation in agriculture. More broadly, it is imperative to integrate environmental protection and resource conservation into agricultural policies.

Modernization of agriculture from the Republic of Moldova may be related to the following directions of activities. Nonfarm activities have become an important component of livelihood strategies among rural households. Employment in non-farm activities is essential for diversification of the sources of farm household's livelihood. It enables households to modernize their production by giving them an opportunity to apply the necessary inputs and reduces their food shortage during periods of unexpected crop failure. Usually, participation in nonfarm activities is driven by inability to earn enough from agricultural activities due to the poor asset base or risky agricultural environment. Imperfections in rural institutions, such as access to credit or insurance markets can also stimulate nonfarm activities.

As a result of the agrarian economy analysis, we can identify two main components when considering the non-agricultural diversification - income and work.

Income and non-agricultural diversification hypothesis assume that diversification are the maximizes of the profit, while the second, non-agricultural activity and diversification indicates comparative advantages of different households underlying the incentives for non-agricultural diversification. The two types of non-agricultural diversification can be defined as follows: first, diversification due to income coincided with a period of capital accumulation (including financial and social capital, and information), while the second type of diversification led by activity often occurs later when the capital accumulation has already occurred. [2]

Diversification of income does not necessarily exclude activity diversification, it is a

dynamic and mixed process with activities and income diversification (by household) that often overlap or occur simultaneously. Thus, for many poor rural households, capital accumulation is a consequence of diversifying income and is not the objective of income diversification.

When considering the type of activities in which an active population is involved, there may be three different models of diversification: (i) interior, (ii) decline and (iii) the direction. Interior diversifications are those who opt for a second job in the same field (either agricultural or non-agricultural sector) as a main activity. This would be most common in case of small facilities with insufficient capital (financial or human).

Decline diversifications are those whose main activity is in the non-agricultural sector and choose a second activity in the agricultural sector. A predominance of diversification of decline indicates a situation where non-agricultural income does not cover subsistence needs, forcing people to return to agriculture, or where agricultural prices are distorted (either high because low levels of agricultural productivity and efficiency, or low due to state policies to protect low-income consumers in urban areas, but with a concomitant impact of disinvestment in agricultural communities).

Direction diversifications are those with a primary agricultural activity and secondary activity in non-agricultural economy. They are diversifications of risk-taking, of demand, having often a better endowment with financial and / or human capital therefore better equipped to take advantage of market opportunities, and thus being able to be diversified. It may also be the case that these direction diversifications can not find opportunities for diversification in agriculture and therefore try to reorient their activities (and / or sources of income) to non-agricultural activities[2].

Agrarian and non-agrarian economy can be directly linked through production activities, or indirectly through income or investments. Production linkages can be either ascending or descending: ascending links either occur

when agricultural sector grows and there is induced a growth upstream in the supply of inputs and services, or when the increase of local manufacturing and services reduces the price and increases the availability of increase in inputs; decreasing connections can occur when activities such as manufacturing and distribution, based on the means of agricultural production are increased and thus increase the demand for agricultural products. Links with revenues arise when a sector income is spent on results elsewhere, and investment linkages occur when a sector profit are invested elsewhere. All these links are important in the development of non-agricultural enterprises in developing countries and economies in transition. However, the links may be weak and the power of different linkages is specific in a context and depends on a number of factors.

## CONCLUSIONS

- Excessive dependence of the national economy on external income sources increases the uncertainty in the economic development of the country in the short and medium term.
- The major risks related to structural changes that may affect the rural area and economy as a whole, are mainly of social and demographic origin.
- Together with the decreasing of economic importance of agricultural activities in rural areas, there is the possibility and need for non-agricultural economic activities in order to achieve a greater coherence between urban and rural areas.
- In terms of economic degradation of villages, there is a need to support and implement strategies to promote remittances as a leverage of sustainable development of the rural areas.
- The reduction of the vulnerability of Moldova to natural risks shall be carried out during the change of the national economy's structure by an increased development of different sectors, based on advanced technologies. Simultaneously, radical transformations in the agricultural sector shall

be carried out by implementation of new technologies of land cultivation, enhancing the production, extending of forest areas and natural reservations, creating a national environmental network.

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## EVALUATION OF SOCIAL SUSTAINABILITY OF AGRICULTURE WITHIN THE CARPATHIANS IN THE REPUBLIC OF SERBIA

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### Abstract

*By transition process, which is presented in the Republic of Serbia for many years, rural areas are also covered in great extent. Changes in national agricultural policy, in terms of orientation towards rural development and multifunctional agriculture, have led to situation that process of development must involve all stakeholders, from governmental institutions, via local community, to population of rural areas. Such approach to rural development could initiate easier integration into international institutions and European Union, as well as to strengthening of cross-border cooperation within the mentioned area of economy. The most part of the Carpathians in the Republic of Serbia is taken by the national park „Đerdap“ and its protected zone. Within the mentioned protected area, sustainable use of agricultural land is based on traditional system of mountain agriculture that provides a high degree of ecological rationality and represents a very good foundation for development of integral and organic production. Opening toward the international community and peculiarly clear commitment of Serbia to European integrations, requires a new definition of role and importance of agricultural sector. Therefore, it is estimated that now is the perfect time for establishment of concrete conceptual framework and Strategy that will answer to key questions within the agro-food sector. In this context, authors' intention (they are also the members of the research team of IAE Belgrade which is the holder of the project III 46006 - Sustainable agriculture and rural development in function of Republic of Serbia strategic goals achievement within the Danube region) is to evaluate a social sustainability of agriculture in the area of the Carpathians in Serbia. Because of that, research is focused to administrative area of next municipalities: Golubac, Kučevo, Majdanpek, Kladovo and Negotin. Considering microeconomic character of research, it was used the original methodology, which could be useful for each area within the Danube region, providing the significant benefit to public administration and management during decisions-making process. At a given moment, by the authors' methodology, which covers the next criteria: density of agricultural population, density of active agricultural population and density of employees in agriculture. Based on this, it could be established the accurate diagnosis for chosen area, joining the estimation for each set of criteria that fits to the goals of sustainable agriculture in the Danube region.*

**Key words:** agriculture, Serbia, social sustainability, the Carpathians

### INTRODUCTION

In its original context, sustainable development is related to the natural sciences, or clearly, to management of natural resources in a way that ensures the preservation of their reproductive abilities. Depletion of natural resources, growth of environmental pollution, erosion of biodiversity, etc., are forcing the thinking about current developmental model, in other words to try to produce today, without prejudice to the right of future generations to meet their own needs (Subić et al., 2005). According to previous definition, it is imposed a need of agriculture re-adaptation toward sustainability and multifunctionality.

Sustainability of agriculture is defined as "development that allows the preservation of land, water, plant and animal resources, which is environment-friendly, technically applicable, economically profitable and socially acceptable" (FAO, 1989).

Starting from the fact that sustainable agricultural and rural development, by rule, does not have certain carrier of the development (as specific business entity), complexity of sustainable rural development is connected to interests of larger number of economic and other subjects, as well as all local interested citizens. Holder of driving force for sustainable agricultural and rural development should be the government, which is through its territorial and departmental authorities only competent for

initiation, implementation and management of concrete territories development.

Participation of all local community representatives in identification of opportunities they have on disposal, as well as in identification of priorities important to themselves, are the key elements necessary for establishment of appropriate sustainable development strategy.

By adequate training, according to scientific-research methods used for: identification of all advantages and disadvantages that are on disposal to community, selection of priorities and strategic planning, representatives of local communities will be able to contribute to faster development of agriculture and better life conditions in rural areas. Sustainable agricultural and rural development of mentioned region significantly contributes to sustainable rural development at the national level, as in whole society.

Agriculture and rural areas in the municipalities of the Carpathian region (Golubac, Kučevo, Majdanpek, Kladovo and Negotin) within the Republic of Serbia, in other word policy of sustainable development of agriculture and rural development are faced important challenges in upcoming long-term period. In last twenty years come to some large changes within the political frame and macroeconomic relationships which were reflected on other aspects of life and business in Serbia. Momentum of market economy and market principals certainly had an impact on agro-food sector, which is the most sensitive and by its nature very specific.

## MATERIALS AND METHODS

Having in mind the multifunctional characteristics of agriculture, FAO creates the following definition: "*Agriculture, which has a primary role to produce food and to contribute to food safety, has also different ecological, economic and social functions*" (FAO, 1989). "*Various functions of agriculture refer to its nature*" (Pingault, 2001).

Different functions of agriculture are certainly closely related, so it is not very easy to draw a correct line that will divide them. According to that, here is a short review on three basic functions of agriculture (Subić et al., 2005):

-*economic function* is reflected through the activities that take place in rural areas, or that are related to employment and income of rural population;

-*ecological function* is connected to the environment protection and improvement, or about impacts (positive and negative) that agriculture has on the environment;

-*social function* includes all social, political, historical and cultural aspects of the agricultural sector and agricultural activities.

In the context of social function, agriculture should contribute to: food security (national and global); rural employment, as well as to unification and stabilization of the total incomes of the rural husbandries; transfer of non-agricultural to agricultural land; preservation of cultural heritage (local customs); improvement of living conditions, according to the norms of each country, etc. (Pingault, 2001).

In order to simplify the estimation of social sustainability of agriculture in the Carpathians within the Republic of Serbia, applied methodology was based on following indicators:<sup>3</sup>

-Density of the total agricultural population (*represents a proportion of the total agricultural land in use and total agricultural population*);

-Density of active farmers (*represents a ratio between total agricultural land in use and total number of active farmers*);

-Density of total number of employees in agriculture (*is a ratio between total agricultural land in use and total number of employees in agriculture*).

Method for the assessment of the social sustainability of agriculture within the Carpathians could be applicable in any other area in the Republic of Serbia, but also in any area within the Danube region as a whole.

## RESULTS AND DISCUSSIONS

For obtaining more realistic assessment of social sustainability of agriculture in the Carpathians

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<sup>3</sup> Authors inspiration for indicators creation was found in IDEA methodology - Indicateurs de Durabilité des Exploitations Agricoles (Louis, 2003).

within the Republic of Serbia, indicators for both, regional and national level were used.

In accordance to available data sources, calculations under selected indicators refer to 2002 and 2011 (*Table 1.*).

Table 1. Density of agriculturalists by engagement and territorial affiliation

Description	Republic of Serbia		Central Serbia		Carpathians	
	2002	2011	2002	2011	2002	2011
<b>Agricultural land in use - total</b>	5.106.900	5.096.267	3.323.725	3.315.679	169.919	148.949
<b>Agricultural population - total</b>	817.052	-	601.905	-	19.479	-
<i>Density of agricultural population (ha/ap)</i>	6,25	-	5,22	-	8,72	-
<b>Agricultural land in use – total</b>	5.106.900	5.096.267	3.323.725	3.315.679	169.919	148.949
<b>Active agriculturalists – total</b>	529.236	-	403.730	-	13.577	-
<i>Density of active agriculturalists (ha/aca)</i>	9,65	-	8,23	-	12,52	-
<b>Agricultural land in use – total</b>	5.106.900	5.096.267	3.323.725	3.315.679	169.919	148.949
<b>Employees in agriculture – total</b>	71.487	34.815	27.414	14.152	774	402
<i>Density of employees in agriculture (ha/ea)</i>	71,44	146,38	121,24	228,48	219,53	370,52

Source: *Popis stanovništva u Republici Srbiji 2002*, Statistical office of Republic of Serbia, Belgrade; *Opštine u Republici Srbiji 2003*, Statistical office of Republic of Serbia, Belgrade; *Opštine i regioni u Republici Srbiji 2012*, Statistical office of Republic of Serbia, Belgrade.

Based on obtained results, it could be said that the best social sustainability reflects the indicator density of agricultural population at the level of Central Serbia in 2002 (5,22 hectares per agricultural inhabitant), while the worst social sustainability shows the density of total number of employees in agriculture at the level of the Carpathians in 2011 (370,52 hectares per employed person in agriculture).

Considering the social sustainability, it could be said that agriculture, on the level of Carpathians within the Serbia, gives the lowest contribution to:

- food safety,
- rural employment and equalization and stabilization of total income of rural households,
- transfer of non-agricultural into the agricultural land,
- preservation of cultural heritage (local customs),
- improvement of life conditions, etc.

On the other side, by observation of the agriculturalists' density in 2011 in compare to 2002, gained results show a density of totally employed in agriculture in next proportions: Republic of Serbia (2,05:1), Central Serbia (1,88:1), Carpathians (1,69:1).

So, according to density of totally employed persons in agriculture in 2011 in compare to 2002, on the territory of the Carpathians,

agriculture gives the highest contribution to the sustainable social development.

