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THE RESEARCH INSTITUTE FOR AGRICULTURE ECONOMY AND RURAL DEVELOPMENT

Agrarian Economy and Rural Development
Realities and Perspectives for Romania

International Symposium

The 6th Edition
November 2015

6th Edition of the International Symposium

AGRARIAN ECONOMY AND RURAL DEVELOPMENT

REALITIES AND PERSPECTIVES FOR ROMANIA

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Bucharest, Romania

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REALITIES AND PERSPECTIVES FOR ROMANIA

in collaboration with

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The Faculty of Management, Economic Engineering in Agriculture and Rural Development, Bucharest, Romania

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SECTION 1
THE CONCEPTS, EVALUATIONS AND STRATEGIC DIRECTIONS IN RURAL AND AGRI-FOOD ECONOMY

POPULATION FOOD SECURITY ASSESSMENT – A METHODOLOGICAL APPROACH

ALEXANDRI CECILIA[1]

Abstract: *The paper approaches the different dimensions and analysis levels of the food and nutritional security, presenting the sets of indicators and methodologies used by the national and international organizations for its assessment. The sources used refer to the indicators and studies elaborated by FAO, OECD, IFPRI, Eurostat, EUI, Defra, the Ministry of Health and NIS. In the recent years, the population food security issue came to the foreground again, due to the challenges at global level, among which we can mention the food demand increase from the new emergent countries, the non-food uses of agricultural production by biofuel production, as well as the impact of climate changes, on agricultural production and on food supply. Food security is a concept that widely evolved in the last decades, while its complexity gradually increased. Practically, at present, in order to evaluate the food security from the different countries of the world, the specialized institutions or research teams use dozens of indicators, in order to measure the multiple dimensions of the food security concept. In this respect, the paper also contains an assessment of the population food security in Romania, as reflected by the most representative indicators presented.*

Key words*: food and nutritional security, methodology, indicators, Romania*.

INTRODUCTION

The first attempts to define the food security, in the early 1970s, focused on the agricultural and food supply availability, as it was considered that the population food security problem is solved if all people have sufficient food to lead an active a healthy life, according to their needs. The access to food and the importance of economic factors conditioning it were issues that appeared later on. The food security concept gradually evolved, and certain authors mention the existence of about 200 definitions for this concept, in early 1992 (Clay, 2002).

Food security can be evaluated at different levels, but most references are made at macro-economic (world, regional or national) level and at micro-economic level, i.e. at household and individual level. Depending on the level referred to, the focus lies on one or several of the four pillars of food security, namely: food availability, supply stability, economic access to food and food utilization represented by the desire of individual people to have a healthy food. In the case of using the food security concept at world or national level, the focus mainly lies on the capacity of countries to provide a sufficient agricultural supply to meet the food and nutritional needs of the population (Pinstrup, 2009). At the same time, recent approaches (FAO, 2014) assign a special importance to the "food autonomy" as factor of food security stability, which diminishes the vulnerability in the face of the fluctuations of domestic and world agricultural markets.

Yet food availability does not ensure the access to food, as the problems related to the distribution of incomes at society level can seriously affect the access to food and the food security at household level implicitly. As such, the food security is ultimately considered as a household or individual issue. It is generally considered that food insecurity and hunger are the direct result of poverty. With the economic growth and increase of population's incomes, the poor households will have the ability and presumptively the willingness to obtain an adequate diet (Senauer et al., 2007). Although the household is used as observation unit in most studies on the population's nutritional situation, the key issue is nutrition at individual level, in particular for the people considered at nutritional risk.

There is an intrinsic relation between the economic development and food security. The economic crises and shocks lead to food insecurity, which means not only food consumption diminution, but also compromising diet quality and diversity. And the lack of an adequate diet, both in terms of calorie intake and of essential nutrients, can erode the population's health and working capacity and thus food insecurity can lead to labour productivity diminution and amplification of the economic problems of different countries (Ghattas, 2014). Thus, together with the FAO

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approaches, the focus should be laid on two concepts that accompany food security, namely the dietary diversity and the vulnerability of different population categories (Pieters et al., 2012). The dietary diversity is essential for the recognition of the micronutrients importance in human nutrition. A more diversified diet is associated with diet quality increase, with an improved food intake, under the background of incomes and life quality increase.

The second issue, namely vulnerability, refers to the probability that a family or human community (nation) has food security problems, in the context of negative shocks (wars, social conflicts, severe crises). One of the great challenges of our world is the unprecedented spread of hunger and food insecurity. The latest FAO estimates reveal that 12.5% of the world population (868 million people) is undernourished, this representing only a part of the malnourished population of the planet. About 26% of the world's children are underdeveloped as a result of food scarcity; about 2 billion people suffer from one of the micronutrients deficiency forms, while 1.4 billion people suffer from obesity (FAO, 2013). These are the recent malnutrition dimensions at world level. In all its forms, malnutrition imposes very high costs on the society in economic and human terms. Among the malnutrition forms, undernourishment and the deficiency in micronutrients are the most dangerous and represent the first priority in the food policies for the population's health.

MATERIALS AND METHODS

The current definition of food security is based on the four pillars mentioned above, namely: 1. access to food, in quantitative, qualitative, safety terms and in conformity with the individual dietary and socio-cultural traditions; 2. food availability, 3. stability of agricultural and food supply; 4. utilization of foodstuffs pertaining to the individual food behaviour (willingness to have a healthy diet). At the same time, food and nutrition security has several levels, a macro-economic level and a micro-economic level, yet the most important is the food security at household and individual level, as it is at this level that the nutritional risks can be truly perceived.

Food security at micro-economic level refers to the capacity of states to provide sufficient food for their population. At this level, for the assessment of food security, the demographic, socio-economic, political and anthropometric factors are taken into consideration, together with other factors that evaluate the international economic environment (Pinstrup, 2009). The supply of foodstuffs can be evaluated using the self-sufficiency indicators of the domestic agricultural production, the food imports and the food aids. The food security at household and individual level can be quite thoroughly investigated using the household budget surveys or other similar surveys that provide a cross-cutting picture of the foodstuffs and nutrients consumed at a certain moment, as well as a picture of the socio-economic and demographic variables of the micro-economic environment. Other directions that should be developed refer to the envisaged perspective: food security on short term and food security on long term. The influence of the agricultural prices evolution on food security should be also discussed here.

The factors influencing the four main coordinates of food security are complex. The scope of the economic systems that generate the necessary framework for reaching food security is very different. Thus, reaching the food availability objective involves the resources, the agricultural and food processing systems, trade, technologies, and distribution systems worldwide and at regional, country and local levels. The access to food depends not only on agricultural productivity, but mainly on the general development of human collectivities, of their incomes and distribution as well as on the sanitary and food safety conditions. There are well-known situations, mainly in the developing countries, with a strong social polarization, where although foodstuffs are available in supermarkets, there is an important number of people affected by food insecurity, due to the extremely limited purchasing power (more concretely due to the lack of incomes). Thus, the access to food is linked to the socio-economic success of national governments, which, through the income distribution and redistribution policies decisively determine the level of access to food.

It is considered that food insecurity – or the food scarcity situations – is not generated by the absence of food availabilities, but rather by the inadequate distribution of food across the

different regions of the world. At the same time, the lack of access to food also contributes to this situation, due to either the inability to produce food or to the lack of purchasing power in the subsistence economies. People with the same food needs have different levels of access to food. This is valid for all countries, even for the richest countries, where meeting the food needs has no longer been a problem for many years, but where population categories or people under food insecurity risk still exist. While in these countries there are extremely few people subject to food insecurity, in the poor countries of the world the chronic scarcity and even hunger situations are quite frequent.

Finally, the last dimension of food security, which refers to the individual food procurement and consumption behaviour is of the most important, as food security is ultimately a condition related to families and individuals. While the governments, through their economic, social and food policies, create the general conditions for their population to be supplied with available foodstuffs and to gain the necessary incomes to procure it (availability and access), food security finally becomes a problem of households and individuals. In this respect, there are frequent situations when even in the richest countries, where food security has no longer been a problem for a long time, there are communities and persons subject to food insecurity or at high nutritional risk. We should also mention here that although most food insecurity cases are generated by the scarcity of food, a nutritional risk is also generated by the food excess, which ultimately leads to obesity, nutritional diseases and other metabolic disorders. At the same time, a frequent situation is that even though the family can buy the necessary foodstuffs (has the purchasing power and the food is available), there are persons in the respective family subject to food insecurity (children and women), mainly in the case when the household head has priority in food consumption or has other priorities or addictions (alcoholism, for instance).

All these consideration lead us to the idea that food security is a desirable condition for the population of a given country or human community, but reaching food security has multiple conditionings, which start from the continuous production of increasing amounts of food in all the fertile regions of the world, it requires an adequate management of agricultural resources, maintaining the prices at an acceptable level and the conservation of the population's purchasing power, being finally conditioned by the people's desire to eat a healthy food.

RESULTS AND DISCUSSIONS

We shall next present the methodology and indicators used for the assessment of food security by two important organizations at European and world level, namely Economist Intelligence Unit and FAO.

1. Global Food Security Index (GFSI) developed by the Economist Intelligence Unit for the years 2008 and 2011-2014. This index represents a score on the basis of which the countries are classified from the point of view of the food security level. The classification includes 105 countries, both rich countries and low-income countries. The selection of countries is based on regional diversity, economic importance and population size. The index starts from taking into consideration the three coordinates of food security, namely: 1. Financial access, 2. Supply availability and 3. Quality and safety. The shares assigned to these three groups of indicators for the final score calculation are: access 40%, availability 44% and quality and safety 16%.

Table 1: The main categories of indicators used for evaluating the Global Food Security Index (GFSI)

Food security		
A. Financial access	**B. Supply availability**	**C. Quality and safety**
- share of food consumption value in total household expenditures -share of population under the poverty threshold -GDP/capita at the purchasing power parity	-domestic supply sufficiency - public expenditures for research and development in agriculture -agricultural infrastructure -agricultural production volatility -risks concerning political stability	-dietary diversification -government's legislation on increasing nutritional standards -availability of micro-nutrients -protein quality -food safety

-customs duties on agricultural imports -presence of food safety -farmers' access to finance		

Source: Global Food Security Index 2012: An assessment of food affordability, availability and quality, Economist Intelligence Unit, 2012.

The indicators used for this index are from the category of food security determinants and risk indicators. The database is complex, it contains quantitative indicators coming from national and international sources. Qualitative indicators coming from experts' opinions, governmental websites and different other sources are also used. But the main data sources come from international organizations, e.g. FAO, World Bank, IMF, United Nations Development Program UNDPI, World Health Organization, World Trade Organization, IFPRI and national institutes of statistics, as well as certain important experts' opinions worldwide.

Recent evaluations of the GFSI index reveals a decrease of the ranking score for Romania, i.e. a 3 point diminution of the food security situation compared to 2013, from 64.3 to 61.3; this decrease mainly comes from the increase of agricultural production volatility in 2014 compared to 2013. In all the years presented in Table 2, the lowest assessments for Romania are in the category of indicators regarding the population's access to food. We mention that this category mainly includes indicators referring to the population's incomes, the share of food consumption expenditures in total consumption expenditures, poverty level.

Table 2: GFSI values for Romania, 2012-2014

	Out of 100 scores			**Position among 109 countries**		
	2012	**2013**	**2014**	**2012**	**2013**	**2014**
General score	64.3	64.3	61.3	39	39	44
1. Economic access	61.8	58.6	58.9	41	48	48
2. Availability	65.7	65.8	59.1	31	31	44
3. Quality and safety	66.6	74.4	73.6	38	29	31

Source: The Economist/Intelligence Unit, Food Security in focus, Europe 2014.

USA is on the first position on the list, with 89.3 scores, followed by Austria and Netherlands, and the last positions are occupied by Congo with 24.8 scores, preceded by Madagascar and Chad.

2. Food security indicators according to FAO methodology

FAO methodology takes into consideration the four pillars of food security, namely: A. Supply availability, B. Access to food, C. Food use and D. Supply stability. This methodology uses indicators for the assessment of food security at macro-economic level, i.e. world, regional and national level, while focusing mainly on the nutritional and food safety issues. For the assessment of food security at micro-economic level, i.e. at household and individual level, FAO uses another set of indicators, generally from the Household Budget Surveys and the Nutritional Surveys, as we shall next see.

A. The Supply availability is evaluated starting from five indicators, namely:

A.1. Average dietary energy supply adequacy, which expresses on a percentage basis to what extent the daily food calorie availability satisfies the specific nutritional needs of the population of each country, in conformity with the national health authorities' recommendations.

A.2. Average value of food production, which represents the food production value per capita in each country, expressed in international dollars. It is calculated as an average for three consecutive years, according to Faostat methodology.

A.3. Share of dietary energy supply derived from cereals, roots and tubers, which represents the daily energy (kcal/capita/day) coming from cereals, edible roots and tubers, related to

the daily energy availability. It is expressed in percentage terms and represents an assessment modality of diet quality and food diversity in different countries and regions.

A.4. Average protein supply, which represents the available protein quantity (gr./capita/day), calculated as a three-year average. It also represents a food quality indicator.

A.5. Average supply of protein of animal origin, which is an indicator identical with the previous one, but it refers only to the daily animal protein availability (gr./capita/day).

B. The **Access to food** uses nine indicators, which evaluate the population's economic and physical access to food.

B.1. Percent of paved roads in total road network. This is one of the indicators by which the World Bank evaluates the development of different countries and regions. More concretely, this indicator provides information on the physical access to markets both for consumers and for farmers. It is expressed in percentage terms, and the evaluation is made at national and regional level.

B.2. Road density per 100 km^2 of land area. This indicator also evaluates the physical access to agricultural and food markets. It is expressed by kilometers of roads per 100 km^2. This is also a development indicator from the World Bank of database.

B.3. Rail lines density per 100 km^2 of land area. This indicator also provides information on the physical access to agricultural and food markets.

B.4. Gross Domestic Product per capita on purchasing power parity basis. This indicator is also used in the GFSI methodology for the evaluation of population's incomes and of the economic access to food. GDP is converted into international dollars using the purchasing power parity rates.

B.5. Domestic food price index. This is an indicator of relative prices that is calculated on the basis of the International Comparison Program, of the World Bank and of the consumer price index developed by FAO. The reference period is 2003 – 2006. Practically, this index reveals the relative level of domestic food prices compared to those from the USA. For USA, this index is equal to 1.

B.6. Prevalence of undernourishment (%) expresses the probability that by randomly selecting a person from the population, this has an insufficient food intake that does not ensure the necessary energy supply for an active and healthy life.

B.7. Share of food expenditures in total expenditures of the population from the lowest quintile (population with the lowest incomes). According to Engel's law, the lower the incomes on a given holding, the higher the share of food expenditures. At national level, this indicator provides a synthetic picture of the population's living standard and at the same time represents a measure of population's vulnerability when the food prices increase. Generally, the food consumption expenditures include the monetary value of foodstuffs from all sources, i.e. the bought food, food from household's own production, from gifts or payments in kind.

B.8. Depth of the food deficit. This indicator indicates how many calories would be needed on the average to bring the undernourished population from a country at the level of dietary recommendations in the respective country. In is expressed in calories/capita/day and is of actuality in the very poor countries of the world and less in the European countries.

B.9. Prevalence of food inadequacy. It expresses the share of population that cannot perform a normal physical activity due to food risks. The undernourished population is not included in this category, this category including the population at risk of not having a dietary energy level in conformity with the performed physical activity requirements.

C. Supply stability contains indicators that evaluate to what extent the member states can meet the population's consumption needs from the domestic agricultural resources (self-sufficiency).

C.1. Cereal import dependency ratio (%)

It is calculated as ratio of cereal imports to domestic supply (equal to the domestic production plus import minus export).

C.2. Percent of arable land equipped for irrigation in total arable land (%). It provides a useful picture of agricultural production stability under drought conditions.

C.3. Value of food imports over total merchandise exports.

This indicator provides an image of the capacity of countries to import foodstuffs in case of need and of the availability of financial resources in case of need.

C.4. Political stability and absence of violence in public spaces. It measures the perceptions that governments may be destabilized by non-constitutional and/or violent measures, by politically motivated acts of violence or terrorism. Information from 30 sources are synthesized, which reflect the experiences of citizens, firms, entrepreneurs, experts from the public and private sector, NGOs on the quality of governance from different regions of the world. For instance, in the year 2012, this index had a minimum value of -2.89 in Somalia and a maximum value of 1.92, in Greenland.

C.5. Food production volatility index. It measures the variability of the relative food prices in a given country, representing an assessment form of stability and vulnerability. Monthly relative prices are used. In order to calculate the variability, the standard deviation formula is used.

C.6. Per capita food production variability. This is an expression of the net food production variability per capita expressed in international dollars. For the calculation of variability, the standard deviation of food production trend per capita is used.

C.7. Food supply variability expressed in calories/capita/day. The trend variability is calculated in the period 1990-2010 using the standard deviation formula.

D. Food utilization includes both indicators that evaluate the necessary infrastructure for a healthy diet, as well as a series of indicators that evaluate the nutritional risk of certain vulnerable categories.

D.1. Population's access to improved drinking water sources (%).

It represents the share of the population with a reasonable access to improved drinking water sources. The indicator takes into consideration information on the households' connection to water sources, the existence of public drinking water supply networks, protection of drinking water sources. It is considered that a reasonable access to drinking water presupposes the supply with at least 20 liters/person/day, and the water supply source is found at less than one kilometer from the household. In Romania, this percentage increased from 75.3% in 1991 to 87.7% in 2008, our country being one of the few EU member states where this percentage is not 100%.

D.2. Percent of population with access to improved sanitation facilities and sewerage system (%). This indicator starts from the reality that the existence of modern sanitation facilities providing for a correct treatment of dejections from the sanitary point of view represents a condition for the prevention of diseases caused by animals, insects and other pathogens. Thus, the existence of the sanitation infrastructure represents a condition for the food safety and for the food security implicitly. In Romania, the sanitation infrastructure of households is still deficient, mainly in the countryside. In the year 1991, only 71.1% of households had access to a modern sanitation infrastructure, and in the year 2008 this percentage was up to 72.1%, while in most EU member states this percentage has reached 100%. A situation similar to that of Romania is found in the Russian Federation, countries of the former Yugoslavia, or in other former Soviet republics (Lithuania, Latvia, Republic of Moldova, Ukraine) or Albania.

D.3. Percentage of children under 5 years old affected by wasting (%).

This indicator belongs to a set of indicators that measure the effects of undernourishment in small children (underweight children or stunted children). This indicator is internationally recognized as an important indicator for the public health.

Furthermore, the stunted children as a result of a poor diet and/or recurrent infections tend to have a higher risk to suffer from certain diseases and have a higher death risk. In Romania, this percentage was 3.5% in the year 2002, similar percentages being also found in the previously-mentioned countries.

D.4. Percentage of children under 5 years who are stunted due to undernourishment (%)

In the year 2008, this percentage was 12.8% in Romania and 11.3% in the Republic of Moldova, in the year 2004.

D.5. Percentage of children under 5 years old who are underweight (%)

This percentage was 3.5% in Romania in the year 2002, while in the Republic of Moldova it was 3.2% in 2005. We mention that the European countries with such nutritional problems in children are very few and they are mainly among the poor, ex-communist countries.

D.6. Percentage of underweight adults in total adult population (%)

D.7. Prevalence of anaemia among pregnant women (%)

In Romania, this indicator was 34.5% in 1990 and decreased to 26.0% in 2011.

D.8. Prevalence of anaemia among children under 5 years of age. The most vulnerable categories in nutritional terms are the pregnant women and the children under 5 years old. The prevalence of anaemia in children under 5 years old was 36.4% in 1990 and this percentage was down to 27.2 % in 2011.

D.9. Prevalence of vitamin A deficiency, in total population

D.10. Prevalence of iodine deficiency, in total population

It is estimated that about 35% of the population worldwide has dietary iodine deficiency.

CONCLUSIONS

The evaluations made by Intelligence Unit and FAO reveal a series of vulnerabilities and risks for the food and nutritional security for the population in Romania.

These are mainly generated by the low level of incomes of certain significant population categories, by poverty, inequalities and social exclusion, which constrain the population's economic access to food. In the second place, food security is also threatened by food availability, owing to the domestic agricultural production instability, mainly generated by the weather excesses, under the background of the continuous diminution of irrigated areas, of inadequate cropping technologies, insufficient utilization of agricultural inputs and of technical progress in agriculture. The import dependency and the agricultural price volatility also contribute to the vulnerabilization of the population's access to food. Another category of indicators that determine the lowering of the population's food and nutritional security in Romania are those referring to the absence of sanitation infrastructure, mainly in the rural area, the absence of the public drinking water supply network, of the sewerage system, even the lack of electric power supply, as well as the lack of population's information on the risks entailed by these conditions.

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ROMANIAN AGRI-FOOD TRADE WITH THE NEW MEMBER STATES (NMS-13) OF THE EU - A COMPARATIVE ANALYSIS

GAVRILESCU CAMELIA[1]

Abstract: *After joining CEFTA in 1997, Romania established a relatively stable group of partner countries for its agri-food trade. Several factors contributed to the stability in time of this group, firstly the existence or establishment of preferential trade agreements, the geographical proximity, and last, but not least, the historical traditions. The exit from CEFTA and the accession to the EU of some of the partner countries, then of Romania itself, changed only temporarily the trade flows, until everyone's adaptation to the "new rules of the game". Among the new Member States of the EU (NMS-13), the main trading partners for Romania were and are Hungary, Bulgaria and Poland. The paper is analyzing the evolution of the agri-food trade flows with these countries, in terms of value and composition of the exchanges.*

Keywords: *agri-food trade, CEFTA, NMS-13, Romania*

INTRODUCTION

EU enlargement to 25, 27 and eventually to 28 Member States has had a significant positive influence in each country that newly joined the "club", as well as at the aggregate level of the European Union, and influenced also the world food markets. All new Member States recorded significant increases in their agri-food trade immediately after accession; EU increased its exports, thus consolidating its leading position in the global market. The New Member States (NMS) have contributed positively by increasing the volume of sold goods and negatively by adding their agri-food trade deficit, to the already existing negative trade balance of the Old Member States (OMS) (Torok and Jambor, 2012). After accession, in most NMS there was a similar trend of significant increase in their agri-food trade (Gavrilescu, 2014).

MATERIAL AND METHODS

International agri-food trade flows are analyzed, both intra- and extra community, for Romania and for the partner countries studied. They highlight the particular features of the Romanian agri-food trade are highlighted, as well as the similarities with the dynamics and structures of trade in the partner countries. The analysis was done on the dynamic trends (export, import, trade balance), focusing on the last 15 years. Comparative composition of the agri-food trade flows is analyzed as well by product group at 2 digit level in the Harmonised System (HS chapters 01-24).

RESULTS AND DISCUSSIONS

In the last decade of the 20th century, while covering the transition period from a centrally planned to a market economy, Romania has faced an economic and systemic crisis, which it has managed to overcome in the year 2000 only. The fractures and disfunctionalities occurred in the agri-food chains as a result of changes in the ownership regime and in economic mechanisms were reflected in the insufficient capacity to cover the domestic demand (in quantity and quality terms) and in a low competitiveness of Romanian agri-food products on international markets. Therefore, during this 10-year period (1990-1999), the Romanian international agri-food trade showed permanently a negative balance, with modest values for both export (below EUR 570 million) and import (under EUR 900 million) (figure 1). The year 2000 marks the exit from the "transition"

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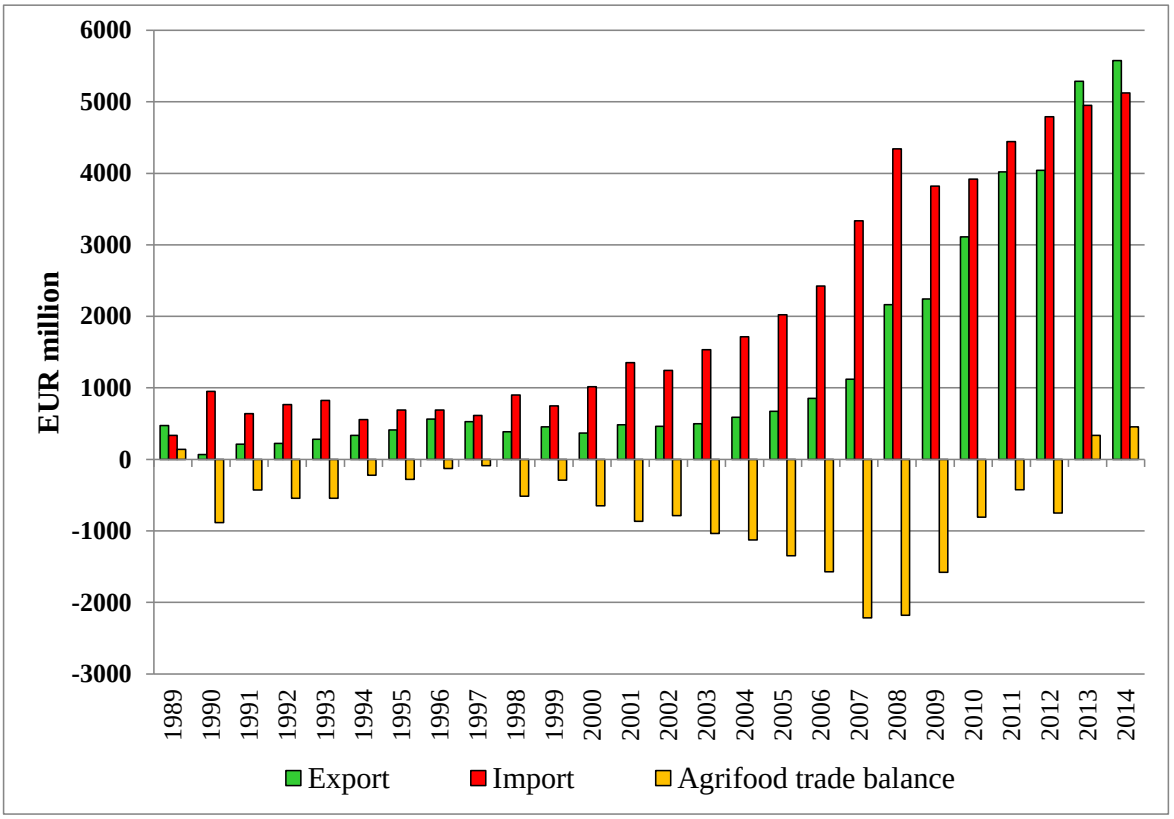
crisis and the entry into a period of economic development that overlaps the pre-accession to the EU. By 2006 (the last before EU accession), exports doubled, the value of imports multiplied 2.4 times and the agri-food trade deficit increased 2.5 times.

During this period, Romania joined CEFTA, which has been a good training field for the capacity of the economy to evolve in an international market with very few protection barriers, and to evaluate its competitveness in comparison with partner countries.

Figure 1 – Romanian international total agri-food trade (2002-2014)



Source: author's calculations using Eurostat data

After the conclusion of the Uruguay Round Agreement on Agriculture (in 1994) and the establishment of the World Trade Organization (in 1995), Romania negotiated a developing country status and hence, very high tariff bindings for agri-food products. In 1997, however, when it joined CEFTA, Romania was obliged to massively reduce the level of protection on imports, and hence had to face strong competition from other partners, especially from Hungary, which was the only country of the Visegrad group that had a positive agri-food balance, both overall balance and that within CEFTA. Romanian export growth in CEFTA was facilitated by a substantial reduction of tariff barriers of other members, but even so, due to lower competitiveness, the degree of market penetration on the partners'markets was lower than their market penetration in Romania. Anyway, Hungary and Poland were the most important destinations for Romanian exports. Increasing the share of exports to CEFTA under an increasing trend of total agri-food exports proves a concentration of export flows to these destinations.

On the other hand, in the general increase of the Romanian agri-food exports one could identify as well the positive influence of the EU Association Agreement (effective since 1995) which offered Romania trade facilities – in fact the possibility to penetrate the EU market at very low (preferential) import duties.

At that particular moment, the Hungarian and Polish agri-food sectors were better developed and more efficient than the Romanian one; as such, their products, cheaper and often better quality, largely entered the Romanian market, causing a strong upward trend in imports. After

joining CEFTA in 1999, Bulgaria became a very important trade partner for Romania: the share of imports originating from Bulgaria in the total import value coming from CEFTA increased over time; at the same time Romanian exports entered the Bulgarian market and increased in absolute and relative terms after 2001 (table 1).

Table 1 – Romanian agri-food trade with CEFTA countries in 1998-2003

	1998	1999	2000	2001	2002	2003
Export destinations (%)						
Bulgaria	0.0*	14.9	14.6	10.5	11.2	18.0
Czech Republic	3.8	3.6	3.2	5.0	6.8	8.2
Hungary	67.0	40.1	53.6	55.8	54.9	40.3
Poland	12.4	32.6	19.5	19.7	18.3	22.1
Slovakia	2.2	0.9	4.3	4.1	2.6	5.6
Slovenia	14.6	7.9	4.7	4.9	6.1	5.7
Total CEFTA	100.0	100.0	100.0	100.0	100.0	100.0
Share of CEFTA in total exports (%)	5.4	9.5	15.1	14.4	12.6	19.1
Import origins (%)						
Bulgaria	0.0*	3.5	3.6	7.4	8.3	8.9
Czech Republic	8.5	6.9	5.2	6.7	8.2	7.9
Hungary	71.7	65.5	69.8	63.9	52.8	54.1
Poland	16.1	19.6	18.5	18.5	27.1	25.0
Slovakia	2.7	2.9	0.8	2.5	2.9	3.7
Slovenia	1.0	1.5	2.0	1.1	0.7	0.5
Total CEFTA	100.0	100.0	100.0	100.0	100.0	100.0
Share of CEFTA in total imports (%)	20.2	20.6	22.6	24.0	20.7	25.9

Note: Bulgaria joined CEFTA in 1999.
Source: author's calculations using Eurostat data

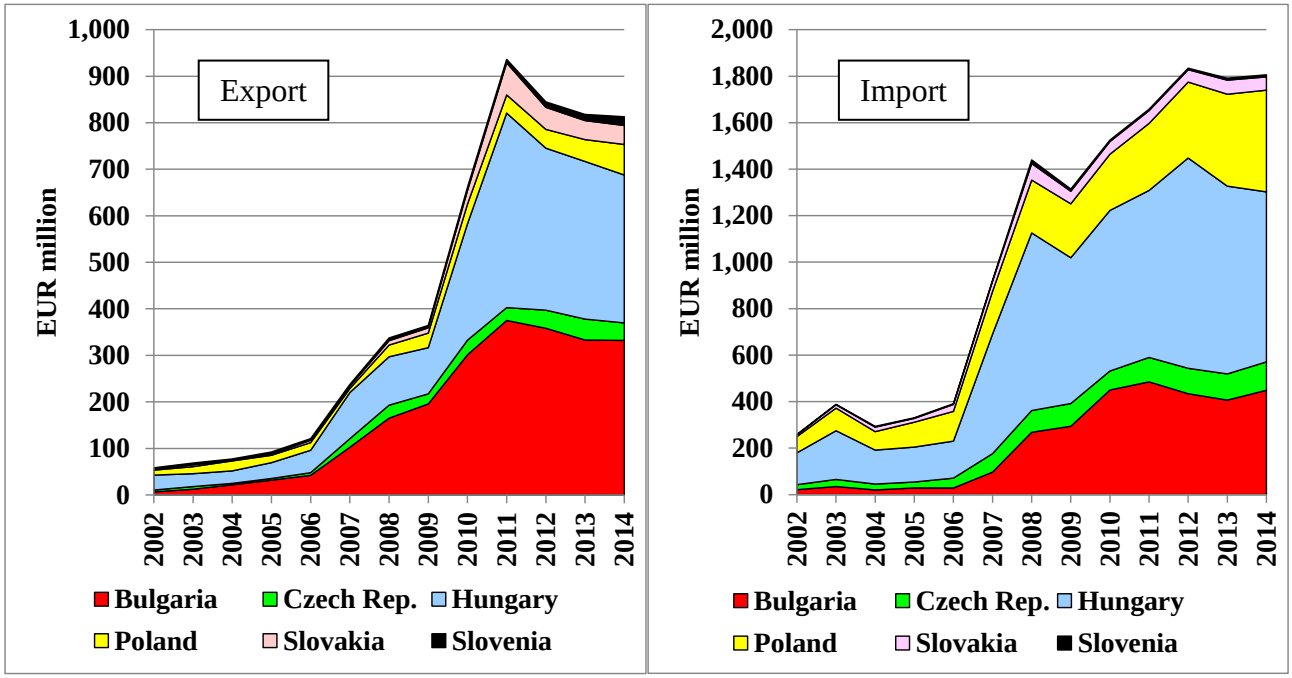
However, during the period it functioned, CEFTA facilitated the increase in trade flows among partner countries. In 2004, with the accession to the EU, Czech Republic, Poland, Hungary, Slovenia and Slovakia left CEFTA, but the trade relations were preserved, and the exchanges in agri-food goods continued on an upward trend, both for exports and imports especially.

In 2007, when Romania and Bulgaria joined the EU, they left as well CEFTA. The advantages of the presence in the Single Market, the significant support for agriculture coming from the CAP budget, together with the pre- and post-accession development programs, that took form of important investment in both production farms and in modern processing units, aligned to the EU quality standards, have resulted in spectacular growth of Romanian food exports (Gavrilescu and Voicilas, 2014). After two years of EU membership only, the export value was 2.5 times higher than in 2006, while in 2014 (8 years of membership), the export value climbed to EUR 5.6 billion, that is 6.53 times higher than in 2006.

After joining the EU, exports to ex-CEFTA countries increased sharply (figure 2), the maximum was reached in 2011 (EUR 936 million). In comparison with the base year 2006, the Romanian exports to Bulgaria multiplied 8.9 times, to Hungary 8.7 times, and to Poland 4 times.

Imports from these countries also recorded also significant jumps: from EUR 0.4 billion in 2006 to a peak of 1.83 billion in 2012.

Figure 2 – Romanian agri-food trade with ex-CEFTA countries in 2004-2014



Note: Bulgaria, as Romania, remained CEFTA member until EU accession in 2007.
Source: author's calculations using Eurostat data

As a result, the Romanian trade deficit in realation to ex-CEFTA countries, which in the pre-accession period not exceeded EUR 270 million, rose sharply to EUR 1.1 billion in 2008, falling gradually to EUR 722 million in 2012 and increasing again in 2013-2014 (table 2).

Table 2 – Agri-food trade balance with ex-CEFTA countries (EUR million)

Year	Bulgaria*	Czech Republic	Hungary	Poland	Slovakia	Slovenia	Total ex-CEFTA
2004	2	-22	-119	-58	-18	-1	-216
2005	3	-22	-116	-91	-14	2	-238
2006	14	-37	-111	-111	-25	0	-270
2007	6	-61	-415	-175	-39	-1	-685
2008	-103	-66	-660	-202	-62	-10	-1102
2009	-99	-76	-528	-201	-43	-4	-950
2010	-149	-50	-441	-200	-25	1	-864
2011	-110	-77	-300	-249	14	1	-722
2012	-76	-70	-557	-286	-6	5	-990
2013	-74	-68	-469	-348	-20	5	-974
2014	-117	-84	-414	-372	-16	10	-993

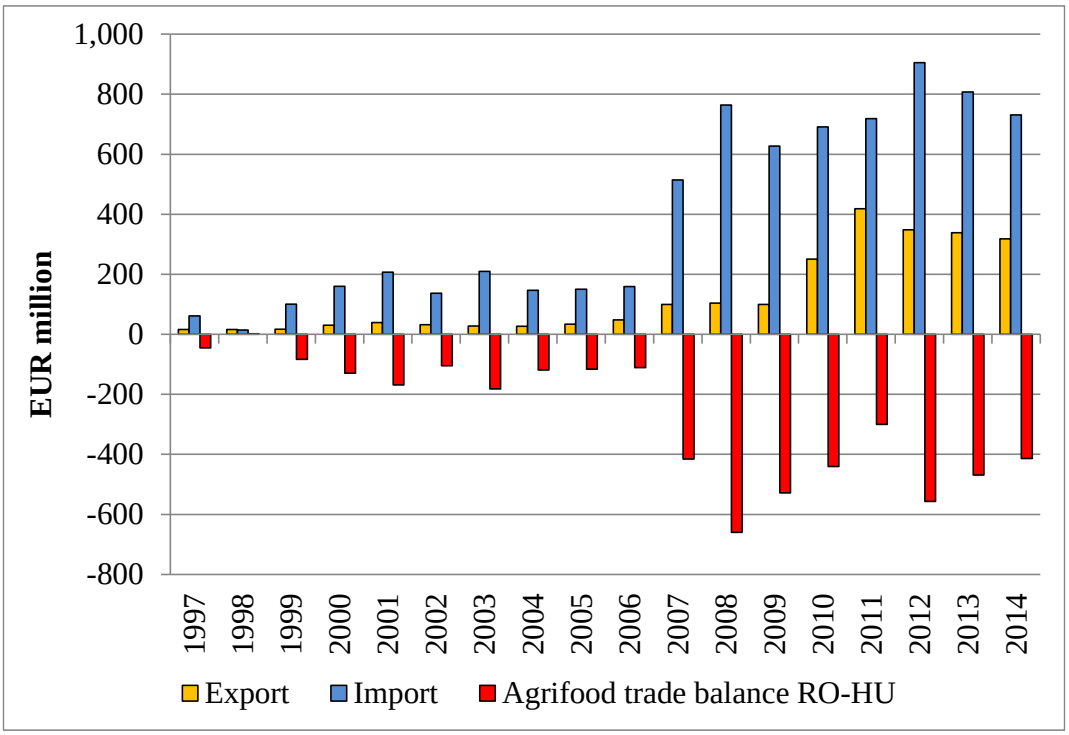
Note: *Bulgaria, as Romania, remained CEFTA member until EU accession in 2007.
Source: author's calculations using Eurostat data

In trade with countries in this group, Romania recorded negative balances. Trade surplus (marked in yellow in table 2) occured in almost all years in relation to Slovenia only; otherwise, the balance was negative, with high levels of deficits in trade with Hungary and Poland. Since accession, in relation to Bulgaria a rather large trade deficit appeared as well.

In the post accession period, in the top Romanian intra-EU agri-food export destinations, Hungary and Bulgaria alternately took ranks 2 and 3, after Italy. Romanian total exports to ex-CEFTA group peaked in 2011 (EUR 936 million).

In the ex-CEFTA group, Hungary is by far the most important trading partner (Gavrilescu, 2013). In the post-accession period, the total volume of trade with Hungary doubled, from EUR 623 million (in 2006) to EUR 1.25 billion (in 2012) (figure 3).

Figure 3 – Romanian agri-food trade with Hungary (1997-2014)



Source: author's calculations using Eurostat data

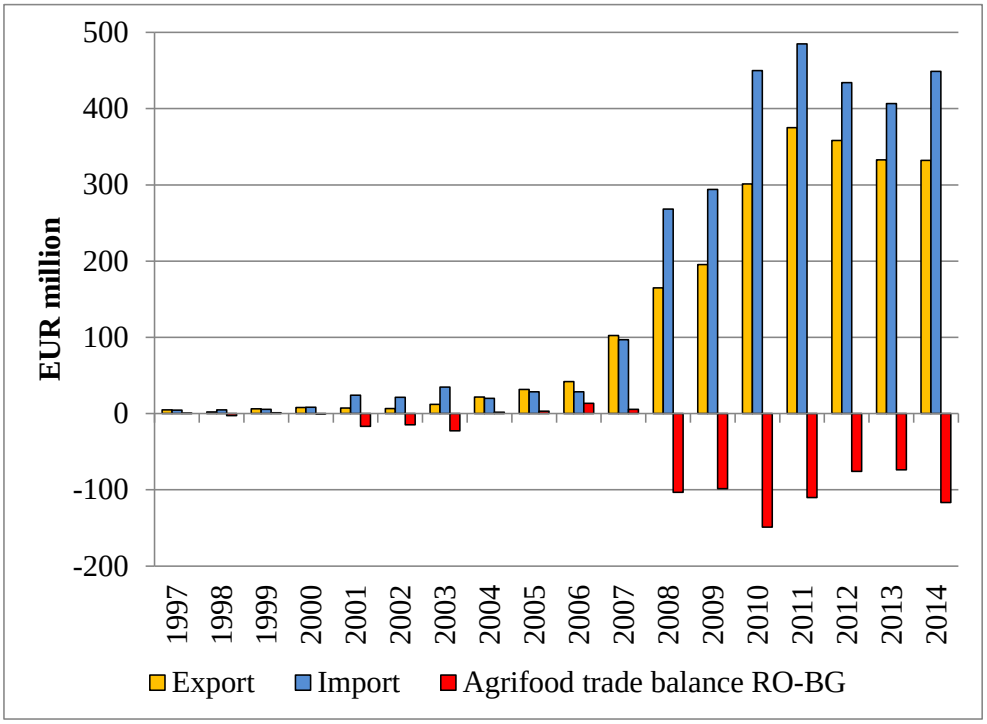
Imports from Hungary have increased greatly in the post-accession period, from EUR 159 million in 2006, to EUR 905 million in 2011. With the sole exception of 1998, the trade balance with Hungary has been consistently negative, with deficit peaks in 2008 and 2012, which amounted to about EUR 600 million.

Product structure analysis shows that Romania exported to Hungary mainly oilseeds, some processed products - edible oils and bakery & pastry products, as well as cereals (especially maize). From Hungary imports are mainly meat (2/3 pork and poultry 1/3), animal feed, livestock, milk and dairy products. Among imported live animals, first are piglets for commercial fattening units, because in Romania there are only very few pigs breeding farms, that are unable to meet domestic demand for piglets for fattening.

The evolution of agri-food trade between Romania and Bulgaria has probably the most spectacular aspect. During CEFTA, Romanian exports did not exceed EUR 10 million. On the other hand, after the accession, both exports and imports have skyrocketed: in 2011 exports were 8.9 times higher than in 2006 and 2012 imports were 15 times higher than the reference year 2006 (figure 4).

The balance was positive until Bulgaria's entry into CEFTA, then turned negative in 2000-2003. In the pre-accession period Romania has managed to export more to Bulgaria, but the balance has deteriorated after accession, when massive growth of imports resulted in significant trade deficits.

Figure 4 - Romanian agri-food trade with Bulgaria (1997-2014)

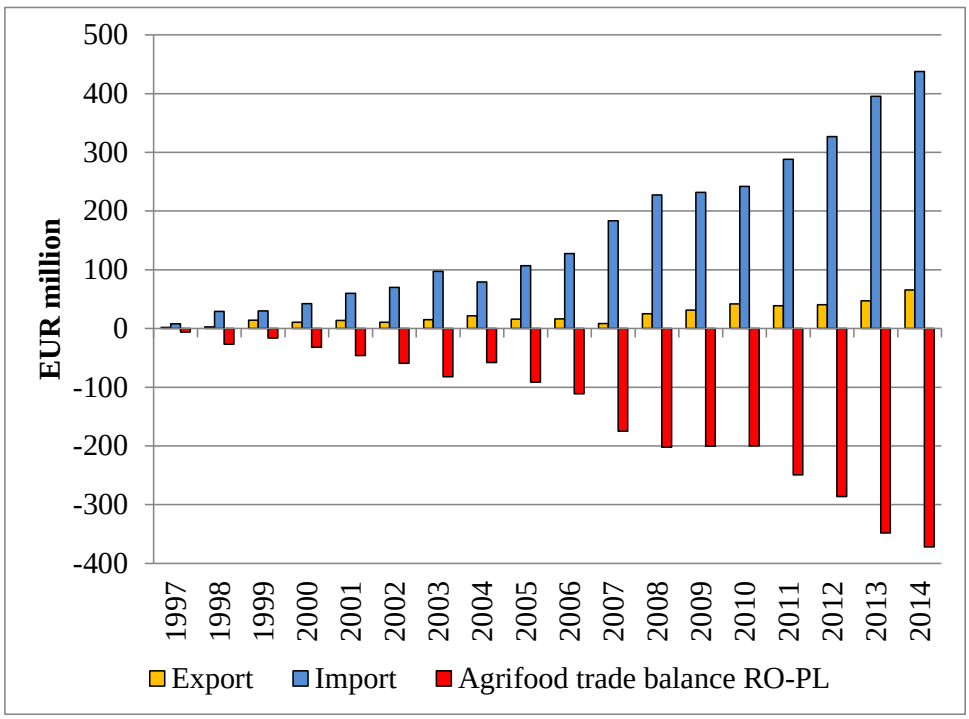


Source: author's calculations using Eurostat data

Romanian exports to Bulgaria consist mostly of animal feed, milk and dairy products, sugar, cereals and oilseeds, and from Bulgaria imports are cereals and oilseeds, coffee, tea, spices, bakery and pastry products.

Romania's trade with Poland is characterized by imports that have increased year by year, at a high pace after 2007, given that exports are very modest (figure 5).

Figure 5 - Romanian agri-food trade with Poland (1997-2014)



Source: author's calculations using Eurostat data

The coverage of imports by exports ranged between 11-17% during 2007-2014. The polish food sector is among the best developed and most competitive of the New Member States. This may be one reason why romanian products came as little on the polish food market.

Romania is exporting to Poland tobacco and cigarettes, bakery and pastry products, equine meat and live cattle. Imports consist mainly of milk and dairy products, pork, prepared foods, cocoa and chocolate.

The result of these combined developments was for Romania a very dynamic trade balance: the first two years after accession, the deficit peaked: EUR -2.2 billion. Since the crisis, due to higher growth rate of exports, the trade deficit decreased almost continuously and very rapidly: in three years only it fell 5.2 times, from EUR -2.2 billion in 2008, down to EUR -423 million only in 2011. In 2013, Romania's agro-food trade balance became positive for the first time in the last two and half decades.

In compensation for disappointing developments in the agri-food trade with some of its main european partners (ex-CEFTA), Romania has shifted significantly its agri-food exports to destinations outside Europe, managing to offset the negative balances in trade relations with the most important new Member States.

Since 2010, Romania’s extra-EU trade balance became positive, and since 2013 its value exceeded the deficit in intra-Community trade, and so Romania has become a net exporter of agricultural products again, and further efforts must be directed towards maintaining and strengthening that position in the coming years as well.

CONCLUSIONS

Throughout the years, but especially during CEFTA (1997-2003), of the member countries of this free trade agreement, Hungary became an increasingly important trading partner for Romania; the next two partners (in terms of agri-food trade value) were Bulgaria and Poland.

After accession, agri-food trade flows with ex-CEFTA countries multiplied several times on all destinations and origins.

In the post-accession period, Hungary ranked among the top two export destinations, and is by far the first country of origin for the Romanian agri-food imports.

Since the CEFTA period, Romania's trade Hungary, Bulgaria, Poland, Slovakia and Slovenia presented constantly significant deficits. This shows that the agri-food sectors of these countries were much better prepared than Romania to enter the Single Market.

Current and future investments in modern farms and processing units will help improve Romania's position on international agri-food markets and will reduce the share of agricultural commodities (cereals, oilseeds, livestock), while increasing the share of processed products in exports, creating prerequisites for increasing overall Romanian agri-food trade competitiveness.

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DYNAMICS AND PERFORMANCES IN THE INTERNATIONAL TRADE OF ROMANIA'S AGRI-FOOD PRODUCTS, BY THE PROCESSING LEVEL

RUSALI MIRELA-ADRIANA[1]

Summary: *The research aims at analyzing the factors of export growth of Romania's agri-food products on the world market during the period 2001-2013. The analysis used statistics for Romania's foreign trade and world trade in nominal terms, by main groups of products aggregated by codes 01-24 of the Harmonised System. The results show changes in the structure of agri-food trade flows of import and export by processing degree, evolution of trade balance and structure of export growth, highlighting the comparative performance of pre-accession Romanian and post-accession.*

Keywords: *agri-food trade, processing sector, post-accession.*

INTRODUCTION

The agricultural sector worldwide has been facing lately with the highest increase of the agricultural prices' level and price volatility of the period following the years '70, as a consequence of an increasingly strong influence of certain factors outside agriculture, such as the macro-economic shocks or the variation of agricultural markets in correlation with energy and other commodities and the great incertitude in relation to climate changes (EC, 2012).

Although the trade policies generally have the greatest effect upon the agri-food trade, as regards the high-value products such as the processed products, the trade flows are also influenced by other factors affecting the consumers' preferences and the agri-food production factors.

Until the recent financial crisis and the subsequent collapse of the world trade, the agricultural trade experienced consistent growth, favoured by the incomes and population growth, the decrease of transport costs and a greater access to the market, having in view the opening of markets by the application of the Uruguay Round Agreement on Agriculture (URAA).

Food industry globalization enabled the firms to have an easier access to capital and technology, two of the most important inputs used in the production of many processed products. Consequently, the food trade practices adapted as structure, partners and net commercial positions for many of these products (Liapis, 2011).

The capacity of a given country to perform as a player in the agricultural and food trade increasingly depends on the way it gets integrated into the sectors of processed products. It depends to what extent the countries get specialized and export these products, using the more plentiful national inputs. The increase of processed products export has a key importance for the socio-economic security, having the potential to extend the labour employment and income gaining opportunities beyond the farm gate.

Thus, the general tendency in the global food trade system to gradually move to an open market is a desirable process in the broader sustainable development context. However, among the countries that joined the European Union in the year 2007, Romania has been confronted with a strong competition pressure in the food processing sector.

In this context, the purpose of the present approach is to deepen the research work on Romania's trade performance on the world markets, continuing the previous approaches (e.g.: Rusali, 2014; Rusali, 2013; Steriu & Otiman, 2013), while focusing on the segment of processed products.

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MATERIALS AND METHODS

The research has been used the methods of statistical analysis in foreign trade and synthesis of the outcome resulted from the evaluations of relevant indicators, by comparing the periods related to Romania's pre- and post-accession to the European Union (EU).

The results provide the evaluation of the contribution of products, aggregated according to sections and chapters, in the foreign trade flows and trade balance, by analyzing the structure of the exports and imports of processed agrifood products in evolution on the international markets.

The statistical material has been provided by NIS – The Romanian Statistical Yearbook and the Statistical Bulletin of International Trade from the corresponding data base of the period of time under review between 2001-2013, comprising the codes of the Combined Nomenclature (CN), respectively chapters 01-24 of the Harmonized System (SA).

RESULTS AND DISCUSSIONS

Romania's agrifood trade had a general increasing trend within the period of time 2001-2013, especially in exports, however, Romania had a small contribution in the total agrifood trade quantum of the 27 Member States, both in exports (0.8%) and in import (1%) (Rusali, 2015).

In the year 2013, the market share of the Romanian exports in EU registered the highest value of the analyzed period of time, of 1.2%.