For more realistic estimation of social sustainability of agriculture on local level, methodological procedure is especially focused to administrative areas of municipalities: Golubac, Kučevo, Majdanpek, Kladovo and Negotin (*Table 2.*).

Results from the table above indicate that the best social sustainability is showed by the density of the total agricultural population on the territory of Golubac municipality in 2002 (or 6,23 hectares per agricultural resident), while the worst social sustainability was reflected by the density of totally employed persons in agriculture on the territory of Negotin municipality in 2011 (828,87 hectares per employee in agriculture).

Observing the administrative area of mentioned municipalities, it could be concluded that agriculture within the municipality of Negotin gives the lowest contribution to social sustainability.

If in this case focus is also on the density of agriculturalists in 2011 compared to 2002, it can be seen that the obtained results show the density of totally employed persons in agriculture in following proportion:

Golubac (1,51:1), Kučevo (0,86:1), Majdanpek (1,95:1), Kladovo (1,64:1), Negotin (2,89:1).

Table 2. Density of agriculturalists per engagement and affiliation to administrative region

Description	Golubac		Kučevo		Majdanpek		Kladovo		Negotin	
	2002	2011	2002	2011	2002	2011	2002	2011	2002	2011
<b>Agricultural land in use - total</b>	15.150	13.826	35.165	32.416	20.353	18.549	28.806	21.993	70.445	62.165
<b>Agricultural population - total</b>	2.432	-	3.216	-	2.112	-	2.113	-	9.606	-
<i>Density of agricultural population (ha/ap)</i>	6,23	-	10,93	-	9,64	-	13,63	-	7,33	-
<b>Agricultural land in use - total</b>	15.150	13.826	35.165	32.416	20.353	18.549	28.806	21.993	70.445	62.165
<b>Active agriculturalists - total</b>	1.586	-	2.143	-	1.673	-	1.441	-	6.734	-
<i>Density of active agriculturalists (ha/aca)</i>	9,55	-	16,41	-	12,17	-	19,99	-	10,46	-
<b>Agricultural land in use - total</b>	15.150	13.826	35.165	32.416	20.353	18.549	28.806	21.993	70.445	62.165
<b>Employees in agriculture - total</b>	132	80	104	111	152	71	140	65	246	75
<i>Density of employees in agriculture (ha/ea)</i>	114,72	172,83	338,13	292,04	133,90	261,25	205,76	338,35	286,36	828,87

Source: *Popis stanovništva u Republici Srbiji 2002*, Statistical office of Republic of Serbia, Belgrade; *Opštine u Republici Srbiji 2003*, Statistical office of Republic of Serbia, Belgrade; *Opštine i regioni u Republici Srbiji 2012*, Statistical office of Republic of Serbia, Belgrade.

Specifically, observing the density of totally employed in agriculture, in 2011 compared to 2002, at the territory of municipality of Kučevo agriculture gives the biggest contribution to the sustainable social development.

## CONCLUSIONS

Assessment of the social sustainability of agriculture, which was done according to methodology based on indicators that follow the density of agriculturalists (by their engagement and territorial and administrative affiliation), refers to the influence of presence or absence of some category of agriculturalists on the gained results in agricultural production within the certain area. As agricultural producers contribute to the maintenance of landscape and living space, they can certainly do a number of services that will benefit to the land, economy and society. Having in mind the social function of agriculture and its influence on the development of economy and society, usage of mentioned methodology could be highly useful for the assessment of sustainable social development within the Carpathians in the Republic of Serbia

during the implementation of the production results in agriculture.

Although the presented criteria are fairly simple, methodological procedure and possibility of its wide application provides a good guide to sustainable agricultural and rural development. In this context was established an idea of introduction and use of mentioned methodology, especially within the decision making process connected to social effectiveness in rural areas. On the other hand, there should be left enough space for finding and application of new methods for assessment of social sustainability of agriculture, as well as possibility of free choice in realization of the concept of sustainable agricultural and rural development.

From the aspect of sustainability and multifunctionality, agriculture can be of great importance, both at the macroeconomic and microeconomic level. Consequently, one of the basic principles in preservation and strengthening of social function has to be favouring of variety of ways in development of agricultural husbandries.

Considering the fact that agricultural production alone, as a guarantor of social stability and a source of incomes, loses on its importance, there

is a need that farmers within the Carpathians in Serbia, in some extent, have to look for their earnings in non-agricultural activities, as on husbandry, as well as out of it.

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## ANALYSIS AND FORECAST OF FINANCIAL RESULTS IN THE VINEYARD FARMS IN MOLDOVA

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### Abstract

*This paper presents a factorial analysis of changes in financial indicators obtained in the agricultural enterprises in the wine sector. The dynamic of profit obtained from 1 ha of bearing plantations and the level of grapes profitability during 2001-2011 is analyzed. To forecasting the level of grapes profitability for the period 2013-2016 there are used the correlation and regression methods.*

**Key words:** correlation and regression methods, financial results, forecasting, wine sector

### INTRODUCTION

In a modern market economy, the maximizing profitability is the fundamental main criterion of the enterprises decisions for attracting resources for the organization of production, to expand or restriction it. The increasing of economic efficiency has the economic and social effects for the producers - by saving the production factors, their rational use, reducing the costs in parallel with the improving of quality and therefore a better positioning in the competitive environment - and for the consumers by the increasing the nominal and real wages and thereby for the increasing their power of thrift, saving working time, sizing leisure time, etc. Profitability is defined as the ability of an agricultural unit to obtain the activity they carried out a profit in the condition of mobilization of available resources.

### MATERIALS AND METHODS

In the research, the authors used data from specialized forms of agricultural enterprises. The following research methods were used: the chronological series method, the comparison method, the method of table and graphic, correlation and regression's method.

### RESULTS AND DISCUSSIONS

Profitability is a essential part of economic efficiency and constitute a key element of determining the yield value of an agricultural unit or a product. An agricultural enterprise (the product) is profitable when it covers their production costs on account of their income and gets a certain profit. Profitability is one of the essential aspects of economic efficiency of an agricultural units, therefore of essential condition of production is what they must be not only useful but also profitable.

The gross profit on the level of the agricultural unit is calculated as the difference between the sum of the sales revenue and the sum of the finished products sold. The profit allows the identification of available resources and opportunities for development of agricultural units. Therefore, the static analysis is not sufficient. It should be compared with the calculated indicators of previous period on the basis of the results of analyzed units or units of the same size and with similar activities, accordance with the requirements of the comparative analysis. The profit reflects the management of consumed resources and has the essential components of business costs and revenues from the economic activity. Profitability is calculated

as relative sizes are comparable over time, space and organizational structure.

Table 1. The dynamic of the grape production profitability in agricultural enterprises in the Republic of Moldova 2001-2011

Year	Profit (MDL) calculated		The level of return,%
	1 q of sold product	1 ha from where the production was sold	
2001	28,17	845,1	20,58
2002	77,44	2904,0	58,47
2003	117,55	4807,7	77,10
2004	76,05	3438,8	44,87
2005	74,44	2344,7	31,02
2006	37,27	935,4	15,88
2007	48,45	1492,3	22,03
2008	21,54	799,30	9,60
2009	10,22	420,0	5,97
2010	26,96	563,6	8,59
2011	86,64	3691,0	36,53

Source: authors' calculations based on specialized forms of agricultural enterprises

The dynamics shows that producing grapes with high profitability indicators were recorded in 2002, 2003, 2004 and 2011. Between 1 q nominated calculated profit of product sold is higher than 76 MDL, profit calculated that 1 ha of grapes is sold increased by 2,900 MDL/ ha and the profitability indicates that every 1 MDL were achieved than 36.5 MDL profit. The analysis shows that the last 11 years in the production of grapes four years farms have achieved profitability of production that can allow an enlarged reproduction of and during the years 2006, 2008-2010 the level of profitability below 15.8% allows businesses to recover a minimum consumption incurred.

As a result of leveling of using the dynamics of analytical indicators in 2001-2011 using linear function to set the following:

- the obtained profit on 1 q of sold product has the trend ( $\bar{N}_t = 55.0 - 3.3t$ ) of decrease in annual average of 3.3 MDL;
- the obtained profit of 1 ha of sold grapes has the trend ( $\bar{N}_t = 2022 - 131.2t$ ) of decrease in annual average 131.2 MDL spite of those

bearing the plantation area from which the grapes were sold to reduced;

- the level of profitability ( $\bar{N}_t = 30.0 - 3.76t$ ) - a decrease of 3.76% in annual average.

This situation shows that, if there are not taken further action to stop the decline of the main indicators of profitability, then the next 4-5 years grape production in agricultural enterprises will be non-profitable.

The studies of grape production profitability require identifying causal links between factors affecting profit with the purpose of future decisions or forecasts. One of the methods of economic and statistical analysis is the regression and correlation analysis.

In developing multifactorial regression model for determining the influence of the factors on the level of profitability of grapes (y) were included measurable factors (x1), with a systematic influence on it.

x1 - productivity of bearing vineyards, q/ha;

x2 - consumption per 1 ha of bearing plantations, MDL;

x3 - the surface of bearing plantations in averaged for an enterprise, ha;

x4 - the average selling price of 1 q grape, MDL;

x5 - the revenue share from the sale of grapes in total sum of industry revenues from crop plants and livestock sector [1].

In this research 325 agricultural enterprises were used from the period 2006-2011 using the STANDARD program (EXCEL, Statistics for WINDOWS). The multiple correlation coefficient  $R=0.73$  shows that, between the profitability of grapes and exogenous factors included in the model are the remarkable intensity link. The coefficient of multiple determination  $R^2=53.3\%$  indicates that variation in the level profitability grapes is influenced by factors included in the model in the amount of 53.3%. This situation demonstrates the selecting of main factors influencing the level of profitability of grapes. Based on processing of information the following multiple regression equation was obtained:

$$\bar{y}_{x_1 \dots x_5} = -19,32 + 3,2x_1 - 0,015x_2 + 0,010x_3 + 0,278x_4 + 0,03x_5$$

The regression's coefficients shows that profitability is increased in the following cases: increasing the productivity vineyards with 1 q/ha – by 3.2%; reducing the consumption to 1 ha in value 1000 MDL - by 15%; increasing the vine planting areas to a company with 10 hectares - 1.0%, increasing the selling price 1 q of grape on 1 MDL - by 0.278% deepening specialization level unit (%) - by 0.03%.

The biggest influence in modifying the profitability level has 2 main factors: productivity on 1 ha and consumption on 1 ha. This result differs from the real only by about 0.3%, which allows us to use the model for forecasting profitability level given the improving factors.

The forecast of profitability grapes until 2016 was determined from the obtained data and the multiple regression equation. Modifying studied factors we calculated the forecasting of grapes profitability level until 2016. Under the influence of improving of significant factors, the profitability of grapes in 2016 may reach an average level of 67.2% increased by 51.7 points compared to the average 2006-2011.

## CONCLUSIONS

In order to raise the profitability of the wine sector should be accelerate the solutions of the main economic problems by creating the legislative and regulation base by the state; the scientifically base of the agrarian policy; the rational use of the resources potential; implementation of new technologies; reproduction the vine plantations in the most precious varieties of productivity.

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## TRENDS IN THE WINE SECTOR EFFICIENCY IN AGRICULTURAL ENTERPRISES IN MOLDOVA

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### *Abstract*

*This paper presents an analysis of the level of development of the wine sector in agricultural enterprises of the Republic of Moldova during 2001-2011. It was analyzed the dynamic of fruit bearing surfaces of the vine, global production and the yield per 1 ha. There were determined the indicators of economic efficiency the grapes and the trend of modifying the wine sector's efficiency for the years 2013-2016 using analytical leveling process according to linear function.*

**Key words:** agricultural enterprises, efficiency, the trend of modification, wine sector

### INTRODUCTION

The main direction of development of the Moldovan wine industry is producing technical varieties of grapes (about 90%), table grapes (about 10%) with 15% increase of the latter until 2015.

Landscape and local traditions of development regions of the country have led to the fact of specializing in the cultivation of vines and production of grapes. The vine is one of the crops which, in hilly conditions, especially in the Central Development Region, enables efficient use of agricultural land on the slopes with an angle greater than 5 degrees, which for other crops the cultivation is not profitable.

On January 1, 2012 the country's vineyards patrimony was 149,6 thousand ha, from which the weight bearing of plantations constituted 92%, of which 141,4 000 ha or 84.6% was in the possession of private owners, and the rest – 8,2 000 ha (5.5%) - public ownership (Statistical Yearbook, 2011).

Investigations conducted by the author are based on data provided by the farms from Moldova and allow us to conclude that during 2001-2011 the total area of plantations of vines decreased from 46,2 000 ha to 34,0 000 ha or by 26% and the yield of fruit bearing with 36%, where the overall yield decreased from 133,7 000 tones to 69,1 000.