Nevertheless, Romania's agrifood trade balance developed a balanced trend, mainly after the accession to the EU, although recorded significant deficits, of -1.1 billion Euro as an average of the period of time 2001-2006, it has been deepen to -1.4 billion Euro within 2007-2013, but (fig. 1).

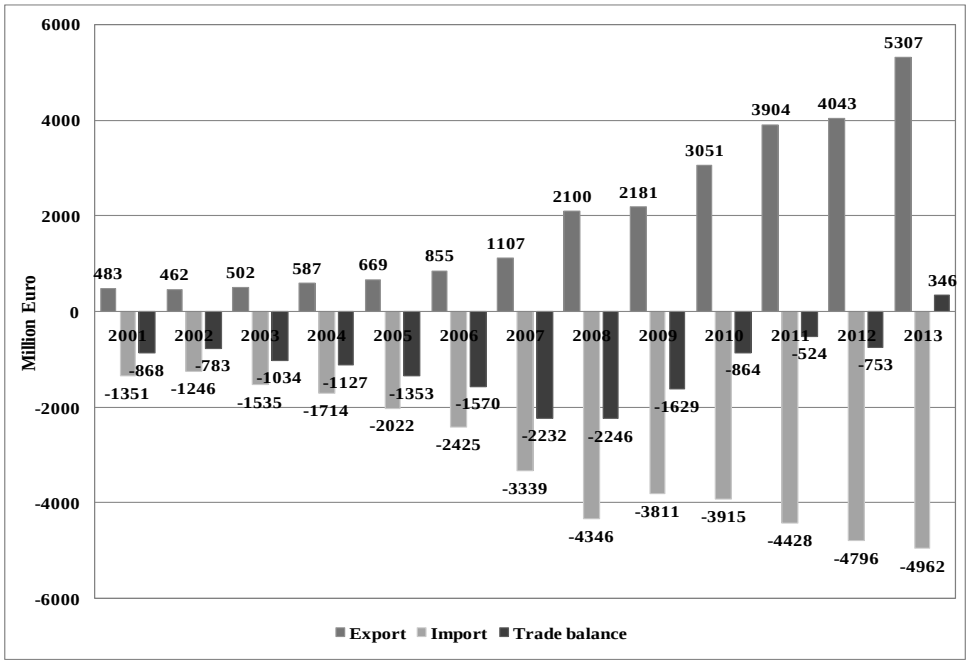
In the period 2001-2013, Romania's total agrifood trade cumulated 65 billion Euro, of which 23% deficit, exports grew 11 times, while imports 4 times.

Following the year 1989, when the agrifood sector was producing a net trade of 139 million Euro, only in the year 2013 Romania's agrifood trade achieved a positive sold, in amount of 346 million Euro (fig. 1), an unique performance in the last quarter of century (Rusali, 2015).

The evolution and structure of the agrifood trade, by the main groups of products of the CN sections, indicating the trade flows and balance are explicitly presented in table 1.

The main contributors to the trade deficit have been the sections IV- *Food, beverages and tobacco* (44% in import), cumulating -862 million Euro in the year 2013 and section I- *Live animals* and animal products (30% in import), responsible of a deficit of -371 million Euro.

The greatest share in exports had the products included in section II – *Vegetable products* (49%), being the single section that recorded an exceeding trade during 2008-2012 and was responsible of the positive sold in the year 2013, of a 1.5 billion Euro value, followed by the section IV - *Food, beverages and tobacco* (29%).



Source: M.A. Rusali, processing of data from NIS.

Figure 1: Romania's agrifood trade flows and balance, 2001-2013

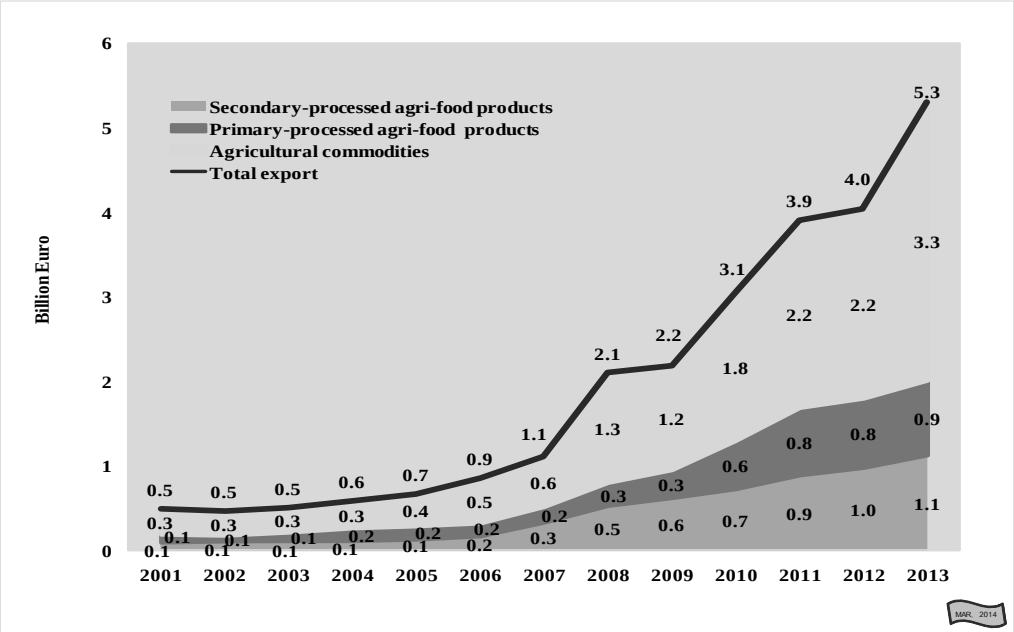
The section III – *Vegetable and animal oils and fats*, although in deficit in almost all the years, had the smallest share in trade (5%), had an increasing trend of export values, in order that registered a net trade in 2013.

Table 1: Romania's agrifood trade flows and balance, by CN sections: structure and evolution 2001-2013 (million Euro)

	I – Live animals and animal products			**II – Vegetable products**			**III - Vegetable and animal oils and fats**			**IV - Food, beverages and tobacco**		
	Export	**Import**	**Balance**	**Export**	**Import**	**Balance**	**Export**	**Import**	**Balance**	**Export**	**Import**	**Balance**
2001	146	-314	-168	202	-375	-174	28	-38	-10	108	-624	-516
2002	153	-312	-159	188	-294	-106	10	-70	-60	111	-569	-458
2003	189	-261	-72	174	-596	-422	28	-55	-27	111	-623	-512
2004	200	-389	-189	208	-543	-335	64	-52	12	115	-730	-615
2005	195	-662	-468	274	-437	-163	62	-59	4	138	-864	-726
2006	211	-707	-496	408	-538	-130	57	-74	-17	179	-1106	-927
2007	248	-870	-622	436	-1037	-601	67	-144	-77	356	-1288	-932
2008	261	-1191	-930	1157	-1259	-102	106	-227	-121	576	-1669	-1093
2009	313	-1108	-795	1092	-998	94	87	-160	-73	689	-1544	-855
2010	416	-983	-568	1606	-1138	469	162	-217	-55	867	-1577	-710
2011	562	-960	-398	2027	-1322	706	240	-246	-6	1074	-1900	-826
2012	728	-1035	-307	1971	-1418	553	183	-239	-56	1161	-2104	-943
2013	747	-1118	-371	3004	-1458	1547	240	-208	32	1316	-2179	-862

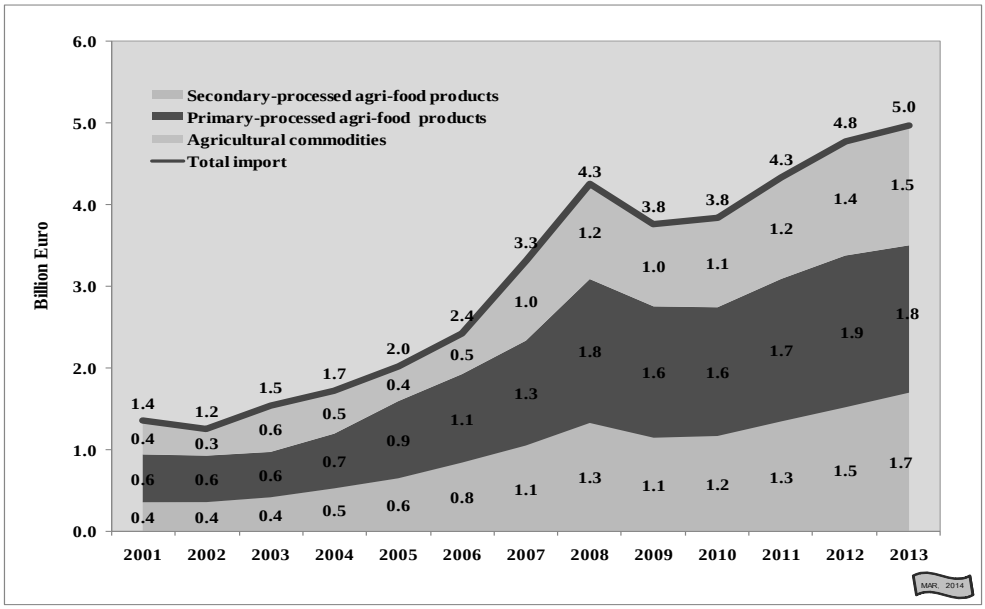
Source: M.A. Rusali, processing of data from NIS.

As it can be observed from fig. 2, in Romania's exports of processed products from the agrifood sector, including the primary and secondary processed products, have been continuously increased, from 185 million Euro, in the year 2001, reaching of over 2 billion Euro in the year 2013. However, their share in the agrifood export had a more reduced increase, from 39%, to 42%.



Source: M.A. Rusali, processing of NIS data.
Figure 2: Structure of agrifood exports, by the processing level: 2001-2013

Exports of secondary processed products had the most rapid yearly increasing rate, of 23%, respectively from 88 million Euro, to 1.126 billion Euro. Comparatively, the primary processed products had an increasing rate of 20%. The basic products evaluated closed to Romania's total agrifood exports increasing rate, of 22%.



Source: M.A. Rusali, processing of NIS data.
Figure 3: Structure of agrifood imports, by the processing level: 2001-2013

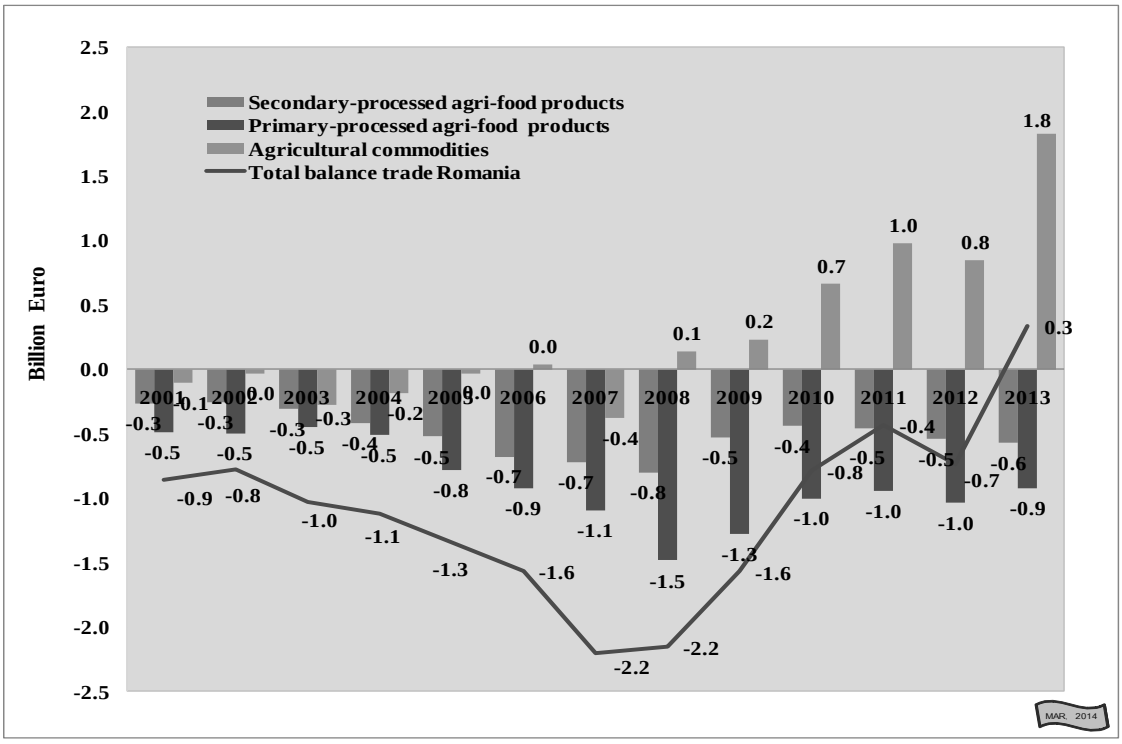
At the same time, the agrifood imports had a lower yearly increasing rate, of 11%, in the period 2001-2013, growing from 1.3 billion Euro, to 4.9 billion Euro, although having comparable high values on all products (fig. 3).

As well, the basic agricultural products prevailed in exports, rising from 289 million Euro, in 2001, to 3.3 billion Euro, in 2013.

It should be noted that exports of basic agricultural commodities, the growth gained momentum after accession, the annual growth rate being 33% versus 12% in the previous period of

analysis, while imports had an annual rate of higher growth in the period 2001-2006, 15% versus 7% in 2007-2013.

As shown graphically (fig. 4), the trade balance varied significantly during the periods under review, the inflection point was 2007.



Source: M.A. Rusali, processing of NIS data.

Figure 4: Romania's agri-food trade balance, by the processing level of products: 2001-2013

Major benefits were brought by the agricultural products that were surplus since 2008, the balance cumulating 1.8 billion Euro in 2013. In contrast, primary processed products were responsible for most of the deficit, amounting together with secondary processed products a deficit of 1.5 billion Euro.

The main Romanian products aggregated in chapters 01-24 according to CN that have performed during 2001-2013 are those which have registered a positive balance in foreign trade.

In table 2 are shown Romania's agrifood products changes in the net trade between pre-and post accession periods, including a selection of the most recent years, and the related amounts of earnings from foreign trade, as well their evolution as a share in exports.

Table 2: Changes in the net trade income of Romania's agri-food products, by chapters CN

2001-2006		**2007-2013**		**2011**		**2012**		**2013**	
Code CN / Denomination	**mil. €**	**Code CN / Denomination**	**mil. €**	**Code CN / Denomination**	**mil. €**	**Code CN / Denomination**	**mil. €**	**Code CN / Denomination**	**mil. €**
01-Live animals	96	10 -Cereals	656	10-Cereals	741	10-Cereals	965	10-Cereals	1658
12-Oil seeds	33	12 Oil seeds	319	12- Oil seeds	566	24- Tobacco and prod.	217	12- Oil seeds	546
14-Other vegetable prod.	1	24 -Tobacco and prod.	173	24-Tobacco and prod.	242	12- Oil seeds	209	24- Tobacco and prod.	271
		01 Live animals	115	23- Residues, wastes of food industry	241	01- Live animals	165	15-Fats and oil	32
		14- Other vegetable prod.	0	01- Live animals	132	14-Other vegetable prod.	0,5	16- Meat and fish preparations	6
				14- Other vegetable prod.	0.5			14- Other vegetable prod.	0.2
Share in export	*28%*	*Share in export*	*38%*	*Share in export*	*42%*	*Share in export*	*38%*	*Share in export*	*50%*

Source: M.A. Rusali, processing of NIS data.

Net trade income summed had decreased sharply in total agri-food exports of Romania after accession, respectively, from 39% in 2006 to 19% in 2007, but the trend has recovered in the next years, so that comparing to the 2001-2006 average of 28%, the average share in exports grew to 38% in 2007-2013. Net trade was recorded only for cereals, oilseeds and live animals, and processed products from CN chapters including tobacco and other vegetable products.

In 2013, due to an outstanding production of cereals, but also of products in the chapters including tobacco, fats & oil, meat & fish preparations and other vegetable products and plaiting materials, the net trade revenue accumulated 2.6 billion Euros, achieved through the contribution of mentioned products, their net trade income sharing 50.4% in export.

There have to be underlined the maintaining of specialization in post-accession period of cereals, oilseeds and tobacco, and a loss in 2013 on the products included in the live animals chapter.

The matrix of products surplus as well notes a growing trend of processed products, from 4% average of period 2001-2006 to 13% in 2007-2013 and a diversification of the supply.

CONCLUSIONS

During the review 2001-2013, there were recorded increases both of the values of exports and imports of agricultural products in Romania, under the impact of political changes of preparation and then join the single European market. The main positive effect in trade was the downward trend of the deficit and regaining in 2013 of the net agri-food exporter position.

During this period Romanian exports of processed products have a continuous growth, although their share in world agrifood exports had a modest increase. Meanwhile, secondary processed products had the fastest growth compared to the primary processed. However, exports of basic agricultural products, as well with an increasing trend, consistently prevailed in Romania's foreign trade.

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THE ROMANIAN EXPORT OF LIVE ANIMALS – A FAR-REACHING ACTIVITY?

MARIANA GRODEA, IULIANA IONEL[1]

Abstract: *In the period 2003-2014, Romania became an important source for the export of live animals (bovines and sheep), both for the intra-Community trade and for third countries. Although in the same period the imports consisted mainly of breeding animals, the balance of trade was constantly positive. The method used in the paper was the comparative analysis of trade-specific set of indicators, the main information sources being international information, reports and studies, FAOSTAT and EUROSTAT statistics. From our analysis, it results that that Romania practiced a conjuncture export, as the herds specialized in meat production, both in the case of bovines and sheep, have a significant share in total livestock herds. The reason why Romania is agreed as supplier of live animals is rather represented by the raising of animals under extensive system, where feeding is mainly based on grazing.*

Key words: *import, export, bovines, sheep, balance of trade*

INTRODUCTION

Having in view that exports represent the most relevant criterion to evaluate product competitiveness, from the analysis of the evolution of the Romanian trade with live animals (bovines, sheep and goats) in the period 2003-2014, an increase of imports could be noticed by 4.7 times in bovines and by 6.8 times in sheep, compared to the dynamics of exports, i.e. 1.2 times in bovines and 1.3 times in sheep respectively.

Starting from the current performance of the Romanian exports, as well as from the challenges existing at European and world level, it is considered that the strategic option for Romania should focus on a competitive, diversified and sustainable export, based on high value added and high specialization in the world trade [1].

Our analysis started from **the presentation of the main trends in the Romanian trade with live animals in the period 2003-2014** (including the crisis and post-crisis years), at Community and extra-Community level, highlighting the main characteristics of the intra- and extra- Community trade. In the light of those presented above, our analysis has as main objective the identification of Romania's advantages and disadvantages in the trade with live animals, in the context of the deep structural changes worldwide and at Community level, and on their basis, the presentation of recommendations and proposals for the decision-makers at macro-economic and micro-economic level.

Since the 2000s, more than one-third of beef produciton, at world level, has been absorbed by only three countries: USA, Japan (about 60% of imports from the Asian area) and Russia, which became the three great world importers on this segment. These are followed by countries like South Korea, EU-27, Egypt and China. The increasing demand mainly comes from the Asian countries (Vietnam, Hong Kong, Malaysia, Philippines), from Latin America and Middle East. In Asia, beef demand grew by 3% per year in the period 2003-2014. The greater demand is explained by the increase of the population's living standard, as well as by the domestic production that in certain cases is insufficient for meeting the demand.

At present, a deficit of mutton can be noticed on the EU market, so that in order to meet the ever-increasing consumption needs, mutton is imported from Australia, Brazil, New Zealand and Argentina. With support to mutton production in Romania, the import needs of the European Union could be covered and domestic production would increase [2].

MATERIAL AND METHOD

As regards the **method and working tools used** for the purpose of this paper, we mention that we made a comparative analysis of the trade with live animals between Romania and the EU-28 member states

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and extra-Community countries. In this approach, we used foreign trade statistical data from the National Institute of Statistics, Eurostat, Faostat, http://exporthelp.europa.eu/thdapp/comext/ComextServle.

This investigation was completed by the analysis of the multitude of factors that constrain the development of Romania's trade with countries outside the European Union.

We reviewed the recommendations identified so far and we also focused on possible solutions for the exporters from Romania, so that, on their basis, these could improve their performance and face competition both on the domestic and third markets.

RESULTS AND DISCUSSIONS

Bovines

Although the raising of bovines is a traditional activity for the rural population and mainly for the people in the mountain area, the bovine herds steadily decreased in the period 1990-2013 (by 62%), beef production being concentrated on the small and medium-sized farms. The small prices offered by slaughterhouses made the great majority of small cattle raisers – natural persons – who have 92% of total herds, to produce mainly for self-consumption and to sell part of their production on the free market. Thus, in the year 2013, beef price in euro /100 kg live weight in Romania was 141 euro, compared to France (353 euro) and Poland (231 euro).

The most important challenge of the Romanian agri-food sector before and after the accession to the EU was to conform to the European food safety and quality standards throughout the agri-food chain. This has had a most significant impact in the meat and dairy industry, where the standards were the most severe. By the end of 2013, in Romania there were 306 agri-food units, red meat sector, in conformity with the EU standards, and 168 units processing milk at European standards.

In Romania, the beef demand is lower, due to consumers' traditional preference for pork; hence, the processed beef consumption accounted for 9.4% of total meat consumption, i.e. 5.1 kg/capita in the year 2013 (about 3 times lower than the average consumption in the European Union). At present, the largest quantities of beef on the Romanian market come from imports, which grew by about 80% in the period 1990-2013, while exports are mainly represented by live animals, i.e. steers at about 120-150 kg. The support measures for the beef cattle sector, represented by transitory national aids, have not reached their objectives as regards producers' stimulation; yet the new measures, introduced through PNDR 2014-2020 (coupled support, de minimis aid for the procurement of heifers), will contribute to the increase of herds and of beef production implicitly.

Sheep and goats

In Romania, sheep and goats are most often raised under extensive system, which presupposes low operation costs. In the period 1990-2013, the sheep herds decreased by 35%, this trend continuing after the accession, while the goat sector experienced the greatest increase as regards the goat herds (+31%). Mutton price in Romania was lower in the year 2013 (99 euro/100 kg live weight), compared to other EU countries (France – 675 euro, Poland – 167 euro).

The Romanian consumers' preferences for mutton and goat meat largely differ by regions: a greater consumption of this type of meat is found in the south-eastern regions, bearing Greek and Turk influences and the region Center, with tradition in shepherding. In the year 2013, the mutton and goat meat consumption amounted to 2.4 kg capita (4.4% of the total meat consumption).

There have been a permanent trade surplus in the trade with sheep and goats, mainly live animals for slaughtering being traded.

The new support measures for the sheep and goat sector (transitory national aids and coupled support) under NRDP 2014-2020 will make it possible for the Romanian producers to better organize the fattening of young sheep and to seize the opportunity to earn good incomes by

exporting significant quantities of carcass meat, having in view the penetration on the Far East markets, where Romania's geographical position does not permit the export of live animals.

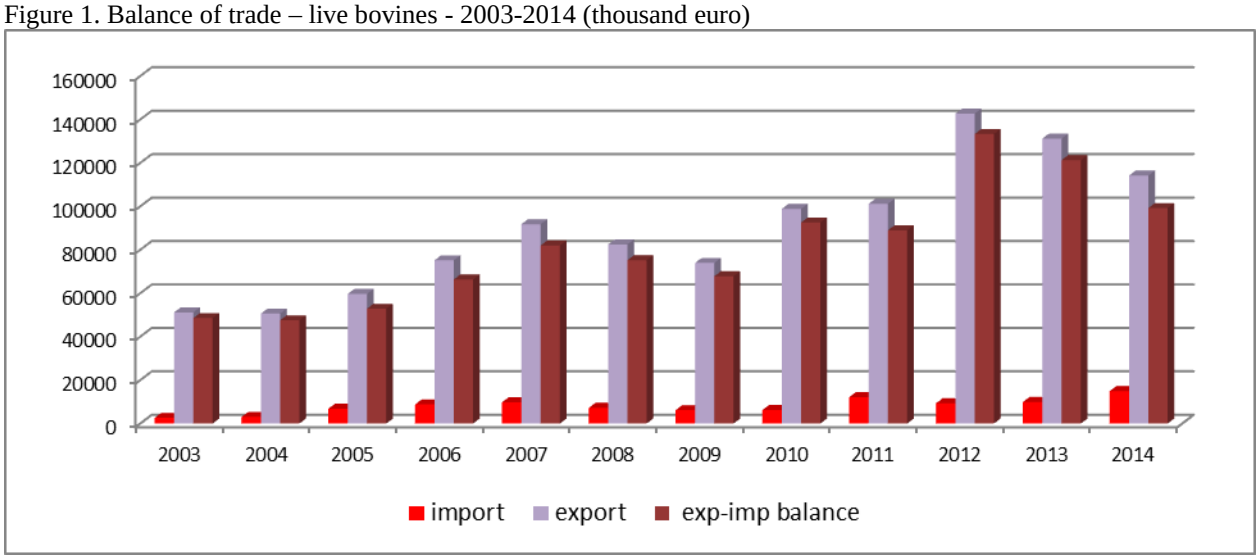
Trade with live animals – Romania's position in the intra- and extra- Community trade

According to the calculations made on the basis of Eurostat statistical data, at intra-Community level, in the year 2014, as regards the *export of live cattle*, in value terms, Romania was on the 7th place (2.73%) in EU-28 and on the 15th place (0.59%) *at the import of live cattle*. At extra-Community level, the main destinations of Romania's exports were Lebanon -31%, Israel-22% and Jordan 20%. At intra-Community level, the Romanian exports went to Italy -33%, Croatia -22% and Spain-20%. The imports of live cattle had the intra-Community partners as main suppliers, the main partner being Germany -24%, followed by Hungary -22% and the Netherlands-15%.

As regards the trade with *live sheep and goats*, Romania is on the first place among the EU-28 countries in *exports* (21%), followed by Hungary (20%) and Spain (18%) and on the 13th position in *imports* (0.61%). In the year 2014, the live sheep and goat exports had as main destination the following extra-Community countries: Libya-63% and Jordan-32%. Romania's exports to intra-Community countries went to Greece -38%, Italy-26%, Bulgaria-23%. Imports mainly came from Hungary (41%) and from the Netherlands-32%.

As it can be noticed in the figure below, in the period 2003-2014, the balance of trade in live bovines was permanently positive (Figure 1)

Figure 1. Balance of trade – live bovines - 2003-2014 (thousand euro)



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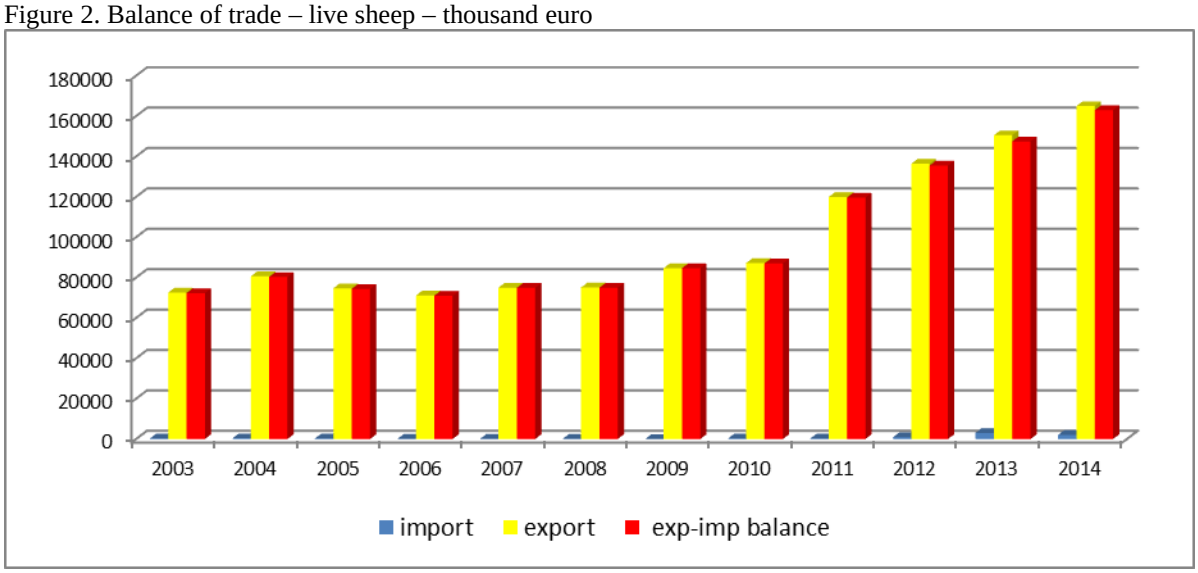
The biggest trade balance was in the year 2012 (133320 thousand euro), up by 49% compared to previous year, on the basis of the decrease of imports by 23% and export increase by 41%.

In the year 2014, compared to previous year, the value of live bovine exports both in intra- and extra-Community countries decreased 6.5% and 13% respectively. As regards imports, the value of imports from extra-Community countries decreased by 75%, while the value of imports from intra-Community countries increased by 52%.

Following the analysis of the value of imports and exports in the year 2014, we could notice that both in the Community and in the extra-Community area, the value of exports is net higher than the value of imports; in the case of live sheep and goats the balance of trade was positive on the basis of the permanent growth of exports in the period 2003-2014 (Figure 2).

Figure 2. Balance of trade – live sheep – thousand euro



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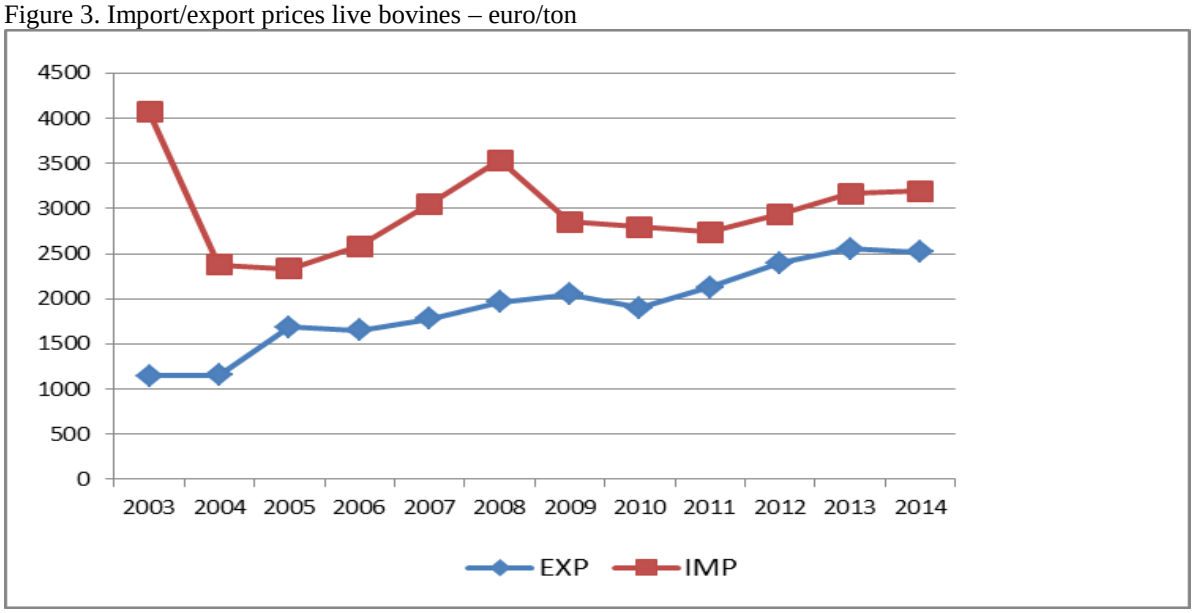
The greatest revigoration began in the year 2011, with the highest balance of trade in the year 2014 (162880 thousand euro). Beginning with the year 2009, Romania no longer imported live sheep and goats from the extra-Community area. The imports from the intra-Community area significantly increased instead; thus, in the period 2010-2014, imports increased 9.3 times. The sheep export almost entirely depends on the orders that come from North Africa and the Middle East. Thus, in the year 2014, 68% of the Romanian exports were covered by the deliveries to Libya (75.7 mil. euro) and Jordan (38.1 mil. euro).

As it can be seen from the figure below, the import price of live bovines exceeds the export price of live bovines (Figure 3).

Figure 3. Import/export prices live bovines – euro/ton



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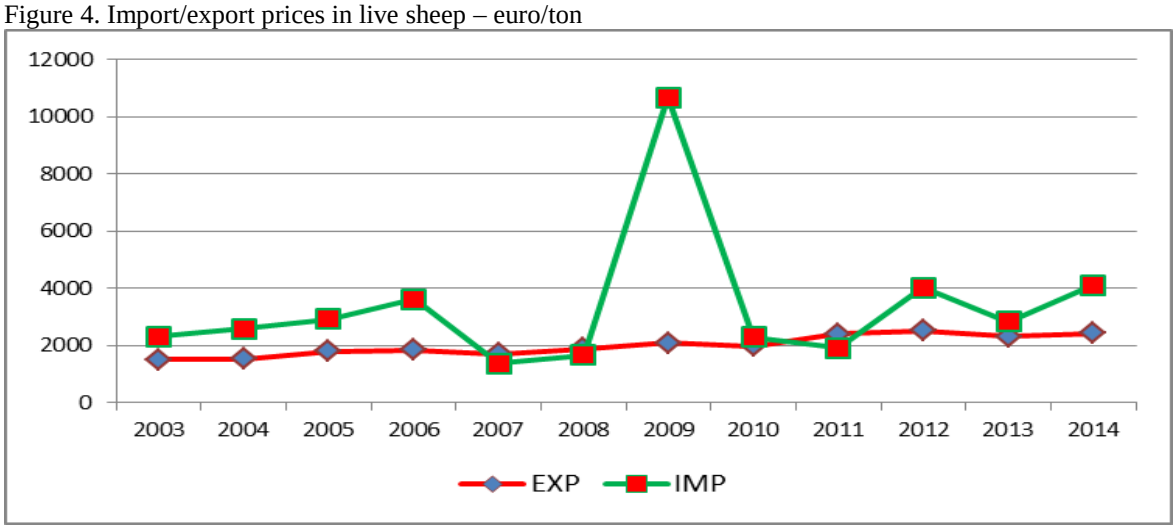
As regards its evolution, in the period 2003-2014, the import price had a significantly decreasing tendency in the period 2003-2004 and increased in the period 2004-2008; after that, its evolution experienced a slight diminution, to get stabilized at 3197 euro/ton in 2014. As regards the export price, we could notice its increasing tendency throughout the investigated period 2003-2014, to reach 2517 euro/ton in the year 2014.

In live sheep and goats, the two (import and export) prices are relatively close, even though the import price is slightly higher than the export price. An exception is the year 2009, when the import price had the highest value, i.e. 10680 euro/ton (see Figure). This was the result of the severe drought in Australia and Latin America, which led to higher grain prices and consequently to the significant decrease of animal herds and of meat production. On the other hand, the middle class from the strong emergent countries such as China or Brazil, which is under full expansion, is increasingly interested in a diet rich in proteins, putting a pressure on this industry by the increasing demand.

Figure 4. Import/export prices in live sheep – euro/ton



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CONCLUSIONS

Due to the much higher subsidy than the subsidy for dairy cows, as well as to the increasingly higher beef demand on the Romanian and export markets, the Romanian farmers got oriented to more profitable animals in the last years, shifting to meat breeds, even before April 2015, when the milk quotas were removed. An important condition for the Romanian bovine raisers to have profit is to have integrated production systems based on agricultural land areas on which the necessary fodder should be obtained.

Another issue to be mentioned is the possible opening of the two great markets, after the blockage determined by the bluetongue disease, which are extremely important for Romania, namely China ahd Turkey. This could contribute, together with the continuation of exports to Libya and Jordan (extra-Community countries) or to Italy, Croatia, Spain, Greece (intra-Community countries), to the revigoration of the livestock sector in Romania, a sector that would bring value added and also fructify the crop produciton.

The analysis of data and information proves that among the main determinants of success on the export markets, one could mention a good knowledge of the foreign competitors and a higher quality of products compared to similar products on the foreign markets.

The main foreign trade efficiency growth modalities in live animals and processed products are the following: diminution of production costs, higher processing level of products, increase in the quality of products and services for export, labour productivity increase, identification of export niches and product specialization, increasing the complexity and diversification level of products for export, modernization and adaptation of export product presentation modality at the level of foreign market requirements.

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THE AGRI-FOOD SECTOR IN ROMANIA – AN ANALYSIS OF THE RESOURCES-UTILIZATION CORRELATION IN THE POST-ACCESSION PERIOD

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Abstract: *As important part of national economy, the agri-food sector had oscillating evolutions in the post-accession period, mainly generated by the need to get in line with the EU requirements. The analysis of the resources-utilizations ratio, from the point of view of production account, reveals significant modifications, as regards both the direct relations between the different subsectors of national economy and the relation between the overall sector and the rest of national economy. Based on data processing from the input-output table from national accounts, the present approach tries to make a diagnosis of the agri-food economy resources utilization in relation to other branches of the economy.*

Key words: *resources, utilizations, national accounts, agri-food sector*.

INTRODUCTION

The analysis of interdependencies between different branches of national economy from the perspective of the formation and utilization of resources acquires an increased importance both from the point of view of potential niches for the sale of obtained production and of the identification of certain sectors whose activity is strongly dependent on the resources from upstream branches. As regards the agri-food sector, the resources-utilizations relation, also known as the input-output table, has an increased importance, generated by the share of the sector in national economy as well as by the driven effects in the relation with the other economic branches.

MATERIAL AND METHOD

From the methodological point of view, the present approach has used public statistical information from the national accounts[3] from the Tempo-Online database of the National Institute of Statistics. Having in view that the analyzed indicators are expressed in value terms, for data comparability these were transformed into comparable prices of the last statistical year, using the consumer price index as deflator. We must specify that the investigated period refers to 2007-2012.

RESULTS AND DISCUSSIONS

The resources of the sector "*agriculture*" in the period 2007-2012 are characterized by an oscillating trend of their distribution modality by different economic branches. Thus, while at the moment of accession, 58.7% of the resources of agriculture were used in agriculture, forestry and related services, in the year 2012, 66% of these resources were used in the food industry. Practically, the allocation of resources to agriculture decreased by 15.3%, while the resource allocation to the food industry increased by 33.6 % in 2012 compared to 2007 (**Table no. 1**).

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Table no.1. Distribution of agriculture resources by other activity sectors in the period 2007-2012 (million RON 2012 prices)

Utilizations	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Agriculture, hunting and related services	21171.7	29969.2	23734.6	21924.1	23205.1	15658.3
Forestry and forest exploitation	108.7	51.5	258.1	150.4	199.7	206.1
Fisheries and aquaculture	7.8	9.1	17.0	14.6	31.5	50.8
Food industry	11717.5	15609.7	15319.9	21478.5	24936.3	23848.8
Manufacturing of beverages	989.9	1442.1	1392.6	5074.8	4825.2	4071.2
Manufacturing of tobacco products	115.5	134.2	31.7	3.5	1.5	0.6
Manufacturing of textile products	660.9	820.1	608.2	381.7	453.7	439.2
Leather tanning and finishing; manufacturing of travelling requisites and leather items, harness leather items and footwear; fur preparation and dyeing	312.6	399.7	370.2	59.1	73.4	61.6
Manufacturing of chemical substances and products	22.8	36.7	29.6	29.9	35.2	19.2
Restaurants and other food services	971.6	1275.0	1216.8	133.5	81.4	50.8
Landscaping activities and building services	0.9	2.1	1.2	84.8	101.9	83.0
Total	**36080.0**	**49749.2**	**42979.8**	**49335.0**	**53945.0**	**44489.6**

Source: Calculations based on Tempo-Online data, NIS, 2015.

In the year 2012, the agri-food sector, overall[4], used 98.5% of the resources of agriculture, up by 4% compared to the year 2007.

The agri-food sector used about 42% of the"*forestry*" resources. As regards the agro-processing industry[5], the period 2007-2012 is characterized by the diminution of the share of resources used from forestry from 51.1% (2007) to 42.5% (2012), which reached 1428.5 mil. RON (**Table no.2**).

Table no.2. Allocation of forestry resources by other activity sectors in the period 2007-2012 (mil. RON 2012 prices)

Utilizations	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Agri-food sector	1210.0	677.9	492.1	744.6	1318.3	1417.2
Extraction of metal ores	0.8	0.5	0.5	0.2	0.5	0.1
Wood processing, manufacturing of wooden and cork products, except for furniture; manufacturing of straw and other wickerwork products from vegetable material	1472.5	2206.1	2097.1	730.0	1287.3	1428.4
Manufacturing of paper and paper products	64.0	132.6	106.7	136.3	214.8	187.7
Manufacturing of furniture	89.3	164.5	147.8	122.4	186.4	153.2
Other industrial activities	7.4	13.8	11.7	23.3	31.9	25.1
Construction of buildings	21.4	81.7	40.5	67.2	121.8	87.0
Civil engineering works	7.8	23.7	20.6	27.8	45.0	30.0
Special construction works	5.8	14.3	13.0	16.9	32.1	19.6
Terrestrial transports and pipeline transports	4.5	8.4	7.8	7.6	16.6	11.0
Restaurants and other food services	0.1	0.1	0.1	2.6	2.2	1.5
Total	2883.6	3323.7	2937.8	1879.0	3256.9	3360.8

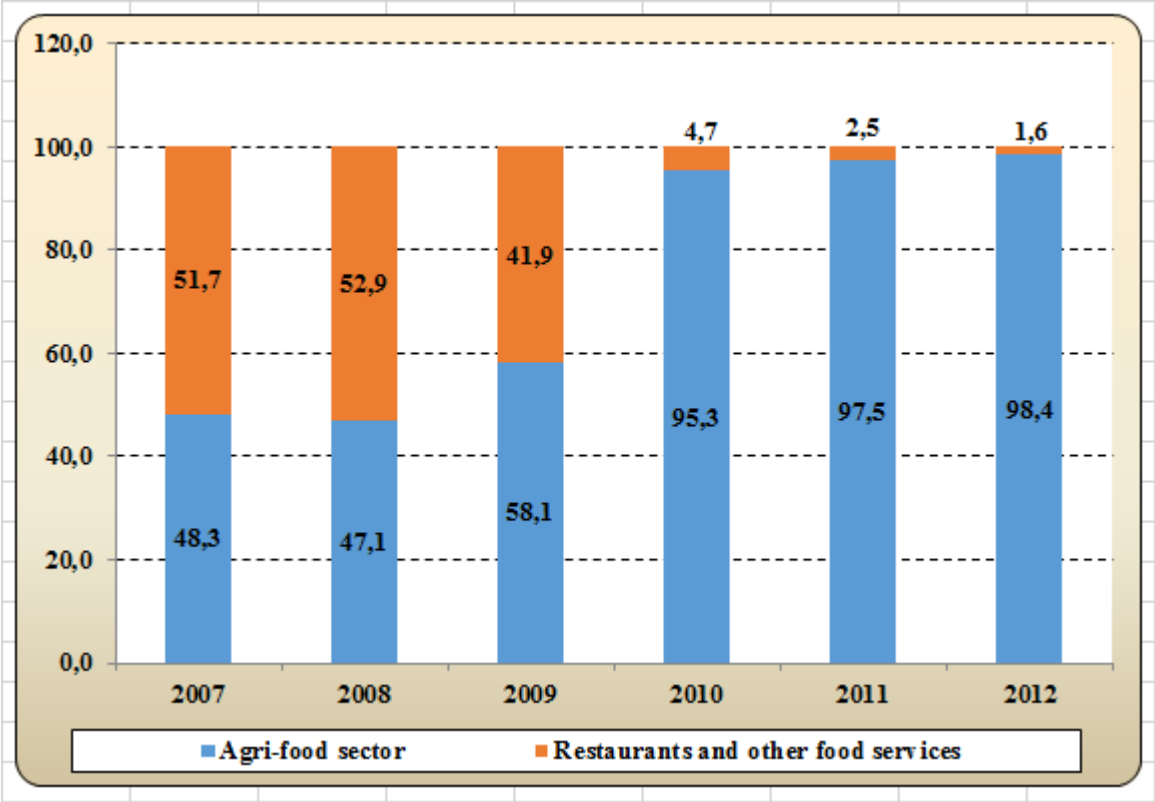
Source: Calculations based on Tempo-Online data, NIS, 2015.

[4] We refer here to the following sectoral structure: agriculture, forestry, related services, forestry, forest exploitation, fisheries, aquaculture, food industry, manufacturing of beverages and tobacco products.

[5] Wood processing, manufacturing of wooden and cork products, except for furniture, manufacturing of straw and other wickerwork products from vegetable material.

The resources of the *fisheries* sector followed an oscillating trend as regards their distribution by other activity sectors, Thus, while in the year 2007, 48.3% of these resources were used in the agri-food sector and the difference in the sector of services (restaurants and other food services activities), in the year 2012 the agri-food sector attracted 98.4% of the resources from the fisheries sector, while the percentage of resources significantly decreased in the sector of services, to reach only 1.6% (**Graph no.1**).

Graph no. 1. Utilization structure of resources from the fisheries sector by activity sectors in the period 2007-2012 (%)



Source: Calculations based on Tempo-Online data, NIS, 2015.

Unlike the oscillations from the other activity sectors, the food industry resources were mainly used inside this sector, with non-significant variations, i.e. about 64%, the difference being allocated to other activity sectors in low percentages (**Table no. 3**).

Table no.3. Distribution of food industry resources by other activity sectors in the period 2007-2012 (mil. RON 2012 prices)

	2007	**2008**	**2009**	**2010**	**2011**	**2012**
Agriculture, hunting and related services	2232	2338	1155	1416	1196	984
Food industry	18611	17927	15510	7580	7036	8207
Manufacturing of beverages	1554	1117	962	876	666	685
Manufacturing of tobacco products	0.5	0.6	0.1	1.4	0.5	0.2
Other branches	12559	18257	15137	7215	6965	5538
Total	**34956**	**39640**	**32765**	**17088**	**15863**	**15414**

Source: Calculations based on Tempo-Online data, NIS, 2015.

A relatively similar evolution was noticed in the industry of beverages and the tobacco industry. Thus, in the year 2012, out of total resources from the industry of beverages, 24.3% were used in the agri-food sector (down by 11.3% compared to 2007), while out of total resources from

the tobacco industry, the share of resources allocated to the agri-food sector was down by 13.7%, from 38.8% (2007) to 25.1% (2012) (**Table no.4**).

Table no.4. Distribution of resources from the beverages and tobacco industries to the agri-food sector in the period 2007-2012 (%)

	2007	**2008**	**2009**	**2010**	**2011**	**2012**
Beverages	35.6	35.5	39.9	26.3	20.5	24.3
Tobacco	38.8	36.1	47.4	27.7	27.2	25.1

Source: Calculations based on Tempo-Online data, NIS, 2015.

The modifications produced in the legal framework from the tobacco industry, by the establishment of non-smoking areas in certain places, generated a significant diminution of the utilization of sector resources in the field of services, mainly in the restaurants and food services industry, from 60.9% (2007) to 43.7% (2012) (**Table no. 5**).

Table no.5. Distribution of tobacco industry resources by other activity sectors in the period 2007-2012 (%)

	2007	**2008**	**2009**	**2010**	**2011**	**2012**
Agri-food sector	38.8	36.1	47.4	27.7	27.2	25.1
Restaurants and other food services	60.9	63.5	52.4	49.9	45.3	43.7
Sportive, leisure and entertainment activities	0.1	0.2	0.0	0.7	1.1	2.5
Different associative activities	0.2	0.2	0.2	21.7	26.3	28.7
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Calculations based on Tempo-Online data, NIS, 2015.

A "recovery" of losses from the food services and restaurants industry can be noticed in the field of sportive, leisure, entertainment activities and different associative activities, in which the allocation of resources from the tobacco industry significantly increased.

CONCLUSIONS

The analysis of interdependencies between the different branches of the economy, of the formation and utilization of certain limited resources suscitated numerous debates not only as regards their approach by different activity sectors but also on the possibility to identify those sectors whose resources are used, to a certain extent, in fields of activity that generate high gross value added in the economy.

Practically, the measurement of the economic activity results is needed in order to reveal the economic development level, its trends and the modality in which the national economy resources are used. The physical and valoric evaluation of the overall results of the economic operators makes it possible to reveal the favourable and unfavourable evolutions in the national economy or a given activity sector.

Our approach to the agri-food sector from the perspective of resource utilization synthetically revealed the following aspects:

- Significant utilization of own resources by each sub-field of activity;
- Noticeable tendency to change the shares of activity fields that use resources from the agri-food sector, generated either by the re-orientations produced in the commercial strategies or by imposing criteria or additional legal requirements;
- The resources of the agri-food sector tend to increase their share as regards their utilization in the sector of services, to the detriment of those from the processing industry.

To sum up, we can conclude that the resources-utilizations analysis can provide the decision-makers with the necessary elements for building up a sectoral development model, as each

input in a system (available resource) and each output (utilization) respectively represent important partitions of the overall national economy system.

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SUPPORT POLICIES FOR AGRI-FOOD EXPORT PROMOTION IN THE REPUBLIC OF MOLDOVA

STRATAN ALEXANDRU[1], IGNAT ANATOLIE[2], MOROZ VICTOR[3]

Abstract: *Agri-food trade has expanded over the recent decade in the Republic of Moldova. Trade policies promoted by the Republic of Moldova are mostly oriented towards product diversification, knowledge transfer and promotion of new competitive goods with high added value for domestic and foreign markets. The trade balance remains dynamic with significant fluctuations in product categories over time and countries of destination, due to climatic and trade shocks. In this context, the aim of the paper is to provide an analysis of agri-food sector and external trade, assess the impact of external factors over the national economy and opportunities for the better export targeting, and identify possible solutions to increase resilience to agro-food foreign trade shocks. For such tasks were used the statistical methods of analysis and informal interviews with main stakeholders. This paper's outcome incorporates the scale, significance and dynamics of the agri-food export including the continued evolution of the regulatory agencies involved and the critical role of support policies provided by other sectors of national economy for the export promotion.*

Key words: *Agri-food trade, trade policies, export promotion*

INTRODUCTION

Over the past two decades, Moldova's economy has gone through significant structural changes. The service sector has been the largest contributor to the economic growth, while tradable sectors, namely agriculture and manufacturing, have stagnated. Moldova's recent macroeconomic performance has been volatile, reflecting exposure to global economic and climatic risks.

The agricultural sector is characterized by large exposures, which often, but not exclusively, come from climate phenomena. There are different types of risks faced by agriculture in several European countries, including the Republic of Moldova.