About 75% of the total area of vineyards is occupied by concentrated white varieties located in the Central Development Region and only 25% of red varieties are concentrated in the south region. The highest peak of the viticulture branch development was reached in the period 1981-1985, when the size of the fruit plantations (246 000 ha), the global harvest of grapes, productivity per 1 hectare and volume of wine products, Moldova ranks sixth place in world after Italy, France, Romania, Spain and Portugal. This allowed the country to become a producer of quality wines and cognacs and a recognized exporter of wine products abroad [3].

### MATERIALS AND METHODS

In the research the author used data from Statistical Yearbook, specialized blanks of agricultural enterprises. There were selected enterprises from the Development Centre and South regions to perform a more detailed analysis of the economic efficiency of production of grapes. There were used method selective comparison method, graphical method and some analytical procedures as research methods of problems.

### RESULTS AND DISCUSSIONS

Negative processes of transition to market economy, social and economic events and

natural disasters have affected the vineyards in the country. Compared to the years 1981-1985 currently living area plantations decreased by 104.1 thousand ha or about 40%. The total amount of taking out the vineyards is more than the surface of planting new vineyards with more than 2 times.

In all categories of households in Moldova the global grape production decreased from 2001 from 505 000 tones by 9% in 2011, while the share value of grapes in the structure of global agricultural production (in comparable prices) increased by 3.5% (Figure 1), on account of weight reduction product of other types that were more responsive to adverse weather conditions in recent years.

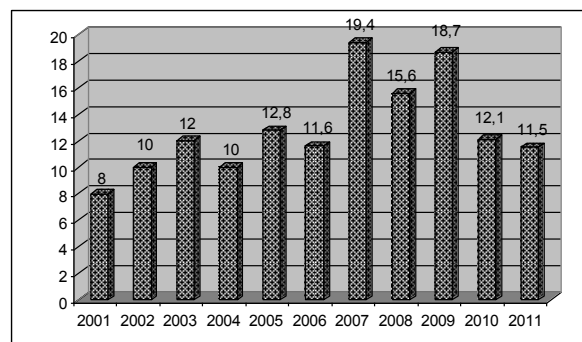


Figure 1. The weight of grapes *Pondera valorii strugurilor* in the structure of agricultural production value (in comparable prices) in the agricultural enterprises of all categories in the Republic of Moldova  
 Source: *Statistical Yearbook of the Republic of Moldova*, Chisinau, 2006, pp. 301 and 2011, p 319

Table 1. Dynamics of economic efficiency in grapes production in the agricultural enterprises of Moldova

Year	Productivity of viticultural plantations on weight bearing viticole pe rod, q/ha	Unit cost of finished products sold, lei	Average price of selling 1 q of grapes, lei	calculated (lei) profit per:		The level of return, %
				1 q of sold product	1 ha from which production was sold	
2001	30,3	136,86	165,0	28,17	845,1	20,58
2002	37,4	132,43	192,4	77,44	2904,0	58,47
2003	41,0	152,46	270,0	117,55	4807,7	77,10
2004	45,2	169,49	245,54	76,05	3438,8	44,87
2005	31,5	238,95	314,37	74,44	2344,7	31,02
2006	25,1	234,76	272,0	37,27	935,4	15,88
2007	30,8	219,93	268,38	48,45	1492,3	22,03
2008	37,1	224,50	246,04	21,54	799,30	9,60
2009	41,1	171,19	181,41	10,22	420,0	5,97
2010	20,9	313,98	340,95	26,96	563,6	8,59
2011	42,6	237,17	323,81	86,64	3691,0	36,53

In 2007-2009 the share of value of grapes reached the level 15-19%.

In total revenues for crop and livestock products the revenue from the sale of grapes is 7.6 to 8.7%.

Economy cannot be considered effective if it is not responsive enough to achieve technical and scientific progress and to use irrationally its economic resources. It is typical for an efficient economy to have a high level of using its economic possibilities and production. Do not forget that efficiency is the result of production, and this result can be low-level, high or negative. And therefore in some cases it can create favorable conditions for expanded reproductive performance, and in some cases, on the contrary, it will lead to lower production.

But how to determine the fact that it is an efficient production or it is not?

For efficiency characteristic of any production sector it 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, which indicate the consumption of materials, labor, etc.

Production efficiency is characterized by the presence of obtained results effect that always exceeds the production consumption.

A high economic efficiency was achieved in 2002, 2003 and 2011, when the grape productivity recorded high levels in the analyzed period and when the correlation between the sales price and the cost of finished products sold was the largest. For every 1 leu consumed the enterprises obtained

an average profit of 77.1 bani, 58.47 bani and, respectively, 36.53 bani.

Vine plantation productivity is the main indicator which characterizes the economic efficiency in viticulture, which increasing, in the conditions of intensification and difficult financing, remains to be a problem for farms. Increase or decrease of plantations

productivity and modification of their quality determines the level of the efficiency of production of grapes. About interdependent nature of vine plantations productivity, unit cost, average selling price of 1 q of grapes and the level of profitability demonstrates Figure 2.

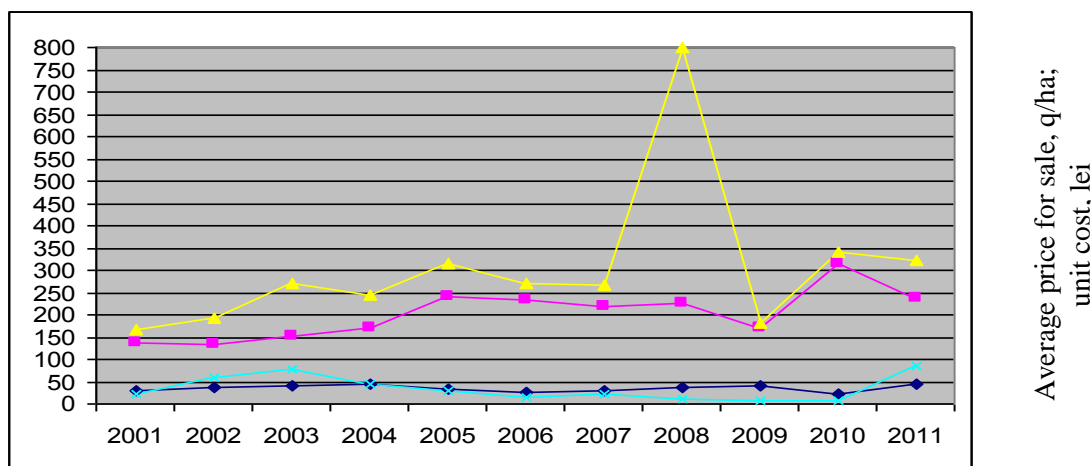


Figure 2. Interdependence between grape productivity, unit cost, average price of sale and the level of return in the agricultural enterprises of the Republic of Moldova *Source: Elaborated by author on the data basis from Table 1.* On the vertical line: Productivity per 1 ha on weight bearing, q/ha; On the abcise: Average price for sale, q/ha; unit cost, lei  
 Legend:.....plantation productivity per 1 ha; - - - - - average price of sale per 1 q.

Analyzing the dynamics of the indicators showing the economic efficiency of grapes during 2001-2011, it was established that this had a tendency of modification on the form of linear function.

$$y_t = a_0 + a_1 t$$

where:  $a_0$  and  $a_1$  – the parameters of the function and  $t$  – scoring the time.

This fact is confirmed by the minimum value of deviation as well as the coefficient of variation. So, adjustment model after the linear function best fits objective trend of evolution of indicators investigated on the farms in Moldova. Exponential and second degree parabolic function proved to be more distant from the actual development indicators during the period studied.

Parameter of linear function  $a_1$  indicates that during the 2001-2011 the economic efficiency indicators of grapes in agricultural enterprises tend to change in the annual average as follows (Table 2):

- bearing vineyard productivity - reduction in annual average by 0.18 q/ha;
- unit cost of finite production sold and the average selling price - the average annual increase by 12.5 and 8.9 lei lei;
- profit calculated at 1 q of product sold and the profitability - the average annual decrease of 3.3 lei or 3.76%.

There were performed some predictions on dynamics indicators analyzed on the basis of the model of linear trend in farms of the Republic of Moldova until 2016.

Table 2. The trend of economic efficiency indicators of grapes in agricultural enterprises during 2001-2011 and forecast for 2016 determined by linear adjustment

Indicator	Equation of linear trend $\bar{N}_t = a_0 + a_1t$	Level on average on period of 2001-2011 years of indicators	Adjusted level of 2016 year	Data of 2016 year in % than the average of the period of 2001-2011 years
Productivity of viticultural plantations on weight bearing, q/ha	$\bar{N}_t = 34,8 - 0,18t$	34,8	28,0	80,5
Unit cost of finite sold production, lei	$\bar{N}_t = 203 + 12,5t$	203,0	313,5	154,5
Prețul mediu de vânzare al 1 q de struguri, lei	$\bar{N}_t = 256,3 + 8,9t$	256,3	336,4	131,3
Profit calculated per 1 q of sold product, lei	$\bar{N}_t = 55,0 - 3,3t$	55,0	25,3	46,0
Level of rentability, %	$\bar{N}_t = 30 - 3,76t$	30,0	-3,0	-33 p.p.

By the extrapolation method are reflected in the dynamics calculations forecasting indicators that show that if you keep the future trend of change in direction and size of the calculation, the predicted economic efficiency indicators of grapes compared with 2011 average of 2001 will be as follows:

In 2016 bearing vineyard productivity will decrease by 19.5% and will reach 28 q/ha, the unit cost of finite production sold will increase by 54.5% and will constitute 313.5 lei, and the average selling price will increase by 31.3%. Given to the fact that the growth rate of unit cost is higher than the selling price in the agricultural enterprises and will reduce the profit calculated per 1 q of sold product with more than 20% and by 2016 the production of grapes will register losses of 3 bani to 1 leu consumed.

Location of agricultural production on regions is based on natural resources that is, in the first place, the soil. Location agricultural production shows how well or how poorly are used the natural-territorial economic conditions and that is reflected in the process of specialization and concentration, in the structure of incomes obtained for selling the production. The share of revenues obtained from selling commodity production from the Central region on average on the period of 2008-2011 is 15.5% and in the South - 50%.

Analysis of wine sector development by regions shows that more than 40% of the potential of grapes production is in the south region. Occupying 44.5% of the fruit plantations all over the country region make a profit share of total profit which is obtained in all regions. Surface weight bearing plantations in Chisinau, Central and Gagauzia region is 9.2%, 22% and 21% and, respectively, the rate of profit is 10%, 5.8% and 7%.

Analysis of economic efficiency of grapes (Table 3), demonstrates a high level of development in the South region. In this region, although productivity per 1 ha of plantations bearing is on an average level in the country, and the average selling price of 1 q grape reached 298.52 lei, which is 3.4% higher than the average in the country. This indicates a higher quality product.

Due to the fact that the growth rate of the sales price of 1 q of grapes is higher than the increase in cost, the farms in the South region have made a profit of 1 q sold by 66.1 lei and 1 ha of the which the production sold is of 25,041 lei, the return was 28.5%.

Economic efficiency of grapes is high and in Chisinau the level of profitability is 19.9%, followed by Central and Gagauzia region with less than 10%. Northern Region put restrictions on the cultivation of vine plantations and only Falesti, Sângerei and Soroca on the lower terraces are cultivated vines for production trade.



Table 3. Economic efficiency of grapes in the agricultural enterprises on developing regions from the Republic of Moldova, on average on 2008-2011 years

Indicator	Region of development				On average in Republic of Moldova
	Center	South	mun. Chişinău	UTA Gagauzia	
Productivity on bearing vineyard plantations, q/ha	31,7	35,85	57,2	25,3	35,5
Unit cost of finite production sold, lei	221,6	232,4	214,0	230,1	236,51
Average selling price per 1 q of grapes, lei	243,0	298,52	256,5	251,3	273,02
Profit (lei) calculated per: -1q of self production	21,4	66,1	42,5	21,0	36,5
-1 ha from which was sold the production	12,10	2504	1703	1320	1368,2
Level of rentability, %	9,7	28,5	19,9	9,2	15,5

## CONCLUSIONS

Based on date obtained from the research, it is believed that in order to avoid the negative trends of modification in the economic efficiency of grape in the wine sector of agricultural enterprises or reducing the rate of growth of 1 hectare of a bearing vineyard is necessary:

- argumentation of optimal level allocated resources of investment per 1 ha;
- implementation of scientific and technical progress;
- realization of only the adaptive technologies implemented with reduced consumption of production;
- use new varieties and hybrids of local selection with high productivity;
- raising the quality level of grapes;
- producing seedlings in conformity with specialization of enterprises in regional profile;
- apply irrigation systems with high and stable yields.
- aplicarea sistemelor de irigare cu randamente înalte și stabile.

Viticulture as a main component of wine and vineyard sector must be appreciated and considered as a national treasure, that should be renewed, sustained and promoted for the next generation.

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## SUSTAINABLE DEVELOPMENT OF DORNA BASIN, BY PROMOTING TOURISM ACTIVITIES IN RURAL AREAS

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**Key words:** rural areas, sustainable development, tourism

### Abstract

*Any strategy of diversification of non-agricultural economic activities and development of micro-enterprises in rural areas, aims to increase farms' side incomes from non-agricultural activities, to create new job opportunities, new services for local people, to promote entrepreneurship and development of rural tourism. Sustainable development by promoting tourism should have as objective, besides recovery and sustainable promotion of cultural heritage the natural resources with tourism potential as well and the use of local products, which are marketed not only as raw materials but also as products with added value.*

### INTRODUCTION

Specific to Dorna area are the scattered villages, often located at the bottom of the valley, especially on the terraces of the main rivers, where, mostly on the villages that are commune's residence, the density of population is higher.

After closing of the enterprises from the field of mining, which occurred mostly during 1991 - 1996, enterprises that contributed to the diversification of the local economy and also to employing a significant proportion of the working population, thus giving pluri-activity to households, the economy in this area has remained typical mountain, especially primary based on recovery of local natural resources, through forestry activities, agri-pastoral activities and tourism.

The share of arable land in this area is very low, most of the lands are covered by pastures and hayfields, whose existence supports the development of livestock and dairy industry. However, the efficiency of the livestock sector is modest due to the fact that it brings low income, lack of competition, initiative and association on interest groups in the area. Many households in the area practice these activities to ensure self-consumption, the

income generated by selling the surplus is quite low and reinvested in costs for household survival (mowing and gathering hay, taking the animals up the mountain during summer, purchase of concentrated food, and so on).

Involving a large number of households in livestock activities represents an opportunity for tourism development and integration of natural local products into tourism product.

### MATERIALS AND METHODS

This article proposes to deal primarily with:

- **Agri-food products** that are obtained in Dorna basin and which are based on: milk, berries, trout, hunt, veal. We wish to highlight the fact that mostly the raw materials are turned into account and not the value-added products. Also, not enough value is placed on products made by using local traditional recipes.

- **Tourism products**

Any product, in order for people to know it, needs to have a known story. If the story is beautiful and interesting it draws attention at first and if people join like the story it can be passed on.

The elders tell the following legend about the place named **Dorna**:

*"Dragos Voda, the founder of Moldova, came here to hunt. Here he met a girl as beautiful as a fairy, with blond hair, named Dorina. Dragos went hunting and in a dense forest he saw a deer, which he began to follow.*

*But the agile deer managed to escape the hunter's arrows, but, being tired, it stopped for a moment near a tree with a thick trunk to catch her breath. Dragoș aimed his bow and shot.*

*At that point he heard a human scream of pain and the deer jumped and disappeared again into the woods. Dragos approached the tree and saw that the one he had killed was the beautiful Dorina. Remorseful, Dragos buried her right on the spot where she was killed and in her memory he named the place and the river around it Vatra Dorinei (Dorina's center), which, in time, became today's Vatra Dornei.*

*The girl's name was Dorina and today many girls from this area are named Dorina too but the loved ones call them Dorna or Doruța".*

Carrying out a comprehensive documentation, studying the documents of the strategies to develop and promote tourism in Bucovina, we have identified in Dorna Basin specific elements that as a whole, contribute to giving the uniqueness of this beautiful depression.

Here are **the components of the tourism product** that we have identified as being insufficiently promoted in Dorna basin:

- Local customs, such as decorating the houses for the great religious events of the year: e.g Great Sunday, St. George, and so on;
- Tourism related events in Dorna area: the festival of painted eggs, the festival of trout organized by Ciocanesti museum-commune, the festival of berries organized by Coșna commune. These events are an opportunity for developing Dorna area as a rich area of biodiversity but also bio-economy and rural eco-economy;
- Tourism based on local therapies: Stroh baths, with various herbal infusions, the effects of peat;
- Agri-zoo-pastoral tourism and tourism to the sheepfolds;
- Religious tourism, which is related to lesser known and isolated hermitages, where people

are rediscovering the secrets of nature, of ancestors, the legends, tranquility and serenity: Mestecăniș, 12 Apostles, Piatra Taieturii, Rarău.

## RESULTS AND DISCUSSIONS

If we want to make a classification we can identify specific elements that may contribute to the development of future tourism products, in the context of biodiversity conservation based on the concepts of bio-economy and eco-economy and these elements are shown in the table below.

Table 1. Specific elements of biodiversity, in relation to local bio-economy and eco-economy, which can contribute to the development of future tourism products

Natural elements	<ul style="list-style-type: none"> <li>• 12 Apostles reservation, Oașoru Peak, Pietrele Doamnei;</li> <li>• Hunting elements: large carnivorous animals, capercaillie;</li> <li>• Flora elements: Rhododendron, Heaven's Dew, Zămbrul (all in the scientific reservation from Calimani mountains);</li> <li>• Medicinal herbs;</li> <li>• Grasslands with a rich biodiversity;</li> <li>• Tinoavele, another exponent of valuable biodiversity;</li> <li>• Mineral water springs (borcuturi);</li> <li>• Berries (wild strawberries, blueberries, raspberries), mushrooms;</li> </ul>
Elements related to traditional life, cultural and ethnographic elements	<ul style="list-style-type: none"> <li>• Sheepfolds and cowfolds, as agri- zoo-pastoral elements;</li> <li>• Haiturile (elements of rafting);</li> <li>• Dorna Arini and Gura Haitii whirlpools;</li> <li>• Dorna's traditional landscape characterized by a harmony mosaic between the strips of pastures, hay, human households, forests;</li> <li>• Trout;</li> <li>• Popular costumes specific to the area;</li> <li>• The architectural elements of settlements;</li> <li>• Picturesque toponyms (names of the places);</li> </ul>
Tourism activities specific to the area	<p>The variety of outdoor activities, among which we can mention:</p> <ul style="list-style-type: none"> <li>• Spa tourism;</li> <li>• River rafting;</li> <li>• Different types of ski and sled activities, till late spring;</li> <li>• Hiking;</li> <li>• Riding;</li> <li>• Fishing;</li> <li>• Extreme sports;</li> <li>• Various types of active tourism;</li> <li>• Tourism related to events in Dorna area (according to schedule);</li> <li>• Religious tourism.</li> </ul>
Local specific products	<ul style="list-style-type: none"> <li>• Milk and milk products;</li> <li>• Products obtained in sheepfolds: curd, cottage cheese, balmuș, lamb;</li> <li>• Mineral waters;</li> <li>• Dorna cake / rings</li> <li>• Cottage cheese rolled in cabbage leaves;</li> <li>• Smoked trout;</li> <li>• Jams, syrups and drinks from berries;</li> <li>• Boletus and chanterelle mushroom stew;</li> <li>• Mushroom Salad;</li> <li>• Dry marinated mushrooms.</li> </ul>
Specific experiences	<ul style="list-style-type: none"> <li>• Active recreation;</li> <li>• Safety, tranquility;</li> <li>• Natural, healthy food;</li> <li>• Self-discovery, return to ancestral roots;</li> <li>• Knowledge of local customs.</li> </ul>

These elements are basically placed in a frame, making up a calendar of major local events, which coagulates the energy of the main actors (people living here, with everything that they and their concern represent), forming a picture that they are "outsiders" are invited to watch and to participate.

Table 2. Calendar of events in Dorna Basin

January	<ul style="list-style-type: none"> <li>• Snow fest in Cărlibaba</li> <li>• Snow fest in Vatra Dornei</li> </ul>
February	<ul style="list-style-type: none"> <li>• Snow fest in Vatra Dornei</li> </ul>
March	<ul style="list-style-type: none"> <li>• The Festival of Painted eggs in Ciocănești – each year it is organized on the day before the day when the Easter Fast begins;</li> </ul>
April	<ul style="list-style-type: none"> <li>• Capercaillie's mating ritual (can occur from March to May, depending on weather conditions);</li> <li>• Craftsmen's fair in Vatra Dornei, where one can see and purchase: painted eggs, Easter ornaments, ceramics, etc..</li> </ul>
May	<ul style="list-style-type: none"> <li>• The celebration of Iacobeni commune;</li> <li>• Ascension – Heroes' Day, commemoration and celebration on Gruiu Peak, Călimani mountains, organized by local communities from Dorna and Bistrita Nasaud, with military participation. Access is facilitated by a road built by the Austro-Hungarian army under the leadership of Maria Theresa, a road which still exists today and can be seen;</li> </ul>
June	<ul style="list-style-type: none"> <li>• Peony Festival organized in Neagra Șarului commune, just below Călimani Mountains;</li> <li>• June 29<sup>th</sup> –celebration of Cărlibaba commune;</li> <li>• June 24<sup>th</sup> Nedeea / Sânzâienele;</li> </ul>
July	<ul style="list-style-type: none"> <li>• People from Dorna start making hay;</li> <li>• The Festival "Flowers on Dorna" in Poiana Stampei, around St. Elias' Day;</li> <li>• National Youth Folklore Festival in Vatra Dornei;</li> <li>• The season of berries and mushrooms starts;</li> </ul>
August	<ul style="list-style-type: none"> <li>• The season of berries and mushrooms is in full swing;</li> <li>• National Trout Festival in Ciocănești commune where one can see: horseback riders parade, rafting on Bistrita Aurie river, folk music performances, competitions of traditional cookery, delighting us with many local food goodies: trout dishes, sweets, mushrooms and so on;</li> <li>• Celebration of Panaci commune;</li> <li>• "Fir's song " Festival organized in Dorna Arini;</li> </ul>
September	<ul style="list-style-type: none"> <li>• Berries Festival - is organized on the first Sunday, in the village of Coșna;</li> <li>• The celebration of Vatra Dornei city;</li> </ul>
October	<ul style="list-style-type: none"> <li>• The sheep and cows are returning from the mountains;</li> <li>• The fake mating ritual of capercaillie;</li> <li>• The celebration of Brosteni commune;</li> <li>• Sheep and agri-zoo-pastoral products fair in Dorna Arini/ Broșteni;</li> </ul>
December	<ul style="list-style-type: none"> <li>• Christmas and New Year;</li> <li>• December 29 – 30 National Festival of Popular Winter Customs and Traditions/Masks' Parade– Vatra Dornei.</li> </ul>

## CONCLUSIONS

1. Agri-tourism and various types of rural tourism are producing value-added for the agricultural products obtained in Dorna Basin. Superior capitalization of these products involves their future certification as traditional products, thus contributing to strengthening local brands / trademarks and implicitly sustainable development;

2. Tourism activities carried out in local communities contribute to clotting and developing public-private partnerships and

associations that contribute to their development;

3. Sustainable development in this respect requires: knowledge, association involvement.

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## FOOD SECURITY IN A WATER-SCARCE WORLD: MAKING VIRTUAL WATER COMPATIBLE WITH CROP WATER USE AND FOOD TRADE

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### Abstract

*Virtual water has been proposed as a mechanism with potential to reduce the effects of water scarcity on food security. To evaluate the role of virtual water in reducing the effect of water scarcity on food security, all components of the available water resource in agricultural areas must be quantified to provide a basis for evaluating food imports driven by water scarcity. We refer to this situation as 'agri-compatible connections' among water scarcity, virtual water, and food security. To date, this has not been captured in the literature on water scarcity, virtual water flows and food security. The lack of agri-compatibility has rendered the virtual water concept seemingly inconsistent with trade theories and water-food security policy needs. We propose two requirements for achieving agri-compatible connections: (i) the limit of crop production imposed by water scarcity should be captured by quantifying all components of the water available to satisfy specific crop water requirement in the importing economy, and (ii) food import should satisfy 'water-dependent food security' need, which is the actual or potential food security gap created by insufficient available water from all sources for crop production (all other things being equal). Further, we propose that agri-compatible water scarcity should capture three key elements: (i) a reflection of aridity or drought potential, (ii) quantification of all the components of water resource available to a given crop at a given locality and time, and (iii) use of crop- and catchment-specific water scarcity factors to evaluate the effect of crop production and virtual water on water scarcity. In this paper, we show the conceptual outlines for the proposed agri-compatible connections. Achieving agri-compatible connections among water scarcity, virtual water and food security will enhance the analysis and understanding of the role of virtual water for food security in the importing economy and water scarcity in the exporting economy. We suggest that achieving agri-compatibility will improve the use of virtual water as a mechanism to reduce existing and future pressures on global food security.*

**Key words:** agri-compatibility, crop water use, food security, virtual water, water scarcity

### INTRODUCTION

Access to water and food is essential to human survival and is recognized as a fundamental human right (UN, 1948; Dubreuil, 2006). Water scarcity is however projected to be a key limiting factor to food production and development in the 21st century (WRI, 2003; UNDP, 2007). Many reports highlight the precariousness of global water security as water scarcity increases in scale and scope due to increasing demand for water (e.g. de Fraiture and Wichelns, 2010; Falkenmark et al. 2009; Falkenmark and Molden, 2008; Oki and Kanae, 2006). Projected changes in the global population,

climate, economic growth and urbanization are expected to exacerbate water scarcity and further destabilize food security (Gregory et al. 2005). The economic theory of efficient allocation of resources tells us that as water becomes scarce, its allocation increasingly shifts from low economic-value activities (agriculture and other primary sectors) to relatively high-value activities (industrial and service sectors) (Ohlsson and Turton, 1999). This potential shift of water away from crop production raises concerns over the destabilizing effect of water scarcity on food security.