Trade policies promoted by the Republic of Moldova are mostly oriented towards product diversification, knowledge transfer and promotion of new competitive goods with high added value for domestic and foreign markets. The current situation in the international trade with agri-food products placed the Republic of Moldova in a difficult position.

In this context, the paper presents an analysis of agri-food sector and external trade, impact of external factors over the national economy, opportunities for the export to EU countries, and possible solutions to increase resilience to agro-food foreign trade shocks.

MATERIAL AND METHODS

Given the challenges of the recent development in food sector, the following research methods were used: analysis of the food sector structure and development tendencies, analysis of the country's food security, analysis of the agri-food trade for main groups of agri-food products and countries, analysis of the impact of external shocks over the export development and country's economic stability and food security.

As main sources of primary information for this study were used reports elaborated with the contribution of authors in the framework of the FP7 project "AGRICISTRADE", data from the publications of the National Bureau of Statistics of the Republic of Moldova and the UN Comtrade data base. As a secondary source of information a range of articles and studies elaborated by local and foreign experts were used.

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RESULTS AND DISCUSSIONS

Historically, agriculture is one of the driving forces of the economy, nature and culture in the country for many centuries. In this environment farming methods adapted to the specific climatic, geographical and economic conditions have been formed. The agricultural sector employs about 29% of the population and the contribution of agriculture to GDP in recent years is around 12-13% [6]. In the context of Moldova's European aspirations, the modernization of the agri-food sector must comply with European patterns and trends that will allow adapting this sector to the requirements of international markets, especially in terms of safety and quality of food. The trade policy pursued by the Republic of Moldova at the current stage is focused on geographical diversification of the agri-food exports, primarily to reduce the risks caused by widespread non-tariff measures to protect certain markets.

The average annual volume of agri-food exports for the period 2010-2014 amounts to about 922 million US dollars. Export geography includes 113 countries, of which the top five account for cca. 54% of total agri-food exports. These are the Russian Federation, Romania, Belarus, Ukraine and Italy (see table 1).

Table 1. Top 10 export destination countries for agri-food products from the Republic of Moldova, 2010-2014, mil. US$, %

Nr.	Country	Total trade value 2010-2014 (mil. US$)	Share (%)	Cumulative share (%)
1	Russian Federation	1049,1	22,8	22,8
2	Romania	425,6	9,2	32,0
3	Belarus	398,6	8,6	40,6
4	Ukraine	375,2	8,1	48,8
5	Italy	238,6	5,2	54,0
6	United Kingdom	181,3	3,9	57,9
7	Poland	167,8	3,6	61,5
8	Germany	165,5	3,6	65,1
9	Turkey	162,9	3,5	68,7
10	Kazakhstan	147,1	3,2	71,9
	Other 103 countries	1297,3	28,1	100,0
	Total World	4609,1	100,0	

Source: Elaborated by authors based on UN Comtrade data base [9]

One can see certain evident tendencies in the agri-food exports' development. Thus exports to Russian Federation decreased from 242 mil. USD in 2010 to cca 131 mil. USD in 2014, or with about 85%. In the same, time agri-food exports to other countries have an increasing trend. Thus, these exports to Romania, Belarus and Ukraine increased during the period on average with 58%, 76% and 37% respectively, while agri-food exports to Italy increased almost six fold during the same period. Per total agri-food exports of the Republic of Moldova have increased during the period of 2010-2014 with about 46% (see table 2).

Table 2. Development of the agri-food exports to top 10 major destination countries and total World, 2010-2014, millions US$, %

Nr.	Country	2010	2011	2012	2013	2014	2014/2010, (%)
1	Russian Federation	242,1	243,8	235,0	197,1	131,1	54,1
2	Romania	61,5	101,0	79,4	86,4	97,4	158,4
3	Belarus	69,2	62,6	69,0	75,9	121,8	176,0
4	Ukraine	52,9	92,2	68,7	88,9	72,5	137,0
5	Italy	13,6	45,7	57,2	41,0	81,0	594,6

6	United Kingdom	24,3	49,1	22,7	42,0	43,2	177,7
7	Poland	20,3	41,8	35,4	36,0	34,3	169,1
8	Germany	23,0	36,1	19,6	44,8	42,0	183,0
9	Turkey	27,0	22,2	16,1	45,1	52,4	194,1
10	Kazakhstan	23,7	26,9	29,0	29,9	37,7	159,5
	Other 103 countries	174,6	195,7	246,7	328,5	351,8	201,5
	Total World	**732,2**	**917,1**	**878,9**	**1015,5**	**1065,4**	**145,5**

Source: Elaborated by authors based on UN Comtrade data base [9]

Agri-food exports of Republic of Moldova have been strongly marked by a significant reduction of supplies to Russia in 2001-2008 and by the introduction of embargo in 2014. In 2010 more than 33% of Moldovan export revenues originated from Russia, comparing with about 12% of total agri-food exports in 2014. Currently, trade relations with Russia are gradually improving though it will take a long time to recover the trade flow up to the pre-embargo level.

The export structure is dominated by few groups of products which reflect a rather primitive structure of the agri-food exports where wine production, fruits, nuts, sunflower seeds and vegetable oils prevail. Export of livestock products is carried out on a much smaller scale. In general, the foreign market is supplied mainly with agricultural raw materials and semi-finished products. The top 5 groups of agri-food products amounted to about 76% of total agri-food exports during the period of 2010-2014. One can mention an 3,5 times increase of exports of products from the groups "02 Meat and edible meat offal" and 2,5 times increase of ~~of~~ those form the group "10 Cereals" (see table 3).

Table 3. Export of top 10 most important agri-food products from the Republic of Moldova, US$ millions, %, 2010-2014

HS Code	Groups of products at 2 digits of HS	2010	2011	2012	2013	2014	Total 2010-2014	Share, %
22	Beverages, spirits and vinegar	178,2	181,3	215,0	252,3	193,7	1020,5	22,1
8	Edible fruit and nuts	167,6	187,0	202,3	204,0	194,0	954,9	20,7
12	Oil seeds and oleaginous fruits	90,4	181,5	99,9	166,6	154,2	692,6	15,0
10	Cereals	71,0	72,0	36,5	120,8	181,2	481,5	10,4
15	Animal or vegetable fats and oils	47,6	77,5	89,7	44,0	77,5	336,3	7,3
20	Preparations of vegetables, fruit, nuts or other parts of plants	52,3	68,8	60,4	76,1	59,7	317,1	6,9
17	Sugars and sugar confectionery	29,1	14,6	35,0	30,5	55,8	165,0	3,6
24	Tobacco and manufactured tobacco substitutes	27,2	28,7	34,2	25,5	16,7	132,3	2,9
2	Meat and edible meat offal	10,2	21,5	21,6	18,8	35,3	107,4	2,3
23	Residues and waste from the food industries	15,2	17,5	21,5	9,7	21,1	85,0	1,8
	Other 14 groups of agrifood products	43,6	66,8	62,8	67,2	76,1	316,5	6,9
	Total agri-food exports	732,2	917,1	878,9	1015,5	1065,4	4609,1	100,0

Source: Elaborated by authors based on UN Comtrade data base [9]

The Republic of Moldova is a member of the WTO and has signed trade agreements with 93 countries. Moldova has a regime of free trade with CIS partners, except of which are bans on imports of certain commodity positions agreed at the intergovernmental level. At a meeting of the CIS Council of Heads of Government of 18 October 2011, Moldova has signed a multilateral agreement on free trade zone, which replaced the bilateral agreements in the field of trade regime in the framework of the CIS. The agreement was ratified by the Parliament of the Republic of Moldova at 27 September 2012 and entered into force for Moldova from December 2012.

An important factor of the economic growth of the Republic of Moldova is the trade relations between the EU and Moldova. The EU's decision to open its market unilaterally to the Republic of Moldova in 2008, through the so-called autonomous trade preferences has led to the growth of mutual trade turnover. This trend will continue due to the signing of the Association Agreement, which includes a deep and comprehensive free trade area (DCFTA) between the EU and Moldova. This agreement creates new and closer political and economic relations between the EU and the Republic of Moldova [8]. At the same time, Moldova committed to the development of mutually advantageous trade with the CIS and other countries.

However, it should be noted the slow pace of growth in agricultural exports in 2004-2013. According to this index, Moldova's rank is the last among the CIS countries. One of the main reasons is the restrictions on imports and the embargo on certain groups of Moldovan agri-food products imposed by the Russian Federation. In the same period the volume of agri-food imports into Moldova has grew at a faster pace [2].

Discussions on strengthening the export orientation of the economy are conducted in Moldova for a long period of time. However, in society and in government circles is growing awareness that the export development is constrained by a number of general economic issues. The main ones are as follows:

- The high level of businesses fragmentation in the agricultural sector, food processing and foreign trade;
- Low level of productivity in all areas of agri-food sector, as a consequence of the use of outdated technologies;
- Unbalanced marketing activities, expressed in excessive concentration of the agricultural and food products trade in certain directions, and the sporadic nature of this trade with other countries and regions.
- Lack of interaction in the field of technology transfer between business, academic and university centers.

Moldova's foreign trade relations with other countries are based on respect for recognized principles and norms of international law and the obligations arising from international agreements concluded by the Republic of Moldova.

The state policy in the field of foreign trade is carried out by means of customs tariff and non-tariff regulation (in particular, through quotas and licensing), the introduction of the established procedure of special duties (i.e. special, antidumping and countervailing) in the foreign trade activity in accordance with the legal framework and the international treaties signed by the Republic of Moldova. The State shall ensure compliance of installed safeguards measures, limitations and restrictions in the field of foreign trade activities to reasons behind the need for their introduction. Preference is given to those protective measures, restrictions and prohibitions that cause minimal damage to the implementation of these activities and do not contradict international norms. [10]

The Republic of Moldova does not apply export duties, however, depending on the situation on the domestic market limitations for export or import of certain goods could be introduced. Import duties on agricultural products are on average 12%, with an average duty on all imported products in 5%. Non-tariff protection methods mostly limited to product labeling in the official language [3].

Certain changes in the trade policy of the Republic of Moldova took place after the conclusion of the Association Agreement, which includes a deep and comprehensive free trade area (DCFTA) between the EU and Moldova.

The agreement involves the removal of import duties on all products imported from the Republic of Moldova to the EU. For some fruits and vegetables this liberalization would imply some quantitative restrictions (tariff quotas), established in accordance with the production and export capacity of Moldova.

In connection with the opening of the Moldovan market for the EU, the Russian Federation has taken a number of measures to protect the domestic food market. Thus, in July 2014 were raised

the tariff duties on 19 commodity groups. Along with the increase in tariffs was introduced a temporary ban on imports of certain types of fruit and vegetable and animal products [4].

These export barriers have complicated the implementation of the Agri-food Sector Modernization Program 2020.

Given the lack of financial resources it was possible to realize only a few, but quite important areas of agriculture reform. During the recent years it was improved the qualitative and quantitative parameters of tractors and agricultural machinery. For this reason various forms of state financial support are used. Training services for machine and tractor stations, as well as for the farms' mechanics are provided free of charge by relevant government and non-governmental institutions.

The strategic goal of the Government to reform the system of food products quality control is implemented successfully. In order to achieve this, the following activities are undertaken:

- Improvement of the legislation that provides greater regulatory compliance with international standards and that reflect all aspects of food production from field to table, including the production of animal feed;
- Strengthening capacities of the National Agency for Food Safety that is obliged to perform a number of key tasks for managing all aspects of the food quality from the field to table, including activities of rapid alert systems, the dialogue and communication with customers, as well as relations with national agencies and scientific organizations;
- Improvement of the control over the food products' quality which will provide a uniform procedure for the operation of the national control and inspection system through an appropriate distribution of powers and responsibilities among all government agencies involved in ensuring food safety.

The budget support of the Moldovan agriculture varies considerably from year to year, reaching a peak of about 75 million US dollars in 2009. In 2012-2013, the total budgetary expenditure on agriculture amounted to 57 mln. US dollars, of which 60% was provided in the form of producer support, while the remaining 40% as the total support for agriculture [1].

Budget support of general services to agriculture (about 23 million US dollars in 2012-2013) increases from 2005, mainly due to the increase of funds for food safety monitoring, and protection and control of pests and diseases. In 2012-2013, these allocations accounted for nearly two-thirds of the total funds for public services. A fairly stable share of budget expenditures is allocated for rural infrastructure, while the share of funds allocated for agricultural research and education fell below 10% in recent years.

Domestic support to agriculture, since 2011, includes only the measures provided by the "green box" such as:

- General services
- Stocks for Food Security
- Payments to ease the effects of natural disasters
- Support for structural changes in the agricultural sector through the partial coverage of investment in technical upgrading.

In the period under review, the overall budget and other transfers account for about 4% of the total value of agricultural production that is significantly lower than in other CIS countries. [7]

Along with this, there were serious problems in the financial sector of Moldova that pose a threat to the sustainable economic development of the country. Weaknesses in the banking sector came to the fore in late 2014 with two successive decisions of the National Bank of Moldova on introduction of special administration in the three commercial banks, representing about 30% of total banking assets.

The budget deficit that emerged in this regard has limited possibilities to continue agricultural subsidies according to the scheme developed in recent years. The need to compensate farmers affected by restrictive measures imposed by the Russian Federation on the export of

agricultural products practically exhausted financial means of the Agency for Payments and Intervention. The procedure for obtaining this support was identified in June 2015, by order of the Minister of Agriculture and Food Industry, while payments were completed in September 2015. Compensations were allocated for those products that could not be sold fresh on the domestic market, due to the lack of market capacity. Most frequently these compensations were paid for fruits and grapes re-directed for processing. The size of this support was varied from 0.04 to 0.1 US dollars per kilogram of fruit or grapes delivered for processing in the Republic of Moldova. [5]

In 2015, that is almost a year after the embargo introduction a gradual resumption of fruit and grapes exports in the Russian Federation has started, which allowed a slight revival of trade relations between these two countries.

In order to exclude extreme situations in the agri-food trade between the two countries it is appropriate to improve the exchange of information on the improvement of mechanisms of regulation of markets for agri-food products, including the smoothing of seasonal price fluctuations for agri-food products and the use of the tariff regulation mechanism for imports of goods.

It may be useful to develop a closer cooperation between research institutes and universities for the development of innovative projects in the field of sustainable use of natural resources in the region and subsequently for improvement of the country agri-food exports.

CONCLUSIONS

- There are positive trends in the development of the agri-food exports of the Republic of Moldova during the last years. However the vulnerability of this sector to natural, economic and commercial risks remains to be very high.
- The current situation in the international trade with agri-food products placed the Republic of Moldova in a difficult position. Exchange of sanctions between a number of Western countries and the Russian Federation provides multiple restrictions on the conduct of economic activities, including international trade that makes it necessary to review existing economic policies, forcing the government to urgently diversify export markets and to take measures to strengthen the economic security of the country.
- The food sector of the Republic of Moldova needs specific actions in order to stimulate development of the high value agriculture through creation of product sales centres, strengthening quality control, organizing regional wholesale markets, assisting producers to sell their products, development of market infrastructure at central level, development of the post harvest and market infrastructure.

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STRATEGIC DIRECTIONS FOR FOOD SECURITY BY BALANCING THE REPORT OF DEMAND AND SUPPLY ON GLOBAL AGRICULTURAL MARKET

PETRE IONUŢ LAURENŢIU[1]

Summary: *In this study I discussed about the results of the FAO studies, I used certain methods of forecasting supply and demand and Ia presented some solutions. Discussions on FAO results are based on population trends, both general and structured areas, urban and rural. Next I have predicted supply and demand for major food products in different geographic areas. These forecasts were established using economic-mathematical calculation methods. Thus, in terms of demand linear regression model was used predict it simple and to offer trend extrapolation method was used to forecast production and to predict import simple regression linear model. Thus the two main components of the market, supply and demand in each of the areas examined were put in antithesis and each represented by a graph for each main agro-food product. The study concludes with several recommendations with which it can establish a balance between supply and demand; recommendations such as reducing yield gaps, boosting the production and reducing losses.*

Keywords: *food security, supply and demand for agricultural products, world population, consumption and production.*

INTRODUCTION

Initiate approaching this theme, the global agricultural market was stimulated by certain features of the agricultural sector, including the fact that it can influence economic growth, but another factor that may influence the agricultural sector, this time is the change and food security trends. The theme of this study is the global agricultural market and its implications on food security.

This study will present recommendations or solutions in terms of balance between supply and demand report on food security. On the one hand, global agricultural demand continues to grow rapidly, and on the other hand, it is obvious that the supply of agricultural products worldwide is not keeping pace with increasing demand.

There are significant factors in terms of increasing global demand for agricultural products, such as:

- continuous growth of the world population,
- revenue growth in developing countries,
- rapidly growing demand for bio-energy (biofuels).

There is a general consensus that the global population will continue to grow at rapid rates; growth has been, to date, about 12% in a decade.

According F.A.O. world population in 2013 was 7.16 billion; it is projected to grow by 2050-9500000000.

Global supply of agricultural products will not keep pace with increasing demand, the main reasons being:

- climate change,
- natural resource constraints (limited availability of land and water)
- technological restrictions.

MATERIAL AND METHOD

The outlook on the demand or the supply is very important because, knowing beforehand their trends, we can prevent and mitigate problems or deficits.

To predict the trend of supply and demand will use certain methods of budgeting and forecasting, especially linear regression model simple for demand the application is the dependent

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variable, and the population will be exogenous variables; and if the offer will be used linear regression model both simple trend extrapolation and the method.

Based on data presented in studies and FAO statistics on requests from previous years and the population can schematising a linear regression model simple application is the dependent variable and the exogenous variable is the population, as follows:

y = ax+b

$\widehat{y_t} = \widehat{a} * x_t + \widehat{b} + \widehat{\mathcal{E}}$, where:

y – the dependent variable (demand)

x – independent variable (population)

$\hat{a}$, $\hat{b}$ – estimates coefficients

$\widehat{\mathcal{E}}$ – Error / residue

Through this model we calculate demand forecasts on specific geographic regions and product categories.

Supply of food products is based on two components, namely: the production and importation. So we offer analysis to predict trends and prospects of the two components.

To forecast production, importation and we use trend extrapolation method by which they will predict a period of three years:

By solving the following system will determine the coefficient function y = a + bx + cx^2 :

$$\begin{cases} na + b\sum x + c\sum x^2 = \sum y \\ a\sum x + b\sum x^2 + c\sum x^3 = \sum xy \\ a\sum x^2 + b\sum x^3 + c\sum x^4 = \sum x^2 y \end{cases}$$, where:

n – the number of terms (years),

a, b, c – coefficients of the „y”function ,

x – takes values symmetrical to 0 (center terms),

y – value of production / import.

Thus, summing up the two components of the supply, we get a projected value of the offer. These values will be present to offer each geographical region partly structured by major foodstuffs.

RESULTS AND DISCUSSIONS

After applying the above mentioned methods, but also from the calculation itself, I present the following situation to forecast the demand and supply of agicultural products:

Table no. 1 Results forecasting demand of food products across geographies

Area	Demand for cereals (thousand tons)			Demand for meat (thousand tons)		
	2015	**2016**	**2017**	**2015**	**2016**	**2017**
Africa	206,494.30	204,451.30	202,380.68	20,748.21	21,458.73	22,178.86
Asia	1,287,626.76	1,315,373.59	1,342,404.91	154,615.37	158,878.21	163,031.12
North America	458,004.51	455,777.32	453,540.18	49,394.53	49,436.92	49,479.50
South America	183,667.50	186,522.88	189,328.10	26,988.22	24,705.97	22,463.81
Europe	567,423.39	571,766.34	574,920.53	78,419.95	78,664.74	78,842.53
Oceania	52,942.83	56,106.44	59,287.66	5,582.35	5,543.70	5,504.82
Area	Demand for milk (thousand tons)			Demand for vegetables (thousand tons)		
	2015	**2016**	**2017**	**2015**	**2016**	**2017**
Africa	56,662.06	58,429.02	60,219.88	83,232.02	85,650.72	88,142.84
Asia	340,021.91	349,650.54	359,030.88	945,904.85	971,331.14	88,102.12
North America	109,077.78	110,654.16	112,237.57	46,478.99	46,040.94	45,600.94
South America	80,993.65	83,737.12	86,432.41	29,580.34	30,314.39	31,035.55

Europe	269,315.54	269,584.49	269,779.82	137,936.10	138,754.94	139,349.64
Oceania	26,528.63	26,574.50	26,620.62	3,358.68	3,327.14	3,295.43

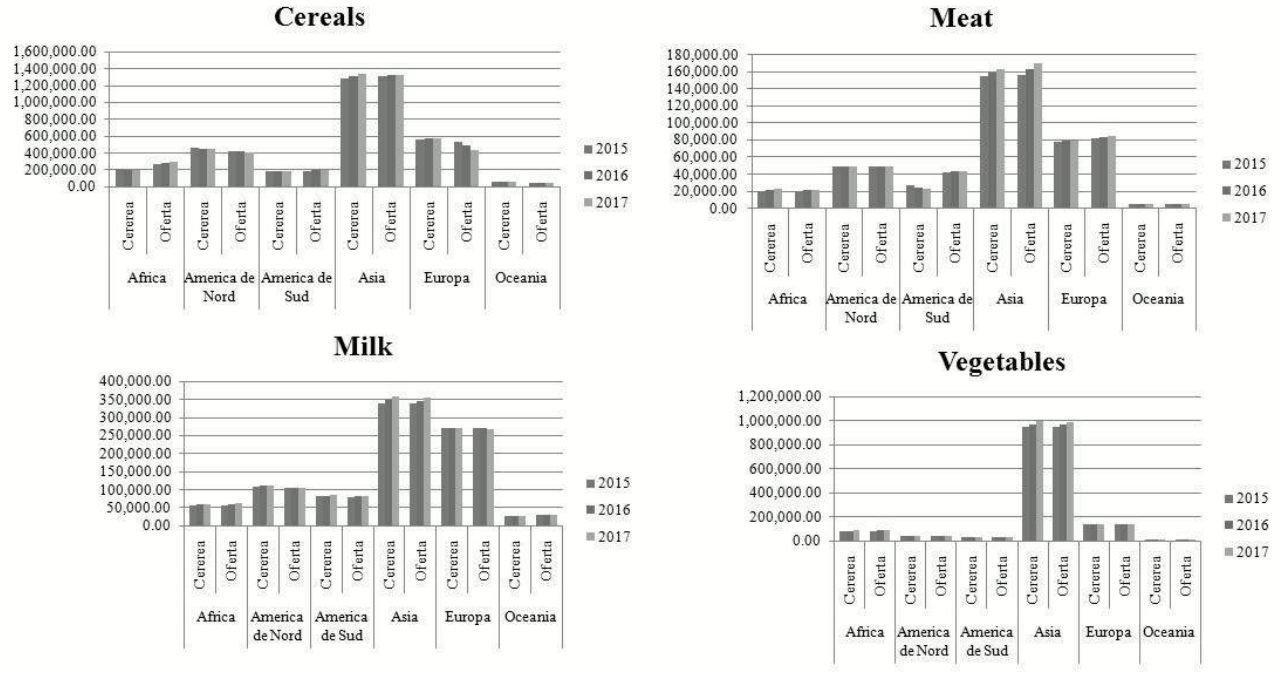
Table no. 2 Results forecasting agricultural products supply across geographies

Area	Supply for cereals (thousand tons)			Supply for meat (thousand tons)		
	2015	2016	2017	2015	2016	2017
Africa	268,467.47	282,528.91	297,988.26	20,618.82	21,348.14	22,104.43
Asia	1,311,873.65	1,324,983.31	1,332,116.44	156,633.76	162,922.48	169,684.55
North America	421,424.82	416,816.55	412,858.18	48,814.67	48,671.09	48,494.94
South America	188,360.80	192,681.26	197,397.92	42,265.14	42,798.60	43,278.42
Europe	528,881.66	490,613.55	437,571.88	81,933.97	83,141.05	84,349.48
Oceania	51,130.90	51,401.56	50,768.66	5,442.71	5,278.95	5,080.77

Area	Supply for milk (thousand tons)			Supply for vegetables (thousand tons)		
	2015	2016	2017	2015	2016	2017
Africa	56,962.71	59,502.76	62,328.96	84,023.35	87,718.61	91,852.01
Asia	338,191.93	347,013.26	355,447.73	944,705.01	968,869.37	992,153.80
North America	103,834.85	104,305.59	104,667.05	46,371.23	45,957.35	45,562.15
South America	79,247.01	81,167.08	82,854.12	29,693.45	30,564.31	31,465.51
Europe	271,119.72	270,292.95	268,932.24	140,435.85	138,953.00	136,187.27
Oceania	29,798.27	30,049.46	30,210.22	3,511.32	3,648.56	3,835.11

Indeed, having predicted the two sides of the market, ie demand and supply, we can compare them to see surpluses or deficits to agricultural products or geographic regions. The comparison between supply and demand by product category and by area, can be seen in the charts below.

Figure no. 1 Forecast of supply and demand for the main product categories



The report supply-demand for grain market will be different depending on the area. For Africa region demand for grain has a decreasing trend and offer an increasing trend, its values will be higher,

leading to a surplus of grain in the area. In North America, both components of the market downward trend, but offer value value will be below demand which will lead to a shortage of grain. In South America, demand and supply have a rising trend, but the tender amount will be higher than the demand. In Asia demand and supply will have an upward trend, but demand is growing faster than supply which will lead to a deficit in the area. In Europe demand for grain will be approximately constant, with a slight increase, but will supply about significant decrease. In Oceania cereals market demand will rise, but the supply is fairly constant, oscillating a little under demand. Thus in the near future in regions: North America, Asia, Europe and Oceania, demand will overcome the supply leading to food insecurity on cereals market.

Analyzing each region, the ratio of supply and demand in the future market of meat we notice the following: In Africa the report supply - demand will be quite balanced, both slightly increasing, the supply being very slightly lower than the demand. In North America demand for meat is greater than the supply, continuing to increase and supply will decrease. In South America supply meat market is higher than demand, with a downward trend, registering a substantial surplus. In Asia both components of the market, have an increasing trend, the supply being greater than demand. The same situation can be observed in Europe, which will lead in the near future at a surplus. In Oceania, supply and demand will show a decline, but demand remains higher than supply. Can be said that regions: South America, Asia and Europe, food safety meat market will not suffer.

On the milk market, the ratio supply - demand is quite balanced in each of the geographic regions analyzed. Thus, in Africa, supply and demand will tend upwards, and the supply will be slightly above both, the demand. In South America, will meet the same trend, but the proportions are reversed, so demand will be higher than supply. The situation in South America is the same as in the North, on the scale a little lower. In Asia demand and supply of milk are very balanced, very low difference in favor of the application, both recording increases. In Europe demand for milk will be almost constant, with a slight upward trend, and the offer will be decreasing, starting over demand in the near future recorded a balance. In Oceania supply and demand in the milk market will have an upward trend, the supply is higher than demand.

The vegetable market is a very important player represented Asia, where the ratio supply - demand is extremely high compared to other regions, thus supply and demand in this area will have an upward trend, although demand will be slightly higher than the offer during future. After Asia, Europe ranks submitting a vegetable ascending and descending offer, will be a point of equilibrium in the near future. Depending on the amount of supply and demand, we can place Africa on a three-zone, which is characterized by a ratio of supply - demand increasing, the supply being greater than demand. In North America, demand and supply for vegetables are almost steady, with a slightly decreasing trend, with very little demand is higher than supply. In South America the two components of vegetable market are quite balanced, both having an upward trend, offer being slightly higher than demand. In Oceania disputed quantities of vegetables on the market are quite small, demand will have a downward trend and supply increasing one.

CONCLUSIONS

Given the outlook for supply and demand we can say that they will maintain the same trend as in previous years, for certain products in certain areas having upward trend, for others in different parts downtrend. With forecasts we can avoid serious problems by preventing negative effects and methods repairers offer support where needed. Therefore I submit to several actions that present a negative character even any unusual recommendations:

Reducing the gap between yields

The yield gap represents the difference between realized productivity and the best that can be achieved using current technology and genetic material. The best yields that can be obtained locally depend on the ability of farmers, to access and use, among other things, seeds, water, nutrients, pest management, soil, biodiversity and knowledge.

Low yields occur because of technical restrictions that prevent local food producers to increase productivity, but also because of economic reasons arising from the market conditions. Recovery of the output gap should help boost food supply, but with uncertain impacts on the environment, and the potential feedbacks could undermine food production in the future. Food production has important negative "externalities", ie or environmental effects on the economy, that are not reflected in the cost of products. To address these negative effects is known broadly that production systems and food chain must become fully sustainable.

Reduction of losses

Approximately 30 to 40% of the food in both developed areas and in those under development are lost as waste, Although the reasons are different. In developing areas, the losses are mainly attributable to the absence of infrastructure food chain, and lack of knowledge or lack of investment in storage technologies.

In contrast, in developed areas, the losses are much lower before sale, but those arising from retail, food services and final consumption, stages of the food chain, recorded increases. Currently in this area of consumers the food are relatively cheap. Consumers have become accustomed to purchase food to the highest standards in terms of appearance; Such retailers take many edible products just because they have a small visual defect.

Of course, various strategies are required to address two types of losses. In developing countries, public investment in transport infrastructure would reduce the percentage of damage; while the better functioning of the market and the availability of capital increase the efficiency of the food chain. If food prices will rise, It is possibly the loss as waste volume to decline, in developed countries. Reducing wastage in developed countries is particularly difficult, because it is closely linked to individual behavior and cultural attitudes towards food.

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ROMANIAN AGRARIAN STRUCTURE AFTER 25 YEARS

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Abstract: *Agrarian structures are synthetic expression of evolution / devolution of agriculture. Dynamic analysis on 25 years of Romanian agriculture highlights the characteristics and future prospects in the context of the National Rural Development Plan - RDP from 2014 to 2020 and the EU's Common Agricultural Policy*

Keywords: *Agricultural economics; farm size; strategy; rural development programs.*

INTRODUCTION

The development of agriculture in its historical evolution was conditioned by agrarian structures by size of holdings and farms and degree of equipment and intensification of agricultural production. In fact, the agrarian reforms carried out in modern and contemporary within 150 years - every quarter of a century - found no way of resolving the rational of sustainable structures, considering that ownership is a natural right, so all everyone has the right to own property, becoming decisive principle of utility and social function of land by subsistence farmers.

MATERIAL AND METHODS

Last agrarian reform carried out after the events of December 1989 with the restoration and establishment of ownership for the transition to a market economy, destroyed the economic agrarian structures made by that date. It was taken as cycle phenomenon Romanian land - land reform every quarter of a century - because today, EU to recommend the association and cooperation to achieve economic viability, as we had and we have destroyed, and now, of all holdings of the 27 EU Member States, i.e. 12 229 thousand farms, Romania holds 3,856 thousand, about 31%[4].

Synthetic, agrarian structures until 1990 were defined by: 3776 agricultural production cooperatives, 411 state farms, 600 economic associations and 114 production units and research, territory merged profiled and organized under 24,000 farms, 776 farms and complex for dairy cows and cattle for fattening, 98 complexes and farms and pig farms, 138 farms and poultry complexes, 676 silos and base reception 66 mixed fodder factory, 740 units of service and so on

RESULTS AND DISCUSSIONS

The average size of farms Romanian (3.4 ha) is more than 4 times lower than the European (14.3 ha) and the degree of fragmentation is very high holding on average 4.5 parcels. A big gap to the EU 27 there where the economic dimension is 9.4 times lower (2700.2 Euro) standard production in Romania to the EU 27 (25 450 euro).

According to GAC in 2010 compared to 2002 national structural changes were not significant. The small farms under 5 ha represent 92% of all farms and 29.7% of UAA used. Farms over 50 hectares far fewer in number (about 21,000) manages 52% of OR.

In principle, a normal evolution of any mode of production or historical periods correspond one agrarian structure, economic organization, legal and territorial, as the agricultural production process is a process of adaptation and transformation of nature according to the degree of technical

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[4] According to data published by the European Union, http://ec.europa.eu/eurostat/web/agriculture

development, economic and social achieved by the company. This agrarian structure in a normal evolution corresponds to effortlessly slow generations that have distributed, arranged and organized territorially, certainly not from the beginning, based on a plan engineer, but an effort directed constantly toward the same end, conditional the same requirements by probing and continual adjustments, repeated failures to harmonize long and successful use of land resources required by the company to rational and harmonious development of rural areas.

The diversity of agrarian structures was due partially the socio-historical and natural-economic conditions in all European countries. It remains a feature essential to Western countries, continuity of development, consolidation, endowment and capital accumulation of family farms and cooperatives supply and delivery of production - compared to Eastern where continuous repetition of the agrarian reforms had implications the sustainability of family and cooperative agricultural structures.

The problem is most obvious in Romania, now, after the 7th agrarian reform (Law 18/1991 Land Law and related legislation)[5] when instead of massive land compact, merged with land tenure optimally positioned and sized - based on the suitability of land for different uses and suitability of land for different crops - farms, and farms profiled rationally organized, everything was sprayed about 47 million plots, resuming so the process began over 150 years of creating subsistence farming, following as far as selecting elites in terms of free movement of the Earth and the market economy, to make family farms viable medium-sized and large as it exists in western Europe as a result of a continuous process of developing and strengthening them.

Romania stressed that there was "tradition" that every agrarian reform made to destroy the accumulations as happened to the agrarian reform of 1945, which destroyed farms medium and large accumulations, for agrarian reform cooperatives (1949-1962) who destroyed accumulations farms and agrarian reform of 1991 destroyed accumulations made in the agricultural cooperatives, agribusinesses state of the facilities, irrigation systems, drainage and soil erosion, as well as the organizational structures of existing farms and holdings land sandwiched profiled appointed and equipped optimally located and organized.

This evolution / devolution for 25 years certify that the measures taken in agriculture after the events of 1989, namely agricultural policy - if any - was a failure.

Thus, by applying the Land Law no. 18/1991 and related legislation we achieved an agrarian structure polarized - on the one hand with the small property owners, on the other hand large farms resulting combination, leasing or sale of agricultural land. And some others were considered for unitary evidence that farms and agricultural holdings and that a unified framework for the implementation of programs financed from the national budget and EU funds. It may consider both farm and the farm as a production system combining the various factors of production - land, capital, labor - perform the various products for own consumption and for sale, to achieve a higher profit[6].

Quick enunciation shows that the use of inputs and modern technologies smallholders who have less capital and credit to purchase inputs (tractors, fertilizers, pesticides, etc.) are not able to adopt modern technologies so that the size of cultivated land Association remains the key strategy for increasing food production and agriculture. This is because we need to understand definitively

[5] Law no. 18/1991 of 19 February 1991 Land Law, MO p. I, nr. 37 of 20 February 1991; Law no. 189 on amendment of the land law, MO Part I of 4 November 1997; Law no. 1/200 for restoring ownership of agricultural land and forestry, MO p. I, of 12 January 2000; Law No. 247/2005 on property and justice reform, MO p. I, nr. 653 of 22 July 2005.

[6] The farm is a technical and economic unit independent, with a single management and which undertakes agricultural activities through the use of land and / or livestock or activities to maintaining agricultural land in good agricultural and environmental or Activity Main or as a secondary activity (Statistical Yearbook 2013). Agricultural farm is the economic unit of basic agricultural production consists of agricultural land and / or premises in which the buildings, storage areas, machinery and agricultural equipment, other outbuildings, livestock and poultry and related utilities that help to conduct agricultural activities (Law 37/11 March 2015 concerning the classification of farms and agricultural holdings, MO p. I, nr. 172 / 12.03.20015, art. I, endearment. 2 pt. a)
Farms and farms may have one or more owners and may be privately or association and the legal form is in line with the provisions of the legislation (Ibid art. 2 (1)).
In line with this, the farmer means a natural or legal person or an associative natural or legal persons, regardless of its legal status, whose holding is situated in Romania and who exercises an agricultural activity (GEO no. 3/2015)

that the restoration and establishment of ownership does not mean a return to traditional cultural backwardness mode[78].

Although agricultural household is not synonymous with holding, holds the overwhelming amount of land, livestock and other production capacities, it is considered to be outdated agrarian romanticism both understatement and her ability to help revive agriculture. But it is essential that they can act as agents of socio-economic to maintain settlements, stimulate socio-economic dynamics of rural communities and develop rural areas. Advocates for family farms and refutation of theses believed that technological innovations would be possible only in large farms is undermined by statistics showing that the family farm is the dominant form of organization in the US and other developed countries; that family farms in these countries continue to retain the family character have increased in size as the introduction of technological progress continues to retain the family character in most[9].

One caveat is necessary: agricultural household is the economic unit of production and consumption of goods in relation to the requirements of the family, while the farm is a production technical and economic enhancement of the earth and may be owned land, the land rented or in custody (location) for the output in terms of economy. The farm can be considered as a production system combining the various factors of production - land, capital, labor - is done in order to sell different products to achieve a higher profit and for own consumption.

The farm as a unit of statistical observation is defined in the Regulation of the European Parliament and of the Council as a single unit, both technically and economically, with a structure and unified management involved in agricultural activities, either as principal activity or as a secondary activity. The farm is self productive in producing agricultural products or activities to maintaining agricultural land in good environmental conditions.

It is essential that the achievement of high competitiveness and diversification of agricultural and food products were and remain basic conditions for maintaining national agriculture as the main supplier of products for the population and for export availabilities.

The lack of a strategy and an agricultural policy based on the functions of the market for substantial funding continues to be competitive has made interventions to be disparate without analyzing the consequences of future measures applied, starting with accelerated privatization and concession, which led destruction accruals made in half a century and labor migration.

The situation persists even now, 25 years after the events of December 1989. The solution adopted in accordance with the common agricultural policy by the RDP 2014-2020 to subsidize and promote investments in agricultural production concentration in medium and large farms is not the best solution in the current stage the conditions of agrarian structures in Romania. System subsidies to households medium and large - as applied in Germany and Italy, under the terms of the plan Mansholt and the common agricultural policy was possible given that the surplus workforce have secured jobs development other branches of the economy, which is inconsistent with the situation in Romania, where deindustrialization led to the destruction of social and migration balance in other countries.

And something more, it is confirmed that market policies alone cannot solve the multifunctional development of agriculture, social issues and regional disparity in the countryside.

Or, is specific to the territory of Romania 2/3 in hill and mountain areas, where most villages and communes so that the solution is a differentiated policy area, having forefront social condition of the population in these areas, depopulation interruption or destruction of villages, the cradle of Romanian history and civilization. So do not ignore potential farms, but to create conditions for fuller exploitation of natural resources, materials, labor and tradition we have.

Their lack of support actually owes the extension of land sales by foreign persons[10]. The

[7] I. Bold, Agriculture Magazine where ?, "Economic Tribune" no. 18, 22 and 23, Bucharest 1991
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solution generally adopted concentration of land and livestock is not alone. This can be achieved by concentrating production cooperative, which provide storage, processing and trading of benefit to all farmers. And we have confirmation in agricultural areas in the lowlands, where he achieved great concentration and specialization in farms, but where are the poorest villages and inhabitants.

Analysis of agricultural structures in the past 25 years attest that the succession laws in the name of privatization have made the statistics continue to mark mainly diminishing agricultural land and agricultural production achieved. Data after 2000 are illustrative only on agricultural structures in the background of a variety of agricultural producers[11] and a territorial continue inactivity disorders cadastre and agricultural territory organization[12].

Thus, it appears that in the period 1990-2014 (Table. 1) farming land decreased by 157 100 ha, with 61,100 ha arable land, with 67 100 ha vineyards and orchards with 116 900 ha.

Table 1

The evolution of land during 1990-2013

Use category		1990	1995	2000	2002	2005	2007	2010	2013
Total	thousand ha	**23839.1**	23839.1	23839.1	23839.1	23839.1	23839.1	23839.1	23839.1
	%	**100**	100	100	100	100	100	100	100
Agricola	thousand ha	**14769**	14797.2	14856.8	14836.6	14741.2	14709.3	14634.4	14611.9
	%	**100**	100.2	100.6	100.5	99.8	99.6	99.1	98.9
Arable	thousand ha	**9450.4**	9337.1	9381.1	9398.5	9420.2	9423.3	9404	9389.3
	%	**100**	98.8	99.3	99.5	99.7	99.7	99.5	99.4
Pastures	thousand ha	**3262.5**	3392.4	3441.7	3423.9	3364	3330	3288.7	3274
	%	**100**	104.0	105.5	104.9	103.1	102.1	100.8	100.4
Finesse	thousand ha	**1465.4**	1497.6	1507.2	1513.6	1514.6	1531.5	1529.6	1541.9
	%	**100**	102.2	102.9	103.3	103.4	104.5	104.4	105.2
Vineyards and vine nurseries	thousand ha	**277.4**	292.4	272.3	259.6	224.1	218	213.6	210.3
	%	**100**	105.4	98.2	93.6	80.8	78.6	77.0	75.8
Orchards and nurseries	thousand ha	**313.4**	277.6	254.6	240.9	218.2	206.6	198.6	196.5
	%	**100**	88.6	81.2	76.9	69.6	65.9	63.4	62.7
Total non-agricultural land	thousand ha	-	-	8982.2	9002.5	9097.9	9129.8	9204.6	9227.2
	%			**100**	100.2	101.3	101.6	102.5	102.7
Forest and other forest vegetation	thousand ha	**6685.4**	6680.2	6457.3	6663.1	6742.8	6740.9	6758.1	6742.1
	%	**100**	99.9	96.6	99.7	100.9	100.8	101.1	100.8

[11] General Agricultural Census was conducted in 2002 and 2010 and structural surveys in 2005 and 2007

[12] Farmers in Romania:

- Households, private farms, family, according to Law. 18/1991;
- Companies, according to Law. 31/1990, republished, as amended;
- Agricultural companies and other forms of association in agriculture, according to Law. 36/1991;
- Limited Liability Companies (LLC), established under Law no. 3/1990
- Agricultural holdings rented according to Law. 161/1994;
- Associations Government Decree no. 26/2000 on associations and foundations, approved with amendments by Legea246 / 2005
- The concession of commercial agricultural companies, according to Law. 268/2001
- Institutes and research stations, according to Law 45/2008
- Agricultural cooperatives, agricultural cooperatives under Law no. 566/2004
- Individual and family enterprises, established under the Emergency Ordinance no. 44/16 April 2008
- Municipalities, county councils and communal;
- Micro Small and Medium recommendation EC 361/2003
- Holdings of people in other countries under Law 17/2014.

Use category		1990	1995	2000	2002	2005	2007	2010	2013
Busy waters, pools	thousand ha	**903.6**	889.8	867.8	851.7	841.4	849.9	833.9	836
	%	**100**	98.5	96.0	94.3	93.1	94.1	92.3	92.5
Dealing with construction	thousand ha	**622.3**	627.2	632.9	635.9	657.1	685.7	728.3	758.3
	%	**100**	100.8	101.7	102.2	105.6	110.2	117.0	121.9
Roads and railways	thousand ha	**388.9**	396.2	388.1	390	391.1	390.1	388.9	389.9
	%	**100**	101.9	99.8	100.3	100.6	100.3	100.0	100.3
Degraded and unproductive lands	thousand ha	-	-	636.1	461.8	465.5	463.2	495.4	500.9
	%			**100**	72.6	73.2	72.8	77.9	78.7
Other areas	thousand ha	**1481.1**	1471.9	-	-	-	-	-	-
	%	**100**	99.4						

By applying land laws has been a sharp differentiation of the two categories of agricultural holdings by legal status, i.e. with or without legal personality, and within these categories (Table no. 2) which creates a true picture of current situation Romanian agriculture, in which 50% of agricultural land and 98% of holdings is owned by small subsistence and semi-subsistence households and 50% of agricultural land is owned by large farms. This makes the average total agricultural production and not at agriculture in other countries. For, while large farms equipped in the art world, with land merged, apply modern technologies recommended by scientific research achieving competitive production, small farmers barely manage to earn a living with output. This condition is favored even subsidies are per surface all producers having different effects: while large manufacturer completes its capital or endowment, small farmers barely manage to survive (help coming from a family member who worked in other sectors and social support). This is because in the absence of a strategy for agricultural development is not operational area the potential of the natural and human resources available.

Table 2

Agricultural holdings using agricultural areas and / or keeping animals after their legal status

Legal status of farms	Total holdings					With farmland and livestock				
	2002	**2005**	**2007**	**2010**	**2013**	**2002**	**2005**	**2007**	**2010**	**2013**
Individual farm	**4462221**	**4237889**	**3913651**	**3823130**	3587724	**3396310**	**3315797**	**3252011**	2696502	2649136
Units with legal personality	**22672**	**18,263**	**17699**	**30,698**	27.880	**3596**	**2532**	**2231**	2526	2056
Companies / agricultural associations	2261	1630	1475	1381	1343	333	212	185	138	114
Trading companies	6138	4824	5174	16500	14.531	1416	955	908	1436	1123
Government units	5698	4818	4177	3263	3283	944	589	376	232	182
Cooperative units	87	108	71	68	66	7	12	10	4	4
Other	8488	6883	6829	9436	8571	896	764	752	692	614
TOTAL	**4484893**	**4256152**	**3931350**	**3859043**	**3629656**	**3399906**	**3318329**	**3254242**	**2702395**	**2662140**

Source: NIS, MARD

As regards agricultural structures (Tables no. 3, 4) show a stabilization of their recent years of keeping a large number of farms with an average size less than European countries[13]With

[13] The average area of farms in European countries: Austria - 24 ha; Belgium -30 ha; Denmark - 60 ha; Finland - 45 ha; France - 52 ha; Germany - 56.6 ha; Greece - 5.6 ha; Ireland - 34 ha; Italy - 6.5 ha; Luxembourg - 58 ha; Netherlands - 30 ha; Portugal - 18 ha; England - 84 ha; Spain - 27.2 ha; Cyprus - 3.5 ha; Swedish - 56 ha; Czech Republic 165 ha; Estonia - 40 ha; Latvia - 16.5 ha; Lithuania - 12 hectares; Poland - 16.2 ha; Slovakia - 120 ha; Slovenia - 20 ha; Hungary - 29 ha; Bulgaria - 24 ha; Romania - 3.6 ha.

holdings of less than 10 hectares being only 6.5 ha Italy, Greece and Cyprus with 5.6 ha to 3.5 ha.

Nothing more significant than this state of affairs continue decreasing livestock compared to 1990 which is the third bovine, porcine 1/2 what justifies the massive imports of food products. This certifies that it is a reality for 25 years and marked the entry into the EU, "you should not we do have problems with agriculture since the EU has surplus production and we are a good outlet." The consequence is direct - the living standard of rural population in Romania to Western countries, and continuing depopulation and degradation of villages, although 29% of the workforce is in agriculture and in the EU the total amounts to 4.5%.

Table 3

Agricultural holdings using agricultural areas and keeping animals after their legal status

Legal status of farms	**Only the agricultural areas in which:**					**Only livestock**				
	2002	**2005**	**2007**	**2010**	**2013**	**2002**	**2005**	**2007**	**2010**	**2013**
Individual farm	**881 005**	**787 607**	**582 396**	992 602	873 408	**184 906**	**134 485**	**79244**	133 965	65,147
Units with legal personality	**18450**	**15311**	**15152**	27,702	25,394	**626**	**420**	**316**	445	408
Companies / agricultural associations	1891	1402	1276	1232	1208	37	16	14	11	20
Trading companies	4290	3608	4039	14.649	13052	432	261	200	390	335
Government units	4674	4161	3759	3024	3093	80	68	42	7	8
Cooperative units	70	77	60	63	62	10	19	1	1	0
Other	7525	6063	6018	8708	7913	67	56	59	36	44
TOTAL	**899 455**	**802 918**	**597 548**	**1021937**	**901 625**	**185 532**	**134 905**	**79,560**	**134 625**	**65,836**

Table 4

Agricultural holdings and utilized agricultural area, where their legal status

Legal status of farms	**Number of farms**					**Number of holdings using agricultural area**					**The utilized agricultural area (hectares)**				
	2002	**2005**	**2007**	**2010**	**2013**	**2002**	**2005**	**2007**	**2010**	**2013**	**2002**	**2005**	**2007**	**2010**	**2013**
Individual farm	4462.2	4237.9	3913.7	3827.3	3601.8	4277.3	4103.4	3834.1	3694.1	3536.3	770,875.8	9102.0	8966.3	7449.6	7271.0
Units with legal personality:	22.7	18.3	17.7	30.7	27.9	22.0	17.8	17.4	30.2	27.5	622,195.2	4804.7	4786.7	5856.5	5784.8
Companies / agricultural associations	2. 3	1.6	1.5	1.4	1.3	2.2	1.6	1.5	1.4	1.3	97556.4	742.1	615.9	550.9	479.7
Trading companies	6.1	4.8	5.1	16.5	14.5	5.7	4.6	4.9	16.1	14.2	216,879.2	1780.8	1951.1	3171.1	330.7
Government units	5.7	4.8	4.2	3.3	3.3	5.6	4.8	4.1	3.3	3.3	286,736.8	2124.7	1872.2	1655.6	1641.0
Cooperative units	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	236.5	3.2	15.1	8.2	9.4
Other	8.5	6.9	6.8	9.4	8.6	8.4	6.8	6.8	9.4	8.5	20786.3	153.8	332.4	457.0	323.7
TOTAL	4484.9	4256.2	3931.4	3859.0	3629.7	4299.4	4121.2	3851.8	3724.3	3563.8	13930.7	13906.7	13753.0	13306.1	13055.8

In this context appears increasingly cooperative association and the idea that the future of Romanian agriculture, but with the direct involvement of the state to exploit more fully the potential of small farmers. Although many years have been about the measures taken have been modest disparate without end. We cannot recall so far granted EUR 5,000 for the purchase of tanks milk collection and cooling without ensuring conditions of location, collection and transport of milk. Akin is also provided in the idea of favoring the concentration of production, subsidizing farm cows and sheep heads 10 of 150 heads (when normal was subsidizing the ends 10-50), not to subsidize

households 1 -3 cows that do not require additional investments in equipment, provides significant milk production provided they are collected and sold.

In this respect, it is mobilizing program for gardening and that of achieving continuous production in a system of greenhouses and solariums, but on the condition that storage for delivery pace and that the dissolution of direct markets symbolic fees or no fees markets booklets.

The materialization of funds received from the EU remains a restriction for small farmers lack capital financing respectively. Hence the need to develop cooperative providing loans with interest rates of 3-5% and a maximum of years thanks to the exemption from taxes.

In this sense, there would be less effective reactivation of consumer cooperatives that provide for the collection and trading directly contributing to the revival of the village and welfare of residents.

We underline that family farms and economic dimensions and multifunctional (agri-tourism) is a solution, but it is lost when taking holdings medium in size when the land law did not limit the size of holdings by sale / purchase and lease of former IAS He preferred to assign a single farmer. The great mass of farmers owners only solution remains cooperative.