Food security is fundamentally linked to water availability for crop use as it is known

that, on a global average, crop production is the largest water use sector (Thenkabail et al. 2010). Globally, the volume of water loss through crop evapotranspiration (ET) ranges from 6,685 to 7,500 km<sup>3</sup> yr<sup>-1</sup> (Thenkabail et al. 2010), accounting for over 70% of global water abstraction (e.g. de Fraiture and Wilchens, 2010; Hamdy et al. 2003; Yang et al. 2006). For example, in 2000, the global crop water abstraction amounted to 7,130 km<sup>3</sup> (of which irrigation accounted for 2,630 km<sup>3</sup>) and total abstraction for domestic and industrial use was 877 km<sup>3</sup> (de Fraiture and Wilchens, 2010). However, soil water deficit experienced under drought conditions during crop growing season is one of the major threats to achieving high and stable crop yields (Boyer, 1982; Rockstrom et al. 2009), making food security overly vulnerable to water scarcity (Liu, 2009). Water scarcity will, however, never be globally homogenous; it will always be geographically differentiated due to differences in climate and the management of different stocks and flows of water in the local hydrological system and differences in usage of water in economic activities.

To address the uneven distribution of global water reserves and increasing demand of water for food production, the movement of water through the trade of food commodities has been rationalised into the concept of virtual water. Virtual water refers to the volume of water used in the production of a unit crop commodity traded (Allan, 1998a, 1998b; 2003). The virtual water concept hypothesises that, by importing water-intensive food products from water-rich areas, water-scarce communities can offset local water scarcity and maintain food security (Allan, 1998a; 1998b; 2003; Yang et al., 2006; Liu et al., 2007; Aldaya, 2010a). It is this hypothesis that gives virtual water the potential to link water scarcity and food security through trade. Thus, importing food products saves the volume of water equivalent to the crop water requirement under the local conditions of production while augmenting domestic food security. Contrasted to engineering solutions, which move water to

people, virtual water is an agro-economic mechanism that moves water embedded in traded food commodities from production sites to people in a water-scarce economy (Allan, 1998a). A large body of literature exists on virtual water, highlighting the utility of the concept as a potentially useful policy instrument for addressing the coupled problem of food-water insecurity (see e.g. Allan, 1998a; Hoekstra and Hung, 2005; Chapagain et al. 2006; Chapagain and Orr, 2009; Yang et al. 2006; de Fraiture and Wilchens, 2010). Virtual water is, therefore, now regarded as a key component of the options available to economies actually or potentially exposed to food insecurity as a result of water scarcity (Roth and Warner, 2008; Allan, 1998a).

Some studies (e.g. Ansink, 2010; Ramirez-Vallejo and Rogers, 2010) have, however, shown that some water-abundant countries import water-intensive crop commodities from water-scarce countries. Based on this evidence, these authors argue that food commodity trade is not motivated by water endowment and, therefore, the virtual water concept is insufficient for addressing policy requirements for improved food and water security. Wilchens (2010) also argued that virtual water does not offer sufficient insight for important policy questions regarding water security as it suffers conceptual limitations regarding relative water endowments and opportunity costs of production among trading countries. This paradox emanates from a lack of agri-compatible connections (or agri-compatibility) among water scarcity, the virtual water concept and food security (Figure 1). Specifically, the water scarcity considered excludes some components of the water resource (mainly soil water) in crop producing areas and its evaluation is entirely from an economic perspective.

Virtual water is a dual concept that has a crop-water use component and a trade component. The two parts, however, require detailed examination so that the ability to match sustainable water use to food security can be evaluated accurately. In this paper, we concentrate on the crop specific elements of

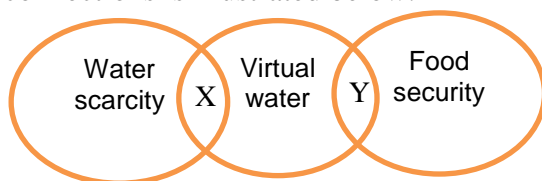


virtual water. We promote the concept that agri-compatibility is required to understand the link between water scarcity and food security through the movement of virtual water and to render virtual water more amenable to water and food security policy. To date, this has not been attempted and this paper proposes to show the requirements for agri-compatible connections by (i)

demonstrating the need for such agri-compatible connection, (ii) providing a formula for calculating crop- and catchment-specific water scarcity (iii) showing the use of agri-compatible water scarcity in the evaluation of the effects of virtual water movements on water and food security.

### Definition of Terms

**Agri-compatibility:** refers to the condition in which food is imported to fill the food security gap created by insufficient aggregate water supply from all relevant sources to satisfy the water requirements of crop production in the importing economy. The idea of agri-compatible connections is illustrated below.



X = agri-compatible water scarcity

Y = water-dependent food import

**Agri-compatible water scarcity:** insufficient water availability from all relevant sources (blue, green, grey) to satisfy the water requirement of a crop or crops at a particular area.

**Water-dependent food import:** import of food to fill potential or actual food security gap resulting from insufficient water from all relevant sources to meet the water requirement of crops.

Figure 1. Definition of terms

## MATERIALS AND METHODS

The paper purpose was to present the ‘agri-compatible connections’ among water scarcity, virtual water, and food security, a field where literature is poor of information.

The second goal of the paper was to identify the requirements for achieving agri-compatible connections as follows:

- a) the quantification of all components of the water available to satisfy specific crop water requirement in the importing economy;
- b) food import should satisfy ‘water-dependent food security’ need.

Based on the main results in the field regarding food security and water scarcity, the final purpose was to identify and present proposals concerning the key elements for agri-compatible water scarcity.

From a methodological point of view the paper is based on the main research results in

the field, presenting the conceptual outlines for the proposed agri-compatible connections.

## RESULTS AND DISCUSSIONS

### Food Security

Food security must necessarily refer to a state in which the food system is secured. Food systems include production and related supply chains of commodities and foods in the production-consumption nexus (Gerbens-Leenes et al. 2010; Gregory et al. 2005). Food security is complex as a number of biophysical and socio-economic factors interact in dynamic and complex ways to affect food systems that underpin food security (Gregory et al. 2005). Food security is generally defined as “availability of and assured access to sufficient food that is nutritionally adequate, culturally acceptable, safe and which is obtained in socially acceptable ways” (Gorton et al. 2009). The

most widely used definition of food security emerged from the World Food Summit (1996): “*food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life*”. The components of food security are availability, accessibility, utilization and stability of access (FAO, 2006).

The preceding definitions of food security reveal little of the issue of food crop production, but the ability to supply food relies on the availability of harvested food crops produced domestically or imported. In this paper, food security is equated to food availability in sufficient quantity to satisfy the dietary requirements of a given population and is understood to have a specific spatio-temporal context. Water is a key factor that links crop system productivity with food availability. Consequently, domestic food production to satisfy food security is subject to the constraint of water availability but food security is achievable through domestic production or import.

#### **Water Scarcity**

Water used in crop production is classified into three main colours: blue, green and grey (Chapagain and Orr, 2009). Blue water refers to groundwater and surface water (streams, lakes, rivers, dams) available for human use that is introduced into crop production systems through irrigation. There is greater competition for blue water from all water use sectors compared with the other water colours. Green water refers the fraction of precipitation that infiltrates and remains in the unsaturated zone of the soil after drainage and is available for crop evapotranspiration. Grey water represents recycled water that is used in crop production after treatment. In assessing the effect of crop production on water availability, grey water is defined as the water required for diluting pollutants from agro-chemical inputs in crop production (Chapagain and Orr, 2009). These definitions, however, leave out or mask the use of rainfall harvesting by collecting runoff or by direct interception from roof for crop production

(but the latter is also used to augment domestic water use in developing countries) and desalinated water that can potentially be used in agriculture. Perhaps, these can be referred to as ‘yellow water’ and ‘red water’ respectively. We label the former ‘yellow’ water because, in terms of crop production, it is considered to be at the interface between blue and green water (Wisser et al. 2010; Hoff et al. 2010); and the latter ‘red water’ because it is expensive and difficult to obtain, particularly in terms of energy consumption.

#### **Types of Water Scarcity**

According to Rijsberman (2006), an individual who is unable to access safe and affordable water to meet personal basic requirements is said to be “water insecure”. An area is “water scarce” when a significant proportion of the population become water insecure for a prolonged period. In the European Environment Outlook (2005), water scarcity is defined as the incidence of insufficient water resources (as a result of low availability or demand exceeding the supply capacity of the natural system) to satisfy long-term average requirements. Rockstrom et al. (2009) state that ‘water scarcity is a general collective term used when water is scarce for whatever reason’. In this paper, water scarcity is defined as insufficient water availability from all sources to satisfy long-term average crop water requirement.

A distinction exists between economic and physical water scarcity. Physical water scarcity refers to inadequate quantity of available water to satisfy demand or water requirement. Economic scarcity or social water scarcity relates to constrained access to water as a result of limited investment in water infrastructure or socio-economic constraint (Rijsberman, 2006). A third type of water scarcity, hybrid water scarcity, relates to a combination of physical and economic scarcity where over-abstraction combines with limited socio-economic adaptive capacity. Ohlsson and Turton (1999) argue, however, that these are not distinctive types of water scarcity, but progressive orders or levels which are emergent from immediately lower orders. Thus, physical scarcity is first order

scarcity. An effort to resolve this scarcity, through engineered systems to augment supply, leads to the emergence of a second order economic type scarcity. Addressing a second order scarcity through enhanced water conservation and use efficiency leads to the possibility of a third order scarcity which is a combination of physical and economic scarcities and signals a shift in water allocation from low-value to high-value use. It can also be argued, however, that economic scarcity can be first order scarcity which, when resolved, can lead to the second order physical scarcity.

Rijsberman (2006) provided a comprehensive overview of water scarcity indicators, discussing their merits, demerits and potential uses. On the basis of computational approaches and inherent assumptions, three broad types of water scarcity indicators can be distinguished: withdrawal to availability ratio, per capita water availability, and hybrid water scarcity indicators.

#### *a) Withdrawal to Availability Ratio*

This indicator compares water withdrawal with the renewal capacity of a watershed or natural system of a given geographic area. A widely used method for calculating scarcity is the Water Resources Vulnerability Index (WRVI) developed by Raskin et al. (1997). This technique computes scarcity as the proportion of total annual withdrawal to total available water resources. When annual withdrawal is 20-40% of renewable water supply, the region suffers water scarcity. When the value is above 40%, the region suffers severe water scarcity. Other approaches include the criticality ratio (Alcamo et al. 1997) which is the quotient of water withdrawal to total renewable water supply. A value of 0.4 indicates high water scarcity. Similar methods of calculating water scarcity can be found in Vorosmarty et al. (2000), Alcamo et al. (2003), and Oki and Kanae (2006). Another variant is the Water Exploitation Index (WEI) which is used to gauge water scarcity in Europe (European Environment Outlook, 2005). The WEI is the quotient of total water abstraction and the long term annual average water resources. A

WEI value of 0.2 is the threshold that indicates water scarcity. A value higher than 0.40 indicates severe water scarcity.

#### *b) Per Capita Water Availability*

This category of indicators presents the amount of water potentially available to an individual in a given population that depends on a given amount of water resources in a particular geographic area (Rockstrom et al. 2009). An example of such a method is the Falkenmark indicator (Falkenmark et al. 1989). The Falkenmark indicator is commonly used because it is easy to measure and is readily understandable and meaningful, even though it also has certain limitations such as masking variability across spatial-temporal scales, infrastructural capacity and demand due to differences in socio-economic contexts (Rijsberman, 2006). According to the Falkenmark indicator, a country is suggested to suffer water stress if its per capita annual renewable water supply (surface water and groundwater) is less than 1700 m<sup>3</sup>, water scarcity if its per capita available water is 1000 m<sup>3</sup> or less, and absolute scarcity when its per capita water availability is less than 500 m<sup>3</sup>. It is easy to deduce from this indicator that an increase in population automatically increases water scarcity as the same amount of water circulates within the local hydrological cycle.

#### *c) Hybrid Water Scarcity Indicators*

Hybrid indicators combine physical and economic water scarcity into a single value. Examples include the water poverty index (Sullivan, 2002) and the social water stress index (SWSI) (Ohlsson, 1999). Ohlsson (1999), for example, generated the SWSI by weighting the Falkenmark indicator using the United Nations Development Program (UNDP) human development index and, thereby, incorporated social adaptive capacity (Rijsberman, 2006). Seckler et al. (1998) incorporated social adaptive capacity into their analysis to distinguish physical water scarce countries from economic water scarce countries.

### **Towards agri-compatible virtual water**

#### *a) Scope for Agri-compatibility*

Currently, any reference to water scarcity is arbitrarily linked to food insecurity and any food import qualifies as virtual water. This limits the utility of virtual water for

addressing specific water and food security policy. We therefore present and elaborate a framework for agri-compatible virtual water (Figure 2).

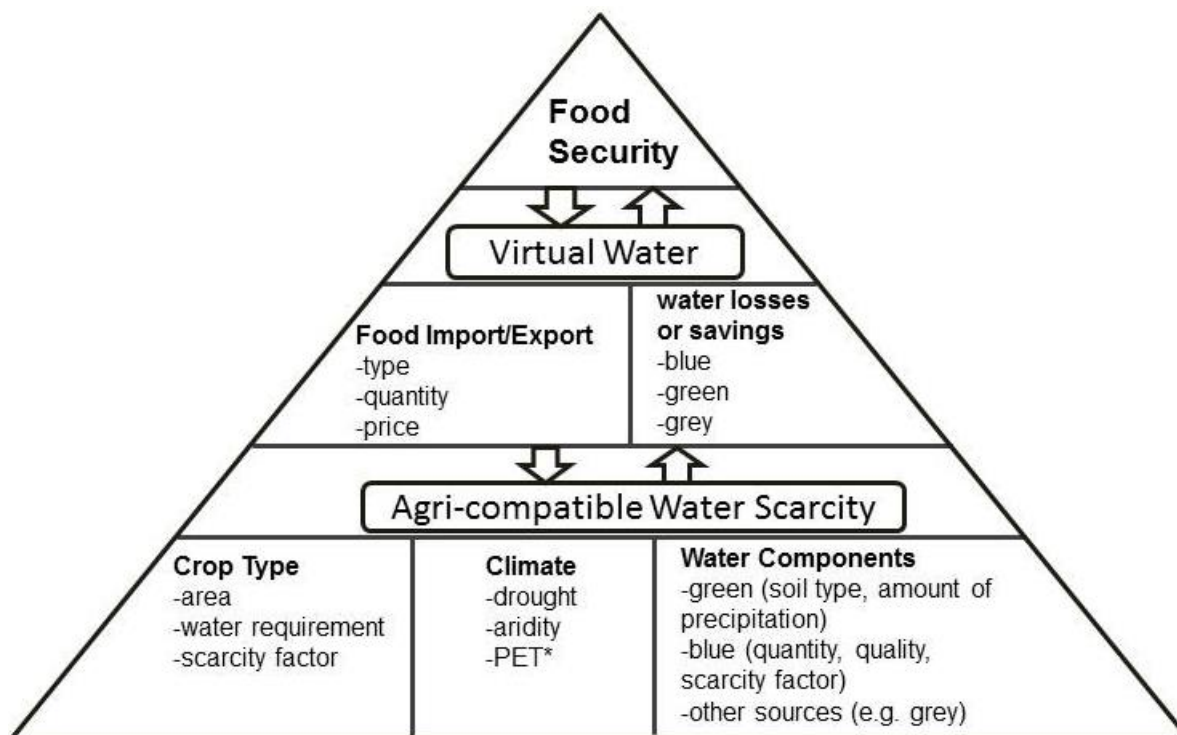


Figure 2. Agri-compatible framework for understanding the role of virtual water in achieving food security in a water-scarce community. The base of the triangle captures the elements of agri-compatible water scarcity which limits crop production and necessitates food import (virtual water). The apex of the triangle shows food security achieved through virtual water. Conversely, food security, achieved through virtual water, also affects water scarcity in the crop production area from which food crops are imported.

\* Potential Evapotranspiration

Current methods of calculating water scarcity are not compatible with environmental water availability for crop production and therefore do not reflect crop water scarcity. These methods are limited by the following factors: i) current water scarcity indicators are based on blue water and socio-economics but do not capture green water availability and use, as well as yellow water or the possibility of red water use. The potential of deep groundwater as a buffer has received scant attention (Koehler, 2008); ii) increasing water scarcity in a certain area may have a high potential to cause a shift in water allocation from agriculture to non-agricultural uses even though the contribution of actual crop water use to overall water scarcity is rarely considered; iii) it is rare to include climatic variables such as temporal changes in

precipitation which is critical for crop performance; iv) not all water scarcities are of significance for crop production, e.g. economic water scarcity has little relevance for rain-fed agricultural systems; (v) the scale of analysis is often too coarse to reveal important spatial, temporal and socio-economic differences within a given country, region or catchment.

Figure 2 shows that virtual water can be used as a mechanism to bolster food security while offsetting water scarcity in an importing economy, but can also affect water scarcity in the exporting economy. Figure 2 shows the two requirements for evaluating agri-compatible virtual water estimates. One, water scarcity must be agri-compatible, the other, food importation should serve “*water-dependent*” food security requirement

(Aldaya et al., 2010b). Water-dependent food security refers to actual or potential food security gap created by insufficient available water from all relevant sources for crop production (all other things being equal) to meet food security requirement.

#### ***b) Agri-compatible water scarcity***

Agri-compatible water scarcity refers to insufficient water availability from all relevant sources to satisfy crop water requirement to the extent that food security is undermined. The components of agri-compatible water scarcity (crop type, climate and water components) are shown at the base of Figure 2. Existing water scarcity indicators give useful information on water availability for use by human populations. There is, however, relatively scant information on the link between water scarcity for food production and security. For water scarcity to be meaningful for virtual water and food security, the concept must be agri-compatible. In other words, water scarcity should be analysed through agricultural systems and expressed in terms of normal water balance concepts and the role of imported food commodities in the food balance sheet and water consumption in the importing economy. Agri-compatible water scarcity, therefore, accounts for the totality of environmental water availability (green, blue and other sources) and consumption in relation to specific crop water requirement (CWR) at a particular place and time. CWR, usually equated to crop evapotranspiration, is a function of climatic and weather conditions, soil properties, agronomic practices and crop factors. As a result and due partly to differences in crop water use efficiency (amount of water used per unit yield), crops can suffer genotype-specific water scarcity under the same production conditions. Agri-compatible water scarcity should capture three elements as discussed in the next sub-sections.

#### ***Aridity and Drought***

Aridity describes the extent of dryness of the atmosphere, in terms of the relationship between precipitation and potential evapotranspiration (PET), of a given agro-ecosystem (Rockstrom et al. 2010). In arid

agro-ecosystems, PET exceeds effective rainfall, spatial-temporal variability of rainfall is high and drought and dry spells are frequent (Rockstrom et al. 2010). The occurrence of seasonal and intra-seasonal water deficit for crops is therefore high and frequent, underscoring a high potential for physical water scarcity. Drought is a temporary shortage of water, over periods of months to few years, due to below-normal precipitation (Dai, 2011). The occurrence of drought during the growing season of crops can ultimately impair crop growth and yield if not addressed. While aridity is a permanent climatic feature of certain geographic regions, periodic and seasonal drought is common in many crop production areas of the world. Drought is a complex abiotic stress and difficult to predict because of the interaction of multiple factors related to crop, climate, soil and agronomic practices (Richards, 2006). Assessment of the effects of drought on yield is further complicated by the varying effectiveness of different crop response and adaptive mechanisms, the time of incidence in the crop cycle and the severity of the drought. Under rain-fed systems, drought can seriously decrease yield and can necessitate food import even though some crops have a physiological capacity to maintain high plant water status and minimize yield loss under short term water stress conditions (Blum, 2005). Aridity and drought increase CWR and increases the need for irrigation. These features make virtual water particularly relevant for regions with arid and semi-arid agro-ecosystems due to the high potential for agri-compatible water scarcity. Thus, in evaluating virtual water flows, it is important to consider the contribution of aridity and drought to water scarcity for crop production and, consequently, food import.

Allan (2000) argues that virtual water is particularly effective and efficient in addressing *progressive and occasional local agricultural drought*. Drought can compel a relatively water-secure economy to restrict food export and increase food import in order to maintain food security. Consequently, agri-compatible water scarcity estimates should

reflect the effectiveness of the climate and weather in relation to the specific water requirement and phenology of a particular crop in a given area and time. Understanding the environmental effects of periodic and

seasonal drought on crop yield response constitutes a more rigorous basis for evaluating the significance of virtual water for food security and water savings.

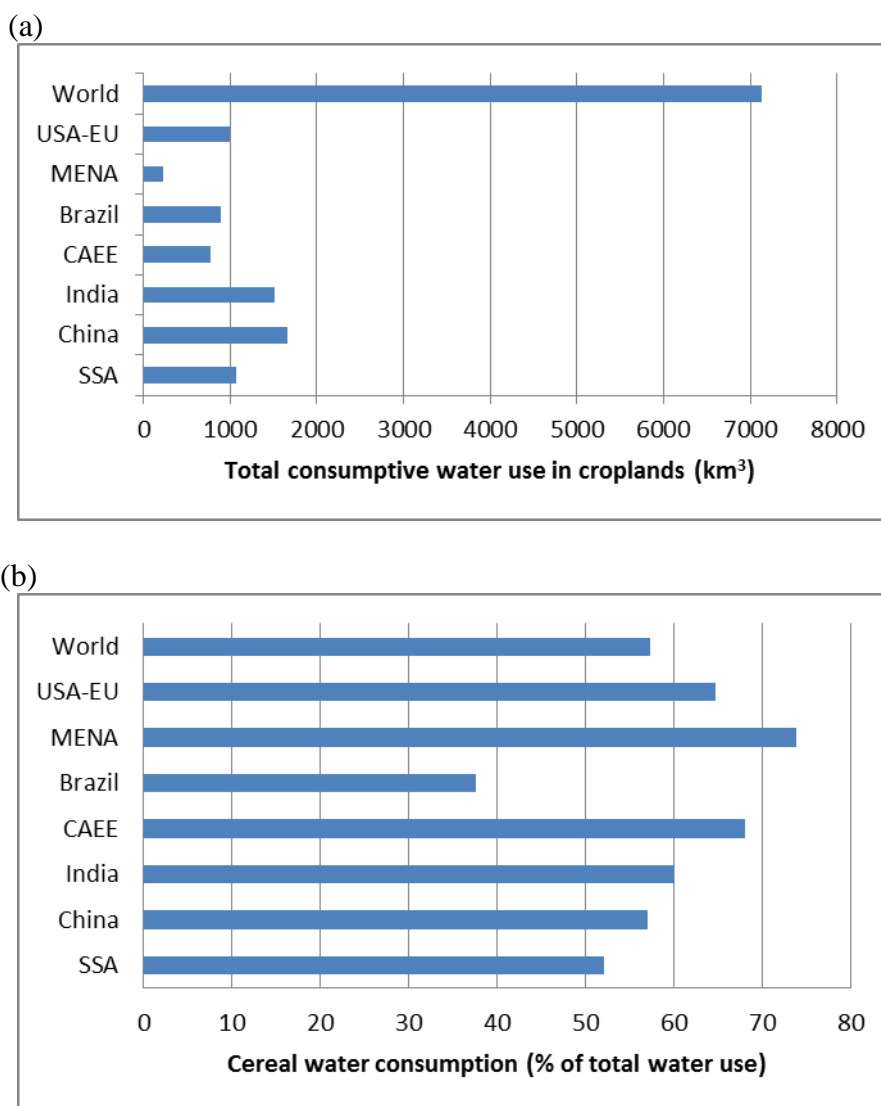


Figure 3. (a) Total crop water use in the world and selected major crop production regions in the year 2000 and (b) water used by cereals as a percentage of total crop water use in the world and selected major crop production areas in 2000 (de Fraiture and Wilchens, 2010).

MENA, CAEE and SSA denote Middle East and North Africa, Central Asia and Eastern Europe, and Sub-Saharan Africa respectively.