These are general measures, but essentially remains an agrarian policy differentiated zonal and given and social role of agriculture and rural areas that hold 45% of the population and over 90% of the territory, representing an economic zone and paramount social both because of the size and because of significant human and natural resources. Due to the low diversification of the rural economy, development is conditional upon the agrarian economy, the structure and viability of agricultural holdings and indivisible relationship triple economic, social and territorial integrated plans and urban landscaping.

CONCLUSIONS

Given the current embodiment of the RDP 2014-2020 and other agricultural development programs with substantial investment provisions, two issues remain train at the Ministry of Agriculture and Rural Development with direct implications in the progress of Romanian agriculture:

- The lack of an Institute for Studies and Agricultural (MARD is the only ministry that has abolished the design after 1989) which had direct implications failure of agrarian structure economic viable by applying land laws and dispersing funds for productive investments without prospective studies and comprehensive documentation of all processes and phenomena that accompany the act of investment in an overview, rational and scientific to achieve competitive production. The re-establishment of an Institute for Studies and Agricultural ensuring realization of agricultural structures Economic through amalgamations of land (removing fragmentation, fragmentation, borders irrational) placement of different uses in massive land compact based on suitability and suitability for different cultures within some farms and farms optimally positioned and sized to land properly organized natural conditions - relief, soil, hydrographic, climate - in accordance with the techniques of decorating - hydro, bio, agro - culture systems - crop rotation, crop into strips, grass strips, Agrotera , improving biological conditions in soil (fining fertilization) organization differentiated each uses units of sizes and shapes best (sole, land parcel, parcels, roads), ensuring the rational use and conservation of natural resources endowment and technical equipment and ending with coordinated investment location and construction projects at the level of modern equipment and technology, to create the framework for agricultural development.
- Lack triple and indivisible relationship cadastre in technical, economic, legal and permanent for systematic knowledge of the land or surface use category and holders (owners). The recent National Programme for Cadastre and Land Registry - 2015-2023[14] creates only the illusion of solving problems, and that, because in 20 years (up to February 28, 2015) were performed in 5

[14] Ministry of Regional Development and Public Administration, the National Cadastre and Land Registry 2015-2023, HG 294/29 April 2015, Official Gazette no. 309/6 May 2015

counties and 7 works in common. This program does not take into account the prospect that the 2018 Land subsidies from EU funds to be replaced with financing firm (but provided entry in the Land Register). The provisions of the program, the realization of the cadastre by 2020 to 800 communes and 2023 to 2337 are common only as "realistic" as the provisions of the White Paper and Cadastre Sustainable Development Strategy of Romania - Horizons 2013 2020-2030, which provided for completion 2030[15].

I do not believe - based on achievements for 20 years - as a feasible program adopted as long as Agency of Cadastre and Land's "state within a state" changes regularly lead eventually moved to another ministry and cadastral works not execute. Something more, emphasize that an effective activity of land became the main occupation of the office and not the execution of cadastral works as it once was (history attests White Paper Cadastre and the Strategy for Sustainable Development of Romania - Horizons 2013 -2020) even if now 4.95 billion lei are assured that it sees for the work in time for the progress of Romanian agriculture.

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THE FUTURE OF THE ROMANIAN RURAL HOUSEHOLD FROM THE PERSPECTIVE OF AGRICULTURAL CENSUSES

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Abstract: *The development of agriculture in nowadays circumstances cannot be merely assessed from the perspective of agriculture as a main branch of national economy, but further from a social point of view which is highly significant as it represents the traditional small farm households which provide the basic necessaries for the rural population as well as the usability implication of over 55% from the agricultural area of the country. On the whole, by agricultural exploitation there is the general tendency of considering its commercial aspect only, perfectly justifiable in the case of agricultural exploitations with a legal, juridical character, but there is also to be regarded the social aspect of agricultural exploitation without a juridical status, which is largely representative for the small farm households. In the period of time between the 2 General Censuses (2002 and 2010) the agricultural exploitations without a legal, juridical status diminshed by 13.6%, while the agricultural area used diminshed by 3.3% only, leaving over 7.5 million agricultural area as responsability for these exploitations.*

Key words: *rural/ small farm household, agricultural exploitation without a legal/ juridical status, the size of the agricultural exploitation, the agricultural area used*

INTRODUCTION

The reconfiguration of the Romanian rural space after December 1989 has engaged all the aspects of the economic and social life based on profound changes in the juridical system, both technically and actively. As a natural consequence of it, in the past quarter century the vernacular village has been significally transformed into a new world still clinging to many unresolved issues from the past.

The structures of land ownership and agricultural exploitation have changed significantly, the land market has crystalised, the commercial flows of agri-food products have been set, the Romanian rural institutional system has also changed consistently and the private business background was reborn and has been developing extensively in the past quarter century. There are constituent elements specific to a democratic society based on a free economy determined by a market economy.

Although the premises of a high-performance agriculture have been created (such as one determined by competition and profitability) and the Romanian village has undergone great changes in terms of updating the basic infrastructures and registering a spectacular rise of new private houses or restoration of the old ones, on the whole, the agriculture has been left behind, at the parameters of extensive development with medium or low productivity rates on hectare or animal, of low efficiency, having an overall character of subsistence farming, aggravated by the highly-progressive aging of the rural population, the lack of diversification of the non-agricultural activities, the scarcity of clear policies and strategies for a a general and long-lasting/ medium-lasting development of the Romanian rural environment.

Under the circumstances, the traditional rural household has regained its lands, but has an aged workpower, lackinging in mechanized tools of farming, having insufficient funds or asssitance from government and a market poorly adjusted to their aspirations. It is the Cinderella of the Romanian agriculture, in spite of the fact that according to the General Agricultural Census of 2010 99.2% of the total of the agricultural holdings in Romania, meaning 52.9% of the total agricultural area of the country. The future development of agriculture in Romania cannot ignore the distinctiveness of the traditional rural household which, if modernized, supported and interested in a business environment close to its characteristics, may very well represent the binomial of the

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commercial agriculture and subsitence farming based on the rebalancing of the relation between the agricultural exploitations having a legal, juridical status and those without it, which cannot represent competition, but may be complementary.

MATERIALS AND METHODS

The research is based on the statistics data provided by the General Agricultural Censuses of 2002 and 2010 in Romania. Data at national level have been selectively undertaken from the first section of the censuses regarding the agricultural exploitation and using what some indicatives define as their number, the total and used agricultural area, the legal status of the holdings, groups on classes determined by the size of the lands and the ownership type of the agricultural lands. The main method employed here is that of of comparative analysis of the two data sources, considering the relative and absolute deviations in relation to the reference year 2010. The results express the courses which can be employed in projecting the future of the rural household in Romania in the near or further future.

RESULTS AND DISCUSSIONS

The study on the evolution of the agricultural holdings in Romania in view of the two general agricultural censuses (2002 and 2010) highlights several significant mutations (table 1) of which we would like to mention the following:

- the total number of the agricultural holdings has dropped to 14.3%, circumstances where the agricultural holdings without a legal status have gone down to 15.5%, while the number of the agricultural holdings having a juridical status has increased by 34.8%;
- the overwhelming weight is represented by the agricultural holdings without a juridical status which have decreased by 0.3% only from 99.5% to 99.2%, while the dominance of the agricultural holdings with a juridical status has incresed from 0.5% to 0.8% out of the total of agricultural holdings;
- considering the total of the agricultural area, the holdings without a juridical status covered 52.9% from the total agricultural area in Romania in 2010, having a decline of 0.9% compared to 2002, while the agricultural holdings with a juridical status increased by 0.9%, summing up 47.1% in 2010;
- the agricultural area used on the total of holdings increased, at a national level, from 1,777.3 thousand hectares in 2002 to 2,388.9 thousand hectares in 2010; the area used by the agricultural holdings without a juridical status increased from 745.8 thousand ha to 857.8 thousand ha, while those having a juridical status increased from 1,031.5 thousand ha to 1,531.1 thousand ha.

From the first batch of indicatives we could determine the following tendencies:

- there is a tendency of decline in the number of agricultural holdings without a juridical status having an annual medium rate of 1.94%, while the agricultural holdings with a juridical status are increasing by 4.35% annually (the medium rate of growth);
- regarding the matter of the total agricultural area and agricultural area used, the changes have no significant relevance. Nevertheless, there has been noted an expansion of the agricultural area unutilized;
- together, the two tendencies depict the increase of the total agricultural area on exploitation from 3.50 ha to 4.08 ha having differentiations between the agricultural holdings without a juridical status with rises from 1.89 to 2.18 ha and those with a juridical status, having a tendency to decline from 319.54 ha to 241.42 ha (medium area).

The agricultural holdings without a juridical status represent the axis of the Romanian rural society because they partially overlap with rural population households. Therefore, in 2010, following the General Agricultural Census there were 3,814.6 thousand agricultural holdings without juridical status, while the 2011 Census of Population and Dwellings in Romania registered 3,262.4 households of the population, with or without children, which summed up 9,232.2

inhabitants, on average 2,830 inhabitants for 1,000 households of the population, or a total population of 2,420 for 1,000 agricultural holdings without a juridical status.

Table 1: The evolution of the proportion between the agricultural holdings without a juridical status and those with a juridical status (2002 - 2010)

Specifications	GAC		Structure (%)		Changes (%) 2002/2010
	2002	2010	2002	2010	
Total of agricultural exploitations (thousands):	4,484.9	3,845.2	100.0	100.0	85.7
- *without juridical status*	4,462.2	3,814.6	99.5	99.2	85.5
- *with juridical status*	22.7	30.6	0.5	0.8	134.8
Total Area (thousand, ha):	15,708.0	15,695.0	100.0	100.0	99.9
- *without juridical status*	8,454.5	8,307.4	53.8	52.9	98.3
- *with juridical status*	7,253.5	7,387.6	46.2	47.1	101.8
Agricultural Area utilized (thousands ha):	13,930.7	13,306.1	100.0	100.0	95.5
- *without juridical status*	7,708.7	7,449.6	55.3	56.0	96.7
- *with juridical status*	6,222.0	5,856.5	44.7	44.0	94.1
Average Agricultural Area (ha)					
Total Area, total of holdings:	3.50	4.08	-	-	116.6
- *without juridical status*	1.89	2.18	-	-	115.3
- *with juridical status*	319.54	241.42	-	-	75.6
Agricultural Area utilized, total of holdings:	3.11	3.46	-	-	111.3
- *without juridical status*					
- *with juridical status*	1.73	1.95	-	-	112.7
	274.10	191.39	-	-	69.8

Source: our calculi based on the data provided by the two General Agricultural Censuses from 2002 and 2010

Thus we have found out that the exceptional social dimension of the agricultural exploitation without juridical status is mainly responsabile for the maintenance of rural households and rural population in the Romanian rural environment.

The high degree of fragmentation of the agricultural holdings without juridical status as index of a dissolving land ownership, constantly under the pressure of fragmentation due to succession debates or associations, as well as the high rate of the subsistence farming (under 2 ha) – 69.81% going up to 71.26%, from 2002 to 2010, in relation to the opposite process of decline in the total agricultural area utilized from 24.15% to 21.25% shows an unfortunate poverty rise of approximately 6.5 million inhabitants in the rural area.

There are multiple tendencies regarding the evolution of the agricultural holdings` structures without juridical status, taking into account the size categories of the total agricultural area (table 2).

There is a slight increase of the holdings area under 0.5 ha by 7.2% in 8 years, a clear decrease of the areas under 2 ha by 13.5% and between 2 and 10 ha by 19.5%, while the holdings between 10 and 50 ha increase, as area, by 42.0% and those over 50 ha increase by 107.1%. Thus we can fairly assess the following tendencies:

- consolitation of the subsistence farming under 0.5 ha;
- decrease of the interest in agriculture within the segment 0.5 – 10 ha;
- high increase of the interest in agriculture in the case of agricultural holdings without juridical status and over 20 ha; these categories have enlarged the total agricultural area by 977 thousand ha between 2002 and 2010.

It is quite interesting the change of opinion about the consolidation of the agricultural exploitation without juridical status during 2002 – 2010, according to the ownership type of the agricultural areas utilized (Addendum 1).

Therefore it turns out that agricultural area utilized and owned declines from 78.53% to 40.13%, while the area on lease increses from 1.08% to 45.25%. These few figures show the tendency of passing the agricultural area from the owner (small farm household) to the user (agricultural exploitation without a juridical status) by leasing or, rarely, by concession or other ownership legal forms regarding the agricultural area utilized. The most significant changes appear

in the cases of leasing for the agricultural holdings between 10 and 50 ha, where the increse is of 22.68%, but mostly in the category over 50 ha, where the increase is of 35.10%. At the same time there are also major changes in the case of ponderence of the utilized agricultural area owned: the increases are of 0.15% for the category under 2 ha and of 23.46% for the category above 50 ha and decreases of 0.57% for the category 2 – 10 ha and of 5.27% for the category 10 – 50 ha.

Table 2. The Evolution of the agricultural holdings without a juridical status and the total agricultural area structurized on size categories of the total area

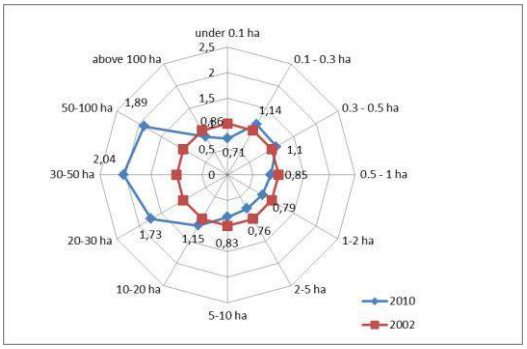
Size category	No. holdings		Structure		Area		Structure		Change of area (%) 2010/2002
	thousands		%		thousands ha		%		
	2002	2010	2002	2010	2002	2010	2002	2010	
under 0,5 ha	1,502.2	1,363.7	33.67	35.75	269.2	288.5	3.18	3.47	107.2
0,5 – 1 ha	716.4	630.7	16.06	16.53	500.3	442.9	5.92	5.33	88.5
1 – 2 ha	896.3	723.9	20.09	18.98	1,272.4	1,034.1	15.05	12.45	81.3
Total under 2 ha	*3,115.0*	*2,718.3*	*69.81*	*71.26*	*2,041.9*	*1,765.5*	*24.15*	*21.25*	*86.5*
2 – 5 ha	1,025.1	795.3	22.97	20.85	3,159.8	2,463.1	37.37	29.65	78.0
5 – 10 ha	260.4	219.9	5.84	5.76	1,719.4	1,466.8	20.34	17.66	85.3
Total 2-10 ha	*1,285.4*	*1,015.2*	*28.81*	*26.61*	*4,879.2*	*3,929.9*	*57.71*	*47.31*	*80.5*
10 – 20 ha	47.3	53.1	1.06	1.39	592.2	693.9	7.00	8.35	117.2
20 – 30 ha	5.8	10.1	0.13	0.27	136.7	242.3	1.62	2.92	177.3
30 – 50 ha	3.6	7.6	0.08	0.20	136.2	292.0	1.61	3.51	214.4
Total 10-50 ha	*56.7*	*70.8*	*1.27*	*1.86*	*865.1*	*1,228.2*	*10.23*	*14.78*	*142.0*
50 – 100 ha	2.9	5.9	0.06	0.16	187.6	404.4	2.22	4.87	215.5
Over 100 ha	2.3	4.4	0.05	0.12	480.6	979.5	5.68	11.79	203.8
Total over 50 ha	*5.1*	*10.3*	*0.12*	*0.27*	*668.2*	*1,383.9*	*7.90*	*16.66*	*207.1*
TOTAL	**4,462.2**	**3,814.6**	**100.00**	**100.00**	**8,454.4**	**8,307.5**	**100.00**	**100.00**	**98.3**

Source: our calculi based on the data collected from the two General Agricultural Censuses from 2002 and 2010

Thus we have learnt that there is a consolidation tendency of the two fundamental components of the agricultural holdings without juridical status, namely the subsistence exploitations concentrate on their social component, while the exploitations over 10 ha aim at the commercial agriculture. It takes shape the existence of an exploitation group (between 2 and 10 ha) which is not certain about their development strategy in future, standing out by a decline tendency that highlights a more energetic activation of the land market.

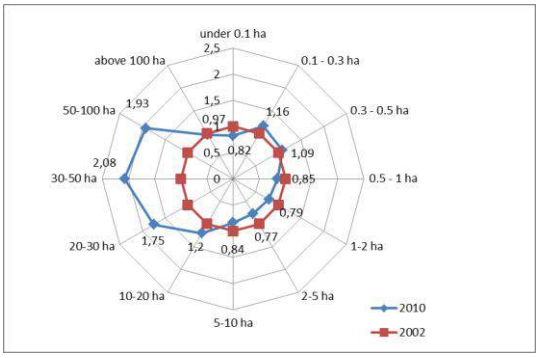
The evolution tendencies of the number of agricultural holdings without a juridical status (Chart 1) and of the agricultural areas utilized (Chart 2) are similar, registering profound changes of increase in the case of the agricultural holdings over 10 ha and decreases in the case of the category under 2 ha, except for the category 0.1 – 0.5 ha, were there are increase tendencies both as number of holdings and as agricultural area utilized.

If the annual increase rates of the total medium agricultural area regarding an agricultural exploitation without juridical status (between 2002 and 2010) are to remain the same, then the total medium agricultural area of an agricultural holdings without juridical status in Romania will double, based on the same scenario, in 70.9 years reaching 2.90 ha.



Source: our analyses and interpretations based on the data collected from the two General Agricultural Censues from 2002 and 2010

Chart 1. The evolution of the agricultural exploitations without juridical status in Romania between 2002-2010



Source: our analyses and interpretations based on the data collected from the two General Agricultural Censues from 2002 and 2010

Chart 2. The evolution of the agricultural areas utilized in the agricultural holdings without juridical status in Romania between 2002-2010

Obviously, this scenario is extremely pessimistic, the future growth rates of the total agricultural area and utilized for an agricultural holdings without juridical status will accelerate due to the following facts:

- the accelerating decrease of the active population in the rural environment;
- the development of the non-agricultural activities;
- the increasing pressure of the agricultural holdings with juridical status by taking over the lands owned by the agricultural holdings without juridical status, regardless of their type of ownership;
- the professionalization of the agriculture by the significant increase of the commercial agriculture to the disadvantage of the agricultural areas owned by the agricultural holdings of subsistence which will decrease by approximately 3 quarters;
- the intensification of the land market.

These few considerations allow us to see, from a moderate point of view, the possibility of doubling the medium area of the agricultural holdings without juridical status in about 30 years or, the optimistic view, in about 15 years as the annual growth rates will be of 0.1448 ha/year or of 0.0724 ha/year (the moderate view).

Thus we have learnt that the agricultural holdings without juridical status will coexist with the agricultural holdings with juridical status for quite a long time, which implies planning a specific strategy of development and consolidation addressed to the agricultural holdings without juridical status, having as central objective the agricultural exploitation of subsistence or subsistence farming.

CONCLUSIONS

The study regarding the future of the small farm household in Romania from the perspective of the General Agricultural Censuses from 2002 and 2010 outlines a few value judgments such as:

- the total agricultural areas and agricultural areas utilized are constantly shifting based on the juridical status of the exploitation, the exploitation structures on size categories and the type of ownership of the agricultural areas utilized;

- the tendencies convey a slow change of the number and total agricultural area and agricultural areas utilized without juridical status, meaning a consolidation of the subsistence farming from the category under 0.5 ha and over 10 ha, while the categories between 0.5 – 10 ha face a slight downfall;

- the agricultural holdings without juridical status are mainly the households of the rural population which, generally are the same with the small farm households, the major difference constituting the non-agricultural households or those limited to out-urban habitation functions;

- the social function of the agricultural exploitation without juridical status is predominantly standing out fin the case of the agricultural holdings of subsistence (under 2 hectares), especially for the category 0.1 – 0.5 ha;

- the commercial function distinguishes mainly in the case of the agricultural holdings without juridical status which uses areas over 10 hectares and where the consolidation phenomenom is much more visible;

- the future of the agricultural holdings without juridical status can take shape by the growth rate of the total medium agricultural area on exploitation which offers its doubling as compared to 2010, following scenarios such as: doubling the medium area of exploitation in *60 years* (*the pessimistic scenario*), in *30 years* (*the moderate scenario*) and in *15 years* (*the optimistic scenario*)*;*

- the small farm household in Romania will have a very long history, which will overlap with the existence of the Romanian state, but it will be continually changing and modernizing and thus securing the perennity of the Romanian village through tradition and culture, as well as the social prosperity through creating an efficient and high-performance microeconomy.

The vernacular village will live as long as the small farm households live, otherwise the village will turn into localities of urban type, mainly based on agricultural businesses or non-agricultural ones in a corporate system. The rural households has the future challenging task of maintaining and preserving the authentic national values and traditional inheritance of the rural environment under the pressure of modernization and optimization of the agricultural activities made in the spirit of tradition while pursuing profitability.

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Addendum 1. The evolution of the agricultural exploitations without juridical status and of the agricultural areas utilized based on size categories of the agricultural area utilized, type of ownership of the agricultural areas utilized (2002 - 2010) (%)

Size Categories	total, d.c		property		concession		leasing		association		free use		Other ways	
	2002	2010	2002	2010	2002	2010	2002	2010	2002	2010	2002	2010	2002	2010
	number													
Under 0,5 ha	100.00	100.00	93.80	94.36	0.40	0.42	0.14	0.30	0.25	0.38	0.62	3.30	4.79	1.25
0,5 – 1 ha	100.00	100.00	91.30	90.74	0.04	0.25	0.09	0.69	0.40	0.87	0.64	5.58	7.53	1.86
1 – 2 ha	100.00	100.00	89.65	89.32	0.01	0.21	0.07	1.16	0.30	1.03	0.47	6.09	9.49	2.19
Total under 2 ha	*100.00*	*100.00*	*92.03*	*92.18*	*0.20*	*0.32*	*0.11*	*0.62*	*0.30*	*0.66*	*0.58*	*4.57*	*6.77*	*1.64*
2 – 5 ha	100.00	100.00	87.77	87.62	0.01	0.19	0.05	1.97	0.19	1.33	0.33	6.21	11.66	2.68
5 – 10 ha	100.00	100.00	85.99	83.85	0.01	0.32	0.08	4.62	0.13	2.03	0.21	5.89	13.57	3.28
Total 2-10 ha	*100.00*	*100.00*	*87.41*	*86.84*	*0.01*	*0.21*	*0.05*	*2.52*	*0.18*	*1.48*	*0.30*	*6.15*	*12.05*	*2.81*
10 – 20 ha	100.00	100.00	76.61	71.64	0.03	1.21	0.34	12.25	0.25	3.54	0.13	6.45	22.64	4.91
20 – 30 ha	100.00	100.00	50.41	56.9	0.09	3.47	1.61	21.69	0.80	5.02	0.12	6.29	46.98	6.64
30 – 50 ha	100.00	100.00	34.62	51.01	0.19	4.71	2.92	26.14	1.49	5.16	0.33	5.96	60.44	7.03
Total 10-50 ha	*100.00*	*100.00*	*71.25*	*65.98*	*0.05*	*2.13*	*0.64*	*15.97*	*0.38*	*4.04*	*0.14*	*6.35*	*27.54*	*5.52*
50 – 100 ha	100.00	100.00	26.87	46.89	0.38	5.05	5.91	31.77	2.78	4.46	0.17	4.47	63.89	7.37
Over 100 ha	100.00	100.00	8.97	42.51	0.57	4.61	10.78	36.94	2.52	4.63	0.13	3.42	77.03	7.89
Total over 50 ha	*100.00*	*100.00*	*18.98*	*44.97*	*0.47*	*4.85*	*8.05*	*34.04*	*2.66*	*4.53*	*0.16*	*4.01*	*69.68*	*7.60*
TOTAL	**100.00**	**100.00**	**90.35**	**90.05**	**0.15**	**0.35**	**0.11**	**1.58**	**0.27**	**0.96**	**0.50**	**5.01**	**8.63**	**2.05**
	area													
Under 0,5 ha	100.00	100.00	94.35	95.64	0.13	1.22	0.11	0.45	0.31	0.19	0.57	1.55	4.53	0.95
0,5 – 1 ha	100.00	100.00	91.27	95.59	0.03	1.90	0.08	0.87	0.36	0.04	0.59	0.87	7.67	0.73
1 – 2 ha	100.00	100.00	89.45	94.94	0.01	1.36	0.06	1.97	0.27	0.17	0.45	1.02	9.76	0.54
Total under 2 ha	*100.00*	*100.00*	*90.51*	*95.22*	*0.03*	*1.47*	*0.07*	*1.44*	*0.30*	*0.14*	*0.50*	*1.07*	*8.59*	*0.66*
2 – 5 ha	100.00	100.00	87.15	93.40	0.01	1.29	0.05	3.16	0.19	0.46	0.31	0.88	12.3	0.8
5 – 10 ha	100.00	100.00	84.52	91.76	0.01	1.42	0.10	5.04	0.15	0.18	0.21	0.73	15.01	0.87
Total 2-10 ha	*100.00*	*100.00*	*86.28*	*92.36*	*0.01*	*1.37*	*0.06*	*4.35*	*0.18*	*0.28*	*0.27*	*0.79*	*13.19*	*0.85*
10 – 20 ha	100.00	100.00	69.75	81.92	0.03	2.07	0.46	12.08	0.34	0.62	0.12	1.57	29.29	1.73
20 – 30 ha	100.00	100.00	45.03	68.22	0.10	2.16	1.84	24.4	0.85	0.93	0.15	1.91	52.04	2.38
30 – 50 ha	100.00	100.00	32.31	57.71	0.17	4.78	3.19	31.16	1.59	0.92	0.29	1.73	62.44	3.69
Total 10-50 ha	*100.00*	*100.00*	*58.58*	*67.41*	*0.07*	*3.35*	*1.20*	*23.88*	*0.66*	*0.83*	*0.16*	*1.73*	*39.33*	*2.8*
50 – 100 ha	100.00	100.00	22.76	46.22	0.40	4.49	6.58	41.71	2.93	0.83	0.17	1.85	67.16	4.89
Over100 ha	100.00	100.00	7.61	39.17	0.81	5.65	12.37	45.98	2.55	1.00	0.12	1.35	76.54	6.86
Total over 50 ha	*100.00*	*100.00*	*11.79*	*39.34*	*0.70*	*5.62*	*10.77*	*45.87*	*2.65*	*1.00*	*0.14*	*1.36*	*73.95*	*6.81*
TOTAL	**100.00**	**100.00**	**78.53**	**40.13**	**0.08**	**5.55**	**1.08**	**45.25**	**0.46**	**0.99**	**0.31**	**1.36**	**19.54**	**6.71**

Source: our analyses and interpretations based on the data collected from the two General Agricultural Censuses from 2002 and 2010

OTHER PROFITABLE ACTIVITIES ON THE FAMILY AGRICULTURAL HOLDINGS ACCORDING TO THEIR ECONOMIC SIZE[1]

JONEL SUBIĆ[2], MARKO JELOČNIK[3], MARIJANA JOVANOVIĆ[4], VELIBOR POTREBIĆ[5]

Summary: *In the paper will be emphasized the importance of the other profitable activities (OPA) on the family agricultural holdings, according to their economic size within the territory of Republic of Serbia, with special focus on the Vojvodina Region. Economic size of the agricultural holding is recognized by the value of its total standard output (SA). Other profitable activities related to the agricultural holdings include incomes from agricultural products sale, rural tourism, fishery, etc., whether they are performed on or outside the holding. Other profitable activities that are not related to agricultural holdings include activities that do not consume resources of the holding, but only the labor, as like in previous case they may be carried on, or outside the holding. According to gained results, average economic size of the holding in the Republic of Serbia is 5.939 EUR, while the realized economic value on the family agricultural holdings (FAH) is 4.990 EUR. Census of Agriculture in 2012 showed that the highest average economic size of the agricultural holdings has a Vojvodina Region (12.032 EUR), what is 3,5 times higher than the value achieved in other regions. From the total sum of 631.552 agricultural holdings in the Republic of Serbia (family agricultural holdings (FAH), as well as legal entities (LE) and entrepreneurs) only 78.301 holdings possess DPA that are in relation to the holding (where 21% of them are within the economic class in range of 4.000 - 7.000 EUR). At the level of the Vojvodina Region, in total there were registered 147.624 agricultural holdings (AH), where 8.405 of them have OPA in relation to the holding (13,6% are within the class of economic sizes 100.000 and more EUR).*

Keywords: *other profitable activities, family agricultural holdings, Vojvodina Region, Republic of Serbia*.

INTRODUCTION

Other profitable activity (OPA) that are in line with agricultural holding, include incomes from the sold agricultural products (diary/meat/fruit/vegetable and other agricultural products); incomes from rural tourism; fishery; sale of timber, or processed timber; sale of national handicrafts products; etc. At the same time, these activities can be done on or outside the holding (*Subić & Markovic, 2014*).

Contribution of the other profitable activities on the agricultural holding is reflected trough the strengthening of its economic size. The economic size of the holding represents the average monetary value of gross agricultural production at the producer prices (expressed in EUR), in other words value of its standard output. Total standard output represents the sum of all individual standard outputs from all agricultural holdings (crops/multi-year plantations or livestock), which are produced on the holding, expressed in EUR (*Cvijanović et al., 2014.*). Obtained value includes sales of agricultural products, the use of the holding, own (natural) consumption on agricultural holding, where excludes out direct payments, taxes, cost of products realization and costs of agricultural products processing.

According to the economic size, all agricultural holdings in Serbia are grouped into 8 economic classes: from 0 to 1.999 EUR; from 2.000 to 3.999 EUR; from 4.000 to 7.999 EUR; from 8.000 to 14.999

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EUR; from 15.000 to 24.999 EUR; from 25.000 to 49.999 EUR; from 50.000 to 99.999 EUR; from 100.000 EUR and higher.

The most of agricultural holdings in Serbia are in a class 0 – 1.999 EUR, more precise 288.559 holdings, or 45,7% of total number of holdings, while the smallest number of agricultural holdings is recorded within the class of economic size 100.000 EUR and more (0,3% of the total number of holdings).

The average economic size (power) of agricultural holding in the Republic of Serbia is 5.939 EUR, while the economic size of the family agricultural holding is 4.990 EUR, or legal entities and entrepreneurs 204.755 EUR. The economic value of legal entities and entrepreneurs is 40 times higher than the value achieved on the family agricultural holdings (FAH), while the economic value of family agricultural holdings at the EU level is 4,5 times higher than the current values achieved in Serbia.

On the territory of Vojvodina Region was recorded the highest economic value of family agricultural holding, and amounts 12.032 EUR, what is two times more than the value recorded on the republic level, or three times more than the value recorded at FAH in the Šumadije Region, or 3,5 times more than values at the FAH in the South and East Serbia Region.

On the other hand, at the level of the Vojvodina Region, it was recorded a significantly lower number of FAH at which were gained the profit from the other profitable activities (OPA), than it is the case in Sumadija and West Serbia Region. The reason is recognized in high polarization of holdings in Vojvodina, whose production structure is based on the capital-intensive production lines (large surfaces under ALU[6] and in possession of LG[7] per employed person, large investments in inputs), what causes the lack of available labor that will be involved in OPA on the holding (*Bogdanov & Babovic, 2014*).

The reason for insisting on intensifying the additional activities on the territory of Vojvodina Region lies in its geographical position, as well as in strategic priorities of local governments, that can improve agricultural production, exchange the goods, to develop a mobility of the labor market, research conduction, and other opportunities, with the main goal to achieve agriculture sustainability (*IAE, 2013*).

Also, the basic characteristics of the holding owners with OPA connected to holding are reflecting in terms of age and sex structure. So, at the republic level, at the total number of households that have a OPA, 86,9% of holding owners are male; where the age structure is like: 4,6% are younger than 35 years; while 33,1% household owners are older than 65 years. On the territory of the Vojvodina Region, there is no significant change in the share of male holding owners (around 85,3%), while in the age structure there are small deviation: 9,9% of owners are younger than 35 years, and 17,3% of them are older than 65 years (*Bogdanov & Babovic, 2014*).

Within the Vojvodina Region the most usual are the holdings specialized in crop production, what is not the case in other Serbian regions, where dominate holdings with mixed plant and livestock production. By creating of opportunities for conduction of other agricultural activities on the holdings, it is possible to expect decrease of unemployment, engagement of labor within the different age groups (which lost their jobs in the process of privatization of companies, as well as during the changes within the structure of the public sector) and permanent fomentation of entrepreneurship in agribusiness in the rural areas (*Tomić et al., 2015*).

MATERIAL AND METHODS

Analysis of the importance of other profitable activities (OPA) on the family agricultural holdings, according to their economic size, considers the use of available database of the Statistical Office of the Republic of Serbia (SORS), more precisely data published after the Census of Agriculture in 2012. Within the paper will be introduced the results of mentioned analysis realized for the territory of the Republic of

[6] ALU - Agricultural land in use
[7] LG - Local government

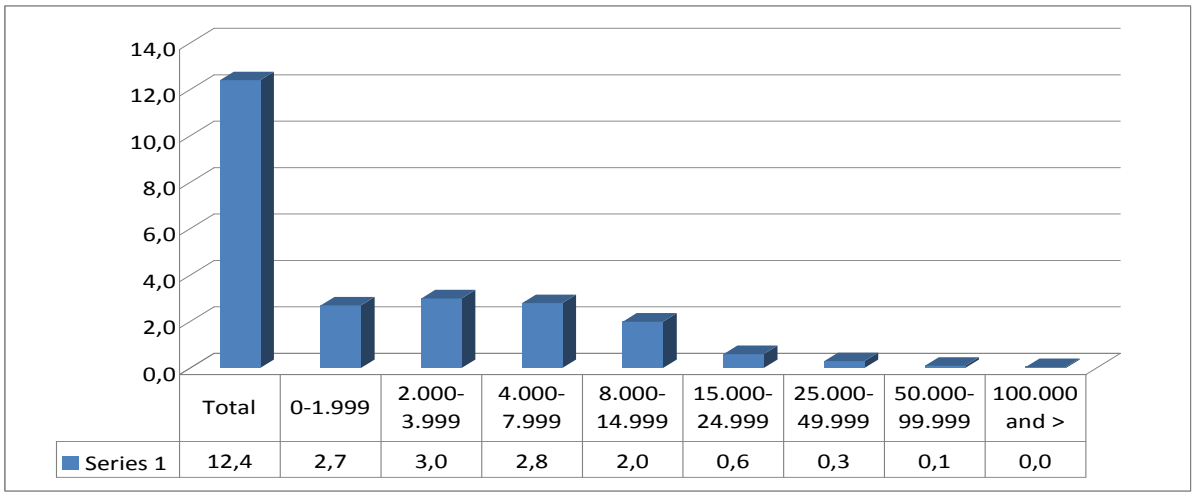
Serbia, with special focus to the Vojvodina Region. Also, presentation of gained results implies a consultation with relevant domestic literature.

RESULTS AND DISCUSSIONS

In Serbia there are 631.552 agricultural holdings (AH) - family agricultural holdings (FAH), legal entities (LE) and entrepreneurs. Only at 78.301 holdings are recorded the existence of other profitable activities (OPA) that are related to the agricultural holding. Therefore, the share of AH with OPA in connection with holding in the total number of agricultural holdings is around 12,40%.

In relation to the economic power of the holdings, the largest number of AH with OPA in connection with the holdings, belong to the class of holdings with economic size from 4.000 to 7.999 EUR (around 3,8%, or 23.820 households). About 3% of holdings are in the class of holdings' economic size from 2.000 to 3.999 EUR, while 2,7% of them belong to the class of economic size from 0 to 1,999 EUR. At the national level, the smallest number of holdings is in the class of economic size from 100.000 EUR and more (277 holdings, with the share of barely 0,04% in the total number of holdings, or with the share of 14,6% in the total number of holdings that belong to this class of economic size), (*Graph 1.*).

Graph 1. Share of AH with OPA connected to the holding in total number of AH in Republic of Serbia, production cycle 2011/2012.



	Total	0-1.999	2.000-3.999	4.000-7.999	8.000-14.999	15.000-24.999	25.000-49.999	50.000-99.999	100.000 and >
Series 1	12,4	2,7	3,0	2,8	2,0	0,6	0,3	0,1	0,0

Source: Data base of SORS: Census of Agriculture 2012.

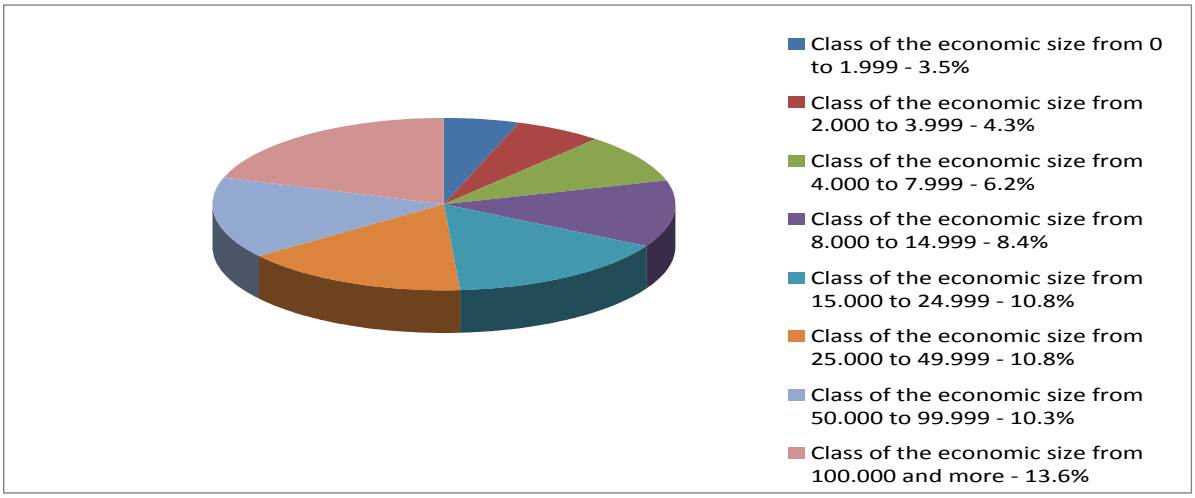
The share of holdings that have other profitable activities related to agricultural holding within the region of Vojvodina is somewhat lower in compare to the other regions in Serbia, what arises directly from the fact of high polarization and high percentage of agricultural land owned by the entrepreneurs.

At the level of the Vojvodina Region, the structure of agricultural holdings with OPA connected with the holding has a following appearance (*Graph 2.*): the largest number of agricultural holdings with OPA in relation to agricultural holding is recorded within the class from 0 to 1.999 EUR (2.122 holdings, with the participation of 3,5% in mentioned class of holdings economic size), while the smallest number of them are in the class of the economic size from 100.000 EUR and more (204 holdings, with the share of 13,6% in mentioned class of economic size).

Economic size classes, from 15.000 to 24.999 EUR and 25.000 to 49.999 EUR were recorded the same share of AH with OPA connected to the holding in the total number of AH on the territory of Vojvodina Region (both, around 10,8% within their classes). Slightly lower share was recorded in the class of economic size of holdings from 50.000 to 99.999 EUR (10,3%).Participation of the AH with OPA in relation with holding in the class from 8.000 to 14.999 EUR is 8,4%, while the classes of holding economic size from 2.000 to 3.999 EUR and from

4.000 to 7.999 EUR were recorded a share of 4,3% and 6,2% in the period (production cycle) 2011/2012.

Graph 2. Share of AH with OPA connected to the holding in total number of AH in Vojvodina Region, production cycle 2011/2012.



Source: Data base of SORS: Census of Agriculture 2012.

Compared to other regions in the Republic of Serbia (Belgrade, Sumadija and West Serbia regions, or East and South Serbia regions), Vojvodina Region has the lowest share of AH with OPA relating to holding in the total number of AH (5,7% compared to the total number of AH on the national level), (*Table 1*.).

In Table 1 will be also presented the structure of agricultural holdings by economic size classes for all Serbian regions, because in this way can be seen all potentials that Vojvodina Region has on its disposal in upcoming period.

Belgrade Region has the highest number of holdings in economic size class from 4.000 to 7.999 EUR (736 agricultural holdings, or share of 12,8% withinthe structure of mentioned economic size of holdings). In the same class, region of Vojvodina has 1.466 agricultural holdings, or about 6,2%. The smallest number of agricultural holdings with OPA related to agricultural holding, at the level of Belgrade Region, is in the class from 100.000 EUR and more (23 farms, that have share of 35,4% in this class of economic size). Similar case was also recorded in the territory of the Vojvodina Region.

Sumadija and West Serbia regions have the highest number of agricultural holdings with OPA connected to the holding in the class holdings' economic size from 4.000 to 7.999 EUR (or 14.360 holdings, with the participation of 27,1% in entire class of this economic size), as well as the smallest number of holdings within the class from 100.000 EUR and more (41 holdings, with the share of 17,2% in entire mentioned class).

Region of South and East Serbia has the highest number of agricultural holdings with OPA in relation to the holding in class of holdings' economic size from 4.000 to 7.999 EUR (or 7.258 holdings, with the share of 23,4% in entire mentioned class), as well as the smallest number of holdings within the class from 100.000 EUR and more (9 holdings, with the share of 9,2% in this class of economic size).

It is notable that the Vojvodina Region is at the end of list, if in focus is the dispersion of agricultural holdings with OPA related to the agricultural holding.

Table1. Agricultural holdings according to the economic size class and other profitable activities connected to the holding, in Republic of Serbia, agricultural production cycle 2011/2012.

Description	Total	Classes of the economic size of holdings (in EUR)							
		0-1.999	2.000 – 3.999	4.000-7.999	8.000-14.999	15.000-24.999	25.000-49.999	50.000-99.999	100.000 and more
Republic of Serbia									
AH - total	631.552	288.559	140.641	113.194	52.949	18.261	11.221	4.825	1.902
AH with OPA in line with holding	78.301	16.854	18.687	23.820	12.712	3.724	1.647	580	277
Share of AH with OPA in line with holding in total number of AH by classes	12,4%	5,8%	13,3%	21,0%	24,0%	20,4%	14,7%	12,0%	14,6%
Belgrade Region									
AH - total	33.244	15.930	7.147	5.728	2.882	951	437	104	65
AH with OPA in line with holding	3.903	673	440	736	639	260	108	24	23
Share of AH with OPA in line with holding in total number of AH by classes	8,7%	4,2%	6,2%	12,8%	22,2%	27,3%	24,7%	23,1%	35,4%
Vojvodina Region									
AH - total	147.624	59.941	26.907	23.487	15.717	8.645	7.479	3.947	1.501
AH with OPA in line with holding	8.405	2.122	1.152	1.466	1.313	937	806	405	204
Share of AH with OPA in line with holding in total number of AH by classes	5,7%	3,5%	4,3%	6,2%	8,4%	10,8%	10,8%	10,3%	13,6%
Region of Šumadija and West Serbia									
AH - total	262.940	115.294	61.708	53.008	23.631	6.183	2.334	544	238
AH with OPA in line with holding	43.816	8.480	10.696	14.360	7.754	1.869	515	101	41
Share of AH with OPA in line with holding in total number of AH by classes	16,7%	7,4%	17,3%	27,1%	32,8%	30,2%	22,1%	18,6%	17,2%
Region of East and South Serbia									
AH - total	187.744	97.394	44.879	30.971	10.719	2.482	971	230	98
AH with OPA in line with holding	23.177	5.579	6.399	7.258	3.006	658	218	50	9
Share of AH with OPA in line with holding in total number of AH by classes	12,3%	5,7%	14,3%	23,4%	28,0%	26,5%	22,5%	21,7%	9,2%

Source: Data base of SORS: Census of Agriculture 2012.

CONCLUSION

Based on the previously presented analysis, next can be underlined:

- In average, economic size of agricultural holding in Serbia is 5.939 EUR, where the achieved economic value on the family agricultural holdings is 4.990 EUR.
- The highest average economic size of AH has the Vojvodina Region (12.032 EUR), or 3,5 times higher value compared to the results gained in other regions, although there is recorded a significantly smaller number of family agricultural holdings that make profits from the other profitable activities than this is the case in Region of Sumadija and West Serbia.
- At the level of the Vojvodina Region, it was recorded a 147.624 agricultural holdings (AH), where 8.405 of them are AH with OPA in line to the holding (where 13,6% of them are within the class of economic size 100.000 EUR and more).
- After creation of the opportunity for other agricultural activities on the holding (increase in the number of households with OPA), it can be expected higher involvement of the population of all age groups, as well as decrease of unemployment, strengthening of agribusiness activities in rural areas and dispersion of activities at holding.

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ECONOMIC STRATIFICATION, THE REMEDY AND DEMISE OF HUMANITY

CRISTIAN C. MERCE[1], EMILIAN MERCE[2], MIHAELA MIHAI[3]

Summary: *The paper shows that the world economic stratification, as well as that of all natural, social and political systems is a natural law and a prerequisite for progress. Stratification itself may mean, however, both the remedy, but also the demise of systems, by exacerbating social inequalities. The database includes the evolution of gross domestic product per capita for different time frames at European level and worldwide. The main methods employed in processing database are the indices method and expectation values of position (quartile values) used to assess the structure of Europe and world countries according to the size of the gross domestic product. In Europe, for a century, stratification has increased visibly. If in 1913, the richest country in Europe achieved a GDP per capita of 3.94 times higher compared to the poorest country, in 2013 the ratio is 13.82 to one. The status of key statistical indicators that characterize the polarization of the world by size of gross domestic product, demonstrates that stratification is less pronounced inside continents, becoming however severe, worldwide. In this regard, it is alarming that in 1994, 75% of world countries were making only 7% of the GDP per capita in the richest country (Monaco). Given that information has now become increasingly more fluid, one can include among beneficiaries, the least developed countries. Circulation of information is, however, under the command of polarizing forces, belonging to the same great powers of the world. In this way, by means of more refined methods, the benefits of progress preserve world hierarchies.*

Keywords: *economic stratification, extreme wealth, extreme poverty.*

INTRODUCTION

God did not make a flat world, but one that is hierarchical, layered. Hierarchies are the patent and the ground of evolution in the living world. To the point where creatures are devoid of reason, layering works flawlessly, ensuring that the best one prevails and is perpetuated. In the case of humans that are endowed with reason, things get complicated. Under the new ownership, layering can mean both the remedy and the demise of social systems of the human species. To balance between good and evil, God gave man free will and implicit absolution for the great gift of freedom to choose between good and evil.

They say that good has fallen into disuse since the creation of the world bringing human decay for evil deeds. Man itself, dominated only by instincts bestowed on him by the Creator, is an animal. He becomes "social man" only through education. Externalization ensuring good qualities is moderation, altruism, modesty, tolerance, patience. In contrast with these qualities by which man learns that not everything that makes you happy is fine, but only what is good makes you really happy, man can easily fall servant of temptations, as instinctual as: pride, greed, lust, waste, pride zeal, anger, blasphemy, confrontation, flattery, quarrel, grumbling.

If God is the creator of people and nature, certainly adjusted and free will, then he has ensured the freedom of choice of each, so that every man should rather choose those facts that lead to respect and helping others, than being violent and destructive under the influence of hatred, indifference and contempt among individuals. I believe the Creator was too generous with his creation as history records too much violence, hatred and contempt, so it appears that man cannot bear limitless freedom and we must find ways of managing the social freedom.

MATERIAL AND METHOD

Man is free to choose between the two classes of attributes, between harmony and conflict, between beneficial and stratification of stress. The analysis of statistics from past centuries proves, unfortunately, that the human species is not fully able to ensure a significant proportion of

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moderation and altruism, and consequently, from one pole of society a decreasing number of people have a growing wealth and at the other pole a growing number of people are becoming poorer.

"After 1989, social inequalities and, above all, the financial one, acquired alarming proportions. The trouble is that very wealthy people appeared, but that multiplied the poor who have become poorer. Romania remains the prisoner of an oriental model (or its own traditional model) with very high social discrepancies." However, in a completely objective analysis, we cannot ignore the causal link between rich and poor. Usually, behind any riches, lies a process of subtraction of undue amounts in a form more or less veiled. Great empires were enriched by theft of fabulous riches of colonized countries. The Romanians were left with nothing but to steal from each other, with the complicity of foreigners who profit the most.

The paradox of the coexistence of extreme wealth and extreme poverty has been the subject of study, analysis and debate for the best minds of humanity. *"The classes taught by Marshall have as their main objective the central paradox of modern society: poverty in the midst of wealth. [...] "It was expected that our rapid progress in science and art production were largely to prevent sacrificing the interests of workers in favor of the interests concerning production. [...] This didn't happen. "*

The phenomenon of polarization of wealth unfortunately widened over the last centuries. "In 1820, the standard of living in the richest country in the world, then the Netherlands, was about three and a half times higher than that of the poorest countries in Africa and Asia. But in 1910 the distance between the richest and poorest has grown to more than 800%". The trend of increased economic polarization of the countries of Europe is visible by comparing the degree of stratification of wealth over a century (Table 4.1).

Table 4.1

Gross Domestic Product evolution in the interval 1913-2013 - GDP / capita

Country	1913	1938	1950	2013
Norway	2501	4337	5463	100819
Switzerland	4266	6390	9064	80528
Denmark	3912	5762	6943	58930
Sweden	3096	4725	6739	58164
Olanda	4049	5250	5996	47617
Ireland	2731	3052	3453	47400
Belgium	4220	4832	5462	45387
Germany	3648	4994	3881	45085
France	3485	4466	5271	41421
United Kingdom	4921	6266	6939	39351
Italy	2564	3316	3502	34619
Spain	2053	1790	2189	29118
Greece	1592	2677	1915	21910
Portugal	1250	1747	2086	21029
Russia	1488	2150	2841	14612
Romania	1741	1242	1182	9499
Bulgaria	1534	1595	1651	7296

Source: Maddison 2003: 66-67, 100, 262.
(Quoted by Bogdan Murgescu, p. 187, with updated data for 2013)

Worldwide, countries stratification by size per capita gross domestic product is more severe. Here is the hierarchy of the world by size GDP / capita in the period after 1994 (Table 4.2).

Table 4.2

Size of key statistical indicators
polarization of the world countries (1994-2013)

No	Country	1994	2000	2007	2013
1.	Monaco	89416	82537	170633	172954
2.	Liechtenstein	64140	75058	130349	145714
3.	Luxembourg	43555	46453	106920	111162
4.	Norway	28713	37473	83556	100819
5.	Qatar	14895	29914	69167	93352
6.	Macao, China	14979	14128	36607	91376
7.	Bermuda	31476	56284	90850	85140
8.	Switzerland	39567	35639	59664	80528
9.	Australia	18081	21678	40996	67468
10.	Kuwait	16431	19787	44902	61310
11.	Denmark	29502	29980	57021	58930
12.	Sweden	24775	27869	50558	58164
13.	Singapore	21578	23793	39224	55182
14.	United States	27776	36467	48070	53143
15.	Canada	19786	24032	44329	51911
16.	Austria	25383	23974	45181	49074
17.	Netherlands	22830	24180	47771	47617
18.	Ireland	15617	25579	59008	47400
19.	Finland	19777	23530	46538	47219
20.	Belgium	23914	22697	43255	45387
21.	Iceland	23663	30929	65566	45263
22.	Germany	26376	22946	40403	45085
23.	United Arab Emirates	26568	34476	44489	42690
24.	France	23059	21775	40342	41421
25.	New Zealand	15147	13483	31997	40842
26.	United Kingdom	18664	25362	46591	39351
27.	Brunei	14223	18087	32109	38563
28.	Japan	38815	37292	34095	38492
29.	Hong Kong, China	22503	25757	30594	38124
30.	Israel	13830	19859	24368	36151
. . . . .					
171.	Rwanda	132	207	373	633
172.	Mozambique	140	141	362	593
173.	Uganda	199	255	400	572
174.	Eritrea	158	179	253	544
175.	Guinea	450	342	411	527
176.	Guinea-Bissau	211	284	465	504
177.	Ethiopia	123	123	241	498
178.	Gambia	720	637	522	494
179.	Madagascar	228	246	379	471
180.	Liberia	65	183	210	454
181.	Niger	177	164	302	413
182.	Central African Republic	266	251	413	333
183.	Burundi	151	130	163	267
184.	Malawi	120	154	266	226

Source: *) The World Bank Group – Developing Countries – Economic Policy – 2008
**) World Bank national accounts data, and OECD National Accounts data files.

RESULTS AND DISCUSSION

The size of statistical indicators characterizing the intra-European countries, confirms that extreme poverty grows under extreme wealth (Table 4.3).

Table 4.3

The size of the main statistical indicators of polarization in some European countries (1913-2013)

Indicator	Year			
	1913	1938	1950	2013
Lower quartile	1741	2150	2189	21910
Middle quartile	2731	4337	3881	41421
High quartile	3912	4994	5996	47617
Maximum GDP	4921	6390	9064	100819
Minimum GDP	1250	1242	1182	7296
GDP at 75% of max countries by GDP (%)	79,5	78,2	66,2	47,2
GDP Report maximum / minimum GDP	**3,94**	**5,14**	**7,67**	**13,82**
Dispersion	1351753	2953568	5276991	603014753
Difference	1163	1719	2297	24556
Average value	2885	3799	4387	41340
Coefficient of variation	**40,3**	**45,2**	**52,4**	**59,4**

In Europe, for over a century, stratification has increased visibly. If in 1913, the richest country in Europe achieved a GDP per capita of 3.94 times greater compared to the poorest country in 2013 the ratio is 13.82 to one. The coefficient of variation, showing that the degree of dispersion of countries by size of per capita GDP, increased from 40.3% in 1913 to 59.4% in 2013 is also significant. Moreover, interquartile classes confirm the substantial increase in amplitude between rich and poor (Table 4.4).

Table 4.4

GDP per capita, quartile class

Year	Quartile class			
	25%	25%	25%	25%
1913	1250-1741	1741-2731	2731-3912	3912-4921
1938	1242-2150	2150-4337	4337-4994	4994-6390
1950	1182-2189	2189-3881	3881-5996	5996-9064
2013	7296-21910	21910-41421	41421-47617	47617-100819

The ratio between the averages GDP in the first three classes of fourth quartile to bottom quartile class is presented in Table 4.5.

Table 4.5

The ratio average value of GDP per quartile class

Year	Quartile class				
	25%	25%	25%	$(q_1+q_2+q_3)/3$	25%
1994	33,86	50,63	75,21	**53,23**	**100,00**
2000	29,80	56,98	81,97	**56,25**	**100,00**
2007	22,38	40,31	65,58	**42,76**	**100,00**
2013	19,68	42,67	59,98	**40,78**	**100,00**

It is remarkable that at the European level no polarization leads to discrepancies as alarming as in the rest of the world. Alarmingly, however, polarization is noticeably higher in 2013 than in 1994. It may be noted in this regard, that if in 1994 the average first three quartile classes represent 53.23% of the fourth quartile class in 2013; this average drops to 40.78%. In Europe, the level of GDP per capita has shown some improvement over a century, but the phenomenon of polarization has deepened. Of course, while the comparison is affected by a number of temporary factors, including the changes in the methodology for calculating GDP and substantial inflation over a century have an important role.

The key state statistical indicators that characterize the polarization of the world by size of gross domestic product demonstrate that stratification is less noticeable inside continents, becoming

very severe worldwide. It is alarming in this regard that in 1994, 75% of the world's countries achieved only 7% of GDP per capita in the richest country (Monaco). In 2013, this percentage, 10.6%, demonstrates a minimal improvement, but also that mankind is capable of removing poverty in the world (Table 4.6).

Table 4.6

The size of the main statistical indicators of polarization world countries (1994-2013)

Indicator	Year			
	1994	2000	2007	2013
Lower quartile	467	632	1124	1871
Middle quartile	1745	1919	4030	5857
Higher quartile	6243	9083	16113	18399
Maximum GDP	89416	82537	170633	172954
Minimum GDP	65	123	163	226
GDP at 75% of max countries by GDP (%)	7,0	11,0	9,4	10,6
GDP Report maximum / minimum GDP	1376	671	1047	765
Dispersion	131934742	160708081	558347612	668442240
Difference	11486	12677	23629	25854
Average value	6418	7570	14156	16494
Coefficient of variation	179,0	167,5	166,9	156,7

According to data regarding the size of gross domestic product per capita at the level of 2013, 25% of the sample of 184 countries surveyed, achieve a GDP / capita between $ 226 and $ 1,871. Another 25% of the poor countries are between $ 1,871 and $ 5,857. Next quarter countries, in the increasing hierarchy, registered between $ 5,857 and $ 18,399. Calculations reveal that 75% of the world's countries are listed at under 11% of the size of GDP per capita made in Monaco.

The situation of the countries examined, on quarters of the interquartile class of gross domestic product, clearly highlights the trend of widening gaps between rich and poor (Table 4.7).

Table 4.7

GDP per capita, quartile class

Year	Quartile lass			
	25%	25%	25%	25%
1994	65-467	467-1745	1745-6243	6243-89416
2000	123-632	632-1919	1919-9083	9083-82537
2007	163-1124	1124-4030	4030-16113	16113-170633
2013	226-1871	1781-5857	5857-18399	18399-172954

The ratio between the average of the first three classes reported to the fourth quartile class is particularly significant (Table 4.8).

Table 4.8

The ratio average value of GDP per quartile class

Year	Quartile class				
	25%	25%	25%	$(q_1+q_2+q_3)/3$	**25%**
1994	0,56	2,31	8,35	**3,74**	**100,00**
2000	0,82	2,78	12,01	**5,20**	**100,00**
2007	0,69	2,76	10,79	**4,75**	**100,00**
2013	1,10	3,99	12,68	**5,92**	**100,00**

It is worrying that the average GDP in the first three quartile class is particularly low compared to the fourth quartile class throughout the period considered. The average level of the first three quartile classes share does not exceed 6% of the average level of the fourth class.

CONCLUSION

The world has evolved from the end of the twentieth century, regardless of system, under the impact of an unprecedented technological progress. Information has now become more fluid, and beneficiaries include less developed countries.

"After all, the rich industrial countries, no matter how pressed by new competition, are doing so well that it's hard for them to arouse concern and compassion. [...] And what happens to the poor? History tells us that the most successful remedies of poverty come from within. Foreign support can be helpful, however, much like wealth fell from the sky, can also do harm. It can discourage effort and plant a crippling conscience of inability. As the African adage says, "The hand that receives is always under the one that offers."

Certainly, the information flow is under the command of polarizers belonging to the same great powers of the world. This way, through more refined methods, the benefits of progress preserve global hierarchies, the lesser ones remaining vitally dependent on strategies crystallized by major power centers worldwide.

European polarization doesn't lead to discrepancies as alarming as in the rest of the world. It is worrying, however, that polarization is more visible in 2013 than in 1994. It may be noted in this regard that if in 1994 the average first quartile three classes represented 53.23% of the fourth quartile class, in 2013 this average drops to 40.78%.

Worldwide, the average GDP / capita in the first three quartile grades is particularly low compared to the fourth quartile class throughout the period considered. The average level of the first three quartile class share does not exceed 6% of the average level of the fourth class. These figures highlight the fact that the capitalist system performance is achieved in not more than 25% of the world's countries. It is one of the most important truths that the Romanians did not know in 1989.

It is relevant to point out in this regard that Romania's situation today, dominated by foreign capital, resembles more and more the same state of the country in the interwar period, harshly accused by intellectuals of that period: "[...] a country composed of 80% peasant farmers cannot support indefinitely an industry driven by 90% foreigners, "foreigners" who largely control the press ".

Certainly, nowadays we do not have 80% peasants, we have only 40%, but the burdens and problems remain the same because a social structure with so many farmers practicing subsistence agriculture is nowhere to be found in the rest of Europe. With such a primitive social structure, our position and hence our destiny in the world or in the European pyramid is sealed for long. We will survive, but it is unlikely that we will become competitive.

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THE PERFORMANCES OF ROMANIAN AGRICULTURE, GIVEN THE RESOURCES ALLOTTED IN THE SOCIALIST AGRICULTURAL SYSTEM, COMPARED TO THE MARKET ECONOMY

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Abstract: *The agricultural performances depend, on the one hand, on the volume, structure and quality of the resources allotted, and, on the other hand, on their management, according to the economic system and to the national policies in the field. This article draws a parallel between the two agricultural systems, i.e. the socialist-planned type and the private one, typical of the market economy. The following periods are compared: 1986-1989 for the former type and 2006-2009 for the latter type of agriculture. The comparison targets the main resources: the agricultural real estate (surface, structure and quality), land reclamations and fertilizers. Between 1986 and 1989, the agriculture benefited from generous resources: over three million ha equipped for irrigations, modern orchards and vineyards, large amounts of fertilizers; as a whole, a more intensive technological system in terms of inputs. The yields increased, especially in cereals. Two decades later, i.e. between 2006 and 2009, the agriculture became extensive. Irrigation decreased by 10 times, a large part of the vineyards and orchards were destroyed, the amount of fertilizers was reduced to 1/3 compared to the 1986-1989 period. In terms of performance, the Romanian agriculture became extensive during the market economy, but there are relatively few differences in the results expressed by the yield level. These express the difference in the technological level between the two periods, due to several causes that we are going to analyze in the article.*

Keywords*: performances, land reclamation, planed economy, market economy.*

INTRODUCTION

Agriculture, as an economic activity, uses the land as its main input and its performances depend on the operating mode of these inputs, characterized by size (stretch), structure and quality. At the national level, the size represents the total area between borders – 23839.1 thousand hectares, known as *the national land fund*. The agriculture uses 14611.9 thousand hectares of this area, i.e. 61.3%. In contrast to the surface, which can be regarded as constant, the structure and quality of the agricultural lands are parameters which vary in time, as a result of human intervention. In their turn, the agricultural performances are directly dependent on the nature, opportunity and level of intervention and, not least, on land resource management and exploitation, as a whole. The two agricultural systems differ radically in terms of the economic and social doctrine, type of property, organization, allocation of the main production factors, also compared to the other sectors of the economy, such as industry or trade, for instance. The comparison is considered appropriate as it can offer suggestions on the development of future strategies, especially since, as far as the market economy is concerned, the Romanian agriculture goes through another transition period.

MATERIAL AND METHODS

The material of this study is relatively diverse. Official statistical data on surfaces, inputs and outputs have been used. In order to quantify the influence of these factors on the results, profile research data, which will be presented below, have been used. Numerous data come from the studies and the research conducted by the author. All were processed by economic research means and methods.

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RESULTS AND DISCUSSION

3.1. The land resource. The area and structure per uses of the agricultural land fund, at the end of 1989 and 2009, were as follows (Table 1):

Table 1. The area and structure per uses of the agricultural land fund (1989 and 2009)

Year	U/M	Agricultural field	uses:				
			arable	grasslands	meadows	vineyards	orchards
1989	thousand ha	14759,0	9458,3	3256,9	1448,3	277,5	318,0
2009	,,	14684,9	9422,5	3313,8	1528,0	215,4	205,2
Difference	±	-74,1	-35,8	+56,9	+79,7	-62,1	-112,8

Source: The Statistical Yearbook of Romania, 1990 and 2010.

The long-term agricultural uses have undergone insignificant changes in what concerns their size. In 1945, the agricultural land measured 15,062 thousand ha, of which 9,472.0 thousand ha was arable land, 5,147.0 ha was permanent grassland and 1,443.0 thousand ha were vineyards and orchards. During the socialist agriculture, the policy in the field designed to maximize the agricultural and arable area, particularly by turning the soil of the grazing grounds from non-mechanized sloping lands.

The agricultural and arable area also increased due to the desiccation of several hundreds of thousands of hectares in the Danube Valley. The Statistical Yearbook of 1989 referred to an agricultural area of 15,094.1 thousand ha, of which 10,080.4 thousand ha of arable land. It seems that these latest figures represented a political order, taking into account that the known objectives in the field aimed at 15,000 thousand ha of agricultural land, and at 10,000 thousand ha of arable land. The figures are refuted by the Romanian Statistical Yearbook of 1990, which mentions, for the end of 1989, only 14,759 thousand ha of agricultural land and 9,458.3 ha of arable land. The differences in area, registered between 1989 and 2009, although not spectacular, reveal a more intensive use structure during the socialist economy, more land that is arable, a larger area of orchards and vineyards, and fewer natural grasslands. The increased intensity in the field of vine and fruit plantations was also manifested, in this period, by the type of plantations, many of them being semi-intensive and intensive.

3.2. The Romanian socialist agriculture. After the completion of cooperativization process in 1962, the land exploitation was organized in large production units, reaching over 5,000 ha in size, as far as the state agricultural enterprises – SAE (known as IAS, in Romanian) are concerned, and 2,000 ha in agricultural cooperatives – AC (known as CAP, in Romanian). The mechanization services were concentrated in specialized units, i.e. machine and tractor stations – MTS (known as SMT in Romanian), later known as agriculture mechanization stations – AMS (known as SMA in Romanian).

Since the first *Five-Year Plan 1951-1955*, in Romania, increasingly larger resources have been allocated, in order to eliminate backwardness, particularly in mechanization. Later, from the 2nd half of the 60s, significant resources were directed towards land reclamation works, especially for irrigation. As far as mechanization is concerned, in just two decades, Romania succeeded in removing a historical gap, primarily in the agricultural endowment with tractors. In 1946, the first Romanian tractor, i.e. IAR-22 was produced, and, between 1959-1970, the area assigned to a tractor decreased from 684 ha to 91 ha per tractor.

In the following decades, however, the production of tractors was more oriented towards the export. Even in 1970, of the 29,289 tractors produced, 13,475 tractors, representing 46% of the entire production, were exported; five years later, i.e. in 1975, 71.4% of the entire production was exported. The share of exports remained at high levels, while the production of tractors decreased, so that, in 1989, **of the 17,124 tractors produced, 17,250 tractors were exported**. In the same year, i.e. 1989, in Romania, there were 62 ha of arable land per tractor, while in Greece there were 30.3 ha/tractor, in France - 20.8 ha/tractor, in Belgium - 12.2 ha/tractor, in Germany 8.3 - ha/tractor, the EU average being 19.6 ha/tractor (2).

As far as irrigation is concerned, in 1960, there was an area of 200 thousand ha equipped for irrigation, representing about 2% of the arable land. 30 years later, we had an area of over three million ha equipped for irrigation, representing almost one third of the arable land, Romania ranking thus third in Europe, after Spain and Italy, the former with only 16.5% and the later with 25.6% of the arable land.

With one of the largest areas equipped for irrigation, in connection to the size of the national land fund, in the last years of the planned economy of socialist agriculture, Romania achieved some of the lowest yields per unit area. In this case, the unsatisfactory results can be explained only by the wrong administration and by the inadequate resource management. The equipping of the three million ha involved a special investment effort, of about 13 billion US dollars, but the works had been made since 1966, in unreasonable rates. For the past 15 years (1974-1989), there was pursued, in particular, the expansion of the areas equipped for irrigation, in most cases dropping the technical requirements for conception and execution, and the environmental protection requirements. On about 40% of the respective area, the irrigation canals are unlined, the water loss reaching 30-60%, the yield of the pumping aggregates is below the catalogue values, the watering equipment has a low reliability level and others are technically obsolete (9). In order to achieve the quota of 5.5 million ha by the end of 1989, since 1983, the EELR (Enterprises for the Exploitation of Land Reclamation) county branches become EOELR (Enterprises for the Operation and Exploitation of Land Reclamation), priority being granted to the execution works.

Continuing to equip new land areas and neglecting the proper operation of the already equipped areas represent the first and the most serious errors in resource management and administration. This happened although the situation was acknowledged at the highest levels: *I do not want to return to the subject of irrigation and land reclamation, but because some comrades have raised the issue of supplementing some investments, I want to point out that, for 1981-1982, we decided not to start any new work. Let's finish the already started irrigation works, tune the existing systems - because some have already started to degrade. Let's ensure their proper functioning. Only when all systems work properly, we will build new ones (1).*

Indeed, in 1981, there were only 17 thousand ha equipped and, in 1982, 62 thousand hectares. Nevertheless, in 1983, a national program was launched (8), according to which, by the end of 1989, 5.5 million ha would be equipped for irrigation, which meant 55% of the arable land of the country. The designers and builders started their work, and, in 1983, there were 120.3 thousand ha equipped for irrigation, and, in the next year, the largest area was equipped, i.e. 261.6 thousand hectares. However, the real economy of the country could not stand neither the ruler's ambitions, nor the builders' momentum, so that the areas equipped annually began to shrink dramatically: 65 thousand ha in 1986, 55 thousand ha in 1987, 45 thousand ha in 1988, and only 27.2 thousand ha in 1989. The equipping continued to place designers in difficult situations, since the newly equipped areas triggered higher costs (longer water transportation canals, greater pumping heights, a more uneven relief requiring complex works). Thus, if around 69-70's, the investment for equipping one ha was around 14,000-16,000 lei/ha, 10 years later this had risen to 40,000-50,000 lei/ha. In addition, since the investment law at that time required that the investment should be recovered from the additional revenues in 10-12 years, the projects provided for increasingly higher yields per ha, so that the additional revenues ensure the compliance with the law. This led to the fact that, in the last years of planned agriculture, there were designed yields of 6,000 kg/ha for wheat and 10,000 kg/ha for maize, in any agro-climatic area of the country, including the wetter areas, where the yields obtained by irrigation were much smaller.

A thorough analysis of how the equipped areas were exploited during 1985-1989, the yields and the economic results are presented in the paper entitled *The Irrigations in Romania's Agriculture*, by A. Lup (3)[2]. The main conclusions of this work, which justify, otherwise, the inappropriate technical and economic results, are the following:

[2] The data source on the operation of the irrigation systems is represented by the operational records of DGEIFCA (the General Economic Directorate of Land Reclamation and Agricultural Constructions) and of the EEOLR county

a) The entire equipped area was not irrigated and the irrigation standards were lower than those recommended by the profile research. During 1986-1989, the equipped area increased from 2,731.1 thousand ha to 3,280 thousand ha, the four-year average being 2,989 thousand ha. The actually irrigated area (at least once) totaled 2,356 thousand ha on average, i.e. 78.8% of the equipped area.The irrigation standard ranged from 2,000 cubic meters/ha in 1988 and 1310 cubic meters/ha in 1986, the average being 1,746 cubic meters/ha, compared to the projected average standard of 2,700 cubic meters/ha, in order to ensure 50% of the AMR (Active Moisture Range), or 3,550 cubic meters/ha, in order to ensure 80% of the AMR. In reality, the water for the irrigated area was provided at a rate of 64.3% and 48.9% respectively. The failure to comply with the irrigation standards was triggered by the reduced performance of the pumping aggregates, and, especially, to the losses by infiltration from the partially non-impermeable canals (Figure 1).

Table 2. The area equipped for irrigation, the effectively irrigated area and the applied irrigation standard

Year	Equipped area thousand ha	Effectively irrigated area thousand ha	Irrigation standard cubic meters/ha
1986	2731,1	2212,2	1310
1987	2877,8	2287,9	1740
1988	3065,5	2397,2	2000
1989	3280.8	2527,0	1933
1986-1989	2989,0	2356,0	1746

Source: DGEIFCA Data (AGRI IF)

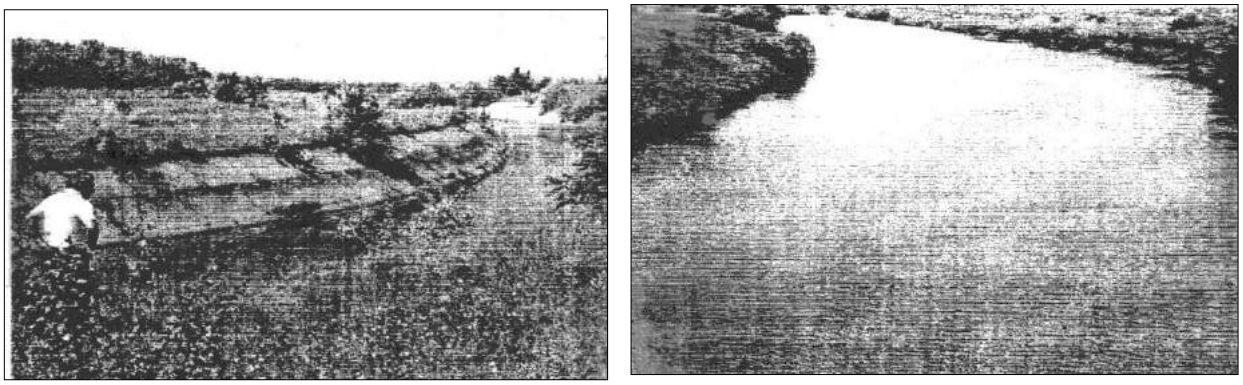
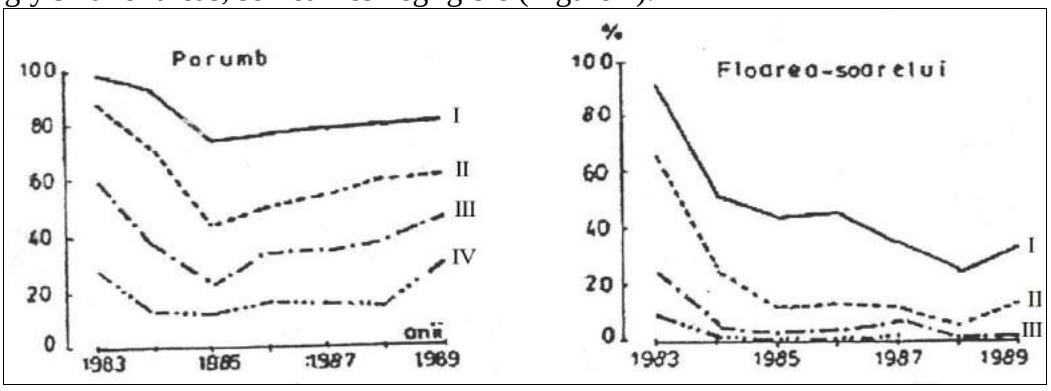


Figure 1. Partially impermeable and non-impermeable main canal in the irrigation system from Carasu, Constanta county (1991)

b) Failure to achieve the programmed number of irrigations. The area that has been watered at least once is statistically considered an irrigated area. Usually, most crops need more irrigations. The records of the EEOLR territorial units reveal that only the first irrigation was performed over the entire area (actually irrigated, not equipped). The other irrigations were made on increasingly smaller areas, sometimes negligible (Figure 2).



branches (Enterprises for the Execution and Operation of Land Reclamation Works), and those relating to the yields obtained, the costs and the economic results were drawn from the AGR-1 reports of the state agricultural enterprises and of the agricultural cooperatives of production, from nine counties in the south and east of the country, with equipped areas larger than 150 thousand ha.

Figure 2. The irrigation share at maize and sunflower, in the Romanian irrigation systems, during 1983-1989

c) The failure to provide the electricity needed in order to pump water, in order to transport it and to water the plants. It was one of the main causes, if not the most important one, due to which the immense efforts to build a formidable yield capacity – i.e. three million ha equipped for irrigation - has not been adequately harnessed. For instance, Table 3 shows the electricity insurance degree for the equipped areas, during 1986-1989 (Table 3).

Table 3. The electricity insurance degree for pumping the water on the equipped areas, during 1986-1989

Year	Equipped area thousand ha	Effectively irrigated area thousand ha	Irrigation standard cubic meters/ha	Insurance degree %
1986	2381,1	3453	2182	63,2
1987	2877,8	4173	1978	47,4
1988	3065,5	4450	2200	49,4
1989	3280,8	4714	2322	49,3
1986-1989	2989,0	4198	2171	51,7

Source: DGEIFCA Data (7)

The average for the four years under study reveals that the electricity insurance degree barely exceeded half of what was needed for a proper irrigation. This was also because the irrigation did not need a uniform consumption during the year. The maximum intensity of the irrigation season is between June and August, when, the appropriate irrigation of the equipped area, in the years 1988-1989, would have needed 20-25% of the national production of energy, in the respective period.

d) Lack of fertilizers. The capacity of the Romanian chemical fertilizer industry was assessed, in the last years of socialist agriculture, to 4.5 million tons of chemical fertilizers with active ingredients annually. The full use of this yield in the Romanian agriculture would have secured over 470 kg/arable ha. The greatest fertilizer yield was achieved in 1986, namely 3,278 thousand tones, which would cover about 340 kg/ha. However, as with the tractors, almost 50% of the yield was exported. In 1980, for example, in Romania, there were allotted 114 kg/ha, while in the Western European countries, there were applied 4-5 times larger quantities per ha.

e) The mismatch between the yield potential of the biological material, the technological standards and the allotted inputs. In the last years of planned agriculture, the use of high productivity breeds and hybrids was mandatory and, depending on the area and on the surfaces equipped for irrigation, the field density or the number of plants per ha was calculated for the circumstances when, during the growing season, the appropriate resources would be allocated, i.e. fertilizers, water, pesticides, etc. The failure to provide the resources in accordance with the requirements had negatively influenced the yields per ha, especially since the designed technologies were more efficient.

f) Various shortages and organizational and managerial dysfunctions. Throughout the socialist agriculture period, there were other numerous shortages, some of which have hindered the management of the main yield factors, as many as they were.

We quote here the lack of fuel and of spare parts, the poor reliability of the equipment, especially of the harvesting one. To these, there are added numerous organizational dysfunctions, most originating in the interference of the political factor in the management of the production units.

The sum of all these dysfunctions had finally led to particularly low yields per ha: about 3 t/ha in wheat and maize; 1.5 t/ha in sunflower; below 1,000 kg/ha in soybeans; 20-22 t/ha in sugar beet, or 12-13 t/ha in potatoes. These results have also been largely influenced by the agro-climatic area, from the south and east of the country, which was equipped and operated under irrigation, in a ratio of over 2/3.

3.3. The Romanian agriculture in transition to a market economy. After 1990, in the transition to a market economy, the Romanian agricultural system has changed radically, becoming one of the most extensive. First, the large production units were closed, entailing an excessive parceling of the agricultural land. The new landowners, counting several million, had no specialized

knowledge in the field, were deprived of any equipment, and did not have the necessary financial resources in order to purchase inputs. This led ultimately to an extreme technological intensification. The Law no.18/1991, under which the land of the former agricultural cooperatives was returned to its former owners or to their heirs, has been criticized right from the start and, practically, in the same year, there were suggested associative forms in order to reconstruct agricultural holdings compatible in size with the rational use of the land work equipment and with the operation of the irrigation systems.

By Law no.36/1991, there were proposed companies with legal personality and family associations without legal personality. None of these forms of association was attractive to farmers, as evidenced by the statistics of the Ministry of Agriculture, showing that, in 2001, compared to 1993, both the number and the share of areas were smaller in the associative forms than the number of the individual households and the areas owned by them (4). Neither was Law 166/2002 on agricultural holdings, which conditioned the granting of several facilities (mainly subsidies for certain products, the establishment of agricultural holdings of minimum 110 ha in lowlands and 50 ha in hilly areas), more successful.

Secondly, the destruction and abandonment of the irrigation systems has deprived the agriculture of one of the main yield factors, i.e. water. Consequently, in the most favorable agricultural areas, high intensity crops, such as maize, soybeans, sugar beet and potato, were abandoned or minimized, in the most favorable cropping areas.

On more than 2/3 of the agricultural areas, the extensive subsistence agriculture is practiced. It is true that, in parallel, a high performance modern agriculture is developed, with a small number of breeds that more resistant to drought (cereals, sunflower, rapeseed), in large units – tens of thousands ha -, some of them competing with the largest estates from the early twentieth century. Unlike the historic estates, the new great estates do not use the peasants' work and draft animals, but high productivity equipment, triggered by engines of several hundred horsepower. The proliferation phenomenon of the great super-mechanized exploitations is not strange to the persistence of millions of subsistence farms or to the rural exodus, including emigration. Thirdly, the fertilizer factor, with a yield intake which is maybe more important than water, as it is applicable throughout the entire cultivated area, has been used in amounts up to three times lower than in the socialist agriculture (41.4 kg/ha compared to 127.8 kg/ha in the first period).

3.4. Comparative performances. Between the two periods, i.e. 1986-1989 and 2006-2009, and, respectively, between the two agriculture types, there are differences in performance, as a result of the allocated resources and of their management mode.

Table 4. The average yields at the main crops during 1986-1989, compared to 2006-2009

Crop	U/M	1986-1989	2006-2009	Difference±	
				Kg/ha	%
The yield in cereals	thousand t	18569,7	13814,4	-4751,3	74,4
Wheat	kg/ha	3059	2530	-529	82,7
Maize	,,	2941	2929	-12	99,6
Sunflower	,,	1618	1266	-352	78,2
Soybean	,,	886	1593	+707	179,8
Sugar beet	,,	21572	31967	+10395	148,2
Potato	,,	12982	14365	+1383	110,7

Source: Statistical Yearbook of Romania, 1990 and 2010 (6)

An evaluation of the performance of the two types of agriculture according to the most important quality indicator – i.e. the average yield per unit area – is shown in Table 4. The yield parameters are superior in the first period, compared to the one from the socialist agriculture, but well below the level appropriate to the resources assigned.

Indeed, compared to 1961-1965, the average wheat yield per ha doubled (3,059 kg/ha compared to 1,446 kg/ha); the maize yield increased from 1,769 kg/ha to 2,941 kg/ha (66.2%); and the sunflower yield increased from 1,114 kg/ha to 1,618 kg/ha (45.2%); the sugar beet yield augmented from 14,891 kg/ha to 21,572 kg/ha; and the potato yield increased from 8,587 kg/ha to 12,982 kg/ha (51.2%).

The yields achieved during 1986-1989, although significantly higher compared to 1961-1965, are considered very inadequate compared to the resources allocated. During the reference period (i.e. 1986-1989), at least 20% of the area sown with cereals were grown in areas equipped for irrigation and the most water demanding breeds (soybean, sugar beet, potato) were cultivated only in areas equipped for irrigation. The chemical fertilizers were applied during the period 1986-1989 in the amount 127.8 kg/ha, in comparison with about 35 kg/ha during 1961-1965.

Regarding the comparison with the results from the 2nd period, i.e. 2006-2009, the latter are a logical consequence of extensive agriculture, with a minimum allocation of inputs. The yield level, compared to 1996-1998, is 82.7% in wheat, 99.6% in maize, 78.2% in sunflower. However, it is by 79.8% higher in soybeans, by 48.2% in sugar beet and by 10.7% in potatoes. A more rational use of inputs for extensive agriculture can explain the phenomenon.

The resource consumption per tone of product is also in favor of the extensive agriculture. For example, during 1986-1989, in the intensive agricultural system, a tone of cereals was obtained with 223 m^3 of water and 65.4 kg of fertilizer, while in 2006-2009, in extensive agriculture, a tone of cereals was obtained with only 32,3 m^3 of irrigation water and 28.5 kg of fertilizers.

CONCLUSION

1. The performances of the Romanian agriculture in the two compared periods (i.e. 1986-1989 and 2006-2009) accurately reflect the organization, structure and volume of the resources allocated and the administration and management of these resources.

2. The first period represents the end of a long process of agricultural modernization, when it had been invested heavily in mechanization, extensive land reclamation works, technological enhancement, performing biologic material, chemical fertilizers and pesticides, services.

3. At the same time, in some areas, such as in hydro-technical equipments, an increasing disproportion existed between the resources dedicated to the equipping of larger areas and those dedicated to rational exploitation.

4. Despite the progress registered in the endowment with mechanized equipment and in the supply with fertilizers, Romania remained far behind the Western European countries with developed agriculture. This was also due to the massive export, both of equipment and fertilizers.

5. The poor reliability of the equipment, especially of the harvesting one, the lack of spare parts, of electricity and fuels completed the list of the causes that triggered a low yield level per ha.

6. The 2nd period, i.e. 2006-2009, is the natural consequence of the disorganization from the first years after 1989. Both the politicians and the experts in the field believe that the abolition of the large agricultural holdings and the way in which the land was returned to its former owners represented strategic errors influenced by new political class in power.

7. In parallel, a type of high-performance agriculture is undergoing, represented by the immense agricultural holdings of tens of thousands ha, next to the still agonizing over three million subsistence farms with rudimentary technology and related results. In the future, the performant agriculture will proliferate, and the subsistence agriculture will disappear and, consequently, the peasant will be forced to leave and the villages will become desert, faster than the environment itself.

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THE VILLAGE IN THE REPUBLIC OF MOLDOVA: ACHIEVEMENTS AND HOPES

SIMION CERTAN[1], ION CERTAN[2]

Abstract: *In the present study, the authors are reflecting upon the concept and the achievements of the part of the agrarian reform dealing with the economic and social development of the village in Moldova, which has as main task "the peasant's social and economic protection", as well as upon the national Program „The Moldovan Village" which covers the legal framework for the sustainable rural development during 2005-2015". Today, almost a quarter of a century since the adoption of the agrarian reform and of the concept of the village's social and economic development, we are presenting a rural development evaluation study.*

Key words: *rural space, village, economy, culture, development, efficiency*

INTRODUCTION

According to the Constitution, the Republic of Moldova's territory "is organized, administratively, in villages, towns, districts...". In January 1, 2014, the 1682 localities in our country included five municipalities, 61 cities comprising 41 localities, 916 villages where the village councils are located and 659 communes. Thus, the basic unit of the rural space in our country is ***the village***.

By declaring its independence in August 27, 1991, our country has decided to consolidate its place among the democratic nations of the world and to reform its economy according to the requirements of the Moldovan Parliament Decision of July 25, 1990,which indicated "... the transition to a market economy as a model of management... ".

Our village is passing through a difficult stage of changes generated by the circumstances of the market economy system and openeness to the world, marked frequently by dynamism, often by uncertainty and risk, sometimes even hostility. Obviously, the situation forces us to step up research processes that occur in rural areas, the study of factors influencing rural development, to outline some proposals for village development in our country, this is giving the actuality of the study (Certan, 2001; Certan&Certan, 2012).

Studies on Moldovan village development are reflected in national and international research. Based on research, the Parliament adopted "The concept on the agrarian reform and of the social and economic development of the village" in February 15, 1991, as well as the National Program "Moldovan Village" from 2005 to 2015 in 2005.

Although this problem has been discussed at various official meetings in out country, tackled in scientific meetings, exposed in various national and international publications, the village in the Republic of Moldova has a difficult and controversial development.

This situation led us back to research on the village development in our country, to estimate the achievements of the provisions of the "Concept" and "Program" above. This study has enabled us to come up with some recommendations on increasing efficiency of the village development in our country.

MATERIAL AND METHODS

In the present research we used the concept of agrarian reform and of social and economic development of the village (hereinafter the Concept) and the National Programme "Moldovan Village" 2005-2015. The documents used in research included also legislation of the European

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Union and Republic of Moldova, textbooks, monographs and other publications on the subject, proceedings of national and international conferences.

The quantitative analysis is performed based upon information selected from both Moldovan National Statistics Bureau and Eurostat. Quantitative analysis is performed based on the information selected from statistical yearbooks of the National Bureau of Statistics of Moldova and Eurostat. The empirical study, and the analysis of the links provided us meanings and explanations relevant to the phenomena or processes that have occurred or occur in the villages of our country. In the research, specific methods and techniques of economic investigations were applied.

REZULTS AND DISCUSSIONS

1. The village: natural potential

The fate of the village is influenced firstly by the ***natural potential*** which, according to Bran (1987), is participating with the "force of its laws and goods", substance (s), energy (e) and information (i), goods in natural state, "manufactured by physical, chemical and biological movements of the material". The natural potential of our country is usually segmented into three areas: North, Center and South.

The climate conditions in 2013 were characterized by 9.4ºC annual average air temperature in Briceni (in the North), 11.1ºC in Chisinau (in the Center) and 11.5ºC in Cahul (in the South); the absolute maximum were 32.6ºC, 33.3ºC,and 24.1ºC, while the absolute minimum was -16.4ºC, -12.9ºC and -13.3ºC respectively. The annual amount of precipitation in 2013 from Briceni was 639 mm, 531 mm in Chisinau, and 516 mm in Cahul. Relative humidity was 75%, 71% and 74% respectively.

Particularly important are the 3,085 large and small rivers. The main rivers are Nistru (1,352 km in length, of which 660 km on the territory of the Rep. Moldova; Prut, with 967 km in length (including 695 km on the territory of the Rep. Moldova), Raut (286 km on our territory), Bic (155 km) and Botna (152 km).

The aquatic resources are represented as well by the natural lakes Beleu (area of 6.26 km^2), Manta (4.5 km^2), Sălaţ (3.72 km^2) and others, by artificial lakes such as Dubăsari (67.5 km^2), Stânca-Costeşti (59.0 km^2), Cuciurgan (27.3 km^2) etc. The national hydrographic network includes also about 3000 mineral water sources such as those in Onițcani, Hîrjăuca, Cornești, Cotova and others. This network includes also the thermal waters in Ungheni (1020-1028 m depth), and those around the village of Chioselia (850-1100 m depth).

Forests and other forest land represents 450,400 ha (that is 13.5% of land), placing us among the least wooded countries in Europe. Natural protected areas represent 1.42% of the country area, including the state natural reserves such as Pădurea Domnească (Glodeni) (5736 ha in area), Plaiul Fagului (Ungheni) (5552 ha), Codrii (Străşeni) (5177 ha), Prutul de Jos (Cahul) (1691 ha) and Iagorlîc (Dubăsari) (1044 ha).

Of particular interest are the 86 geological and paleontological monuments, with a total area of 2681.8 ha, such as the cave "Emil Racoviță", the "Rashkov" complex etc.

The most important component of the natural potential is the land fund, which, at the beginning of 2015 stood at 3384.6 million ha with diverse mix of relief and many reservations and spectacular scenery such as Saharna, Țipova Trebujeni and others. The soils are mainly chernozems (80%), containing 2.5-5% humus, which provides increased fertility of agricultural land. The quality average mark is 68 points.

The concept on the agrarian reform and of the social and economic development of the village, initiated by the Parliament of the Rep. of Moldova dated February 15, 1991, shows that "the main part of the agrarian reform is the reform of land relations. The main orientation of the land reform is demonopolization of state ownership of land and, as a result, acknowledgement of land as a commodity, and of different types of property in agriculture". On January 01, 2014, the privately

owned land area was 1,848,400 ha (table 1), representing approximately 73.9% of the agricultural land.

The agricultural land dominates in the land fund, by 2,500,100 ha (73.87% of the total), of which 1,848,400 ha (73.93% of total agricultural land) in private ownership. Among public agricultural land, pastures are dominating (52.7%), followed by arable land (40.6%); while among private agricultural land, the arable land (85.9%) and perennial plantings (14%) are dominating.

Table 1 – Agricultural land (January 1, 2014)

Item	Total		*din care:*			
			Publică		Privată	
	mii ha	%	mii ha	%	mii ha	%
Agricultural land - total, *of which:*	2500.1	100	651.7	100	1848.4	100
- arable land	1816.1	72.6	264.7	40.6	1551.4	85.9
- perennial plantations, *of which:*	295.3	11.8	37.5	5.8	257.8	14.0
- orchards	135.8	5.4	21.8	3.3	114.0	6.2
- vineyards	141.2	5.6	8.2	1.3	133.0	7.2
- pastures	348.0	13.9	343.4	52.7	4.6	0.2
- hayfields	2.0	0.1	1.5	0.2	0.5	0.0
- fallow	38.7	1.6	4.6	0.7	34.1	1.9

Source:Statistical Yearbook of Rep. Moldova

2. Human potential

The statement of Adam Smith (1992) that human activity creates the mass of applies to the man in the village as well, who, through work, over time, has shaped the rural space as needed and is applying it to achieve the goal that "consists of the peasant's social and economic protection", which requires the study of human potential contribution to rural development (Certan&Certan, 2012).

Total population in our country is decreasing slightly, from 4.3616 million people in 1990 (table 2) to 4.3479 million in 1995, and this is due to the reducing population's natural increase from 8.0 ‰ to 0.8 ‰. Further reduction of the population in 2000 down to 3.6441 million after 1996 is because statistics did not include anymore residents in the districts from the left side of the river Nistru. After the year 2000 the population continues to decline, reaching 3.5576 million in 2014, due both to declining natural increase and emigration.

Table 2 – Resident population, by residential area

Year	Population (thousand inhabitants)			% in total		natural increase (‰)		
	Total	urban	rural	urban	rural	total	urban	rural
1990*	4361.6	2069.3	2292.3	47.4	52.6	8.0	9.3	6.6
1995	4347.9	2033.0	2314.9	46.8	53.2	0.8	1.5	0.2
2000	3644.1	1514.2	2129.9	41.5	58.5	-1.1	-0.4	-1.8
2005	3600.4	1476.0	2124.4	41.0	59.0	-1.9	-0.4	-3.0
2010	3563.7	1476.7	2087.0	41.4	58.6	-0.9	1.1	-2.3
2011	3560.4	1481.7	2078.7	41.6	58.4	0.0	1.4	-1.0
2012	3559.5	1485.7	2073.8	41.7	58.3	0.0	1.4	-1.1
2013	3559.5	1492.2	2067.3	41.9	58.1	-0.1	0.9	-0.8
2014	3557.6	1503.0	2054.6	42.2	57.8	-0.2	0.6	-0.9

Note: * Data are for the whole country

Source: authors'calculations based on the Statistical Yearbooks of Rep. Moldova

The rural population dominates. The share of the rural population increased from 52.6% in 1990 to 59.0% in 2005, then had a clear decreasing trend, down to 57.8% of the total population in

2014. It is significant that after 2005 the urban population is growing, which is due to internal migration from rural to urban.

The natural increase in urban areas is higher, varying between 9.3‰ in 1990 to -0.4‰ in 2005. In rural areas it decreased from 6.6‰ in 1990 to -1.8‰ in 2000 and subsequently it has negative values only. On January 01, 2014, the rural population was 2,054,600 persons (57.8% of total). The aging coefficient was 15.7%, exceeding the demographical aging rate (12%) measured on the G. Bojio- Gamier scale.

The number of active persons decreased from 1.696 million in 1995 (table 3) down to 1.236 million in 2013 (by 27.13%). The activity rate decreases more intensely, from 47.1% in 1995 down to 34.7% in 2013 (by 12.4%).

Table 3 - Distribution of population by participation in economic activity in Rep. Moldova

Item	1995	2000	2005	2010	2011	2012	2013
Population – total, *of which:*	3604	3639	3595	3582	3560	3560	3558
- economically active population (thousand pers.)	1696	1655	1422	1235	1258	1215	1236
- activity rate (%)	47.1	45.4	39.5	34.7	36.3	34.1	34.7
Population employed in economy (thousand pers.)	1673	1515	1319	1143	1173	1147	1173
- employment rate (%)	46.5	41.2	36.6	32.1	33.0	32.2	32.9
Population employed in agriculture (thousand pers.)	710	765	537	315	323	303	338
- employment rate in agriculture (%)	42.8	50.5	40.7	27.5	27.5	26.4	28.8
Number of persons that left the country	5432	9128	6827	4714	3920	3062	2585

Source: authors'calculations based on the Statistical Yearbooks of Rep. Moldova

The number of people employed in the economy decreased from 1.673 million in 1995 down to 1.173 million in 2013 (by 29.9%). The number of people employed in agriculture has decreased even more drastically, from 711 thousand in 1995, down to 338 thousand in 2013 (2.1 times), and the employment rate in agriculture decreased from 42.8% in 1995 down to 28.8% in 2013.

The number of people that left the country increased from 5432 persons in 1995 to 9128 in 2000, and then steadily declined, down to 2585 persons in 2013.

Total employment in the national economy decreased from 1.2472 million in 2007 (table 4) down to 1,1728 million persons in 2013 (by about 6%), while those employed in rural areas decreased from 698,600 persons in 2007 (56% of total employment), down to 622,300 persons (53% of total employment) in 2013. The number of people employed in agriculture in rural areas decreased from 392.1 thousand persons (56.1% of all employment in rural areas) in 2007, down to 317,3 thousand persons (51.0%) in 2013. Very few (8.2% in 2007 and 8.5% in 2013) are employed in the industry.

Table 4 – Employment, by residential area and age groups (thousand persons)

Item	Total		*of which,* by age groups:											
			15-24 years		25-34 years		35-44 years		45-54 years		55-64 years		65 years and over	
	2007*	2013	2007	2013	2007	2013	2007	2013	2007	2013	2007	2013	2007	2013
Active population	1313.9	1235.8	140.5	118.5	263.0	318.1	324.2	290.8	372.5	310.4	168.3	173.3	45.5	24.5
Employment	1247.2	1172.8	120.2	104.3	247.7	298.7	310.5	277.8	359.8	298.8	163.7	168.8	45.4	24.4
- in rural areas	698.6	622.3	65.8	59.5	115.1	130.3	173.8	146.2	206.2	175.2	99.9	94.4	37.5	16.6
of which: - in agriculture	392.1	317.3	26.5	25.9	56.3	55.4	89.3	71.5	115.3	92.2	68.7	57.4	35.9	14.9
- in industry	57.4	53.1	10.7	6.8	11.5	14.1	15.0	15.2	15.1	12.4	5.0	4.6	0.0	0.0

Note: *2007 is the first year when the National Bureau of Statistics of Rep. Moldova releases this information

Source: authors'calculations using data from „Labour in Rep. Moldova. Employment and unemployment", National Bureau of Statistics, Chişinău, Rep. Moldova, 2007, 2014

The share of young people aged 15-34 employed in the national economy in 2007 was 29.5%, while those employed in rural areas was 25.9%; while the respective shares were in 2013 34.4% and 30.5% respectively. We are happy that the share of young people coming into agriculture increased in this period from 6.7% to 8.1%, but it remains insufficient.

Employment in the private sector increased from 871.1 thousand persons (69.8% of total) in 2007 (table 5) to 876.9 thousand persons (74.0% of total) in 2014.

The number of people employed in the private sector in rural areas increased from 530.9 thousand persons (76.0% of total) in 2007, to 504.5 thousand persons (78.0% of total) in 2014. Most of those in the private sector are employed in agriculture, accounting for 72.5% in 2007 and 67.7% in 2014 of total employment in the private sector in rural areas. In the public sector only those employed in public administration, education, health and social assistance are dominant.

Table 5 – Employment by economic areas and ownership (thousand persons)

Item	2007			2014		
	total	private	public	total	private	public
Total employed population	1247.2	871.1	326.5	1184.9	876.9	307.9
Population employed in rural areas, *of which in:*	698.6	530.9	153.0	646.9	504.5	142.4
- agriculture, hunting and forestry	392.1	384.8	3.8	344.6	341.4	3.2
- industry	57.4	41.8	6.9	55.3	51.4	3.8
- constructions	32.5	31.5	0.0	32.1	31.5	0.0
- wholesale, retail, hotels and restaurants	53.3	50.2	1.9	57.1	53.9	3.2
- transportation and communications	21.6	10.6	10.9	21.1	11.3	9.8
- public administration, education, health and social assistence	124.3	2.9	121.1	112.8	2.1	110.7

Source: authors'calculations using data from „Labour in Rep. Moldova. Employment and unemployment", National Bureau of Statistics, Chişinău, Rep. Moldova, 2009.

Totalul salariaţilor s-a micşorat de la 831,7 mii persoane (66,7% din totalul celor ocupaţi) în 2007 (tabelul 6) la 797,6 mii persoane (67,3% din totalul celor ocupaţi) în 2014 (cu 4,1%). Cu circa 8% s-a micşorat numărul salariaţilor din mediul rural. În ambele cazuri s-a redus şi numărul lucrătorilor pe cont propriu.

All employees (wage earners) decreased from 831.7 thousand persons (66.7% of those employed) in 2007 (table 6) to 797.6 thousand persons (67.3% of those employed) in 2014 (by 4.1 %). The number of employees in rural areas decreased by about 8%. In both cases the number of self-employed workers decreased as well.

Table 6 – Employment by main economic activities (thousand persons)

Item	Total, *of which:*		wage earners		self-employed workers		unpaid family workers	
	2007*	2014	2007	2014	2007	2014	2007	2014
Total employment	1247.2	1184.9	831.7	797.6	375.2	350.3	29.0	27.8
Employment in rural areas, *of which in:*	698.6	646.9	355.4	326.9	313.5	288.7	27.5	27.8
– agriculture, hunting and forestry	392.1	344.6	82.5	64.4	283.3	252.1	26.1	27.7
– industry	57.4	55.3	54.6	52.7	2.4	2.6	0.0	0.0
– constructions	32.5	32.1	15.7	11.0	16.4	21.2	0.0	0.0
– wholesale, retail, hotels and restaurants	53.3	57.1	42.4	46.9	8.3	7.3	0.0	0.0
– transportation and communications	21.6	21.1	19.3	17.6	2.3	3.4	0.0	0.0
– public administration, education, health and social assistance	124.3	112.8	124.2	112.3	0.0	0.0	0.0	0.0
– other activities	17.3	23.8	16.7	22.0	0.0	1.7	0.0	0.0

Note: *2007 is the first year when the National Bureau of Statistics of Rep. Moldova releases this information

Source: authors'calculations using data from „Labour in Rep. Moldova. Employment and unemployment", National Bureau of Statistics, Chişinău, Rep. Moldova, 2009, 2014

The number of wage earners and self-employed workers decreased in all branches except those employed in wholesale and retail trade, hotels and restaurants: the number has increased by 7%, while those involved in other activities decreased by 37%.