Cereal grains have the largest water use in global crop production, can fail due to seasonal drought and are the most traded crop commodity (Yang et al. 2006). World crop water use was over 7000 km<sup>3</sup> in 2000 (Figure 3a), of which cereals accounted for 57% (Figure 3b). Cereals also accounted for over 70% of total crop water use in the Middle East and North Africa (MENA) region in 2000

(Figure 3b). The higher aridity of the MENA region largely accounts for the high irrigation water requirement of cereal production (de Fraiture and Wilchens, 2010; Allan, 1998a; 1998b), giving rise to agri-compatible water scarcity. Not surprisingly, cereals constitute the largest food import to the MENA region. According to de Fraiture and Wilchens (2010), in 2000, Egypt alone imported 8

million tonnes of grains from the USA. As a result of the grain import, Egypt saved 8.5 billion m<sup>3</sup> blue water which could have been used to produce the imported grains (de Fraiture and Wilchens, 2010). Evaluations of virtual water show that the higher import of cereals and grains to the MENA region serves the purpose of water-dependent food security (Allan, 1998a; 1998b) as water availability is limited substantially by aridity. Therefore, it is important that the analysis of agri-compatible water scarcity incorporates a 'climate' factor that reflects the effect of aridity or drought potential.

#### Green and Blue Water Availability

Green and blue water are the main components of water resource that serves specific crop water requirements in crop

producing areas, even though other components may exist in some other crop producing areas. A number of studies highlight the dominance of green water in global crop production by indicating that green water consumption is about 4-5 times higher than blue water consumption (Hoff et al. 2010; Aldaya et al. 2010b), yet green water volumes and consumption are rarely estimated (Hess, 2010). Hoff et al. (2010) suggest that two-thirds of global precipitation is stored as green water while the remaining third is blue water. Even the MENA region, which depends largely on irrigation, meets 50% of their total crop water requirement from green water, either in rain-fed agriculture or from precipitation over irrigated land (Hoff et al. 2010).

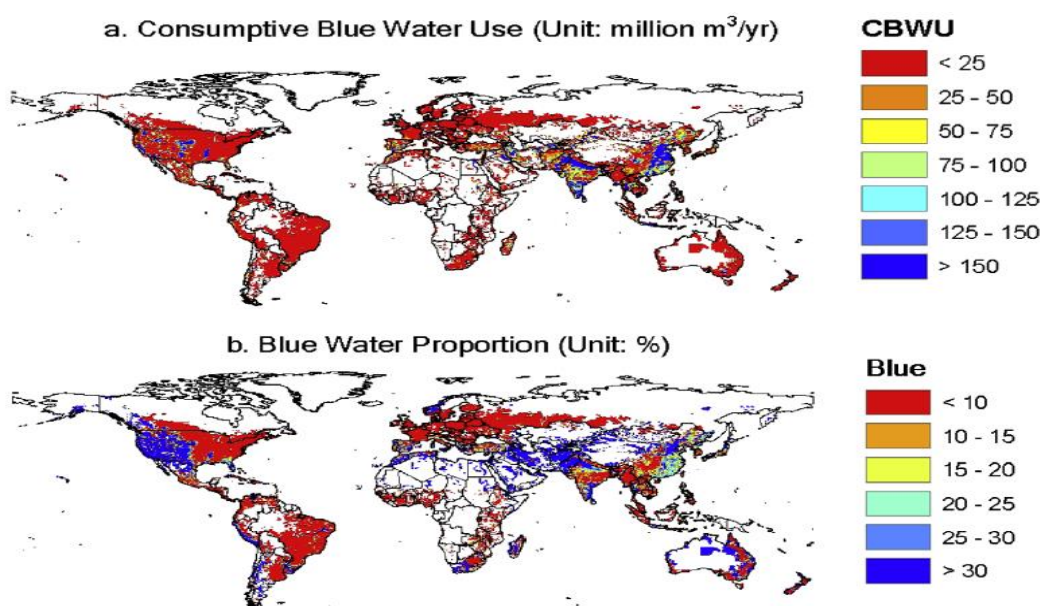


Figure 4. Global pattern of (a) blue water use in crop production (b) blue water use as a proportion of total water use in crop season (Liu and Yang, 2010).

Rockstrom et al. (2009) showed that global water scarcity for crop production can be significantly diminished when green water is properly sourced and managed. Liu and Yang (2010) undertook a spatially-explicit assessment of global green and blue water use on croplands and pasture fields. Their work demonstrated that high water use occurs in China and India, the southern part of West Africa, the mid-belt of USA and parts of South America. However, while blue water use could be substantial in global crop

production (figure 4a), its proportional contribution to total water use is small (figure 4b). Green water therefore significantly moderates water scarcity and should be reflected in agri-compatible water scarcity.

#### Calculation of Crop and Catchment Water Scarcity Indicators

Allan (2000) asserted that analysis of drought must be specific to a given crop type or land use. Similarly, agri-compatible water scarcity must be specific to a particular crop and catchment at a particular area and time in

order to be meaningful and purposeful. The work of Ridoutt and Pfister (2010) is significant as it creates opportunity for quantifying the specific contribution of each product to water scarcity, through its life cycle, and the location of water scarcity.

Nevertheless, it does not fully capture agri-compatible water scarcity. We propose a calculation scheme for agri-compatible water scarcity factors at crop and catchment levels (Table 1).

Table 1. A scheme for calculating agri-compatible water scarcity at crop and catchment scales.

(i) CROP FIELD	(ii) CATCHMENT
Per unit time (t):	
$BWR_i[t] (m^3) = (ET_c[t] - P_{eff}[t]) \times A$ [where $ET_c \geq P_{eff}$ ]	$BWR_c[t] = \sum_{i=1}^n BWR_i[t]$
Per season:	
$BWR_i[season] = \sum_{t=1}^l BWR_i[t]$	$BWR_c[season] = \sum_{i=1}^n BWR_i[season] =$ TBWR
Scarcity factor ( $Cf_i$ ) = $\frac{BWR_i[season]}{BWf_i}$	Scarcity factor ( $Cf_c$ ) = $\frac{TBWR}{\sum_{i=1}^n BWf_i}$

Note:

- (i)  $BWR_i$  denotes blue water requirement of crop  $i$  per unit time ( $t$ ) ( $m^3$ );  $P_{eff}$  denotes effective rainfall (mm) (effective rainfall is the proportion of rainfall that remains in the root zone after runoff and deep percolation);  $ET_c$  denotes crop evapotranspiration (mm);  $A$  denotes areal coverage of crop  $i$  ( $m^2$ );  $BWf_i$  denotes the fractional amount of blue water in the catchment available for to crop  $i$  ( $m^3$ );  $l$  denotes length of crop growing period (days).  
 (ii)  $TBWR$  denotes total blue water requirement of all crops considered in the catchment ( $m^3$ );  
 $n$  denotes number of crops considered; and  $c$  denotes catchment.

Scarcity factor ( $Cf$ )  $< 1$  implies no scarcity;  $Cf > 1$  implies water scarcity.

Thus, taking  $Cf = 1$  as the threshold for water scarcity, it implies water scarcity increases as  $Cf$  increases from 1 and vice versa.

The development or use of these crop and catchment specific scarcity factors is important for the following reasons:

- i) not all the catchments in a country might have agricultural withdrawals or abstractions of blue water
- ii) different catchments will have different scarcity factors with respect to agriculture and overall withdrawal; and for different crops grown in the catchment
- iii) there can be water scarcity in a particular area without there being water scarcity for a particular crop in the same area. Thus, green water availability could be sufficient to support the production of some crop(s) in a catchment that might be suffering blue water scarcity.

iv) intra-seasonal dry spells might adversely affect crop yield in a country or an area that is not considered as water-scarce in the conventional sense.

v) knowing the crop and catchment water scarcity factors will help match crops to catchments in order to save water or reduce the effect of the production of a particular crop on a given catchment. This will, in turn, aid the analysis of the effect of land cover change on water scarcity in a given catchment.

vi) the equations also have operational significance as they can be used to monitor temporal water scarcity (for only green water, blue water or both) at crop, field and catchment scales.

vii) the crop- and catchment-specific scarcity factors can be used in calculating crop water footprints and related effects on humans and ecosystems at both sites of production and consumption.



## CONCLUSIONS

Virtual water has been proposed as an essential component of the policy toolkit available to water-scarce communities to reduce the effect of water scarcity on food security. As water scarcity becomes more widespread and crop production becomes increasingly constrained, interest in virtual water is growing in the water research and policy community. However, the connection and the mechanism by which virtual water can reduce the effect of water scarcity on food security remains unclear and contested. We attribute this situation to a lack of agri-compatibility, which should provide a basis for evaluating the role of virtual water in reducing the effect of water scarcity on food security. To evaluate the role of virtual water in the global issue of water scarcity and food security, all components of the available water in crop producing areas need to be quantified to provide a basis for evaluating food imports necessitated by water scarcity. This makes virtual water agri-compatible.

The agri-compatibility framework improves understanding of the connections among water scarcity, virtual water and food security; and shows the relevance of virtual water as a mechanism for reducing the effect of water scarcity on food security. This paper shows scope for agri-compatibility and has argued, that, to ensure agri-compatibility, two key requirements must be met. First, water scarcity should be agri-compatible and, second, food importation should serve “water-dependent” food security requirement. Addressing the former significantly improves overall agri-compatibility. Agri-compatible water scarcity must capture three elements: i) It should account for the totality of water availability and consumption from all relevant sources in crop production. This requires further research effort in the accurate measurement and monitoring of the dynamics of green water availability and consumption in croplands; ii) The analysis of water scarcity for food production should incorporate a ‘climate’ factor that reflects aridity and drought potential; iii) Water scarcity factors

should be specific to crops and catchments to show the scale of crop and land use effect on local hydrological system and, therefore, water scarcity. A conceptual framework for analysing agri-compatible connections among water scarcity, virtual water and food security has been presented and a scheme for calculating agri-compatible water scarcity at crop and catchment scales has been proposed. Making virtual water agri-compatible will require a multi-disciplinary research effort that spans socio-economics, hydrology, soil-water-crop-atmosphere dynamics, spatially-explicit modelling and policy analysis. Nevertheless, achieving such agri-compatibility will significantly advance the utility of virtual water for policy in addressing the effect of water scarcity on food security.

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## ELIGIBLE PRODUCTS AND FUNDS ALLOTTED TO ENTERPRISES IN ORDER TO INFORM AND PROMOTE AGRICULTURAL PRODUCTS IN ROMANIA AND IN THE THIRD COUNTRIES

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### Abstract

*The paper aimed to present the promotion and information actions on the agricultural products in the context of the EU and Romanian regulations and the public budget allotted by products and actions. Also, there were pointed out the main aspects regarding the role of agricultural products marketing and the major factors which could influence market price and producers profit. Finally, there were presented the information and promotion actions suitable to the obtaining of the funds.*

**Key words:** *agricultural products, eligible products for funding, information and promotion, Romania*

### INTRODUCTION

Marketing is considered as a set of economic and organizational activities of the enterprise that seeks to create and discover customer needs and to cover their requirements with products and services which by their characteristics, their prices and time and space availability, can provide a set that can assure their frequent buying by consumers and enterprise profits [4].

In this context, the paper aimed to present the promotion and information actions on the agricultural products in the context of the EU and Romanian regulations and the public budget allotted by products and actions.

### MATERIALS AND METHODS

In order to set up this paper it was used the legislation in force provided by the EU and Romania regarding funding for information and promotion of agricultural products.

### RESULTS AND DISCUSSIONS

Information and promotion actions for agricultural products are a common agricultural policy instrument, financed by the European Agricultural Guarantee Fund

(EAGF) for financing of market measures, export refunds and direct payments to farmers. The support given to the information and promotion programs complete and reinforce the actions of the Member States and the third countries, especially in terms of quality, nutritional value and food safety and production methods, contributing to the multiplication of national and private initiatives, with an expected effect of increasing the trade flows and information on the products.

Information and promotion actions have as object the agricultural products and their production methods and food-based on agricultural products, without being guided by certain commercial brands and without encouraging a product consumption because of its specific origin. Product origin could be indicated when the product name is registered and protected under EU policy on quality products. The information and promotion actions are being conducted under the Regulations, Ordinances and Laws in force, as follows:

-Regulation (EC) no. 3/2008 of 17 December 2007 on information and promotion actions for agricultural products on the internal market and in third countries;  
-Regulation (EC) no. 501/2008 laying down

detailed rules for implementing Regulation (EC) no. 3/2008 of the Council on information and promotion actions for agricultural products on the internal market and in third countries [2];

-Emergency Ordinance no. 76/2008 to designate the competent national authorities for coordination, monitoring, management and implementation grants for the financing of information and promotion of agricultural products on the internal market and in third countries, as well as Law no. 1/2004 on the establishment, organization and functioning of the Agency for Payments and Intervention in Agriculture, approved by Law no. 36 of 13 March 2009.