In terms dictated by competition economy, by the increased dynamics of change, proficient employees and self-employed workers are needed (Gavrilescu, 1997). That proficiency, according Boettinger, is acquired through "methods handed down from teacher to student ...", through education, which ultimately is contributing to providing the country, including our villages, with productive and efficient people. Making people productive through education, says Peter Drucker, "is the first of the challenges of our age".

The total employed population with higher, vocational special secondary and secondary education, in other words with vocational training are about two thirds (table 7) and vary unsignificantly from 62.8% in 2013 to 62.98% in 2010. Shares are different when analysing the share of population with higher, vocational special secondary and secondary education in total self-employed workers, which are 35.47%, respectively 44.34% in the analyzed years; while the shares are 36,62% în 2008 şi 39,37% în 2010 in the total of those working in agriculture, hunting and fishery.

In total employment, the number of those with higher education increased from 20.4% in 2008 to 25.3% in 2013. Definitely lower is the share of self-employed people with higher education, even if it increased from 4.12% in 2008 to 5.85% in 2013. Even lower (3.27% in 2008, 3.84% in 2010 and 4.00% in 2013) is the share of those with higher education in total employment in agriculture, hunting and fishery. Obviously, the quality of education at all levels, of higher education included, should match the requirements of the day regarding the training of productive and efficient people (Rusu, 2005).

Table 7 – Employment, by education level (thousand persons)

Item	**Year**	**Total**	***of which*, with education:**					
			higher	**special secondary**	**professional secondary**	**highschool**	**secondary**	**primary, no education**
Employment, total, *of which:*	2008	1251.0	255.7	206.3	319.0	252.3	203.0	148.0
	2010	1143.4	262.8	180.2	277.2	236.8	178.1	8.3
	2013	1235.8	312.7	180.8	274.9	238.2	220.5	8.8
– self-employed workers	2008	358.9	14.8	35.2	97.3	95.0	106.1	10.0
	2010	297.0	14.7	26.4	90.6	79.4	81.6	4.3
	2013	332.4	19.4	22.0	76.5	60.9	96.2	4.8
– in agriculture, hunting and fishery	2008	388.6	12.7	30.1	99.5	105.1	128.3	12.9
	2010	314.7	12.1	24.8	87.1	84.3	99.6	6.7
	2013	337.9	13.5	29.4	87.9	78.5	122.1	6.5

Source: authors'calculations using data from „Labour in Rep. Moldova. Employment and unemployment", National Bureau of Statistics, Chişinău, Rep. Moldova, 2009, 2011, 2014

The man from the village, over time, through work, has shaped the rural area according to its needs which, according to the concept of agrarian reform and social and economic development of the village, "consists in the peasant's social and economic protection", involving the following functions specified in the "*European Charter of rural areas*" (1995):

a) *economic*, which includes sustainable use of natural resources, development of an efficient agricultural production system, promote tourism and other services;
b) *organic*, which means protecting the natural bases of healthy life (land, air, water), maintaining the diversity and the specific character of the landscape, preserving biological systems;
c) *socio-cultural*, which refers to preserving community and cultural traditional values linked to the rural way of life, to preserving the values embodied in rural communities.

3. The evolution of the economy in the rural areas

Agriculture, for any country, including for Rep. Moldova was and remains the most present economic activity in rural areas, even if the contribution of agriculture to GDP decreased from 36.14% in 1990 (table 8) down to 15.23% in 2014.

Table 8 – Contribution of economic activities to the GDP formation

Item	1990	1995	2000	2005	2010	2011	2012	2013	2014
GDP, in comparable 2005 prices (USD billion)	5.96	2.39	2.12	2.99	3.50	3.73	3.70	4.05	4.21
PIB per capita (USD), *of which in:*	1613	650	583	831	983	1047	1040	1138	1191
- agriculture	36.14	33.02	29.03	19.53	14.45	14.26	13.43	14.29	15.23
- industry	36.65	32.15	21.72	16.34	15.91	16.84	16.71	17.11	16.69
- services	27.21	34.83	49.25	64.13	69.64	68.90	69.86	68.60	68.08

Sursa: calculele autorilor pe baza datelor Băncii Mondiale (http://data.worldbank.org/indicator)

The global agricultural production obtained in the public sector ranges from MDL1,022 million (9.9% of the total) in 1995 (table 9) to MDL 88 million (0.97% of total) in 2005, then, if calculated in comparable 2005 prices decreases from MDL 117 million (0.94% of total) in 2005 down to MDL 42 million (0.42% of total) in 2012.

Table 9 – Global agricultural production in comparable 2005 prices (MDL billion)

Item	1995*	2000*	2005*	2005**	2010**	2011**	2012**
Total, *of which:*	10293	7919	9080	12402	12147	12758	9909
- public	1022	98	88	117	79	66	42
- private, *of which in:*	9271	7819	9092	12285	12068	12692	9867
- colective (cooperatives)	5143	2034	2652	3508	3813	4054	3191
- farms	240	2434	6440	8777	8255	8638	6676
- households	3888	3351					

Notes: * in comparable 2000 prices
** in comparable 2005 prices

Source: Statistical Yearbooks of Rep. Moldova

In the private sector, the agricultural production coming from households and farms holds the largest share, increasing from 44.5% in 1995 to 71.4% in 2005, then decreasing to 67.7% in 2012.

But even in the most unfavorable year (2012), the households and farms, while holding about 43.8% of agricultural land only, achieved 67.37% of the total agricultural production in the country: 58% of crop productionand about 87% of animal production.

The situation in agriculture is largely influenced by investments. Total investments in fixed assets for agricultural production increased from MDL 90.7 million in 1995 (table 10) to MDL 1785.1 million in 2013 (about 20 times).

Table 10 - Investments in fixed assets for development of agriculturii (MDL million)

Item	1995	2000	2005	2010	2011	2012	2013
Investments in fixed assets for agricultural production, *of which:*	90.7	58.9	425.1	1045.6	1808.2	1641.8	1785.1
- in the public sector	25.5	8.2	42.9	30.8	47.5	46.1	32.8
- in the private sector	64.5	46.2	341.0	862.5	1444.1	1434.7	1647.8
- in the mixed sector (public and private)	0.7	3.8	6.4	0.9	3.0	0.7	0.5
- in joint ventures enterprises	-	0.3	30.3	123.2	234.5	92.4	26.4
- in enterprises belonging to foreign investors	-	0.4	4.5	28.1	78.9	67.9	77.5

Source: authors' calculations based on information selected from http://www.statistica.md

In the analyzed years, investment in agriculture increased 1.29 times in the public sector and 25.5 times in the private sector. The contribution of foreign investors increased 194 times, but its share in total investment in 2013 was 4% only, which is far too low.

After independence major changes have occurred in branches contribution to total agricultural production. During 1995-2013 crop production dominates, its share varying between 61.5% in 2012 (table 11) and 72.3% in 2013. Cereals are the main crop, with an increasing share, from 17.9% in 2012 to 28.8% in 2013.

Table 11 - Structura producţiei agricole pe ramuri în gospodăriile de toate categoriile (%)

Specificare	1995	2000	2005	2010	2011	2012	2013
Total agricultural production, *of which:*	100	100	100	100	100	100	100
- crop production, of which:	*70.0*	*69.0*	*68.9*	*66.2*	*71.7*	*61.5*	*72.3*
- cereals	19.0	25.0	22.9	18.8	28.0	17.9	28.8
- vegetables	7.0	5.0	7.3	7.4	8.1	6.0	5.5
- fruit, nuts, shrubs	7.0	3.0	4.4	3.9	6.8	6.7	5.4
- grapes	9.0	12.0	12.8	12.1	6.1	10.4	9.0
- animal production,of which:	*30.0*	*31.0*	*31.1*	*33.8*	*27.9*	*38.5*	*27.7*
- meat	16.0	14.0	14.8	18.9	14.5	21.5	15.4
- milk	10.0	13.0	10.9	10.2	10.0	11.1	8.0
- eggs	3.0	4.0	4.4	4.0	3.3	4.2	3.0

Source: authors' calculations based on the Statistical Yearbooks of Rep. Moldova

If in the 90's of last century the share of fruit was 17%, their share varied from 3.0% in 2000 to 6.8% in 2013, following the rule of fruitfullness alternation (a fruitful year followed by a less fruitful year). In the less productive years, the cumulative share of vegetables, fruit, nuts, shrubs and grapes is lower than the share of cereals. In animal production structure, which is ranging from 27.7% in 2013 to 38.5% in 2012, meat production is dominating (14% in 2000 and 21.5% in 2012).

Mutations that occurred in the agricultural production structure shows a decreasing trend of the share of intensive crops such as grapes, fruits, vegetables, tobacco etc. and increasing the share of products requiring small amount of capital such as wheat, maize, sunflower and others.

The export of agrifood products decreased from USD 584.7 million in 1996 (table 12) down to USD 291.0 million in 2000, then increased to USD 582.9 million in 2005. In the years 2005-2013, the value of exported agrifood products increased 2.8 times. If in 1996 foods prevailed (77.6%), followed by vegetable products (11.6%), animals and animal products (10.3%), in 2013 crop products held the largest share (49.9%), followed by foods (42.1%), and alcoholic and soft drinks (24.8%).

Table 12 – Foreign trade (USD million)

Item	1996	2000	2005	2010	2011	2012	2013
Total exports	795.0	471.5	1090.9	1541.5	2216.8	2161.9	2428.3
Total imports	1072.3	776.4	2292.3	3855.3	5191.3	5212.9	5492.4
General trade balance	-277.3	-304.9	-1201.4	-2313.8	-2974.5	-3051.0	-3064.1
Agrifood exports	584.7	291.0	582.9	732.2	917.1	878.9	1015.5
Agrifood imports	142.9	109.6	279.6	591.4	687.8	743.3	783.8
Agrifood trade balance	+441.8	+181.4	+303.3	+140.8	+229.3	+135.6	+231.7

Source: authors' calculations based on information selected from http://www.statistica.md

The share of agrifood exports in total national exports dropped from 73.55% in 1996 to 61.4% in 2000, to 53.42% in 2005 and to 41.82% in 2013, but the agrifood trade balance remained positive throughout those years. Structural changes occurred in the agrifood exports over the years. If in 1996 foods were prevailing (by 77.6%) (table 13), followed by crop products (11.6%), animals and animal products (10.3%), in 2013 the crop products took the largest share (49.9%), followed by foods (42.1%) and alcoholic beverages and soft drinks (24.8%).

Table 13 – Value of exported agrifood production (USD million)

Item	1996	2000	2005	2010	2011	2012	2013
Total agrifood exports, *of which:*	584.7	291.0	582.9	732.2	917.1	878.9	1015.5
- live animals and animal products	60.03	22.8	17.2	27.0	38.0	37.8	37.2
- crop products, *of which:*	67.70	65.9	131.9	340.7	471.0	360.5	507.0
- vegetables	*3.86*	*1.83*	*4.80*	*8.77*	*24.53*	*16.97*	*12.55*
- edible fruit	*28.82*	*22.30*	*60.88*	*167.62*	*186.96*	*202.32*	*203.97*
- fats and oils	3.37	3.9	37.8	47.6	77.5	89.7	44.04
- foods, *of which:*	453.63	198.4	396.0	316.9	330.6	390.9	427.3
- sugar	*58.58*	*3.12*	*7.52*	*29.06*	*14.58*	*35.02*	*30.54*
- vegetables and fruit preparations	*77.51*	*29.30*	*46.48*	*52.27*	*68.77*	*60.37*	*76.07*
- alcoholic and soft drinks	*224.13*	*128.02*	*314.55*	*178.19*	*181.31*	*214.97*	*252.3*
- tobacco	*76.76*	*30.56*	*11.89*	*27.16*	*28.72*	*34.21*	*25.51*

Source: authors' calculations based on information selected from http://www.statistica.md

The largest increase in exports was for crop products, from USD 67.7 million in 1996 to USD 507 million in 2013 (7.5 times). Export of edible fruits increased from USD 28.82 million in 1996 to USD 203.97 million in 2013 (7 times) and of vegetables from USD 3.86 million in 1996 to USD 12.55 million in 2013 (3.25 times). However, tobacco and sugar exports decreased sharply from USD 76.76 million in 1996 (1.9 times), down to USD 25.51 million in 2013 (about 3 times).

Changes occurred in the structure of agrifood imports as well. Foods are prevailing, even if their share in total agrifood imports decreased from 57.48% in 1996 (table 14) to 51.48% in 2013.

Table 14 – Value of imported agrifood production (USD million)

Item	1996	2000	2005	2010	2011	2012	2013
Total agrifood imports, *of which:*	142.9	109.6	279.6	591.4	687.8	743.3	783.8
- live animals and animal products	16.62	10.7	57.2	94.7	107.8	130.3	146.8
- crop products, *of which:*	41.12	25.3	65.0	168.8	199.1	204.6	203.5
- vegetables	*13.04*	*4.34*	*8.72*	*30.17*	*38.49*	*33.80*	*32.49*
- edible fruit	*2.11*	*3.25*	*17.69*	*58.02*	*68.45*	*66.73*	*67.05*
- fats and oils	3.04	2.4	9.9	19.3	25.1	28.4	30.02
- foods, *of which:*	82.14	71.2	147.5	308.6	355.8	380.0	403.5
- sugar	*25.20*	*3.24*	*6.81*	*12.54*	*23.01*	*30.78*	*37.68*
- vegetables and fruit preparations	*1.54*	*1.35*	*13.60*	*22.72*	*25.12*	*24.43*	*26.26*
- alcoholic and soft drinks	*29.66*	*5.09*	*34.02*	*44.95*	*50.29*	*68.28*	*76.07*
- tobacco	*12.30*	*54.36*	*38.91*	*91.44*	*92.89*	*83.04*	*78.18*

Source: authors' calculations based on information selected from http://www.statistica.md

The import edible fruit increased significantly, from USD 2.11 million in 1996 to USD 67.05 million in 2013 (about 32 times), as well as the import of vegetables and fruit preparations (about 17 times), live animals and anim al products 8.8 times), tobacco (6.4 times) and crop products (4.9 times), which confirms the intensification of exchanges.

If our country intends to boost exports, it should orient the economic exchanges vector towards the more stable market, towards the market offering higher prices.

Achieving the economic function in rural areas includes promoting tourism as well (Wiener & Diez, 2009). Characteristic for our country is the domination tourist exports over imports. In 1995, the total number of departures abroad was 2.17 times higher than that of arrivals of foreign visitors to Moldova, in 2000 it was 1.82 times higher, and 2.28 times in 2005, then increased sharply (13.09 times) in 2010; subsequently remained virtually at the same level reached in 2013 (11.98 times).

Arrivals of foreign visitors to our country in 1995 for holiday and leisurere was about 10% of the total; in 2005 it increased to 31.2%, and subsequently decreased to 25.1% in 2013. Of course, the number of foreign visitors to the country for holiday and leisure is very modest.

For any state, extremely important it is that the number of visitors in their own country to surpass that of those going abroad. The inland movement of residents as compared to their departures abroad increased from 23% in 1995 to 82.3% in 2000, to 106.2% in 2005, then decreased to 30.4% in 2010 and to 21.7% only in 2013.

Tourism is greatly affected by the accommodation facilities. The number of places in touristic and agro-touristic boarding houses increased from 210 in 2005 (table 15) to 867 in 2013.

Table 15 – Indicators of the hotel industry in rural areas in Rep. Moldova

Item	2005	2010	2011	2012	2013
No. of places in touristic and agro-touristic boarding houses	210	743	813	905	867
No. of places in holiday villages	4833	5165	4519	4473	4685
No. of tourists accomodated in touristic and agro-touristic boarding houses	1807	13290	11701	11570	11526
- of which foreigners	1003	2383	2417	3881	4363
No. of tourists accomodated in holiday villages	47889	18386	25826	39522	33027
- of which foreigners	74	2171	3231	3781	4823
No. of overnight stays of tourists in touristic and agro-touristic boarding houses	3799	43583	37317	36895	34513
- of which foreigners	2492	7219	8482	15240	15380
Nr. of overnight stays of tourists in holiday villages	143163	45433	54109	119797	108509
- of which foreigners	518	5354	9318	9013	11659

Source: authors' calculations based on information selected from http://www.statistica.md

The number of tourists involved in the internal tourism in our country increased from 16,400 in 1995 to 60,800 in 2005 (3.7 times) and then decreased to 35,600 in 2010 (1.7 times), and it remained at this level until now.

The concept of agrarian reform and social and economic development of the village was foreseeing for the rural area "location of departments and divisions of city industrial enterprises". If the total industrial production value increased from MDL 15,427.9 million in 2003 (table 16) to MDL 39,024.3 million in 2013 (2.5 times), in the rural localities it increased 2.65 times. But even this increase is far too insufficient for the rural areas of our country.

Table 16 – Value of industrial production (MDL million)

Item	2003	2005	2010	2011	2012	2013
Total, *of which:*	15427.9	20148.1	28140.1	34194.4	36362.2	39024.3
- in Chişinău municipality	8555.6	10807.7	16171.6	20142.9	21506.9	22590.7
- in Bălţi municipality	1895.1	2225.0	3042.8	3456.8	3774.8	3207.6
- in localities in rural space	4977.2	7115.4	8925.7	10595.0	11080.5	13226.0

Sursa: Calculele autorilor în baza informaţiei selectate de pe http/www.statistica.md

Roads, especially local ones, are causing major difficulties. At the end of 2013, out of 9343 km of public roads, the national roads accounted for 3335 km (35.7%) and the local roads 6008 km (64.3%), of which 5474 km paved (58.6%). Both national and local roads are low quality.

For rural economy in our country, protection of earth, air and water remains extremely important to ensure a healthy life. One of the main tasks of our country is maintaining the diversity and the specific character of the landscape, and preserving the biological systems. Both the natural foundations of healthy life and of biological systems are poor.

Total investment in long-term tangible assets for environmental protection and rational use of natural resources varies, with an increasing trend from MDL 6,060 million in 2000 (table 17) to MDL 72,369 million, current prices in 2014 (about 12 times).

If in 2000, 2010 and 2011 the investments for protection and rational use of land dominated, representing 77.9%, 47.4% and 49.0% of total investments, in 2005, 2012, 2013 and 2014,

investments for protection and rational use of water resources accounted for 52.5%, 20.7%, 59.7% and 60.7% respectively of total investments.

Table 17 – Investments in long-term tangible assets for environment protection and rational use of natural resources (MDL thousand, current prices)

Item	2000	2005	2010	2011	2012	2013	2014
Total, *of which for:*	6060	43939	41521	31050	73479	65955	72369
- protection and rational use of water resources	1315	23062	14250	14819	15196	39377	43938
- protection and rational use of land	4723	20877	19698	15208	9789	22810	26312
- protection of air	-	-	0.0	0.0	45477	1694	-
- other	22	-	7572	1022	3018	2073	2119

Sursa: Calculele autorilor în baza informaţiei selectate de pe http/www.statistica.md

Investments in air protection were more consistent (61.9% of total) in 2012 only. But investment for environmental protection are insufficient.

In general, the economy of the rural area, does not ensure, unfortunately, the achievement of the concept "to provide labor utilization in the village (especially youth) and regulation of migration processes" and obviously influenced the social and cultural development of the village in our country.

4. Social and cultural development of the villages

The social and cultural development of the village, under the concept of agrarian reform and social and economic development of the village is "achieved by accelerated development of the social sphere of the village, by improving working conditions, as well as the material and spiritual life of the rural population".

The nucleus of social structure in rural areas, as stated in the document, is the family, and has set not accidentally that "a system of measures is developed in order to improve the working and living conditions of the peasant family". Although rural disposable income (monthly average per person) increased from MDL 723.8 in 2006 (table 18) to MDL 1406.1 in 2013, it does not cover the minimum subsistence level which in 2013 was MDL 1612.3.

Table 18 – Disposable income

Item	2006	2013	2006	2013	2006	2013
Disposable income, monthly average per person (MDL), *of which:*	839.6	1681.4	1000.8	2046.3	723.8	1406.1
- from wages	41.6	41.6	57.1	53.8	26.1	28.3
- from self-employment in agriculture	18.6	9.1	2.6	1.1	34.5	17.8
- from self-employment in non-agricultural activities	7.8	6.9	10.4	7.6	5.2	1.1
Population with monthly average income lower than 1600 MDL (%)	90.8	71.8	85.8	52.9	94.3	86.1

Source: authors'calculations based on „Aspects regarding the living standard of the population", www.statistica.md.

The share of population with average monthly income per person lower than 1600 MDL decreased from 90.8% in 2006 to 71,8% in 2013 (by 19%), while in rural areas it decreased from 94.3% in 2006 down to 86.1% (by 8.2% only), which means 2.3 times slower.

It is natural that this situation reflected on consumer spending. Food expenditures, even if reduced from 44.4% in 2006 (table 19) at 42.8% in 2013, remain dominant. This expenditure in rural areas exceeds both the national average and those in urban areas, where their share increased from 39.6% in 2006 to 41% in 2013.

Home related expenditurea are increasing from 18.4% in 2006 to 22.7% in 2013, while the expenditures for health and medical care increased from 5.3% in 2006 to 5.7% in 2013. One shoud highlight that the expenditures for education are lower than those for alcoholic beverages.

Table 19 – Structure of households consumption expenditures (%)

Item	Total, *of which:*		in urban area		in rural area	
	2006	2013	2006	2013	2006	2013
Total consumption expenditures, *of which for:*	100	100	100	100	100	100
- food	44.4	42.8	39.6	41.0	48.8	44.9
- alcoholic beverages	2.8	1.6	2.1	1.3	3.4	1.8
- clothing and footwear	11.9	10.3	11.6	9.1	12.1	11.6
- home maintenance	13.7	19.1	13.1	20.3	14.2	18.0
- home endowment	4.7	3.6	4.9	3.3	4.5	3.9
- health and medical care	5.3	5.7	5.4	5.5	5.1	6.0
- education	0.4	0.8	0.7	1.0	0.2	0.7

Source: authors'calculations based on „Aspects regarding the living standard of the population", www.statistica.md.

Food expenditures influenced the consumption structure and quantity. For example, consumption of bread and bakery products decreased from 129.7 kg/person/year in 2006 (table 20) down to 110.0 kg/person/year in 2013 (by 19.7 kg/person/year). The consumption of these products decreased sharper in rural areas (by 34.8 kg/person/year).

Table 20 – Consumption of food products (kg/person/year)

Item	Total, *of which:*		in urban area		in rural area	
	2006	2013	2006	2013	2006	2013
Bread and bakery products	129,7	110,0	94,7	98,9	153,1	118,3
Meat and meat products	37,0	41,6	34,0	46,4	39,2	37,9
Milk and dairy products	179,0	219,9	189,8	250,9	171,3	196,5
Vegetable oil (liters/person/year)	12,3	12,4	9,8	12,3	14,0	12,5
Eggs (pieces/person/year)	180,0	178,7	172,0	202,5	186,0	160,8
Sugar	15,4	16,6	15,0	16,9	15,8	16,4
Fish and fish products	11,7	16,2	11,0	15,9	12,3	16,1
Potatoes	50,1	48,3	44,8	50,1	53,9	47,0
Vegetables and melons	59,1	109,2	56,0	110,0	61,3	108,5
Fruits and berries	28,0	49,1	27,8	53,1	28,2	46,1

Source: authors'calculations based on „Aspects regarding the living standard of the population", www.statistica.md.

Consumption of meat and meat products in 2006-2013 increased from 37.0 to 41.6 kg/person/year, but in rural areas decreased from 39.2 to 37.9 kg/person/year. Even if it increases from 28 kg/person/year in 2006 to 49.1 kg/person/year in 2013, the consumption of fruits and berries remains far too low.

Households in rural areas are even less equipped in 2014 with durables than the urban ones. If in urban areas 98.2% of all households are equipped with TVs, 97% with refrigerators and freezers, 55.5% with computers, 72.2% with automatic washing machines, and 74.4% with vacuum cleaners, in the rural areas the endowment degree is much lower: 95.2% with TVs, 87.3% with refrigerators and freezers, 31.6% with computers, 25.4% with automatic washing machines and 40.7% with vacuum cleaners.

Some 72.4% of urban households and only 23.4% in rural areas have hot water, and 19.8% and 0.0% respectively from centralized distribution. Only 39.8% of urban households and 0.5% in rural areas enjoy central heating. The situation is similar for gas network, bathrooms, sewerage, etc.

The main pillar of the social and cultural development is education. Net enrollment rate in preschool education increased faster nationally from 68.6% in 2005 to 81.6 in 2013 (by 13%), as compared to that in rural areas, where it increased from 59.1% to 70.1% (by 11% only) respectively. The number of day schools, gymnasiums and high schools located in rural areas fell from 1351 in 2004/2005 to 1189 in 2013/2014. The total number of students in those years dropped from 546,615 to 352,053 (by 35.6%) in urban areas, while in rural areas it fell from 418,115 (309 students per school on average) to 259,691 (218 students per school on average) (by 37.9%).

Another pillar of the social and cultural development is health care. According to official statistics (table 21), healthcare indicators in rural areas are largely similar to those at national level.

Table 21 – Health care indicators

Item	2005	2010	2011	2012	2013
Number of physicians, total	12577	12780	12914	12934	12934
- of which in rural areas	9639	10051	10189	10223	10223
Number of paramedical personnel, total	27966	27519	27445	27407	26781
- of which in rural areas	23514	22793	22868	22772	22092
Number of beds in hospitals, total	22961	22021	22031	22162	20760
- of which in rural areas	19451	18471	18451	22162	17160
Number of personnel in ambulance stations, total	2814	3298	3349	3307	3313
- of which in rural areas	865	977	976	927	907
Number of visits to doctor per 1000 inhabitants	254	283	279	271	271
- of which in rural areas	202	251	250	242	237

Source: authors'calculations based on the Statistical Yearbook of Rep. Moldova

The social and cultural transformations in the village should be directed, as shown in the concept, to the rebirth and development of cultural, national and historical traditions. The number of libraries in rural areas remained at the same level in 2005-2013, but the number of visits fell from 6.0 million in 2005 to 3.7 million in 2013. The number of cultural institutions and the number of seats in the rural areas remained at the same level, but require renovation. Cultural and historical sights of the countryside as the monastery "Assumption of the Virgin Mary" in Căpriana, the Orhei museum complex, the castle "Soroca" and others have been renovated, and others will be brought to an acceptable condition.

CONCLUSIONS

Both provisions of social-economic development of the villages, part of the concept of agrarian reform and social and economic development of the village and the National Programme "Moldovan Village" were achieved in very modest proportions, and the development of the Moldovan villages is poor.

We think that establishing a program for a realistic development of the Moldovan villages is imperatively necessary, starting with from possibilities, aimed at making the rural economy efficient, which is the foundation of formation of a social and cultural sphere matching the European standards.

Therefore, it is recommended the program to include:

- mobilization and judicious use of human, natural and material capital;
- modernizing and adjusting agriculture to the requirements of competitive economy, promoting a system of effective and efficient agricultural production, consolidation of farms to generate the food that would ensure the producers' welfare;
- environmental and specific rural cultural heritage protection;
- preservation and transmission of specific traditional crafts;
- improvement of the business climate and supporting small farmers;
- ensuring a favorable investment climate for business development;
- development of institutional system and effective economic mechanisms of legal regulation of activities in rural areas;
- vocational education of human resources in rural areas;
- training of farmers and providing advice to owners and managers in agriculture.

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MED-ARB AND ARB-MED PROCEDURES IN CONFLICTS AMONG PROFESSIONALS IN AGRICULTURE

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Abstract: *Disputes among professionals in agronomy are generally caused by failure in performing a contract, most often the result of unclear formulations or of some flaws in drafting a contract. These arise from a failure to observe objective law, the non-satisfaction of subjective law and a failure to perform one's obligations. These are moments when Med-Arb is needed to resolve disputes and preserve business relationships between farmers. First, we must emphasize that the ADR (Alternative Dispute Resolution) phenomenon is far smaller in Romania when compared to the United States of America (a leader in the field, as previously shown), but also as to any other West European country that holds a tradition in the field. The ratio between classical state justice and alternate methods for dispute resolution is overwhelmingly in favour of the former. Thus, from data provided by the Superior Council of Magistracy, in 2014, at a national level, there were over 4,200,000 cases on the docket before courts of law and only 800-900 cases before The Romanian Court of International Commercial Arbitration. As regards mediation, The Mediation Council declared several thousand mediations carried over 2014. The purpose of this paper is to carry out an analysis on out-of-court alternatives for dispute resolution in business relationships among agribusiness professionals or between agribusiness professionals ans professionals from other fields, with whom they establish varied legal relationships.*

Key-words: *mediation; arbitration; agronomy; Med-Arb; dispute*

INTRODUCTION

Med-Arb and Arb-Med have emerged as alternate procedures for dispute resolution and in response to the inertia present in the classical system of justice. As regards the mediation procedure, itwill not be analysed in the present article, as it has been dealt with in previous ones[1]and, therefore, we shall discuss only the institution of arbitration and its importance for the business environment in agriculture. The importance of theoretical knowledge pertaining to these institutions of law, as well as the advantages of their application in circumstances arisen in conducting legal relationships among professionals in agronomy makes their learning an element that should not be neglected when modelling a sustainable strategy for each professional in agronomy and related fields.

MATERIALS AND METHODS

Regulatory documents were used in order to conduct this study, such as: laws, ordinances, resolutions or decisions; case law and legal doctrine, as well as statistical data. Their rendition is conducted via logical and rational clarifications and explanations over the content and meaning of norms, aiming at a correct knowledge thereof. As methods of interpretation we hereby mention literal or declarative interpretation, extensive interpretation, restrictive interpretation, logical interpretation, grammatical interpretation, systematic interpretation, in conjunction with other legal stipulations or the historical and teleological method of interpretation, by establishing their ends and practical usefulness contemplated by law givers upon constituting a legal rule.

RESULTS AND DISCUSSIONS

Med-Arb is an alternate procedure for dispute resolution consisting of mediation and arbitration. When resorting to the Med-Arb procedure, conflicting parties in agronomy consent to commencing the procedure with a private mediation and, if the dispute between them cannot be

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settled with an agreement, to continue with a private arbitration. Thus, in the hypothesis of a litigation bearing on the obligation to perform, in the case of a land lease contract, the lesser and the lessee, if they consent to it, shall first proceed with a mediation to settle the litigation and, if no arrangement is reached, the parties will continue with the attempt to solve the conflict via arbitration. For Med-Arb to exist, the arbiter and the mediator must be one and the same, otherwise the two procedures will be separate. In a Med-Arb procedure, the third party conducting the procedure is called Med-Arbiter[2]. The distinct feature of this procedure consists in that it prioritizes the parties' agreement; in the aforementioned case, priority is granted to the agreement between lessor and lessee and, at the end of the mediation procedure, if no such agreement has been reached (mediation agreement), the dispute shall be settled by an arbitral award. In the mediation stage, parties try to resolve their dispute according to their needs and interests, whereas in the arbitration stage, dispute resolution is conducted pursuant to legal and contractual stipulations that apply to the case[3]. Bearing this logic, it is preferred for a litigation between a vegetables farmer and the broker placing them on the market to be solved by mediation, as this procedure is known to be faster, or, in the case we presented, as it involves the vending of perishable goods, the risk of their decay and that of causing economic damages could be quickly removed via an agreement leading to conflict resolution and the continuance of business relationships between parties.

Arb-Med is an alternate procedure for dispute resolution made out of arbitration and mediation. In the Arb-Med procedure, parties consent to commencing the procedure with an arbitration and, if the dispute between them cannot be settled with an agreement, to continue with a private mediation. For Arb-Med to exist, the arbiter and the mediator must be one and the same, otherwise the two procedures will be separate. In the Arb-Med procedure, the third party conducting the procedure is called arb-mediator[4].

The Med-Arb procedure takes on many forms:
a)Non-binding Med-Arb;
b)Medaloa (Mediation and Last-Offer Arbitration);
c)Med-Arb show cause;
d)Post-arbitration mediation.

a) *Non-binding Med-Arb:*

Non-binding Med-Arb is a less common procedure where both mediation and arbitration are not procedures that conclude with a binding solution for the parties. This procedure can be useful when a solution rendered by an arbiter is accepted by the parties or it determines them to continue negotiations until reaching a solution.

b)*Medaloa:*

Medaloa is a combination between mediation and last-offer arbitration. If mediation between parties fails, the med-arbiter proceeds to a judgement, rendering a resolution that corresponds to one of the final offers of the two parties. With this, in a hypothesis of settling a conflict arisen between a manufacturer of chemical fertilizers and his buyer, a conflict whose object is the payment of indemnification for non-conforming sold merchandise, an arbitral award can force the party whose claims are unsuccessful (the manufacturer) to pay indemnification in tranches, if this was the offer formulated by him, but unaccepted by the buyer, as the offer is the only possible solution to cover the debt and satisfy the creditor's right (the buyer).

c)*Med-Arb show cause:*

2 Megan Elizabeth Telford ," **Med-Arb: A Viable Dispute Resolution Alternative"**,"IRC Press", 2000, p. 3.
3 Mihuț Gabriela Gyongy, "Amicable procedures for dispute resolution among professionals", unpublished doctorate thesis, p.40.
4 Megan Elizabeth Telford ," **Med-Arb: A Viable Dispute Resolution Alternative"**,"IRC Press", 2000, p. 3.

Similar to the classical Med-Arb procedure, Med-Arb show cause differs from it in that the arbiter renders only a draft award which is presented to the parties and the latter have an opportunity to discuss and prove the existence of incoherence or irregularities in the award and to demonstrate why the med-arbiter should not decide as comprised in the draft award. Given that in common law systems, arbitral awards can be challenged only on strict grounds such as abuse of arbitral powers, arbiter fraud etc. and the remedy at law is not easy to access, we consider that such a procedure is extremely useful both for the parties, who have a chance to be heard on the matter of the decision, and for the arbiter, who will have the conviction of having rendered a thorough and lasting award. In the hypothesis of a conflict arisen between a cereal farmer and a seed importer, a conflict having as object seed lack of quality and non-conformity, with the*Med-Arb show cause* procedure, the med-arbiter's draft can be amended by the parties so that technical indicators falling under the European legislation on varieties and seeds should be enlisted in the enacting terms of the rendered arbitral award, thus eliminating ambiguity from its content.

d) *Post arbitration mediation:*

It is a Med-Arb form that consists in a mediation conducted by the med-arbiter after the arbitration session is closed and, at the same time, before pronouncing the arbitral award. The purpose of this procedure is to offer parties a last chance to reach a mutually agreed solution. The method is very efficient since it is meant to safeguard business and personal relationships between professionals and to preserve the trust of parties who are in fact the decisive premise for the continuance of commercial relationships in agribusiness. Today, in Romania, pursuant to provisions in art. 544 par.(2) ofNCCPwhich stipulates that "Subject to the observance of public order, good morals and of the imperative stipulations of law, parties can establish, via arbitral agreement or a prior written deed, at the latest upon establishing the arbitral tribunal… any other norms regarding the good performance of arbitration", in conjunction with art. 7 in Law 192/2006and art. 27 par.1 in the same law, parties can stipulate the Med-Arb procedure in any of the aforementioned forms, except for the non-binging Med-Arb.Mention must be made that provisions in art. 544 par.(2) of NCCP allow parties the right to decide only on issues related to the procedure, but not on the award itself. Romanian law does not contemplate any conditions on the exercise of the arbitrator position, as in Romania this activity can be exerted by any person of age[5].

Arbitration

Arbitration is an institution holding an old tradition in Romanian law. The modern regulation of arbitration was given via the Code of Civil Procedure adopted in 1865 (Book IV *On Arbitrators*, art.339-370), having as model the French Code of 1807 and the Code of Civil Procedure of the Canton of Geneva of 1849[6]. Stipulations in Book IV were applied until the communist regime came to power, when economic principles and corresponding economic laws came in conflict with the liberalism specific to Book IV and with the principle of free will of the parties stemming therefrom. In 1993, in the spirit of the new direction, Book IV in the Code of Civil Procedure was substantially amended. The main source of inspiration was the UNCITRAL Law model which, although not directly embedded in domestic law, had a substantial contribution to the

5 Mihuț Gabriela Gyongy, "Amicable procedures for dispute resolution among professionals", unpublished doctorate thesis, p.42.

6 It was the first systematic approach on the procedure of arbitration, the first regulatory document that dedicates an entire chapter to it. Until then, rules on the matter had been formulated in regulations that capture the attention of historians of business law, such as: Donici's Manual of 1814; The Calimach Code – adopted in Moldova in 1817 – in whichart. 1828 stipulated that "litigant parties can not only agree among themselves on the object of their conflict, but they can also submit it in a good formulation to the decision of others, which then bears the name of arbitrium";The Caragea Code –entered in force in Țara Românească and which dedicated 21 articles to arbitration, in Chapter XVIII – „For arbitration" (*eretocrisie*, as was arbitration called) andChapter XVII – "For Agreement". The longest period in force, of almost 50 years, was held by the Calimach Code –which contained the most performing regulation.

reformin this field of law and legal institutions. The Code of Civil Procedure[7]regulates private voluntary arbitration. Rules included in the Code of Civil Procedure constitute the general law in matters of arbitration. Book IV is dedicated to arbitration.[8]

The Code of Civil Procedure is the general law for private voluntary arbitration. The notion of private voluntary arbitration incorporates domestic arbitration / international arbitration, ad-hoc arbitration / institutional arbitration, arbitration in law / arbitration in equity, commercial arbitration[9] / civil arbitration.

Arbitration is an alternative to the traditional way of solving litigation in court. It allows agronomy professionals to solve their disputes out of court, which has many advantages, such as: time saving, low expenses, low risk of losing crops / perishable goods, fruit etc. Arbitration has a contractual nature; therefore, farmers must agree toand can never be forced to subject themselves to arbitration. After having agreed to solve their dispute through arbitration, conflicting parties are free to opt from several alternative procedures or to structure arbitration proceedings as they see fit. Moreover, arbitration awards are usually enforced by the courts of law in the country.

Pursuant to art. 533, Title I, Book IV in NCCP, arbitration is defined as "an alternate jurisdiction of a private nature". Parties in conflict and the competent arbitral tribunal are granted the freedom to establish "rules of procedure in derogation from the general law, on condition that such rules do not come against public order and imperative legal stipulations". As regards institutionalized arbitration, it is defined as "a form of arbitral jurisdiction which is established and functions on a permanent basis attached to a domestic or international organization or institution or as a standalone non-governmental organization of public interest, established under the law, based on its own internal regulation, applicable in all disputes submitted for a solution pursuant to an agreement for arbitration" (art. 617, Title VII, Book IV, Code of Civil Procedure)[10]. Parties in arbitration proceedings can be professionals in agronomy, farmers, providers of related services, vendors of agricultural goods or produce etc. At the same time, the object of an arbitration procedure can be all those disputes arisen between professionals in agronomy and competent institutions (e.g. A.P.I.A.) in relation to rights and obligations they may hold.

Case study

Between S.C. TRADING IMPORT-EXPORT S.R.L. and THE ASSOCIATION OF AGRICULTURAL PRODUCERS "RECOLTA ARPAȘU DE SUS" there arose a dispute on the failure of S.C. TRADING IMPORT-EXPORT S.R.L. to observe its contractual obligation to hand over 50 tractors, although the ASSOCIATION OF AGRICULTURAL PRODUCERS „RECOLTA ARPAȘU DE SUS" had performed its obligation to pay the related price. In the sale-purchase contract concluded between the parties, under art. 28, entitled "Dispute Resolution", it was specified that "any dispute arisen between the parties in relation to contract performance, shall be settled via arbitration, before the Court of Arbitration attached to the Romanian Chamber of Commerce and Industry".

By inserting an arbitration agreement in the contract between them, under the sanction of nullity, the parties resorted to arbitration. It is provided that "the condition for a written form of agreement is deemed as fulfilled when the resort to arbitration has been agreed by correspondence exchange, irrespective of its form, or by an exchange of procedural deeds or when the existence of

7 The New Code of Civil Procedure (NCCP)

8 Art.541-612.

9 Taking into consideration the system established through the NCCP, the analysis of the new regulation on arbitration shall be conducted from the perspective of domestic and international private voluntary arbitration that involves only professionals.

10 Mihuț Miki, The Evolution of Arbitration in Romania, International Conference of Doctorate Candidates, Timișoara, 2015, p.159.

agreement has been claimed in writing by one party and not challenged by the other". As regards compromise, the Code of Civil Procedure stipulates that it can be concluded even if parties find themselves in litigation before another court (ordinary law). Article 544 in the Code of Civil Procedure makes reference to "the efficiency of arbitration clauses": whether an arbitration procedure is concluded with or without the rendering of a decision on the matter of the cause, the arbitration clause is not affected, that is "it shall remain valid and it shall serve as grounds for any new arbitration procedure that might be initiated pursuant to it for the settlement of any litigation arisen between parties as derived from the main contract". The principle according to which "the conclusion of an arbitration agreement excludes, for the litigation that forms its object, the competence of the courts of law" is also preserved.

Legal competence is the only condition imposed by the Code (art. 547) to solicit arbitration. Thus, in the given situation, both entities in the agricultural field possess legal competence and they can sit at the arbitration procedure, as they meet the conditions stipulated in NCCP as regards civil capacity. Arbitrators must always be in odd numbers (art. 548, par. 1). If parties have not established a number of arbitrators by agreement, the litigation shall be judged by three arbitrators (article 548, par. 1). The acceptance of having been designated as arbitrator is made only in writing and it is sent to the parties by "any means that can ensure transmission of the the document text and confirmation of receipt", that is by mail, fax machine, e-mail or by another means (art. 551). In order to solve a dispute in agronomy, it is advised that at least one arbitrator should have a specialization in agronomy, for a better understanding of speciality terminology and for the understanding of established practices between litigating parties (trade practices, customs of the place etc.)

In terms of liability, arbitrators are not liable for damages, but they are liable under the law, if requirements in law are met. Article 557 (let. d) in NCCP stipulates that liability of arbitrators can be engaged "if in bad faith or by gross negligence they violate other duties that lie with them".

As regards an arbitration term, the rendering of an arbitration award is subject to a mandatory term of 6 months, under the sanction of caducity, but only if parties have not foreseen otherwise in the agreement for arbitration (art. 559). The arbitral tribunal can rule, on thorough grounding, to extend the arbitration term, only once, for 3 months at the most. In the hypothesis of the case study, resorting to this procedure and opting for a shorter term can have beneficial results for the association involved, as it can gain in a short time an arbitration award that can be enforced, in the absence of voluntary compliance, so that taking possession over the 50 tractors (in a short time – as compared to the term needed to solve the matter in court) might save the crop year.

Parties choose the language in which arbitration is to be conducted. If parties miss to foresee this issue in their agreement or they do not come to an agreement on this matter on a later date, the language of arbitration shall be the language of the contract from which the dispute has arisen or an international language to be decided by the arbitral tribunal (art. 562 NCCP). In the case before us, as the parties were Romanian legal entities, the language used in arbitration was Romanian. Taking into consideration that business relationships of large farmers and agricultural producers most often bear extraneous elements, the possibility of electing the language to conduct a procedure is a real advantage in terms of procedure expedience and costs. As regards state justice, pursuant to the law, it can only be conducted in the Romanian language, all steps in the proceedings made by a foreigner / non-speaker of the Romanian language having to be subjected to the filter of interpreters or translators, as applicable, followed by authentication of translated writs by a notary public. All these stages require substantial amounts of money and they lead to a delay in solving the dispute.

Arbitration procedure.

Referring a dispute to the arbitral tribunal. As regards the arbitration procedure (Title IV), in relation to referring a dispute to the arbitral tribunal, the application for arbitration must contain elements that identify the parties such as personal identification number, sole registration code or fiscal identification code. If the petitioner has his/her domicile (and registered office, we consider) abroad, an address for service (domicile / registered office) in Romania must also be indicated, where procedural notifications shall be communicated (art. 563, par. 1, let. a). In the proposed case, the party that referred their dispute to the arbitral tribunal wasthe ASSOCIATION OF AGRICULTURAL PRODUCERS „RECOLTA ARPAȘU DE SUS", having its registered office in Romania.

Judgement. As regards *judgement* (Chapter II under Title IV), the core principles of the civil trial are accordingly applicable to the arbitration procedure as well (art. 567)[11]. The tribunal's communication with the parties, in connection with actions undertaken by the tribunal, can be made, pursuant to the new stipulations, by fax machine, e-mail or any other means that can ensure transmission of the document text and confirmation of receipt (art. 569). As regards the checking of competence, the arbitral tribunal proceeds to such an examination "upon the first hearing date having completed the legal procedure" (art. 571, par. 1). If itdeclares itself as not competent to judge, the arbitral tribunal shall pronounce a resolution but it cannot be the object of an action for annulment (art. 571, par. 3). In the presented case, the arbitral tribunal declared itself as competent to judge. Any incident concerning arbitration, as it is regulated in the new Code, enters the competence of courts of law, more specifically under the jurisdiction of the county court in whose territory an arbitration is conducted.[12].

Exclusive competence of arbitral tribunals. If one party is absent at debates, the arbitral tribunal holds an exclusive competence as regards weighing the reasons for absence and deeming them as sound, as well as if the absence of a party would give grounds to adjourn the cause; in such circumstances, the decision of an arbitral tribunal cannot be subjected to any remedy at law (art. 574). An arbitral tribunal also holds exclusive competence if, in terms of evidence, it is called upon to decide on the usefulness, relevance and conclusiveness of the evidence produced by parties. (article 579).

The hearing of witnesses and experts can also be conducted, upon their request or having their consent, at their abode or place of business. The solicitation of written information from public authorities on their deeds and actions is also stipulated (art. 582). This is another advantage. If, as regards state justice, this action cannot be accomplished otherwise than by letters rogatory and for sound reasons (the impossibility for a witness to be present in court due to medical reasons), as regards arbitration, their hearing can be conducted at their place of business / registered office / domicile. Therefore, to hear a witness who is caught up in the harvesting season of perishable goods, his/her absence from work to appear before the court in another location can result in major losses for the company. As stated before, for arbitration, such a witness can be heard in his/her location.

*Arbitration award.*The last chapter underTitle IV (Chapter IV), refers to arbitration awards. An arbitral tribunal settles a matter subjected to arbitration by rendering an award that is mandatory.

11 For example, equality of parties, the right of disposal, obligations that must be observed by parties during the civil trial, good faith, the right to defence, contradictoriness, orality, direct contact, continuity etc.

12 This provision is comprised in article 124 in the new Code, Book I, Title III (Competence of Courts of Law), Chapter III (Special Provisions).

In the cases of "clarification", "supplementation"and "arbitral award amendment", the tribunal pronounces its decision via a separate resolution in situations of clarification or award supplementation, whereas in circumstances of error correction (that is material errors that do not change the merits of a solution, as well as computation errors) is ruled by conclusion (art. 595).

In the presented case, the arbitral tribunal rendered an arbitration award in favour of THE ASSOCIATION OF AGRICULTURAL PRODUCERS "RECOLTA ARPAȘU DE SUS" by ordering S.C. TRADING IMPORT-EXPORT S.R.L. to deliver the 50 tractors, as well as to pay a penalty for the delaying in tractor delivery.

Annulment of an arbitral award.

The annulment of an arbitral award is the subject matter of Title V in the new regulation comprised in the Code of Civil Procedure[13]. As regards the competence in settling an action for the annulment of an arbitration award, according to the new regulation, this lies with the Court of Appeals in whose jurisdiction such an arbitration took place[14]. In the case studied, there was no reason to initiate an action at law for the annulment of the arbitration award.

Enforcement of an arbitration award.

The provisions in principle related to the enforcement of arbitration awards are comprised in two articles that jointly form Title VI: voluntary compliance (art. 605) and compulsory execution (art. 606). SC TRADING IMPORT-EXPORT SRL performed its obligation voluntarily. In the contrary hypothesis, pursuant to the general law, it would have been bound to the payment of damages and enforcement costs.

CONCLUSIONS

In the legal case herein presented as case study, by resorting to arbitration, the parties: THE ASSOCIATION OF AGRICULTURAL PRODUCERS "RECOLTA ARPAȘU DE SUS" and S.C. TRADING IMPORT-EXPORT S.R.L. settled their dispute in 6 months, whereas had they resorted to actions in court, the matter would have been settled in 3-5 years (taking into consideration the merits of the case and the remedy at law by appeal), which is of essence for agricultural producers given the type of activity they perform by employing tractors (tillage, sowing, harvesting etc.).

When disputes arise among professionals in agronomy, an intervention is needed from bodies that can solve the emerged issues and re-establish justice. Most of the time, matters are brought before courts of law, but lately the latter cannot cope with the large numbers of case files and work load that befall them. Farmers who have been at least once involved in settling a litigation in court are convinced that this path of settling a dispute implies lost time, means and effort, so other means, faster and more efficient, are ever more sought. Although Med-Arb and Arb-Med are not new institutions, they are gaining more ground in the practice of dispute resolution. Med-Arb and Arb-Med represent alternate out-of-court paths for dispute resolution. It is a type of justice in derogation from state justice, where parties, via an arbitration agreement, decide to solve their conflict through arbitration or mediation and not in court.

Founded on provisions in the New York Convention (1958), Arb-Med and Med-Arb have become true and efficient alternatives to state justice, having their own regulations and a standalone existence. The importance granted today to arbitration, as private justice, in other jurisdictions, is visible (USA, Great Britain, Canada, France and Germany). We must emphasize the ADR (Alternative Dispute Resolution) phenomenon is far smaller in Romania when compared to the

13 Art.608 in the Code of Civil Procedure

14 Since most arbitration awards are rendered by the Court of Commercial Arbitration attached to the Romanian Chamber of Commerce and Industry, with headquarters in Bucharest, any eventual action for the annulment of awards rendered in organized institutionalize arbitration by this institution will be settled by the Bucharest Court of Appeal.

United States of America (a leader in the field), but also to any other West European country that holds a tradition in the field. In Romania, the ratio between classical state justice and the alternate methods for dispute resolution is overwhelmingly in favour of the former.

Causes from which this situation arises:

- The non-existence of a tradition or the short time span since some ADR methods have started to be applied in Romania. Except for arbitration, an institution that does hold a tradition in modern Romanian law, the other ADR methods are either non-regulated (because in Romania a high portion of ADR methods are non-existent both in terms of legal or other type of regulation and in practice) or they have been regulated only recently (the best example in this respect is mediation);
- The non-existence of some centres or institutions of reputation with a significant practice in ADR. Of course, there is one exception, the Court of Appeals attached to the Romanian Chamber of Commerce and Industry and the County Chambers of Commerce that engage only in arbitration, but not in other ADR methods. It is to be wished and expected for mediation practice to enhance in the following years.
- The insufficient knowledge of ADR methods, of the regulations that govern them and the advantages they can offer possessed in the Romanian business environment and by professionals (including those in agronomy), who are actors in domestic and international trade. Insufficient knowledge and understanding of a phenomenon, of an institution, naturally generates distrust. On the other hand, trust in a mechanism destined to solve a dispute in which a party is involved cannot be won otherwise than as a result of practical outcomes, of a concrete solution that such a party seeks when deciding to go on this course;
- The mindset of professionals that might resort to ADR methods – the success recorded by alternate methods of dispute resolution, except for arbitration, depends on a manifestation of will on behalf of parties involved, on their accepting a proposed solution, which is not inherently mandatory, but it becomes so only after the parties have accepted it.

There are two groups of factors that make us believe ADR will evolve in Romania:

a) The economic, legal and geopolitical background – Romania being a member state in the European Union binds it to a progression (starting with developments in law, as previously shown, down to the most insignificant operation that involves two professionals/traders in different member states) similar to the other member states, which implies, among others, the use of alternate methods for dispute resolution, as a modern and efficient means to solve disputes and, at the same time, to optimize access to justice.

b) The current level of development attained by ADR in Romania – underlining once again that arbitration is found to hold a better position as compared to the other ADR methods, the current level of ADR in Romania is incipient, minimal.

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SECTION 2

ECONOMICS, MANAGEMENT AND MARKETING IN AGRICULTURE

THE IMPLICATIONS OF THE AGRICULTURAL HOLDINGS WITH LEGAL ENTITY WHEN USING THE AGRICULTURAL LANDS IN ROMANIA

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BOHATEREŢ VALENTIN MIHAI[2]

Abstract: *High-performance agriculture cannot be done in the absence of modern agricultural holdings, altogether holdings with a legal entity based on private property lands or those on lease, conceded or rented, which meet the agrotechnical request fit for each holding type. In this regard, the General Agricultural Censuses from 2002 and 2010 reveal a series of information that outline the manner in which the agricultural holdings with legal entity engage themselves in using the agricultural lands in Romania. Thus we notice holding groups distributed on size categories and how their holding structure is influenced by the usage category of the lands utilized and also by the geographical particularity of the region. Additionally, there is an improvement regarding the qualitative developments made in order to change the medium size of the agricultural holding with legal entity. The study identifies the current and perspective trends concerning the changes of agricultural holding (with legal entity) structure as effect of the direct relation between the agricultural holdings without legal entity and those with legal entity when using the agricultural lands in Romania.*

Key words: *agricultural holdings with legal entity, medium size of agricultural holding, the usage of lands, holding structures*

INTRODUCTION

The metamorphosis of the agrarian structures after 1989 has drawn profound and multiple changes in the existing relation between the structure of land property and those of agricultural holdings in terms of their juridical status.

Before 1989 the agricultural area of the country was owned in percentage of 29.7% by state agricultural units of which 13.7% belonged to the state agricultural enterprises, 60.8% to the production agricultural cooperatives which gave 6.1% to the use of CAP members cooperative from the country agricultural area and 9.5% the private producers' households who owned those lands from the total agricultural area only, area that actually represented the land property of those farmers who were not part of the general collectivization.

After 1989, by implementing the land laws and promoting the new structures of agricultural holdings totally based on private property of the agricultural lands, it came to a point where, in 2010 the agricultural holdings without legal entity represented 52.9% from the total area of the agricultural holdings in Romania, while the agricultural area used by those was up to 56% and the difference of total area (47.1%) of the agricultural holdings or the agricultural area utilized (44.0%) to was part of the agricultural holdings with legal entity.

Under the circumstances, the appearance, development and consolidation of the agricultural holdings with legal entity outline the qualitative dimension of the commercial agriculture in a continuous progress, but also keeping a very special relation with the agricultural holdings without legal entity which still provide the social protection of the rural households and feed, as well, the land funds owned under various legal forms the agricultural holdings with legal entity. Consequently, the study of the development evolution and perspective of the agricultural holdings with legal entity shapes the improvement perspective of an increasingly efficient land fund in agriculture in light of rising the output per hectare and profitability as well.

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MATERIAL AND METHODS

The study relies on the data and figures collected from the General Agricultural Censuses from 2002 and 2010. Two relevant indicatives have been elaborated for the agricultural holdings, namely, the number of agricultural holdings and the total areas from an holdings and the agricultural areas utilized in relation to the legal aspects of the holdings, type of land holding and usage manner of the agricultural areas, analyzed in view of size categories of the total holding areas or agricultural areas utilized by these.

The analysis tool mostly employed is the method of comparative analysis based on the information extracted from the two data sources in terms of absolute and relative aberrations and evolution of the medium areas of the agricultural holdings with legal entity which allow the outlining (under different scenarios) of their development.

RESULTS AND DISCUSSIONS

Between 2002 and 2010 the agricultural holdings with legal entity increased from 0.5% to 0.8% out of the total number of agricultural holdings in Romania. In point of total area they slightly decreased from 49.3% to 47.1% out of the total area owned by agricultural holdings as well as the agricultural area used by these which dropped from 44.7% to 44.0% out of the agricultural area utilized at national level. The present legal framework allows organizing agricultural holdings with legal entity under various forms of holdings, such as companies, agricultural associations, commercial companies, units of public administration, cooperative units and other types –all distributed on production profiles (vegetal, livestock or mixed - see table 1).

Table 1 Agricultural holdings with legal entity that use agricultural areas and have livestock (no.)

Specification	**Total, of which:**		**Holding Profile**					
			mixed		**vegetal**		**livestock**	
	2002	**2010**	**2002**	**2010**	**2002**	**2010**	**2002**	**2010**
Total, of which:	*22,672*	*30,698*	*3,596*	*2,526*	*18,450*	*27,702*	*626*	*445*
Companies/ Agricultural Associations	2,261	1,381	333	138	1,891	1,232	37	11
Commercial Companies	6,138	16,500	1,416	1,436	4,290	14,649	432	390
Units of Public Administration	5,698	3,083	944	163	4,674	2,915	80	5
Cooperative Units	87	68	7	4	70	63	10	1
Other Types	8,488	9,666	896	785	7,525	8,843	67	38

Source: our calculi based on the data gathered from the General Agricultural Censuses from 2002 and 2010

On types of units, from a numerical point of view, the most significant growth was registered in the case of commercial companies that went up from 6,138 to 16,500 during 2002 – 2010, while other types of agricultural holdings with legal entity registered decreases of 39% (companies/ agricultural associations) and 54.9% (units of public administration). The cooperative units had completely insignificant numbers.

There was also registered an important development in the segment of agricultural holdings of vegetal profile, which grew from 18,4 thousand to 27.7 thousand during 2002-2010, while the agricultural holdings of livestock profile dropped from 626 to 445 units and those of a mixed profile decreased from 3.6 thousand to 2.5 thousand units, having great differentiations among the organization forms. The most obvious growth was registered in the case of commercial companies of agricultural profile. In terms of land potential in 2010 the commercial companies used 54.1% from the agricultural area utilized with legal entity, while the units of public administration used 27.4%, companies /agricultural associations 9.4%, and cooperative units barely 0.1% from the agricultural area utilized (table 2.)

Table 2 Agricultural holdings with legal entity, agricultural area utilized and agricultural area utilized per holding

Specification	Total of agricultural holdings (no.)		Agricultural holdings that used agricultural area (no.)		Agricultural area utilized (thousand ha.)		Medium agricultural holding utilized per holding (ha.)	
	2002	2010	2002	2010	2002	2010	2002	2010
Total, of which:	*22,672*	*30,698*	*22,046*	*30,228*	*6,222.0*	*5,856.5*	*274.43*	*190.78*
Companies/ Agricultural Associations	2,261	1,381	2,224	1,370	975.6	550.9	431.47	398.90
Commercial Companies	6,138	16,500	5,706	16,085	2,168.8	3,171.1	353.34	244.51
Units of Public Administration	5,698	3,083	5,618	3,078	2,867.4	1,604.5	503.22	667.66
Cooperative Units	87	68	77	67	2.4	8.2	27.19	120.24
Other Types	8,488	9,666	8,421	9,628	207.9	521.8	24.49	53.98

Source: our calculi based on the data gathered from the General Agricultural Censuses from 2002 and 2010

As a phrase of evolution of the agricultural holding with legal entity, by validating the number and agricultural areas utilized during 2002 – 2010, it is registered a decrease of the medium agricultural area utilized, overall holdings from 274 to191 hectares: companies/ agricultural associations from 431 to 398 hectares and commercial companies from 363 to 245 hectares; increases were registered in the case of the units of public administration (from 503 to 668 hectares) and for the cooperative units (from 24 to 120 hectares).

The analysis gets even more interesting when the study approaches the comparative evolutions among different size categories of the agricultural holdings with legal entity on various forms of organization (Addedum 1).

Numerically, in 2010 the commercial companies which represented 53.6% out of the total number of agricultural holdings with legal entity grouped as ponderance in the size category under 10 hectares in ratio of 48.1%, while the size category above 100 hectares gathered 31.7% from holdings. The rest of holdings were distributed on other size categories.

In view of agricultural holding, in 2010 the commercial companies held 44.6% from the total area of the agricultural holdings with legal entity, having a size-category based distribution of the agricultural area utilized in ratio of 95.3% in the size category over 100 hectares, which conveys the obvious tendency towards large holdings, slightly mechanized, with a high potential of production and increased profitability.

The units of public administration, in spite of the fact they have a relatively low ponderance (10.1%), use 29.7% from the total agricultural area, which, on one hand shows the dimension of the land fund of the public administration, and, on the other hand reveals the percentage of the agricultural areas without commercial usage.

In terms of type of land holding, during 2002 – 2010 there were significant mutations in the sense that the agricultural area owned and utilized decreased from 2.8 million hectares to 2.4 million hectares, while the area on lease increased from 0.7 million hectares to 2.7 million hectares, phenomenon that shows obvious shifting relations between the land owners and the land users, the partition of owners and, at the same time, users having increasing chances as an expression of consolidation of the agricultural holding and interest rise regarding the transformation of the land fund into a premise of the profit in agriculture (Addendum 2).

On the whole, the agricultural holdings with legal entity highlight a numerical growth as agricultural area utilized for all size categories too, except for the category 5 – 10 hectares where the number of agricultural holdings decreased by 8% and in the case of agricultural area utilized there is also a decrease by 8% for the category over 100 hectares that influenced the decrease of the agricultural area utilized by 6% (table 3).

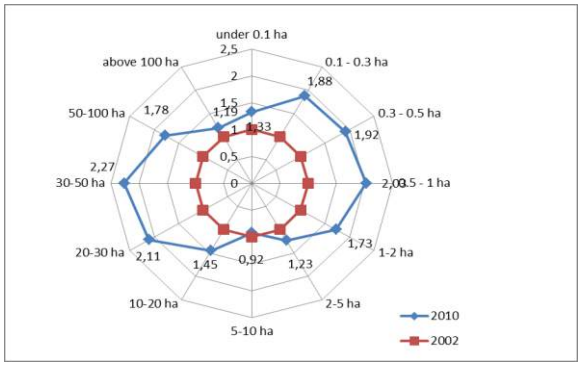
Table 3 The evolution of the agricultural holdings with legal entity depending on the number of holdings and the agricultural area utilized on size categories of the agricultural area utilized between 2002 – 2010

Size Category	Year	Absolute Values		Relative Changes 2010/2002		Absolute Changes 2010-2002		The medium Area Utilized per Holding (ha.)	
		number	hectares	number	hectares	number	hectares	2002	2010
Under 0,1	2002	568	27	1.33	1.46	188	12	0.05	0.05
	2010	756	40						
0,1 - 0,3	2002	1,110	194	1.88	1.96	982	186	0.17	0.18
	2010	2,092	381						
0,3 - 0,5	2002	627	235	1.92	1.96	574	226	0.37	0.38
	2010	1,201	461						
0,5 - 1	2002	947	629	2.03	2.08	976	680	0.66	0.68
	2010	1,923	1,310						
1-2	2002	1,288	1,687	1.73	1.80	945	1,345	1.31	1.36
	2010	2,233	3,032						
2-5	2002	2,874	9,341	1.23	1.23	647	2,110	3.25	3.25
	2010	3,521	11,451						
5-10	2002	3,166	19,763	0.92	1.00	-248	-77	6.24	6.75
	2010	2,918	19,686						
10-20	2002	1,455	17,883	1.45	1.59	655	10,597	12.29	13.50
	2010	2,110	28,480						
20-30	2002	446	10,667	2.11	2.14	497	12,141	23.92	24.19
	2010	943	22,809						
30-50	2002	500	19,154	2.27	2.32	636	25,336	38.31	39.16
	2010	1,136	44,490						
50-100	2002	1,091	77,109	1.78	1.84	850	64,979	70.68	73.20
	2010	1,941	142,089						
Over 100	2002	7,974	6,065,259	1.19	0.92	1,480	-482,986	760.63	590.47
	2010	9,454	5,582,273						
TOTAL	2002	22,046	6,221,952	1.37	0.94	8,182	-365.445	282.23	193.74
	2010	30,228	5,856,506						

Source: our calculi based on the data collected from the General Agricultural Censuses from 2002 and 2010

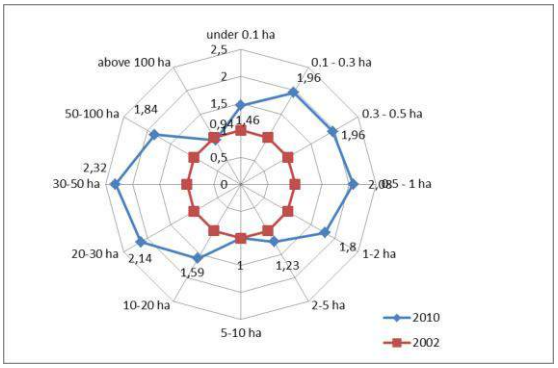
Both, in view of number and area, the most significant increases are recorded in the following size categories: 0.1 – 0.3; 0.3 – 0.5; 0.5 – 1 ha; 1 – 2 ha, which suggest the development of the non-vegetal agricultural holdings, having the potential to evolve in holding organizations, service providers, manufacturing/ processing, green houses and gardening as well. Other increases are registered in the following size categories: 20 – 30 ha, 30 – 50 ha and 50 – 100 ha as a result of the development and consolidation of the small agricultural holding (25-75 ha), the highest ponderance being represented by the category over 100 ha, where, although the medium agricultural area utilized per holding had decreased in the last 8 years from 760 ha to 590 ha, this category used in 2010 a percentage of 95.3% out of the total agricultural area utilized from the agricultural holdings with legal entity. Although numerically this category stands for approximately a third from the total number of holdings, the medium area utilized per holding with legal entity is potentiated, again, in spite of the fact that, on the whole, it diminishes from 282 hectares to 194 hectares in 2010.

Therefore the evolution of the agricultural holdings with legal entity divided on size categories of the agricultural area reflects two clear development and consolidation tendencies from a numerical point of view and as agricultural area utilized of the small categories (0.1 – 2 ha) and of the medium-size categories (30 – 100 ha), while the holdings over 100 hectares have a different situation: in spite of their growth in number, their area utilized decreases as a result of the increase stand of the medium area holding, but with the perspective of consolidation in view of improving the ratio between the land area owned and the land areas on lease (chart 1 and 2).



Source: our calculi based on the data collected from the General Agricultural Censuses from 2002 and 2010

Chart 1. The evolution of the number of agricultural holdings with legal entity that utilized agricultural areas in Romania between 2002-2010



Source: our calculi based on the data collected from the General Agricultural Censuses from 2002 and 2010

Chart 2. The evolution of the agricultural areas utilized with legal entity in romania between 2002-2010

Another relevant aspect, privilege of the large agricultural holdings, is given by the evolution of the land usage categories within the agricultural holdings with legal entity. To be noted that the arable area with the highest ponderance is within the size categories 50 – 100 hectares, while on average per total holdings the ponderance of this usage grew from 46.0% to 48.5%, on a vertiginous decline in the case of natural pastures and hayfields (from 8,1% to 29,8%) and, finally, in 2010 perennenial crops registered between 4.1% and 5.3% in the size categories under 100 ha (Addenda 3 and 4).

However the most pressing issue, when using agricultural areas, is the agricultural area unutilized. Between 2002 – 2010 at national level the unutilized agricultural areas grew from 1,777.3 thousand ha to 2,388.9 thousand ha, with differentiations on agricultural holdings without legal entity (increases from 745.8 thousand ha to 857.8 thousand ha.) and on agricultural holdings with legal entity (increases from 1,031.5 thousand ha to 1,531.1 thousand ha.). As absolute value the expansion of the agricultural area unutilized during 2002 – 2010 is claimed by the agricultural holdings without legal entity in percentage of 18.3% and also by the agricultural holdings with legal entity in percentage of 81.7%, so accumulating in 2010 about 5.9% of the agricultural area unutilized without legal entity, while the difference of 64.11% din from the area is to be found in the administration of the agricultural holdings with legal entity.

Judging this aspect can lead us to several mistrusts of difficulties or wrongfull practices in agriculture, among which we would like to mention the following: a) 15.2% of the national agricultural area does not allow getting a zero profit threshold, which at least would maintain the simple reproduction of the agricultural funds; b) the ponderance of the agricultural area unutilized is higher (20.7%) as a direct effect of the higher holding costs; c) the reserve of agricultural area unutilized may constitute illegal manoeuvre spaces for getting extra financial assistance which does not diminish the costs but directly boosts the profits; d) the existence of a high percentage of the agricultural area unutilized shows actually the limits of the real agricultural holding which in future will strictly restrain to the agricultural area utilized, while the difference represented by the agricultural area unutilized is due to be returned to the rightful owners or, in the case of a low production risk (determined by proper agrochemical and pedological studies), to be directed to non-agricultural usage, mainly forestry and lake basins.

Paradoxally, there are also agricultural lands with high agricultural potential which are not used as an expression of some gross institutional shortcomings, such as: the inexistence of a proper agricultural market which meets the real demands, the under-financing of the holding costs, the slow movement of the land funds, serious deficits for the investment financing, lack of small mechanization, multiple deficiencies of the agricultural services and so on.

The evolution of the agricultural holdings with legal entity show the importance of large agriculture (the commercial type as practiced in big farms) which aloow the proper organization of

holding, the complex mechanization of the technological processes and the implementation of the subsidiaries addressing modern agriculture, both efficient and profitable.

CONCLUSIONS

The agricultural holdings with legal entity represent the backbone of the romanian agriculture. The study of their involvement in using the agricultural lands in Romania in view of the General Agricultural Censuses from 2002 and 2010 allows us reach the following conclusions:

- the agricultural holdings with legal entity build the competitional business environment in Romanian agriculture;
- although their numerical ponderance is still reduced, the agricultural area utilized covers almost half the agricultural land heritage of the country;
- the commercial companies of agricultural profile stand out as they utilize over 54% of the agricultural area with legal entity, while the importance of the companies/ agricultural associations decreases and the cooperative units are completely insignificant;
- there are clear the development tendencies of the farms with a vegetal profile, while the livestock production is on decline, turning into a narrow specialized segment developed by economic entities with high financial resources only;
- the units of public administration block up an important land fund which is necessary to work efficiently in order to develop the social component, spacial expansion and less the economic component;
- there are 3 size categories for the agricultural holdings which stand out: between 0.1 – 2 ha there are development tendencies, between 20-100 ha there are stagnancy tendencies and finally, over 100 ha there is a slight remission. The medium size of the agricultural holding with legal entity has the tendency to decline, significally visible in the case of the commercial companies (from 353 ha to 245 ha) during 2002-2010;
- the most relevant decline tendency of the medium dimension is registered in the caseof agricultural holdings with legal entity which belong to the size category over 100 ha, from 761 ha in 2002 to 590 ha in 2010;
- the development and consolidation tendency of the agricultural holdings with legal entity outlines by modifying the relation between land owned and land on lease, which in 2010 represented 85.4% of the land fund; the consolidation degree is accentuated by the increase of the owners' category that use and manage their lands by themselves or maintain their holding by entrusting its usage;
- the agricultural holdings with legal entity are not in contradiction or competition with the agricultural holdings without legal entity because the importance of the economic and social functions override depending on the type of holding, as they are going to co-exist for a long time from now on and taking into consideration that the two functions are not disjoint but they override in a different manner;
- in future the social function within the agricultural holding with legal entity will evolve assisting the development of the economic function within the agricultural holdings with legal entity;
- the agricultural holdings with legal entity constitute the basic component for the development of large agriculture of commercial type which is competitive, efficient and profitable, while the agricultural holdings without legal entity will constitute the basic component of small agriculture of family type but with enhanced performances by increasing the intensification, diversification, efficiency and profitability under specific specialized regional and local conditions.

Therefore it is undeniable and worth taking into consideration the existence of some real premises for the development and consolidation of agricultural holdings with legal entity in Romania which cannot be done if they are not in agreement with congruent normal economic and social relations, with the agricultural holdings without legal entity, which will also contribute to the consolidation and updating of the traditional rural household.

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Addendum 1. Agricultural holdings with legal entity and the total agricultural area of the agricultural holding distributed on size categories of the total area

Specifications	**under 10 ha**		**10 - 30 ha**		**30 - 50 ha**		**50-100 ha**		**over 100 ha**		**total**	
	2002	**2010**	**2002**	**2010**	**2002**	**2010**	**2002**	**2010**	**2002**	**2010**	**2002**	**2010**
Total no., of which:	***10,222***	***13,877***	***2,436***	***3,524***	***748***	***1,302***	***1,088***	***1,876***	***8,178***	***10,022***	***22,672***	***30,601***
Company/agricultural associations	177	114	119	78	71	65	217	147	1,677	972	2,261	1,376
Commercial Societies	1,729	7,903	498	1,462	258	666	577	1,175	3,076	5,209	6,138	16,415
Units of public administration	2,161	292	319	128	110	84	146	162	2,962	2,415	5,698	3,081
Cooperative Units	68	38	7	2	2	0	2	2	8	26	87	68
Other types	6,087	5,530	1,493	1,854	307	487	146	390	455	1,400	8,488	9,661
Total thousand ha, of which:	***32.4***	***37.0***	***37.2***	***59.6***	***28.3***	***50.6***	***76.6***	***136.4***	***7,079.0***	***7,103.9***	***7,253.5***	***7,387.6***
Companies/Agricultural associations	0.5	0.4	2.3	1.5	2.7	2.6	15.4	10.9	965.7	558.7	986.6	574.1
Commercial companies	3.7	15.6	9.0	26.2	10.0	26.2	40.3	85.4	2,186.8	3,144.4	2,249.8	3,297.8
Units of public administration	4.8	0.7	5.3	2.3	4.3	3.3	10.7	12.2	3,548.3	2,173.5	3,573.4	2,192.1
Cooperative units	0.1	0.1	0.1	0.0	0.1	0.0	0.2	0.2	7.3	8.1	7.7	8.4
Other types	23.3	20.2	20.6	29.6	11.3	18.5	10.0	27.8	370.9	1,219.2	436.1	1,315.3

Source: our calculi based on the data collected from the General Agricultural Censuses from 2002 and 2010

Addendum 2. Agricultural holdings with legal entity and the agricultural area utilized distributed on size categories of the area utilized and holding type

Holding type	**under 10 ha**		**10 - 30 ha**		**30 - 50 ha**		**50-100 ha**		**over 100 ha**		**total**	
	2002	**2010**	**2002**	**2010**	**2002**	**2010**	**2002**	**2010**	**2002**	**2010**	**2002**	**2010**
Total no. of which:	***10,212***	***14,839***	***2,436***	***3,343***	***748***	***1,315***	***1,088***	***2,335***	***6,727***	***12,066***	***22,662***	***33,898***
owned	9,308	13,901	1,894	2,538	454	744	349	1,107	3,425	4,955	15,430	23,245
on franchise	82	230	21	82	12	66	22	112	157	629	294	1,119
on lease	72	346	159	529	119	393	328	890	1,452	4,972	2,130	7,130
In partnership	9	38	21	34	12	23	34	31	170	227	246	353
utilized with free franchise/ title	188	187	20	77	4	31	4	61	29	275	245	631
Other types of holding	553	137	321	83	147	58	351	134	2,945	1,008	4,317	1,420
Total thousand ha., of which:	***31.9***	***36.3***	***28.5***	***51.3***	***19.1***	***44.5***	***77.1***	***142.2***	***6,065.1***	***5,582.3***	***6,222.1***	***5,856.6***
owned	29.3	33.7	19.1	38.9	8.4	25.7	24.2	65.7	2,762.4	2,186.3	2,843.5	2,350.3
on franchise	0.1	0.5	0.3	1.1	0.3	2.1	1.4	6.4	147.1	315.2	149.3	325.3
on lease	0.4	1.4	3.0	9.0	4.6	13.9	23.2	59.3	639.9	2,566.6	671.2	2,650.2
In partnership	0.0	0.1	0.4	0.4	0.5	0.4	2.4	1.2	87.0	56.1	90.3	58.2
Utilized with free franchise/ title	0.4	0.3	0.3	0.9	0.1	0.8	0.3	2.6	18.1	75.3	19.2	79.9
Other types of holding	1.7	0.3	5.4	1.0	5.2	1.6	25.6	7.0	2,410.6	382.8	2,448.6	392.7

Source: our calculi based on the data collected from the General Agricultural Censuses from 2002 and 2010

Addendum 3. The evolution of the number of agricultural holdings with legal entity distributed on size categories of the area utilized and on usage categories

Size Categories	Arable Land		Family gardens		Natural Pastures and Hayfields		Permanent Crops		The Total of Agricultural Area Utilized		Agricultural Area Unutilized		Other Areas		Total
	2002	2010	2002	2010	2002	2010	2002	2010	2002	2010	2002	2010	2002	2010	
under10 ha	73.7	63.8	5.2	0	37.1	44.6	8.7	10.4	95.0	97.6	10.5	8.0	75.2	55.7	100.0
10-30 ha	84.6	77.5	6.2	0	45.9	53.6	11.5	14.8	98.3	99.1	13.2	17.1	72.2	72.4	100.0
30-50 ha	82.1	72.9	5.5	0	45.6	54.0	14.7	13.6	99.2	99.5	12.4	13.5	67.9	68.2	100.0
50-100 ha	86.5	72.6	1.3	0	28.0	45.4	11.9	11.4	99.3	99.8	9.3	10.9	46.6	41.8	100.0
over 100 ha	77.1	67.1	0.7	0	47.7	51.9	10.8	8.3	99.9	100.0	14.9	14.5	59.8	58.8	100.0
total	77.0	67.4	3.5	0	41.7	48.5	10.1	10.4	97.5	98.8	12.4	11.6	67.7	58.3	100.0

Source: our calculi based on the data collected from the General Agricultural Censuses from 2002 and 2010

Addendum 4. The evolution of the total agricultural areas with legal entity distributed on size categories of the area utilized and on usage categories

Size Categories	Arable Land		Family Gardens[1)]		Natural Pastures and Hayfields		Permanent Crops[2)]		The Total of the Agricultural Area Utilized		Agricultural Area Unutilized		Other Areas[3)]		Total
	2002	2010	2002	2010	2002	2010	2002	2010	2002	2010	2002	2010	2002	2010	
under 10 ha	57.8	51.6	0.1	0.0	22.1	27.7	2.6	4.1	82.6	83.4	1.9	4.4	15.4	12.2	100.0
10-30 ha	55.1	48.6	0.0	0.0	20.0	28.4	3.3	5.0	78.3	82.0	1.6	5.8	20.1	12.2	100.0
30-50 ha	50.0	48.4	0.0	0.0	14.5	28.1	4.7	5.3	69.2	81.8	1.3	3.6	29.5	14.5	100.0
50-100 ha	72.1	58.2	0.0	0.0	15.2	29.0	4.8	4.5	92.1	91.6	0.9	2.7	7.0	5.7	100.0
over 100 ha	45.6	48.3	0.0	0.0	38.6	29.8	1.6	0.9	85.8	79.0	1.5	3.5	12.7	3.4	100.0
Total	46.0	48.5	0.0	0.0	38.1	29.8	1.6	1.0	85.8	79.3	1.5	3.5	12.7	3.7	100.0

Source: our calculi based on the data collected from the General Agricultural Censuses from 2002 and 2010

1) family garden - area of 1500 square metres (at the most) meant to obtain the agricultural products, mainly for the consumme of the agricultural holding (without legal entity) members. The family garden is generally separated from the rest of the agricultural area. Occasionally, the surplus of agricultural products which come from this area may be subject for selling (RGA 2010, Vol I, Glossary, page 294, INS, București).

2) permanent crops – crops which occupy the land for long periods of time and which are productive for many years, do not need a rotation system, and are different from the permanent pastures. The permanent crops cover areas occupied by fruit-growing plantations, fruit shrubs, viticultural plantations, orcharding, viticultural and forestry nurseries (except for those non-commercial forestry nurseries which belong to forestry areas) and plants for twine works (RGA 2010, Vol I, Glossary, page 293, INS, București).

3) under the category of usage „other areas" are the following: woody areas, including coppices on short-term rotation system, areas occupied by buildings, roads, quarries, stony/ rocky soil, rush-bed, and also ponds, pools and swamps.

THE INTERPROFESSIONAL ORGANIZATIONS - FROM THE NEED OF ESTABLISHMENT TO THE NEED OF DEVELOPMENT AND AFFIRMATION

IOAN-NICULAE ALECU[1], ANA-MARIA GEORGIANA STROE[2]

Abstract: *Through the present study it aims to represent the actual image of the interprofessional organizations on product chain in Romania, reflecting briefly the establishment and development issues. In the context of the reorganization of entire agrifood production system, in dealing with future crises, whatever is their nature, it's needed to seriously manage the organizational issues and to present them as a useful tool for increasing the access to new markets for producers and to offer local products quality to consumers in Romania both. Using the documentation method it was obtained an overview of the relationship between the need of affirmation and the real need to convert the interprofessional organizations in Romania in functional structures. The Ministry of Agriculture and Rural Development recognized till now only five IPO but the analysis and the directly involved interprofessional organizations opinions exchanges, it was emerged some primordial issues in order to improve the legislation of interprofessional organizations on product chain. The interprofessional organizations on product chain are meant, almost in ingrate way, to be interposed between the pressing help need in the development of intra-community trade relationships and the stiffness required by the legislation.*

Key words: *interprofessional organisations, agrifood sector, legislation, need, development*

INTRODUCTION

As essential part of ensuring the basic needs of the world population, agriculture is essential in any country of the world[3], and especially for Romania, due to the urgent need to have a strong economic system. Romania must to rebuild its production and research systems both but it's needed also an increase of the production efficiency any kind it is, vegetal and livestock both. In front of the continuing global population increases, the need for agrifood products will increase being in front of the most suitable and useful moment to start an intense structural reform. The main weapon owned by Romania, the fertile land, is the most important way can followed to not remain in the second row when we talk about productivity.

The potential, but especially its maximization, isn't provide the resistance in front of the challenges of the XXI century, being urgent required more and more investments in a better integration in the food chain. When we talk about investments we mean, without exception, to all aspects of life and the reference range, recalling the need for investments in human resources, in the future (understanding the "sustainability" term) and in technics and technologies worthy of present times and production needs. Generally speaking, we need investments in time and money and the farmers positioning in the food chain must be strengthened in order to be able to cope all challenges.

MATERIAL AND METHODS

The interprofessional organizations on product chain represents a modest treated research topic so far in scientific literature for which, the bibliographic sources who could be subject to an extensive bibliographic research are numerically limited. In the preparation of this study we used a documentation about the content of legislative acts developed in order to regulate the establishment and functioning of the interprofessional organizations in Romania along with a a declarative interpretation of the opinions issued so far. By the corroboration of the mentioned working methods it was obtained an overview of the relationship between the need of affirmation

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[3] Stanzeleit D. (2013), *Memoriu transmis Ministerului Agriculturii și Dezvoltării Rurale*;

and the real need to convert the interprofessional organizations in Romania in functional structures, towards achieving the purpose for which they were established.

RESULTS AND DISCUSSIONS

In the context of reorganization of the entire agri food production system, dealing with the future crises, whatever their nature are, it requires a serious management of the organizational problems and presentation like useful tool for the increase of access to new markets and quality both. Of course, when we talk about the organisation of the involved in agri food production players, we take into consideration a lot of organization structures, from producer groups and cooperatives (as forms of organization with economical role) to associations, federations and confederations (as forms of organization with representation role). An active involvement on the entire agri food production chain is expected from the interprofessional organizations on product chain.Studying the sustainable development strategy drafted by the Romanian Government, we find that the estimation of continued economic growth with average growth rates of GDP starts from 5.6-5.8% in 2008-2013 followed by a decrease till 4,8-5% in 2014-2020 and 3,8-4.2% in 2021-2030.[4] Probably you wonder why the estimated average of annual rate is decreasing, not increasing how it can be normal. Could it be the absence of any real perspectivity or, maybe, a distrust in our country's potential to meet high expectations?

In Romania, the food products market is heavily influenced by a multitude of issues of which we mention the orientation to quality of customers compared to an accessible price, the rate of imports, chain distribution length (represented by the number of intermediaries through which a product passes till the final consumers shopping basket) the price competition and the capacity to supply the market with agri food products. Transformation of the interprofessional organizations on product chain in functional structures, the marketing policy, the storage and distribution systems in continuous flow with zero stocks and the processing of raw materials in an integrated system are certainly aspects that should support the retail market of agri food products regulation.

Through the development of integrated food chain, the romanian farmers will be able to diversify and increase their sources of income, to develop sustainable connections with the consumers[5]. In the context of promoting local food products and quality raw materials, creating an integrated food chains opens new market opportunities for farmers and other entrepreneurs in rural areas in order to diversify its product line, promotion and sales policies on local markets, either individually or in common. Thus, it requires the development of a legal framework in order to promote the romanian agricultural producers interests according with the technological and economic requirements of modern agriculture through the planning of organised production and distribution, obtaining qualitative products with affordable prices from valorical point of view for local consumers and taking over agri food products on pre-signed contracts with regional warehouses especially built for that. In Europe, there are currently about 500 million consumers of products and services, the most important consumption being that of agri food products. This fact leads the appearance of protecting european consumers's structures, one of it being the possibility to use a mediation procedure of conflicts between producer and consumer, in order to repair the damages caused to the second ones[6]. IPO can have the necessary and sufficient tools to alleviate these types of conflicts.

In order to support the above considerations it comes the establishment and the functioning regulation of interprofessional organizations (IPO), associative forms with juridical personality, non-profit, formed on the initiative of economic activities representatives in the agri

[4] Guvernul României (2008), *Strategia Națională pentru Dezvoltare Durabilă a României Orizonturi 2013-2020-2030;*
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food chain[7]. According with *Government Emergency Ordinance no. 103/2008 on the establishment of interprofessional organizations for agri food products* and *Government Decision No.. 1068 of 23 September 2009 on the organization and functioning of interprofessional organizations for agri food products and the approval the criteria of representation, the procedure for awarding and retreat the recognition, control and monitoring, as well as the delegation of responsibilities,* IPO are set up by the initiative of all organizations or part of the professional organizations on product chain and pursuing the achievement of all the objectives among which we mention the contribution to the proper functioning of markets by promoting products suitable to market requirements in terms of quality and quantity; the hardening of food safety, especially by ensuring the traceability of products, acting in the interests of users and consumers; the participation of professional organizations members in elaboration strategies and programs for development of their sector; connection and cooperation with the funding bodies in the country or abroad in order to contract credits and deploy of programs to ensure the development of sustainable and competitive production units.

For recognition of IPO, the Ministry of Agriculture and Rural Development constitutes The IPO Committee, responsible with the application of recognition, monitoring and retreat of IPO recognition and also with the decision about delegation of responsibilities. Legislation stipulates a very important thing: the composition and functioning of the Committee and also the IPO working procedures could be approved by Ministry Order and could contain, as an observer, a representative of the agri food chain in analysis[8].

Till now the Ministry of Agriculture and Rural Development has acknowledged a number of five IPO and we remember them in order of their recognition: The National Interprofessional Organization of Wine – O.N.I.V.; The Romanian Interprofessional Organization of Cereals and Derived Products – O.I.C.P.D.R.; The National Interprofessional Organisation Prod Com Vegetables and Fruits in Romania; The Interprofessional Organisation for Poultry, Eggs and Processed Products; The Interprofessional Organisation of Pork Meat. Still in recognition are The Interprofessional Organization of Sugar in Romania, The Interprofessional Association Bio Romania, The National Interprofessional Organisation of the Associations in Medicinal and Aromatic Herbs and The Interprofessional Organisation on tobacco chain.

The necessity of founding interprofessional organizations on product chain can no longer be doubted but their regulating represents an immediate emergency task.

Due to Romania's obligations as a result of commitments under the Treaty of Accession to the European Union, it is necessary to take all measures in order to facilitate the access to EU funds for agriculture. 2014 was a transition year, during which the Member States have prepared implementation of C.A.P. 2014-2020, under Regulation (EU) no. 1308/2013 of the European Parliament and Council creating a common organization of the agricultural product markets and repealing Council Regulation (EEC) No. 922/72 (EEC). 234/79, (EC) no. 1037/2001 and (EC) no. 1234/2007, requiring the revision of national legislation on recognition of interprofessional organizations on the food products chain[9].

In line with those mentioned in the previous paragraph, the Regulation (EU) no. 1308/2013 stipulates that Romania, as a Member State, can decide if the interprofessional organizations recognized before 1st of January 2014 in accordance with the national law and are eligible by the Art. 158, 1st paragraph, are considered to be recognized as interprofessional organizations in accordance with Art. 157 and could continue to function[10].

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[7] OUG nr. 103/2008, *Ordonanță de urgență privind înființarea organizațiilor interprofesionale pentru produsele agroalimentare*;

[8] *H.G. nr. 1068 din 23 septembrie 2009 privind organizarea și funcționarea organizațiilor interprofesionale pentru produsele agroalimentare;*

[9] Guvernul României (2014), *Ordonanţă de Urgenţă privind recunoaşterea organizaţiilor interprofesionale pentru produsele agroalimentare*; Proiect de act normativ;

[10] Jurnalul Oficial al Uniunii Europene (2013), *Regulamentul nr. 1308/2013 de instituire a unei organizări comune a pieţelor produselor agricole,* L 347/671, RO;

Is identifying the necessity to transpose the european provisions in order to implement the common agricultural policy, particularly, the provisions relating to the establishment and recognition of the interprofessional organizations which have an important role in the delivery of consultancy services and training for the increase of the capacity to absorb specific european funds among whose beneficiaries are also the interprofessional organisations.

To launch the measures 1.1.1. „Training, information and diffusion of knowledges" and 1.4.3. „Providing advisory services to the farmers" is needed to speed up the creation of the legal framework for recognition of the interprofessional organizations beneficiaries of those measures. The risks to lose E.U. funds through the National Rural Development Programme (N.R.D.P.) and the European Fund for Guarantee in Agriculture (E.F.G.A.) should be minimized by creating the necessary conditions to continue reform process of the agricultural and rural development sectors by ensuring a high uptake.

The draft law for regulating the functioning of interprofessional organizations on product chain creates the necessary legal framework for the conclusion of interprofessional agreements and contracts, so as to contribute to the reduction of tax evasion, to obtain fair competition conditions and to prevent the distortions of markets, taking into consideration the increase of competitiveness and quality of agri food products from the local agricultural sector.

Why IPO needs to function on their maximum capacity and on the real potential offered by the trained engineers who lead them? The members of the National Federation PRO AGRO, as recognized IPO (The National Interprofessional Organization of Wine – O.N.I.V.; The National Interprofessional Organisation Prod Com Vegetables and Fruits in Romania; The Interprofessional Organisation for Poultry, Eggs and Processed Products; The Interprofessional Organisation of Pork Meat) together with recognized IPO's representatives, where vegetal sector members of National Federation PRO AGRO are founding members – The Romanian Interprofessional Organization of Cereals and Derived Products – O.I.C.P.D.R. – and IPO who's still in recognition or establishment process (Interprofessional Organization of Sugar in Romania, The National Interprofessional Organisation of the Associations in Medicinal and Aromatic Herbs and the IPO on the production chain of potatoes, tobacco, honey and bee products) asked for the improvement of legislation and came with a series of proposals in this way.

From the analysis and opinion exchanges between the directly involved interprofessional organizations, it has emerged several primordial issues in order to improve the legislation who talk about interprofessional organizations on product chain, respectively on Government Emergency Ordinance no. 103/2008. They made a comparison between the material version of Ministry of Agriculture and organizations's proposals which was submitted to the specialized department involved with the defining of chains, clarifying the role and place of IPO in development of the agricultural sector policies and establishing of a functional IPO Committee, like direct partner of Ministry of Agriculture on the realization of agri food sector strategies. The absence of an adapted legislation about interprofessional organizations creates difficulties to the economic operators on the entire agri food chain.

The rights and benefits obtained through the negotiation by IPO with other legislative structures – like M.A.D.R., the Agricultural Committees of the two parliamentary chambers etc. – by amending the draft law or signing agreements, should rest and be invoked only to the members not to be arbitrarily assigned to all producers from agri food sectors in Romania and not to frontload the representativeness for those who are not part of the main associative forms and who were never involved in obtaining such benefits, subsidies, state aids and so on.

The draft Government Emergency Ordinance about the recognition of interprofessional organizations on agri food chain, posted for public debate on the Ministry of Agriculture and Rural Development's website on 20th of March 2014 took over only a part of the mentioned above IPO's proposals.

CONCLUSIONS

The association in agriculture doesn't have only an economic role, as agricultural cooperatives and producer groups, but also a representation and defense of the producers's interests role and regulation of markets functioning. The legislation, no matter for which sector it was created, is constantly changing. Any country in the world adapts their legislation when socio-economic and geopolitical evolutions requires it.

The interprofessional organizations on product chain have the role, almost unpleasing, to be interposed between the pressing need of help in the development of intra-community trading relationships and the stiffness required by the law. The main problem faced, because of there aren't founded and recognized more IPO so far, is the obligation to ensure the necessary percentage from the total production, processing and sales in the sector, the absence of specific organizations or the misunderstanding among the potential members on most of the 21 product chains in Romania, according to the common organization of the market.

We conclude, in the end, that the added-value it brings the set up and the regulation of proper functioning of its is almost immeasurable. Creating added-value on the agri food production chain it refers to the value brought to the goods and services from providers. "Providers", as producers, manufacturers or processors, members of an interprofessional organisation on product chain, have the opportunity to be actively involved in the conceive of regulation mechanisms of the markets and in the creation of the appropriate framework in order to promote the products they provide to the final customer. The activity of the interprofessional organizations on the agri food sector must be in service of producers, to meet their needs, to give them the opportunity to to assert themselves arising undoubtedly an urgent need to set up those kind of associations oh product chains including absolutely all agri food chains.

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EVOLUTION AND STRUCTURE OF AGRICULTURAL FARMS DURING 2002-2013

ELISABETA ROSU[1]

Abstract: *The agriculture's evolution and restructuring process was rather a slow one and the phenomenon of structural coexistence of the two types of agricultural farms, with or without juridical personality was maintained. The large number of agricultural farms shows how ample is their fragmentation phenomenon, having negative consequences upon economic performance, general state of evolution and development. The agricultural farms' structure as regards the utilized agricultural area is one of contrasts, from some hectares in the case of the subsistence households, to tens of thousands hectares in case of commercial farms.*

Key words: *agricultural farms, structure, agriculture.*

INTRODUCTION

The multifunctional role of agriculture is fully recognized, reason for which an overall knowledge of its structure and evolution has in view mainly the agricultural farm. The evolution of the agricultural farm was and is strictly linked to the transformations in the Romanian society.

In this context the main goals of the paper had in view the analysis and evolurion of the agricultural farms in the period period between the two General Agricultural Censuses (2002 and 2010) and of the final results of the farm structural survey in 2013[2]. Also, it was realized an analysis of the evolution and structure of the agricultural farms in regional profile, in the attempt to evidence the mutations which took place at the level of the Romania's development regions.

In view of reaching the goals established there were used data supplied by: i) The General Agricultural Census, 2010); ii) statistical data/on line information NSI. The methodology comprised the statistical analysis of the primary data using as working instrument the Excel quantitative analysis program.

RESULTS AND DISCUSSIONS

The number of agricultural farms diminished in the year 2013 opposed to that registered in 2010 by 6%, and opposed to 2002 by 18% as result, mainly, of the concentration process.

The utilized agricultural area of the agricultural farms diminished in 2013 by 1.9% opposed to year 2010 and by 6.7% opposed to year 2002, as result of the fact that some agricultural areas remained un-farmed.

The agricultural area which came averagely per one farm registered a slight increase, from 3.24 ha in year 2002 to 3.60 ha in the year 2013.

The phenomenon of structural duality of the agricultural farms was characteristic for the whole analysed period, the farms without juridical personality representing over 99% of the total farms' number. With all this the number of the agricultural farms without juridical personality was continously decreasing, in the year 2013 being by 15.8% smaller as opposed to the year 2002.

[1] Institute of Agricultural Economics, Romanian Academy;

[2] http://www.insse.ro/cms/ro/content/farm-agricultural-survey-general-data-at national-level-

Table 1

The number of agricultural farms by the juridical status and utilized agricultural area

Indicators	**MU**	**Total agricultural farms**			**Of which:**					
					Without juridical personality			**With juridical personality**		
		2002*)	**2010*)**	**2013**)**	**2002*)**	**2010*)**	**2013**)**	**2002*)**	**2010*)**	**2013**)**
Number of farms	Thou.	4299	3859	3630	4277	3828	3602	22	31	28
Utilized agricultural area	Thou.ha	13931	13306	13056	7709	7450	7271	6222	5856	5785
- arable land	Thou.ha	8774	8306	8198	5437	4725	4558	3337	3581	3640
- pastures and hayfieds	Thou.ha	4644	4506	4398	1878	2307	2315	2766	2199	2083
- permanent crops	Thou.ha	344	312	302	225	236	240	119	76	62
- family gardens	Thou.ha	169	182	158	169	182	158	-	-	-
The utilized agricultural area which comes averagely per one agricultural farm	ha	3.24	3.45	3.60	1.80	1.95	2.02	282.2	190.8	207.5

Source:)GAC 2010, NSI;*

**) http://www.insse.ro/cms/ro/content/structural-survey-in-agriculture-general-data-at-national-level-

The utilized agricultural area by the agricultural farms registered decreases, both in the case of the farms with juridical personality, and in the case of those without juridical personality It is to be remarked the fact that in the period analysed the agricultural farms with juridical personality were utilizing over 44% of the agricultural area.

The utilized agricultural area which came averagely per one agricultural farm without juridical personality increased from 1.80 ha in year 2002, to 2.02 ha in year 2013.

The utilized agricultural area which came averagely per one agricultural area with juridical personality had a fluctuant evolution in the analysed years.

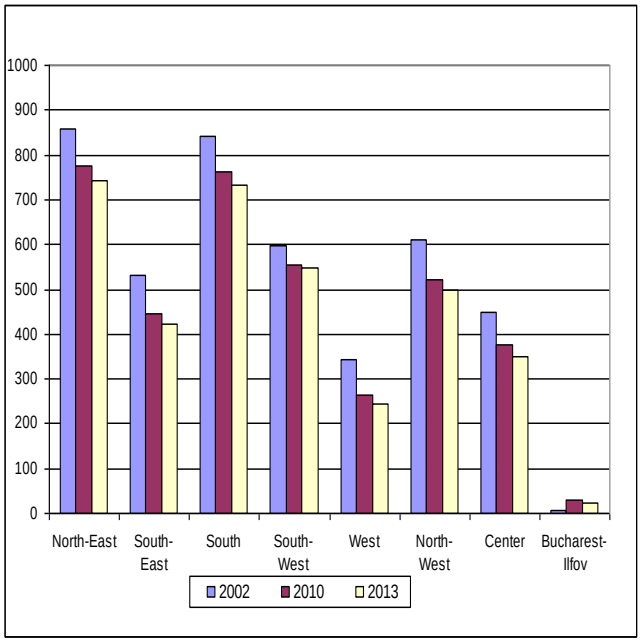
In the structure of the utilized agricultural area by agricultural farms it is predominating the arable land, followed by that with pastures and hayfields, both in the case of agricultural farms without juridical personality, and in the case of those with juridical personality.

At regional level, both the number of the agricultural farms with utilized agricultural area, and the utilized agricultural area are distributed according to the zone's specific.

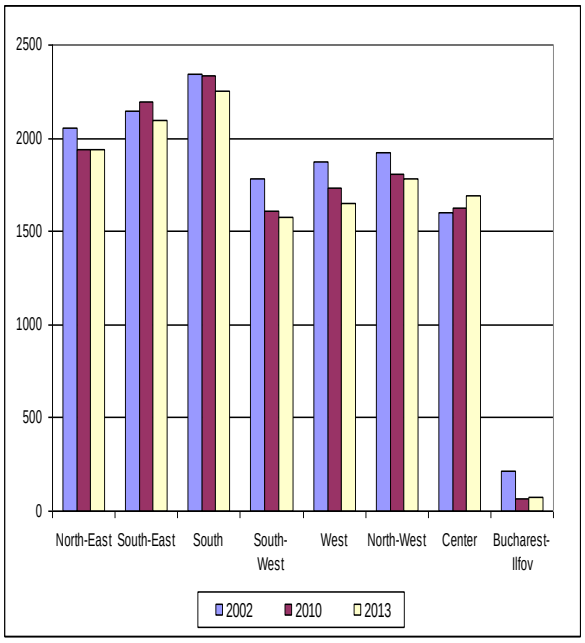
The biggest number of farms was to be found in the development regions North-East and South, both in year 2002, and in the years 2010 and 2013, and the biggest utilized agricultural areas by the agricultural farms were to be found in the develpment regions South and South-East.

Thus, the utilized agricultural area which came averagely per one agricultural area in the development region North-East was of 2.3 ha/farm in the year 2002 and 2.6 ha/farm in year 2013, and the South development region was of 2.7 ha/farm in 2002 and 3 ha/farm in the year 2013.

Graphic 1
The number of agricultural farms at regional level



Graphic 2
The utilized agricultural area by agricultural farms, at regional level



Source:)GAC 2010, NSI;*
**) http://www.insse.ro/cms/ro/content/structural-farm-survey-in-agriculture-general-data-at-national-level

Except the development region Bucharest -Ilfov, the smallest number of agricultural farms and the biggest utilized agricultural area was to be found in the West development region, folowed by the develpment region South-East. The utilized agricultural area which came averagely per one agricultural farm in the West development region was of 5.4 ha/farm in the year 2002 and it reached to 6.7 ha/farm in the year 2013, and the utilized agricultural area which came averagely per one agricultural farm in the development region South-East was of 4 ha/farm in the year anul 2002 and reached to 4.9 ha/farm in the year 2013.