-Emergency Ordinance no. 34/2006 on the award of concession of services contracts. Organizations and Bodies which could implement these measures are the following ones:

-Public Funds - Co-financing of max. 80% (30% of national public funds and up to 50% of the EU budget);

-MARD (Ministry of Agriculture and Rural Development);

-APIA (Agency for Payments and Intervention in Agriculture);

-SEAP (Electronic System of Public Procurement);

-ANRMAP (National Authority for Regulating and Monitoring Public Procurement);

-EU (European Union);

-The internal market (European Union's single market).

-List of the third countries and geographical areas where promotion actions can be achieved:

a) Countries: South Africa, Macedonia, Australia, Bosnia and Herzegovina, China, South Korea, Croatia, India, Japan, Kosovo, Montenegro, Norway, New Zealand, Russia, Serbia, Switzerland, Turkey, Ukraine.

B) Geographical areas: North Africa, North America, Latin America, Southeast Asia, Near and Middle East [3].

Marketing is very important for societies because it is like a bridge between producers and consumers. Normally we must pay a

special attention to this domain but curious is the fact that only 40% of all the companies in the world are focused on this sector, invest and have specialized departments.

Table 1. Annual MAPDR Budget by agricultural product

PRODUCTS	Annual Budget, MADR (Euro Thousand)
Milk and dairy products	110
Wines with protected origin or protected geographical indication, wines with the grape varieties for wine-making	130
Products with protected geographical indication (IGP)	100
Fresh and processed fruits and vegetables	120

Source: [www.madr.ro](http://www.madr.ro) [1]

There are two important aspects of the marketing of agricultural products:

1. The first aspect is dealing with the physical process that brings products from producers to consumers; the fundamental stages of this process are collection, packaging, transport, processing, storage and lastly retail sale of agricultural products.

2. The second aspect involves the market pricing mechanism. Emphasis will therefore be placed on the market mechanisms that contribute to the pricing of agricultural products and on the way that producers can obtain acceptable prices for their crops.

Agricultural prices depend on various factors such as:

-demand and supply, depending in their turns on the total available amounts of a given product and can include local production;

-the production of neighbouring countries as well as world production in the case of export products;

-producers' need for ready cash: the more they need cash at harvest-time, the more they will accept low prices. On the contrary, if they decide to stockpile instead of to sell immediately, market prices will go up;

-demand originates from the end users or consumers and is supplied by dealers or intermediaries;

-demand is influenced by product quality and price, when consumers will buy more if the

price is low, but they may be willing to pay a higher price (depending on their income) if product quality is good [2];

- perishability of agricultural products;
- lack of labour force (in our country and also in Europe, most of the people are not tempted to work in agriculture);
- high prices for inputs;
- farmers obtain money only after one cycle of production (which can vary from one product to another);
- economic crisis.

Types of promotion and information actions:

- actions on public relations, promotion and advertising, mainly intended to point out intrinsic features and advantages of the EU products in terms of quality, food safety, specific production methods, nutritional and health aspects, labeling, animal welfare and environmental protection;
- information campaigns;
- evaluation studies of the results of the information and promotion actions;
- attending events in the field;
- participation in national and international fairs and exhibitions, where special stands are organized in order to enhance products;
- market studies;
- high level trade missions.

## CONCLUSIONS

Based on the EU and Romanian regulations regarding the information and promotion measures and actions which could be financed, it was concluded that the actions have to be carefully selected depending on the agricultural products and also to take into consideration the main aspects and factors which could influence these actions.

Funding is allotted only for the products listed by the Ministry of Agriculture and Rural Development.

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## EUROPEAN PROJECTS AS A TOOL FOR IMPROVING FARMERS SKILLS VIA MODERN INFORMATION TECHNOLOGIES

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### Abstract

*This article presents European projects with the main focus on the improving the skills and competitiveness of farmers by modern information and communication technologies and e-learning methods. Two projects – AVARES - Enhance attractiveness of renewable energy training by virtual reality and NewCAP - New European Standards in the Context of Reformed EU Common Agricultural Policy are projects under the Leonardo da Vinci Transfer of Innovation grant scheme. They try to present new way of vocational education and training in the agrosector. The main aim of the AVARES project is to develop the multimedia learning materials for vocational education and training in the field of agricultural and rural development and application of modern information and communication technologies into vocational education and training. The emphasis is put on the application of modern ICT equipment and technologies, with the main focus on the Virtual reality, 3D visual display and e-learning 2.0 methods. New programming period 2014 – 2020 will bring significant changes within the Common Agricultural Policy (CAP) which will have a serious impact on economy especially of larger beneficiaries. The „NewCAP“ project aiming at preparation of actors in rural areas to take the proposed changes in the policy through interactive educational programme.*

**Key words:** e-learning, common European policy, competitiveness of farmers, renewable energy sources, vocational education and training

### INTRODUCTION

Vocational education and training aims to develop knowledge, skills, jobs' habits and other competences of students. The final effect of a graduation is the qualification, which enables them to engage in the working process as a skilled workforce or continue their studies.

For the successful entry of graduates into the labour market adequate education and training are necessary.

According to the Bruges Communiqué[1] it is essential to adapt the content of vocational training in favor of changing needs of labor market. Integration of needs of the changing labor market into the content of the vocational education and training requires better understanding of skills of new created sectors and related changes within more and more integrated Europe.

The main aim of the vocational education and training is to contribute continuously to the employment and economic growth as well as to react on more extended social challenges. By the quality and excellence of vocational education and training in EU communities is essential to ensure the sustainability of employment and economic development. In the knowledge-based society there are vocational skills and competencies as important as the academic ones. At the present EU there are preferred thematic fields focused on sustainable development. In more details we can speak about topics related to the energetic sustainability linked directly to the use of renewable energy resources and the Common Agricultural Policy. The paper focuses on two international projects in the frame of the Leonardo da Vinci - Transfer of Innovation programme with their main aims to enhance the quality and attractiveness of

vocational education and training via current information and communication technologies.

## MATERIALS AND METHODS

In the new vision of European Commission for the future of vocational education and training [1] has been written that vocational education and training is chosen by an average of around 50% of all students in upper secondary education. However, the sector needs to be modernized to make it more attractive and more relevant for job market needs with the aim to help young people to find a suitable job and adults with an opportunity to update skills throughout their working life.

There are several ways of how to give vocational education and training a new impetus. First of all, it should ensure the highest possible quality of education and training. Second, it should use new, creative and innovative methods for education [2]. At the present time, 3D graphics, virtual reality or Web 2.0 technologies actively intervene into the educational process. As technologies change the society, they change the education and training systems as well. Paper presents a way of how to use e-learning and computer based learning methods, Web 2.0 technologies and multimedia for an efficient and attractive shifting from the traditional book/textbook paradigm to a new way of the digital learning content in the vocational education and training.

Project “**AVARES - Enhance attractiveness of renewable energy training by virtual reality**” has started in November 2012 and its main aim is to use virtual reality, Web 2.0 technologies and e-learning 2.0 as educational methods and tools for improving quality of the vocational education and training in the area of renewable energy sources.

Fundamental emphasis is put on the application of modern ICT equipment and technologies, especially on Virtual reality and 3D visual display, social networking and Web 2.0 methods.

The main aim of the project “**Newcap – New European Standards in the Context of**

**Reformed EU Common Agricultural Policy**” is to create an interactive educational programme for rural actors as farmers, agricultural advisors, rural people and especially rural youth seeking their job. The project assumes using of e – learning methods and resources – CBT, WBT, LMS system, various forms of auto testing - included into individual modules and multimedia study materials chapters, as well, synchronic and asynchronous communication.

## RESULTS AND DISCUSSIONS

### Project AVARES

Fundamental emphasis of the project partnership is put on the application of modern ICT equipment and technologies, especially on Virtual reality and 3D visual display, social networking and Web 2.0 methods.

The created Virtual Learning Environment provides users of vocational education and training with the space joining popular social networks and mobile technologies as well as qualitative content. As in a real classroom, the students can communicate between them and with the teacher and collaborate in learning experiences. There are available activities, as blog or wiki, which use Web 2.0 techniques and students start to be not consumers of Web information, but they become information producers as well.

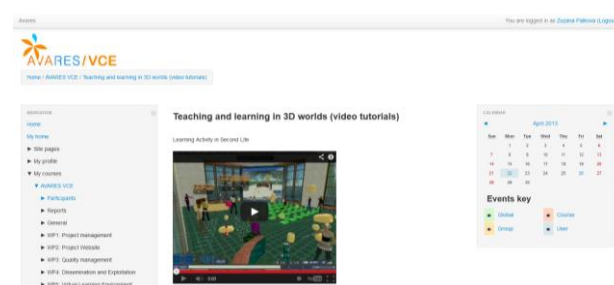


Fig. 1. AVARES Virtual Environment with the 3D World Tutorials for teachers/trainers

Virtual 3D auditorium, as a part of Virtual Learning Environment, include the major teaching facilities - open air auditorium and smaller open air classroom. The auditorium and the classroom include facilities that enable lecturers to make use of PowerPoint

presentations, to display films, to hold face-to-face learning process as well as discussion rounds with experts or host various events such as courses, workshops, seminars.

As a last part of the Virtual learning environment 3D Virtual RES Park has been developed. It has been set up as the Island with several buildings and areas. On the windy table-land students can visit Wind turbine, on the roof of Research and development Centre students can see solar collectors and PV cells and inside are prototypes of RES devices - turbines or heat pumps.

Thanks to the new learning methods and professional content of the learning materials, the AVARES project will allow to vocational education and training participants obtain practical knowledge and skills from area of renewable energy resources and their effective using.

Participants of the learning process, through theoretical knowledge obtained in the multimedia learning materials and virtual reality of the 3D RES Park, should acquire knowledge and skills for preparation and competently review the application of the RES, to assess the suitability of the type of renewable energy for specific natural, climatic and geographical conditions.

They can analyse the energy consumption of buildings or premises and will be able to design and implement energy efficient solution with regard to available resources.

New methods of learning give possibilities for application the principles of the non-barrier learning as well.

### Project NewCAP

To avoid obstacles and to meet requirements determined within the new Common Agricultural Policy, Slovak University of Agriculture in Nitra together with partner universities decided to apply for the NewCAP project – “New European Standards in the Context of Reformed EU Common Agricultural Policy“. From this point of view, the main aim of the NewCAP project is to create an interactive educational programme for rural actors (farmers, agricultural advisors, rural people and especially rural youth

seeking their job) which will provide them complex information in the field of the new reformed Common Agricultural Policy. This project is transferring an innovation from the previous NEW AGRI pilot project which was focusing on creation of printed training handbook in a field of Common Agricultural Policy and cross – compliance (project No. 2005-I/05/B/F/PP-14137 New Agri: New European Ways in Agriculture).

Project is being realized from September 2012 together with three project partners - Agroinštitút Nitra, štátny podnik, Slovakia, Confederazione Italiana Agricoltori Toscana, Italy and University of Agribusiness and Rural Development, Bulgaria.



Fig.2. NewCAP project web site  
(<http://www.newcap-project.eu>)

Project web page was created within the project initial phase (<http://www.newcap-project.eu>). It provides complex information on project aims and objectives, consortium and planned outputs. All this basic information is available in English and partner languages, as well. An access to e – learning modules will be provided in the future from the web page. For this purpose – and as the main project output, too – an interactive training programme for farmers and farm advisors will be created and situated in the e – learning platform. The training programme will consist of online learning modules focused on new Common Agricultural Policy and modified cross – compliance – “a mechanism that links direct payments to compliance by farmers with basic standards concerning the environment, food safety, animal and plant health and animal welfare, as well as the requirement of maintaining land in good agricultural and environmental condition“. The NewCAP project will help to

farmers mainly in new EU member states to be prepared for the new programming period (2014-2020) and to meet the Statutory Management Requirements and Good Agricultural and Environmental Conditions within the system of cross – compliance by providing them online training system in the field.

From this point of view, the results of the project are defined as follows:

- developing of webpage on CAP, cross-compliance, direct payments, etc.,
- creation of LMS and Virtual learning environment,
- creation of online training modules focused generally on the new CAP and specifically on new CAP components concerning direct payments for farms and cross – compliance,
- distribution of newsletters and other dissemination tools related to CAP to famers and other stakeholders.

## CONCLUSIONS

In recent years there are thematic fields closely connected to the extension of the labour market and sustainable development focusing on the renewable energy sources and the agricultural policy support. Projects AVARES and NewCAP realized at Slovak University of Agriculture in Nitra supported by Leonardo da Vinci programme, Transfer of Innovation bring the present situation in the field to both young graduates and experienced farmers by using the modern ICT, virtual reality, electronics education methods as well as social networks.

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