Table 2

The livestocks'numbers by main species, by the juridical status of agricultural farms

- thousands heads -

	Total agricultural farms			**Of which:**					
				Without juridical personality			**With juridical personality**		
	2002*)	2010*)	2013**)	2002*)	2010*)	2013**)	2002*)	2010*)	2013**)
Bovines	2871	1990	1936	2737	1817	1778	134	173	158
Ovines	7238	8412	8944	7009	8172	8671	229	240	273
Goats	744	1241	1326	739	1212	1297	5	29	29
Porcines	8260	5345	4235	7000	3516	2385	1260	1829	1850

Source :)GAC 2010, NSI;*
**) http://www.insse.ro/cms/ro/content/structural-farm-survey-general-data-at-national-level

At the level of agricultural farms the numbers of bovines and porcines decreased by 32.5% şi respectively 7% in the year2013 as opposed to the year 2002, and the numbers of ovines and goats incresed by 23.5% and respectively 78.2% in the same period.

At the level of the agricultural farms without juridical personality, the decrease of the livestock number at bovines and porcines was more stressed, while the agricultural farms with juridical personality registered increases of the livestocks' numbers at these species..

Increases of the numbers of ovines and goats were registered, both within the agricultural farms without juridical personality, and within those with juridical personality in 2013, opposed to the year 2002.

In 2002, from the total of the utilized agricultural area, the area under ownership represented 90.5% the rest being farmed under other forms. In the following years, on the background of the decrease of the share of areas under ownership, the share of areas under lease registered significant increases. Thus, if in 2002 the share of leased in areas was representing 0.2% from the total of utilized agricultural areas, in the year 2013 this represented 27.4%.

Table 3

The lands' farming modality in the year 2010 as opposed to the year 2002

- % -

Specification	**2002*)**	**2010*)**	**2013**)**
Under ownership	90.5	60.0	61.4
Under lease	0.2	27.0	27.4
Under concession, share cropping and others	9.3	13.0	11.2

Source:)GAC 2010, NIS;*
**) http://www.insse.ro/cms/ro/content/structural-farm-survey-general-data-at-national-level

The significant increase of the leased land areas' share shows that the leasing phenomenon was in full amplitude.

Romania's agrarian structure

Romania's agrarian structure is made of four categories of agricultural farms[3]:

- The family agricultural households with areas between 0.1-1 ha, which, due to the small agricultural areas and strongly fragmented are not eligible for the EU financing; their agricultural land is made greatly of gardens, pastures and natural hayfields and it is a weakly productive soil;
- Subsistence and semi-subsistence households (farms) with agricultural areas between 1-10 ha which are producing, greatly, for their own self-consumption needs;
- Commercial family farms with areas between 10-100 ha;
- The commercial companies with areas bigger than 100 ha, with agricultural areas made of arable land of best quality, placed in most favorable zones.

Table 4

Agricultural farms by the size class and the utilized area

- % -

	Number			**Suprafaţa**		
	2002*)	2010*)	2013**)	2002*)	2010*)	2013**)
0.1-1 ha	50.5	54.2	54.5	5.4	5.3	5.0
1-10 ha	48.1	43.6	43.0	40.4	33.5	33.4
10-100 ha	1.2	1.8	2.1	7.3	12.4	13.3
Over 100 ha	0.2	0.4	0.4	46.9	48.8	48.3
Total	100	100	100	100	100	100

Source: own calculations after *) GAC *2010, NSI;*
**) http://www.insse.ro/cms/ro/content/structural-farm-survey-general-data-at-national-level

In the year 2013 the share of the agricultural farms with areas comprised between 0.1-1 ha in total farms was of 54.5%, increasing as opposed to the year 2002. The share of the utilized agricultural area by this category of farms did not suffer significant changes.

The agricultural farms with areas between 1-10 ha, registered percentage decreases, both as numbers, and as utilized area in the year 2013 opposed to the years 2010 and 2002

The share of the farms with areas between 10-100 ha in total farms increased, both from number point of view, and of the utilized agricultural areas.

The smallest share was held by the agricultural farms with over 100 ha in total farms, while the share of the utilized by them areas was bigger. In other words, an extremely small number of agricultural farms are utilizing almost half of the country's agricultural area.

[3] Otiman P.I., (2012*), Structura agrară actuală a României – o mare (şi nerezolvată) problemă socială şi economică a ţării*, în Revista Română de Sociologie, anul XXIII, nr.5-6, Bucureşti

CONCLUSIONS

In year 2013, opposed to the years 2010 and 2002 there decresed, both the total number of the agricultural farms, and their utilized agricultural area.

There did not intervened structural modifications in the evolution of the agriocultural farms in the analysed period, the agricultural farms without agricultural personality representing over 99% of total farms. So, the greatest part of the agricultural farms in Romania were individual subsistence farms (individual agricultural farms, authorised physical persons, individual or family enterprises), while, under 1% of the total were agricultural farms with juridical personality (autonomous regies, or farms associations, commercial companies, institutes or research stations, and educational units with agricultural profile, local councils and other public institutions, cooperative units and other types of units). These were farming but 44% of the agricultural area of Romania.

The agricultural area which came averagely per one farm registered a slight increase, from 3.24 ha in the year 2002 to 3.60 ha in the year 2013.

The agricultural area which came averagely per one agricultural farm with juridical personality had a fluctuant evolution, while the agricultural area which came averagely per one farm without juridical personality registered a slight increase, from 1.80 ha (2002) to 2.02 ha (2013).

At regional level, the agricultural area which came averagely per one agricultural farm was much under the average per country in the development regions West and South-East.

The leasing phenomenon was in full process of evolution having in view that the share of the areas under ownership decreased, while the share of areas under lease was in continuous increase.

Predominant in the Romanian agriculture were the farms with less than 1 ha agriciltural land which were utilizing little over 5% of the country's agricultural area. Even if these ones do not contribute to the development of a performant agriculture, they have an important social role, as they ensure the food security of the inhabitants in the rural.

The agricultural farms with areas over 100 ha, that are the commercial farms, the commercial companies, were holding an extremely reduced percentage of the total farms' number, but were utilizing the biggest agricultural area of the total country's agricultural area. The territorial concentration of these agricultural farms is conferring them a areal competitive potential.

Such a distribution, accentuatedly bipolar, with the biggest part of the agricultural land-parted, on one hand, between extremely modest households as physical size, which are producing in majority for their own needs, and on the other hand, of a relatively small number of commercial agricultural farms which are producing under industrial system and are adopting modern technologies is constituting the main factor which is limiting the increase the Romanian agriculture's competitiveness and which is revealing its structural lack of equilibrium.

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ANALYSIS OF STATISTICAL INDICATORS FOR OUTPUT AREAS, IN SUD-VEST OLTENIA DURING 2000-2013

VLAD CRISTINA MIHAELA[1], DAN CUJBESCU[2]

Summary: *this article examines the Region South-West Oltenia development acreage main vegetable crops in the period 2000-2013, bearing in mind the current situation of Romanian agriculture is the direct result of a specific rural way of life, requiring intervention not so much by the Common Agricultural Policy measures such as economic, fiscal, social policy, etc. Thus, based on data processed by the National Statistics Institute, TEMPO-Online time series, and their interpretation by methods of statistical analysis were able to highlight the fluctuations that have occurred during this period.*

Keywords: *agriculture, countryside, farmland.*

INTRODUCTION

South-West Oltenia is one of the eight development regions of Romania. The region comprises the counties of Dolj, Gorj, Mehedinti, Olt and Valcea, a total of 40 cities and towns, 408 communes and 2070 villages. The relief has a relatively balanced distribution, including mountains, plains, hills and plateaus. In the north of Oltenia, the relief has mountains and hills (the Carpathians and sub-Carpathians), predominantly forests and grasslands. The plain area is specialized mainly in the cultivation of cereals[3].

This region is marked by its dependence on agriculture, this took the form of a subsistence agriculture practiced by aging rural population and the urban people redundant. Making a significant contribution to the regional gross domestic product and low productivity, this economic sector is characterized by fragmentation and lack of land and modern production methods.

MATERIAL AND METHOD

The analysis at the Development Region South-West Oltenia, were used the following statistical indicators: arithmetic; surface structure; average annual rate of growth; standard deviation, standard deviation.

In statistics and probability theory, the standard deviation of a random variable is a measure of the dispersion of its values around one considered medium.

Xo be random variable with mean value μ:

$$\mathrm{E}[X] = \mu$$

Here, the operator E indicates the average (estimated) of X. When X is the standard deviation of the size

$$\sigma = \sqrt{\mathrm{E}\left[(X - \mu)^2\right]}.$$

The standard deviation σ is the square root of the mean value of (X - μ) 2.

Average annual growth areas is the indicator current year - last year the indicator) / previous year the indicator. The percentage increase in areas planted express the extent that extend from one year to another.

Statistical indicators included the main cereals and technical plants that have over 90% of the cultivated area. Year period 2000-2013 was analyzed, and this a 2009-2013 subperiod to capture the recent phenomena of agriculture of the region, and a key role in drawing up plans for production agriculture.

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RESULTS AND DISCUSSION

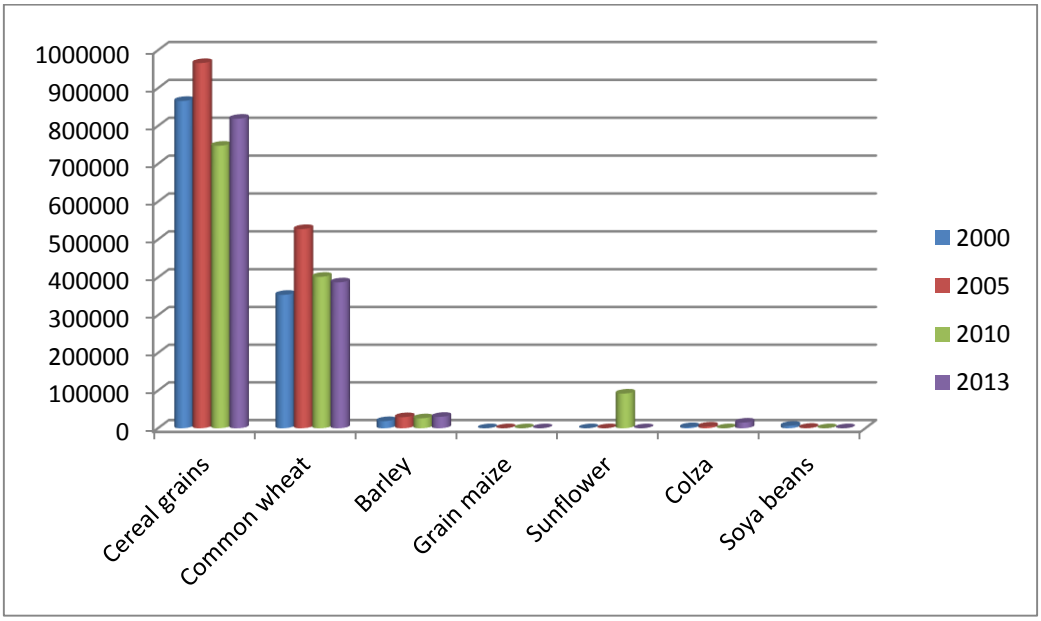
The climate zone South-West Oltenia is temperate continental characterized by monthly average air temperatures are between 11.3 ° C to 10.9 ° C. Caracal and Slatina and average rainfall ranges from <500 mm in the south-west county Up to 600 mm in settlements in the northern tip of the Getic plateau[1]. This climate is favorable for cereal grains which held over 75% of the county's agricultural suptafața (table 1). Among cereals, wheat crop was grown on 354,026 ha (30.9%) in 2000, and 401 562 ha (36.3%) in 2013. The corn crop occupied an area of 465 536 ha (40, 6%) in 2000 and 346 643 ha (32.5%) in 2013. The two crops, wheat and corn, held 68.8% of the agricultural area of the region [1].

Reflecting the importance of cereals, the ship began work on a building called investment "Scholarship grain Corabia", which will operate an administrative office, a laboratory for quality grain with specific active trading activity on the stock market development and certification laboratory for quality grain. A share in agriculture Assn Development Region South-West Oltenia has crops and oil or sunflower and rapeseed. Sunflower crop was cultivated on 69,743 ha (6%) in 2005 and came to be cultivated on 132,247 ha (12.4%) in 2013. The culture of rape had oscillations of acreage from 2896 ha (0.3%) in 2000 to 15,089 ha (1.4%) in 2013. vegetable crops shows a small increase from 34 151 hectares surface (3%) in 2000 to 40 090 ha (3.8%) in 2013. As a matter decreases in feed areas from 85 679 ha (7.5%) in 2000-51432 ha (4.8%) in 2013. Also dropped surfaces to soybeans, tobacco , potatoes, orchards and crops in the greenhouse.

From the analysis of the acreage statistics (Table 1, Table 2, Figure 1), we find that the cereal grain cultivated area of 860 535 ha was, with an average rate of -0.43% decrease over the period 2000-2013, decreasing diminished in the last 5 years -0.17%. The coefficient of variation of cereal grain acreage was 8.9% during 2000-2013 and fell to 3.9% in 2007-2013. Calculating acreage limits for a confidence interval of 90% probability (10% risk), they were 896 843 ha and 860 534 ha, which is 36 309 ha.

As a synthetic indicator has been calculated the share it is this difference compared to the average recorded for this period. This difference between limitete areas is 4.2% of the average. Comparing it with the 5.3% result for the period 2007-2013, that in the latter period oscillations were higher areas compared to the first period.

Figure 1 Areas planted (ha) the main crops during 2000-2013



Processed NIS, TEMPO-Online time series, Farming 2000-2013

Table 1 Size and structure of the main crops cultivated during the period 2000-2013 in the South-West Oltenia

No.	The main crops	2000		2005		2010		2013	
		ha	%	ha	%	ha	%	ha	%
1	Total	1145416	100.0	1154445	100.0	1023571	100.0	1066502	100.0
2	Cereal grains	866 170	75.6	966 202	83.7	747 767	73.1	819 151	76.8
3	Rye	3105	0.3	4624	0.4	3976	0.4	3106	0.3
4	Common wheat	354 026	30.9	527 690	45.7	401 562	39.2	386 918	36.3
5	Barley	18,948	1.7	29,435	2.5	26,371	2.6	30,304	2.8
6	Barley	14701	1.3	18005	1.6	19061	1.9	19,068	1.8
7	Grain maize	465 536	40.6	375 425	32.5	276 396	27.0	346 643	32.5
9	Peas	1174	0.1	310	0.0	1242	0.1	3206	0.3
10	Beans	2467	0.2	2099	0.2	1706	0.2	1268	0.1
11	Oil plants dc:	119 388	10.4	75,491	6.5	156 486	15.3	148 133	13.9
12	Sunflower	109 207	9.5	69,743	6.0	92057	9.0	132 247	12.4
13	Colza	2896	0.3	4474	0.4	63,395	6.2	15089	1.4
14	Soya beans	6463	0.6	1127	0.1	151	0.0	80	0.0
15	Tobacco	5361	0.5	1473	0.1	20	0.0	143	0.0
16	Plt med. Aromatic	384	0.0	32	0.0	3098	0.3	38	0.0
17	Potatoes - total	16802	1.5	16616	1.4	18135	1.8	14090	1.3
18	Vegetables - total	34,151	3.0	41,032	3.6	46,565	4.5	40,318	3.8
19	Vegetables degree. famil			15043	1.3	13255	1.3	12092	1.1
21	Arable fodders	85,679	7.5	62,178	5.4	60337	5.9	51,432	4.8
24	Strawberry plantation	213	0.0	306	0.0	316	0.0	322	0.0
25	Fruit orchards	41,861	3.7	40,450	3.5	23,676	2. 3	27121	2.5
26	Area greenhouses	202	0.0	83	0.0	75	0.0	35	0.0
27	Arable land idle	89,155	7.8	54,585	4.7	206 281	20.2	94,924	8.9

Processed NIS TEMPO-Online time series, Farming 2000-2013

A significant percentage have surfaces *idle land* CAA. 94 924 ha (8.9%) in 2013.

Table 2 Statistics of areas planted with major crops, during 2000-2013, in Sud-Vest Oltenia

No	The main crops	UM	2000	2005	2010	2013	Arithmetic mean	Standard deviation (ha)	Factor variation (0)	Square mean (6x)	Maximum (Med j+l77 * 6 x)	Minimum limit (Med j l77 * 6x)	Absolute diffrence	%of the averege
1	Cereal grain	ha	866 170	966 202	747 767	819 151	860 535	76,711	8.9	20502	896 843	860 534	36309.0	4.2
		%		0.97	0.91	1.04	-0.43	x	x	x	x	x	x	x
2	Commo n wheat	ha	354 026	527 690	401 562	386 918	409 240	60,762	14.8	16239	437 999	409 239	28760.0	7.0
		%		1.07	1.05	1.24	0.69	x	x	x	x	x	X	x
3	Barley	ha	18,948	29,43 5	26,37 1	30,30 4	21,746	6705	30.8	1792	24,919	21,746	3173.0	14.6
		%		1.62	1.20	1.50	3.68	x	x	x	x	x	x	x
4	Oats	ha	14701	18005	19061	19,06 8	18361	2480	13.5	663	19535	18361	1174.0	6.4
		%		1.03	0.92	0.92	2.02	x	x	x	x	x	x	x
5	Grain maize	ha	465 536	375 425	276 396	346 643	392 454	52,851	13.5	14125	417 469	392 454	25015.0	6.4
		%		0.82	0.72	0.84	-2.24	x	x	x	x	x	x	x
6	Sunflow er	ha	109 207	69,74 3	92057	132 247	90,896	20001	22.0	5346	100 363	90,896	9467.0	10.4
		%		0.77	1.35	1.15	1.48	x	x	x	x	x	x	x
7	Colza	ha	2896	4474	63,39 5	15089	18,841	17869	94.8	4776	27298	18,841	8457.0	44.9
		%		1.01	1.78	0.97	13.54	x	x	x	x	x	x	x
8	Soya beans	ha	6463	1127	151	80	1330	2109	158.6	564	2328	1329	999.0	75.1
		%		0.19	4.44	0.50	-28.67	x	x	x	x	x	x	x

Processed NIS, TEMPO-Online time series, Farming 2000-2013

The wheat crop (Table 2, Table 3.), The area presents a growth rate for the period 2000 to 2013, 0.69% versus 0.41% for the period 2009-2013 ajugându to the cultivation area 386 918 ha in 2013. deviation of 90% probability limits of 28760 ha is (7% of the average) for the period 2000-2013 and 49 198 ha (13.4% of the average) for 2007-2013.

Barley crops (Table Table 2, Table 3), the area presents a growth rate during 2000-2013, 3.68% versus 8.38% for the period 2009-2013, ajugându to the cultivated area of 30 804 ha in 2013. deviation of 90% probability limits it is 3173 ha (14.6% of the average) for the period 2000-2013 and 8115 ha (36.2% of the average) for 2007-2013.

Table 3 Surface statistical indicators main crops in 2009-2013, in Sud-Vest Oltenia

Nr	The main crops	UM	2009	2010	2011	2012	2013	Media / rhythm	Standard deviation (ha)	Variation coefficient (%)	Standard eviation(σx)	Maximum limit(Medj+ 1,77*σx)	Minimum limit(Medj- 1,77*σx)	Absolute difference	% of the average
1	Cereal grain	ha	824757	747767	791649	789012	819151	794467	30600	*39*	*13685*	815404	773529	*41875*	*53*
		%		091	106	100	104	*-017*	X	*X*	*X*	*X*	*X*	*X*	*X*
2	Common wheat	ha	380636	401562	349954	311263	386918	366067	35951	*98*	*16078*	390665	341467	*49198*	*134*
		%		1.055	0.871	0.889	1.243	*041*	X	*X*	*X*	*X*	*X*	*X*	*X*
3	Barley	ha	21961	26371	14584	20166	30304	22677	6003	*265*	*2685*	26784	18569	*8215*	*362*
		%		12.008.105	05.530.317	1.382.748	1.502.727	*838*	X	*X*	*X*	*X*	*X*	*X*	*X*
4	Oatmeal	ha	20804	19061	19596	20759	19068	19858	871	*44*	*390*	20453	19261	*1192*	*60*
		%		0.916.218	10.280.678	1.059.349	0.918.541	*-215*	X	*X*	*X*	*X*	*X*	*X*	*X*
5	Maize	ha	382342	276396	386455	414269	346643	361221	53162	*147*	*23775*	397596	324845	*72751*	*201*
		%		072	140	107	084	*-242*	X	*X*	*X*	*X*	*X*	*X*	*X*
6	Sunflower	ha	68404	92057	102380	115414	132247	102100	24096	*236*	*10776*	118587	85613	*32974*	*323*
		%		13.457.839	1.112.137	112.731	1.145.849	*1.792*	X	*X*	*X*	*X*	*X*	*X*	*X*
7	Rape	ha	35594	63395	36227	15539	15089	33169	19790	*597*	*8850*	46709	19627	*27082*	*816*
		%		1.781	0.571	0.429	0.971	*-1.931*	X	*X*	*X*	*X*	*X*	*X*	*X*
8	Soybean	ha	34	151	60	161	80	97	56	*578*	*25*	135	58	*77*	*792*
		%		444	040	268	050	*2.385*	X	*X*	*X*	*X*	*X*	*X*	*X*

Processed NIS TEMPO-Online time series, Farming 2000-2013

Oat crops (Table 2, Table 3), the area presents a growth rate for the period from 2000 to 2013, 2.02% versus -2.15% for the period 2009-2013 ajugându to the cultivation area 19 068 ha in 2013. deviation of 90% probability limits is 1174 ha (14.6% of the average) for the period 2000-2013 and 1192 ha (6% of the average) for 2007-2013.

The maize grain (Table 2, Table 3), the surface shows a growth rate for the period 2000-2013, of -2.24%, -2.42% compared to 2009-2013, ajugându to the cultivated area of 346 643 ha in 2013 . Deviation from the limits of the 90% probability of 25015 ha (6.4% of the average) for the period 2000-2013 and 72751 ha (20.1% of the average) for 2007-2013.

The sunflower crop (Table 2, Table 3), the area presents a growth rate for the period 2000 to 2013, 1.48% versus 17.92% for the period 2009-2013 ajugându to the cultivated area of 132 247 ha in 2013. The deviation of the limits of probability 90% is 9467 ha (10.4% of the average) for the period 2000-2013 and 32 974 ha (32.3% of the average) for 2007-2013.

Rape crops (Table 2, Table 3), the area presents a growth rate for the period 2000 to 2013, 13.54% -19.31% compared to 2009-2013, ajugându to the cultivated area of 15089 ha in 2013.

deviation of 90% probability limits is 8457 ha (44.9% of the average) for the period 2000-2013 and 27082 ha (81.6% of the average) for 2007-2013.

Soybean crops (Table 2, Table 3), the area presents a growth rate for the period 2000-2013, of -28.67% versus 23.85% for the period 2009-2013 ajugându to the cultivated area of 80 ha in 2013.

Deviation of 90% probability limits is 999 ha (75.1% of the average) for the period 2000-2013 and 77 ha (79.2% of the average) for 2007-2013.

CONCLUSIONS

In last twenty years, the farm sector from subsistence and semi-subsistence, because of its size major, was the target of many policy measures aimed to restructure, but those measures have had the desired effects: achieving better productivity and higher efficiency[2].

This situation it is due to various reasons such as reluctance towards the phenomenon owners associations; continuously changing legal and fiscal systems that have created an environment of distrust and uncertainty, lack of capital necessary to ensure good development, low level of domestic agricultural subsidies, functional problems in creating distribution channels in rural areas, etc..

Due to a large number of small farms, real possibilities of restructuring of these are quite low, especially considering that the number of farms considered in recent years to support in order to transform them into commercial farms, only included farms subsistence between 2 and 8 ESU (about 350 thousand farms over 5 hectares - about 9% of the total) and that only about 1.1 million farms were eligible for support under SAPS scheme (direct payments). Ineligibility of nearly 2 million farms support measures changes in the structure of rural population (aging), lack of agricultural infrastructure, technical jobs, etc, remain real problems that require structural changes in all economic, legislative and social aspects Romanian countryside.

In conclusion it should be considered first that the current situation of Romanian agriculture is the direct result of a specific rural way of life that requires interventions not so Common Agricultural Policy, as by economic, fiscal, social policy, etc.

As highlighted above, significant oscillations were cultivated areas, especially if we take into account all the support measures in the last twenty years to create a modern commercial agriculture. Even today over 99% of farms are subsistence and semi-subsistence farms (almost 94% of less than 2 ESU). Given that the RDP support measures to increase the competitiveness and diversification are primarily directed at 2-8 ESU farms, the great problem of Romanian agriculture is that over 3.6 million farms with less than 2 ESU (91 % of total holdings), and only about 1 million of them receive support through the SAPS (single area payment scheme) or PNDC (complementary national direct payments). To quantify the real impact of the support but CAP subsistence agriculture and implications for sector restructuring, research within this work requires a review on the basis of the next agricultural census. This will allow us to quantify, even if not directly impact agricultural policy measures in 2007-2013. Only in this way through a post accession, we see real change in the sector.

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FARMS REGIONAL ECONOMIC DEVELOPMENTS IDENTIFIED IN THE FADN PANEL

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Abstract: *The paper adresses an approach on indicators from the public database FADN (Farm Accountancy Data Network), at farm level selected from Romania. The study focused on analyzing the data series in 2012 (the latest year reported in the FADN) and the second part of the study was supported by the report on the last six years (2007-2012) and four of the eight regions. The data comes from public database FADN and the methodology consisted of a descriptive analysis of the data and presenting them as graphic and tabular form. The results recorded consisted of highlighting the differences between regions and survey findings have highlighted a decrease in interest and rental costs and also in investment levels, compared to 2012; in the same conditions, the total production and cash flow increased.*

Keywords*: farms, Romania, FADN, regional, productions, indicators*.

INTRODUCTION

Romanian agriculture is one of the most important sectors, both in areas for cultivation and by the diversity of crops and direction of production. However, agriculture has had to face many challenges, particularly in the last 20-25 years, and its assertion as the basic sector in the economy was influenced by measures related to European harmonization. In these circumstances, the need for a study based on actual data collected from a representative sample of farms in all regions and to bring results related to agricultural economic indicators, found their place in research field. FADN was introduced as the data collection system 50 years ago, in 1965. Currently it uses data from about 5,000,000 farms in the 27 European member countries, representing more than 90% of total EU agricultural production. This is designed to collect accountancy data on agricultural holdings in order to determine the revenue and analyse the agricultural business. An existing database query could get to the link http://ec.europa.eu/agriculture/rica/database. FADN was helpful from the start in configuring and adapting the common agricultural policy, in a real database. In Romania, the establishment of the Farm Accountancy Data Network was done by O.G. 67/2004, approved by law no. 465/2004. Liaison Agency for Romania is the RICA department from the Ministry of Agriculture and Rural Development. This agency carries out an annual survey and then, the questionnaires are transmitted to European Commission for validation and payment. Research based on FADN information are essential trace from the reform process and evaluation of CAP measures, but also in achieving long-term agricultural policies. (www.madr.ro). For the accounting year 2012 were collected accounting information from 6,000 farms, from which were validated by the European Commission (EC), a number of 5717 farms. Data confidentiality is an important issue for the farmer who provides the data; this is ensured by Article 16 of Regulation 1217/2009 EEC, consolidated version of Regulation No. 79/65 / EEC. FADN database provides the data as standard results that can be consulted through a series of reports, organized in datasets. The European Commission has defined each variable in standard results in order to ensure a correspondence between the definitions of its own variables and those of other institutions producing agricultural statistics The results calculated for each year is average and are given in € (EUR / ECU), which will allow data to be aggregated in any country and compared. Research based on the same database were also made by other authors. In this respect, we mention Kusz, Gedek, Ruda and Zajac (2014), authors who were interested especially regarding data on farm investments. Also based on data

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provided by FADN, researchers Skarżyńska, Grzymek and Abramczuk, (2014) analyzed data on the global economic situation of Eastern European countries. Likewise, the authors Veveris, Krievina and Leimane (2007) underlined the positive and negative aspects of agriculture in Latvia, cost structure issues through the analysis of economic information farms, using FADN data. Farm efficiency issues, using FADN data, were elaborated by Toma (2010) who considered that "FADN is an instrument based on annual survey of incomes and results evaluation ...". Approaching the same source of information, Simtion (2014), focused on analyzing the data standardization in agriculture. On his turn, Dona (2013), made an analysis on the evolution of specialized horticultural or mixed farms, also based on information obtained from FADN. In the same respect and based on the same source of information, details on some productions have been presented by Kuta and Golab (2014) focusing on the production costs and the profitability of different varieties of potatoes. Finally, we mention the study of Chavas (2011) who appreciate the fact that it will need more studies to increase the understanding on the environment and how it has to be transformed "into supporting and feeding the human race, including estimating the economic value of multifunctionality in agriculture …".

MATERIAL AND METHODS

As we mentioned, the data used in the study were collected by FADN in the Romania' sample in 2012 and data from the regional level during the 2007-2012 period. For the analysis at the regional level, we chose from the 8 regions, only 4- North-East, West, North West and Centre. The other 4 regions (South East, South Muntenia, South-West Oltenia and Bucharest-Ilfov), will not be addressed in this study, and it will be the subject of subsequent works. Groups of variables chosen for this regional analysis were as follows. Structure variables (labor paid and utilized agricultural area), then, variables ranging from production (output crop production, output livestock production and farmhouse consumption); category of chosen data from costs and taxes were related to rent and interest paid and taxes; balance indicators focused on the following variables: buildings, machinery and short-term loans, medium and long term loans. The last category of indicators (financial indicators), referred to the investment and cash flow. The data used in this study and their description comes from public database FADN (EUFADN Database, Eurostat), accessed in April-May 2015). The methodology consisted of descriptive data analysis and comparative analysis results are presented in tabular and graphical form.

RESULTS AND DISCUSSIONS

In this part of the paper, we present the categories of indicators, the results of comparative analysis between the 8 regions (North East, South East, South Muntenia, South West Oltenia, West, North West, Centre, Bucharest-Ilfov) in the year 2012. In this regard, Fig. 1 illustrates paid labor and the utilized agricultural area on the 8 regions. Thus, we can see a proportional evolution of the two indicators. The following figure (Fig.2) captures comparative graphical form, the crop and animal production and farmhouse consumption in all 8 regions in 2012. We identified an important level of crop production in the South East, West and Bucharest Ilfov, a level of animal production in the South East, West and Central. Farmhouse consumption is a relatively important in all regions.

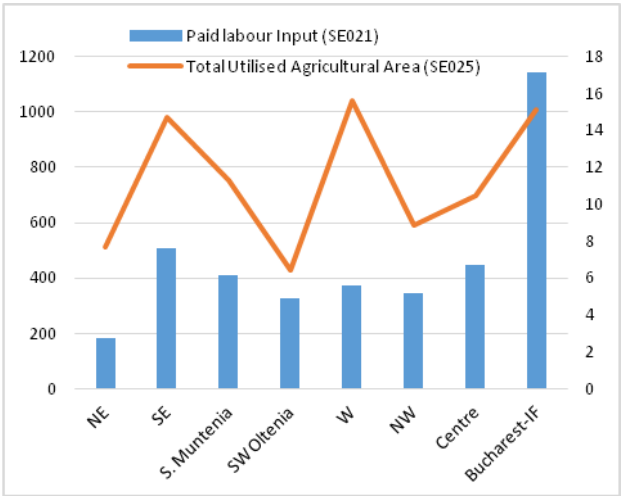

Fig. 1: Production structure, 2012
Source: EUFADN Database Eurostat, Extracted 04/05/15

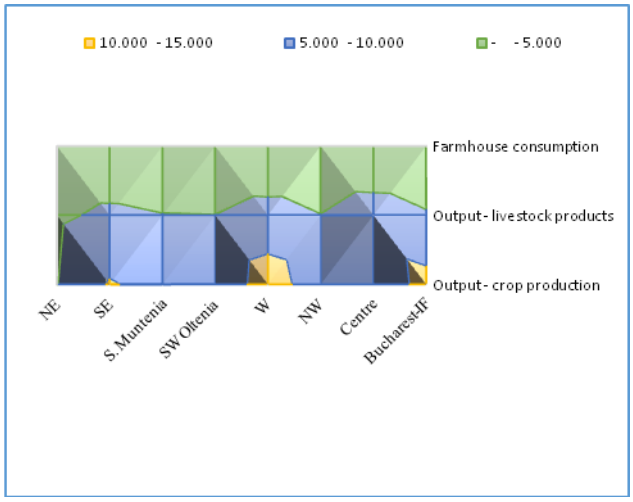

Fig. 2: Crop and livestock production, 2012
Source: EUFADN Database Eurostat, Extracted 04/05/15

The charts that follow refer to two categories of costs and revenue indicators both for 2012. The categories of costs considered are interest and rent paid. We note in this regard that the greatest interest paid is registered in Bucharest-Ilfov region, and the lowest is recorded in region North East. Regarding the rent paid, the areas with the highest levels are in order South East, South Muntenia and West, and the lowest rent paid was recorded in the South-West Oltenia.

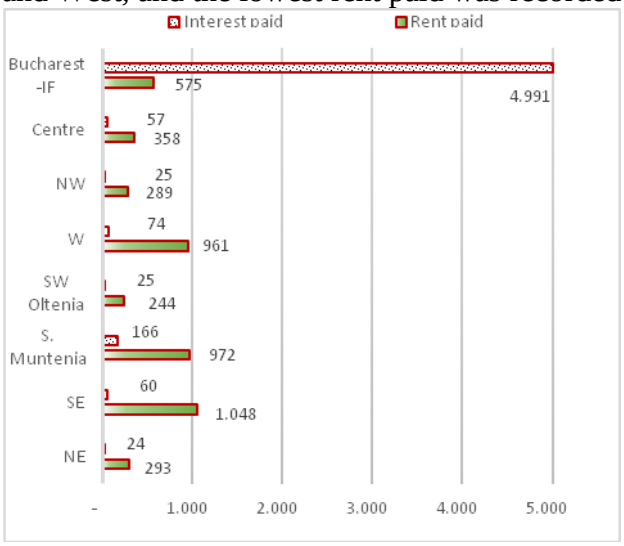

Fig. 3: Costs categories, 2012
Source: EUFADN Database Eurostat, Extracted 04/05/15

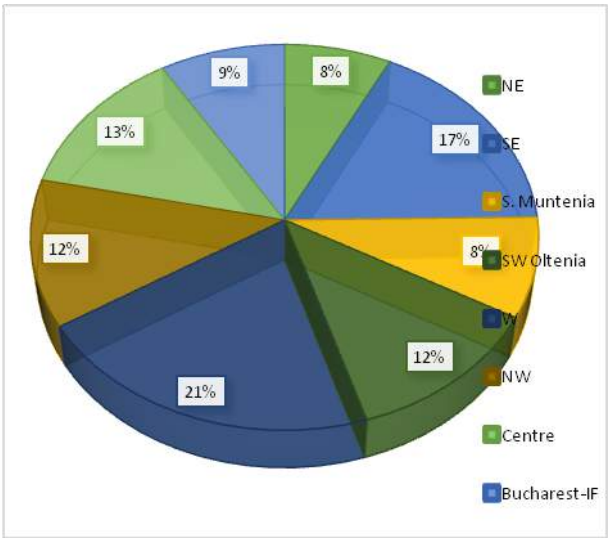

Fig. 4: Net income/farm, 2012
Source: EUFADN Database Eurostat, Extracted 04/05/15

The indicator Net income / farm is represented in Fig. 4 as a percentage of the total per year. We will noted so that the highest income is recorded in the West region (21%), followed by the South East (17%) and the lowest rent is recorded in the North East (8%).

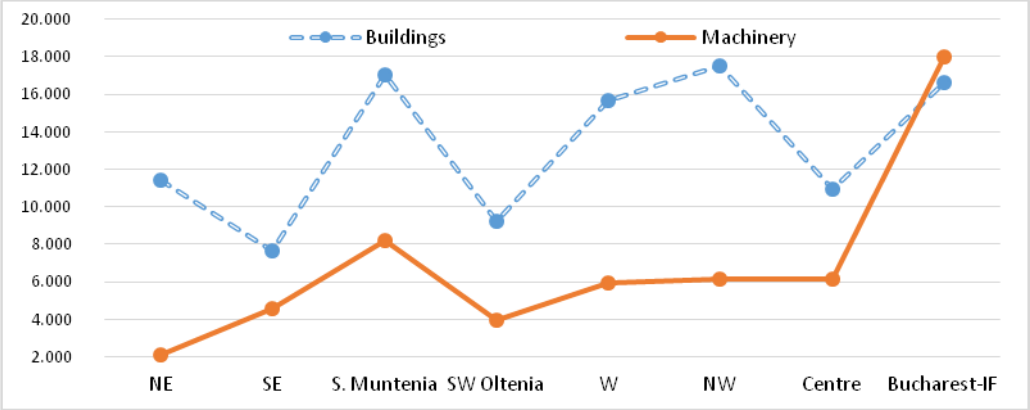

Fig. 5: Indicators Balance, 2012, Source: EUFADN Database Eurostat, Extracted 04/05/15

A representation of the indicators "buildings" and "machinery" is made in Fig. 5. We can see that the North East region has the lowest level in machinery and in the Southeast it wa found the lowest buildings level. Bucharest Ilfov region has recorded the highest level for the two categories and this may be the raison for the highest level volume level of interest paid in the region. Next, we present in tabular form the six years dynamics of the previous indicators, only four development regions (Northeast, West, North West and Centre), during the 2007-2012 period. Thus, Table 1 presents the evolution in the groups of indicators on the structure and outputs.

Table no. 1: Structure and productions. Data is expressed in procentage (%) baded on the year 2012, 2012=100%

Year	*Region*	*Paid labour Input*	*Utilised Agricultural Area*	*Output - crop production*	*Output - livestock products*	*Farmhouse consumption*
2011	NE	114,6	102,9	109,3	117,2	115,8
	W	104,7	97,6	98,2	106,4	108,3
	NW	137,5	109,3	103,1	111,5	98,4
	Centre	128,3	95,7	99,7	110,4	95,1
2010	NE	105,8	107,1	113,1	121,5	114,2
	W	109,1	102,2	95,6	94,6	104,4
	NW	171,4	107,1	101,3	117,9	97,2
	Centre	127,2	92,5	92,1	107,5	138,2
2009	NE	162,6	100,3	89,9	78,4	158,5
	W	114,4	79,6	54,7	82,0	232,9
	NW	179,5	95,0	98,7	82,0	133,1
	Centre	196,6	108,4	94,0	100,1	212,9
2008	NE	153,5	75,5	94,2	59,3	171,7
	W	205,5	67,5	44,9	68,0	158,8
	NW	241,0	86,9	95,4	83,6	66,8
	Centre	283,2	87,4	102,5	122,6	189,9
2007	NE	268,3	70,5	69,9	69,2	170,5
	W	194,6	62,6	52,1	76,0	198,9
	NW	417,5	79,0	83,5	203,2	79,3
	Centre	524,2	88,0	81,9	322,9	185,9

Source: EUFADN Database Eurostat, 2015

From the table we can see that in terms of paid labor, this is an increase compared to 2012. The next three indicators (area used, crop and animal production), have recorded a constant growth, and we can even say that these indicators have had, with some exceptions, lower values in the years prior to 2012. The last indicator in Table 1, farmhouse consumption had a positive dynamics in the years prior to 2012, except the North West region where consumption was lower from the reference years before 2012, the other areas were with higher percentages of 100%. The following table presents the dynamics of costs and loans, compared to 2012. We can say that rent paid until 2012 were lower than in 2007-2011 in all regions, except the North East, in 2010 and 2011. Interest payments are higher than the reference year, indicating possibly a relaxation of or a decrease in credit interest. Medium and long-term loans had a lower dynamic forom the reference year, except

in the North East and North West areas. Short-term loans were higher by 150% in 2007-2011, compared to reference year 2012.

Table no. 2: Costs and balance indicators. Data is expressed in procentage (%) baded on the year 2012, 2012=100%

Year	*Region*	*Rent paid*	*Interest paid*	*Long & medium-term loans*	*Short-term loans*
2011	NE	101,0	204,2	145,9	251,4
	W	70,8	148,6	81,4	280,8
	NW	78,5	160,0	181,3	23,5
	Centre	76,8	157,9	50,7	187,6
2010	NE	106,1	245,8	206,1	323,9
	W	82,7	91,9	74,0	120,5
	NW	71,3	196,0	208,6	86,8
	Centre	83,2	133,3	44,1	166,8
2009	NE	76,1	137,5	65,7	165,1
	W	49,9	144,6	74,1	368,6
	NW	58,8	236,0	261,0	373,5
	Centre	70,7	396,5	126,9	278,3
2008	NE	33,1	183,3	171,3	185,3
	W	43,4	154,1	104,4	464,7
	NW	39,8	252,0	56,1	154,4
	Centre	70,4	386,0	149,8	337,8
2007	NE	36,2	191,7	106,1	181,7
	W	54,0	106,8	193,5	123,7
	NW	54,3	1380,0	524,1	1441,2
	Centre	70,1	1414,0	763,4	1167,3

Source: EUFADN Database Eurostat, 2015

In the Table. 3, are presented in dynamics flows the financial indicators compared to 2012 and this indicates a significant fluctuation for gross investments and Cash Flow indicator is 2007-2011 to a lower level of the 2012 year. This could lead us to the idea that in 2012 it was made more investments, combine with a cash flow that also had a larger volume compared to the previous period.

Table no. 3: Financial indicators. Data is expressed in procentage (%) baded on the year 2012, 2012=100%

Year	*Region*	*Gross Investment*	*Cash Flow*
2011	NE	-175,0	110,1
	W	214,0	84,3
	NW	-178,9	92,0
	Centre	92,0	91,1
2010	NE	150,8	87,0
	W	89,3	76,5
	NW	163,9	89,9
	Centre	47,8	76,2
2009	NE	57,8	65,4
	W	196,6	35,7
	NW	187,9	80,2
	Centre	142,7	52,4
2008	NE	66,4	56,2
	W	238,8	29,5
	NW	25,5	86,6
	Centre	108,0	72,6
2007	NE	92,2	39,5
	W	87,4	32,5
	NW	77,6	86,6
	Centre	422,6	62,7

Source: EUFADN Database Eurostat, 2015

CONCLUSIONS

As findings of this study will include the following. In 2012, analyzed for all eight regions, workforce and total area were noted related data and production volume was proportionally. Comparative cost analysis showed us a huge amount of interest paid Bucharest-Ilfov region, where we find also the highest volume of machinry and buildings, meanwhile, in North East region this index is the lowest. At the same time, rent payments may reach from 244 euros (South West Oltenia) to 1048 (South East). Net income / farm appears to be correlated closely with those costs. We are talking about a maximum of 21% of the total in 2012 to the West, while the minimum (8%) is reached in the North East and South Muntenia. Compared with 2012, the analyzed indicators in 2007-2011, in four selected regions, recording a decrease overall costs, an increased in production level, but at the same time, investments are affected and the cash flow indicator increased.

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MONITORING AND RECOVERY OF THE SOIL BIOTA IN CONDITIONS OF THE DEGRADATION PROCESSES INTENSIFICATION IN THE REPUBLIC OF MOLDOVA

IRINA SENICOVSCAIA[1]

Abstract. *Statistical parameters, criteria and scales of the soil biota stability to the natural and anthropogenic impact in the Republic of Moldova has been developed. The modifications of the biological properties of soils as a result of their long-term arable use and the impacts of erosion processes have been established. The zones of homeostasis (natural stability) of the biota of different soils have been determined for the first time at the national level. The current status of biota of arable soils is characterized by the significant reduction in comparison with soil's standards that are in conditions of natural ecosystems and with the level of the 1960s. The scales of soil biological indicators for the evaluation of the degree of chernozems' degradation and its environmental certifications have been developed. The application of no-tillage technology on the soils of the Republic of Moldova has been discussed.*

Key-words: *soil biota, degradation, natural stability, recovery, quality standards.*

INTRODUCTION

Soil global degradation has acquired a catastrophic character and is one of the main causes of global environmental crisis [6]. The current state of the soil cover in the Republic of Moldova is characterized by the intensification of the processes of degradation and desertification [2]. The decline in the organic matter content and the compaction of the arable soils with the normal profile is one of the main manifestations of the degradation processes in agricultural lands. There has been a significant deterioration of the conditions needed for the vital activity of soil invertebrates and microorganisms.

In the balanced ecosystems processes of microbial decomposition of organic matter and its synthesis are closely linked with the growth of plants that provides the stable existence of undisturbed ecosystems during long periods of time. In degraded ecosystems the equilibrium is disturbed, mineralization processes are predominant in them. The stable deviation of biota indices from the equilibrium state of the parameter values either displaying an increase or decline indicates essential ecological changes or the destruction of soil ecosystem [4, 12 and 13]. The changes in biological properties may indicate the risk of likely soil degradation as a result of human activity. The basic criterion to evaluation the stability of soil biota to anthropic influence is the capacity to preserve and maintain the dynamic equilibrium or homeostasis [11 and 12]. In this respect, the use of soil bio-indication as an integrated monitoring tool for soil degradation might serve as a prospect solution [1].

The purpose of the research was to determine the effect of different anthropogenic and natural impacts on biota's state in zonal soils aiming to develop the scale parameters of their stability for the national soil quality standards and to estimate the effect of *no-tillage* technology on the biota's restoration of degraded soils.

MATERIAL AND METHODS

Experimental sites and soils. Our comparative study has been performed in three zones of the Republic of Moldova. Land management practices in the condition of long-term field experiments have been analyzed.

The first site was in the north, on the long-term field experiments of the Research Institute for Field Crops "Selectia" (Beltsy). It had 3 plots: fallow land (10-23-year-old), the long-term arable land with crop rotation (management without fertilizers) and black fallow established for 30-43 years. The soil was the typical chernozem with humus content of 5.06 % under lea, 4.17 % under arable

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land and 3.54 % under black fallow land. Soil samples were collected from the 0-30cm layer of the experimental plots during 1994-1998 and 2006-2007.

The second site was located in the center of the country, in the Ivancha village, Orhei region. The natural land under fallow (40-60-year-old), forests and the long-term arable land with crop rotation without fertilizers were tested. Soils were the leached chernozem with humus content of 3.42 % and pH = 6.9 and the gray forest soil with humus content of 2.32 % and pH = 6.6 in the 0-30 cm layer. Soil samples were collected during 1958-2006.

The third site was located on the territory of "SoroAgro" SRL in the Rediu Mare village, Dondusheni region. Technology of *no-tillage* has been implemented for 2 years at the demonstration plot with the area of 106 ha. The area of control plot with conventional tillage (plowing to a depth of 25-27 cm) consists of 109 ha. The soil was presented by the deep heavy loamy leached chernozem with humus content of 3.71 % and pH = 6.66 in the 0-40 cm layer. The site has been tested in 2014.

The fourth site was located in the southern zone, in the Ursoaia village of the Lebedenco district, Cahul region. The soil of the site is an ordinary chernozem. Chernozems with different degrees of degradation caused by (slightly, moderately and severely eroded) erosion processes have been compared to the chernozem with a normal profile and the eroded soil which was under 58-years-old fallow. Soil samples were collected from the 0-30 cm layer of the experimental plots during the period of time between 1997 and 2008.

Status of invertebrates. The state of invertebrates was identified from test cuts by manually sampling the soil layers to the depth of soil fauna occurrence applying Gilyarov and Striganova's method [7].

Microbiological properties. The microbial biomass carbon was measured by the rehydratation method based on the difference between carbon extracted with 0.5 M K_2SO_4 from fresh soil samples and from soil dried at 65-70^oC for 24h, with K_c coefficient of 0.25 [5]. Counts of microorganisms (bacteria, fungi and humus-mineralizing microorganisms) were obtained on agar plates [14].

Enzymatic activity. The urease activity was measured by estimating the ammonium released on incubation of soil with buffered urea solution by colorimetrical procedures [8]. The dehydrogenase activity was determined by the colorimetric technique on the basis of triphenylformazan (TPF) presence from TTC (2, 3, 5-triphenyltetrazolium chloride) added to air-dry basis of soil [8]. The polyphenoloxidase and peroxidase activities were determined by the colorimetric technique with the use of hydroquinone as a substrate [9].

Chemical properties. Organic C was analyzed by the dichromate oxidation method [3]. The humus content was calculated using the coefficient of 1.724. Humus reserves were calculated taking into account the bulk density of soils.

Statistical analysis. Biological indices were evaluated statistically using the variation and correlation analysis. Statistical parameters of the state of soil invertebrates were calculated taking into account the depth of soil fauna occurrence, microbes and enzymes – for the layer of 0-30 cm.

RESULTS AND DISCUSSIONS

Evolution of the soil biota and humus content in arable soils. During the 50 years of the utilization of arable soils the humus content decreased on average by 20-25% from its initial level. Annual losses due to mineralization processes account for 0.01-0.02%. Mineralization processes are dominated in soils, degraded as a result of long-term arable use. The growth of humus-mineralizing microorganisms has been noticed (Figure 1).

The current state of microorganisms of arable soils in the conditions of agricultural ecosystems of the Republic of Moldova is characterized by a decline in the number and activity compared to the level registered in 1960s (Figure 2). The biological degradation of arable soils is interconnected with the dehumification processes, compaction and destruction of the soil structure. A major reason for the deterioration of soil biological properties and for the decline of humus content under arable agriculture is annual tillage, which aerates the soil and breaks up aggregates where

microbes are living. The selection process of species that can survive in conditions of a lower organic matter content and deterioration of physicochemical parameters of soil systems is taking place among the microorganisms. The long-term use of plowing on soils with the whole profile leads to the decrease of microbial biomass by 1.6-3.6 times in the 0-30 cm layer. Profiles of the soil are covered by the degradation process as in the upper horizons, and as a whole. The reserves of microbial biomass in virgin and fallow soils constitute 5.9-12.7 t ha-1, in arable soils with the normal profile – 3.6-7.2 t ha-1, in eroded arable soils – 1.6-1.9 t ha-1 in the 0 - 100 cm layer. A characteristic feature of long-term dynamics of arable is a significant decrease in the number of bacteria and fungi. The reduction of the biochemical potential and diminution in the size of homeostasis zone of soil invertebrates and microorganisms result in the attenuation of natural soil stability. The size of the homeostasis' zone and natural stability of the biota in arable soils decline respectively: typical chernozem → leached chernozem → gray forest soil.

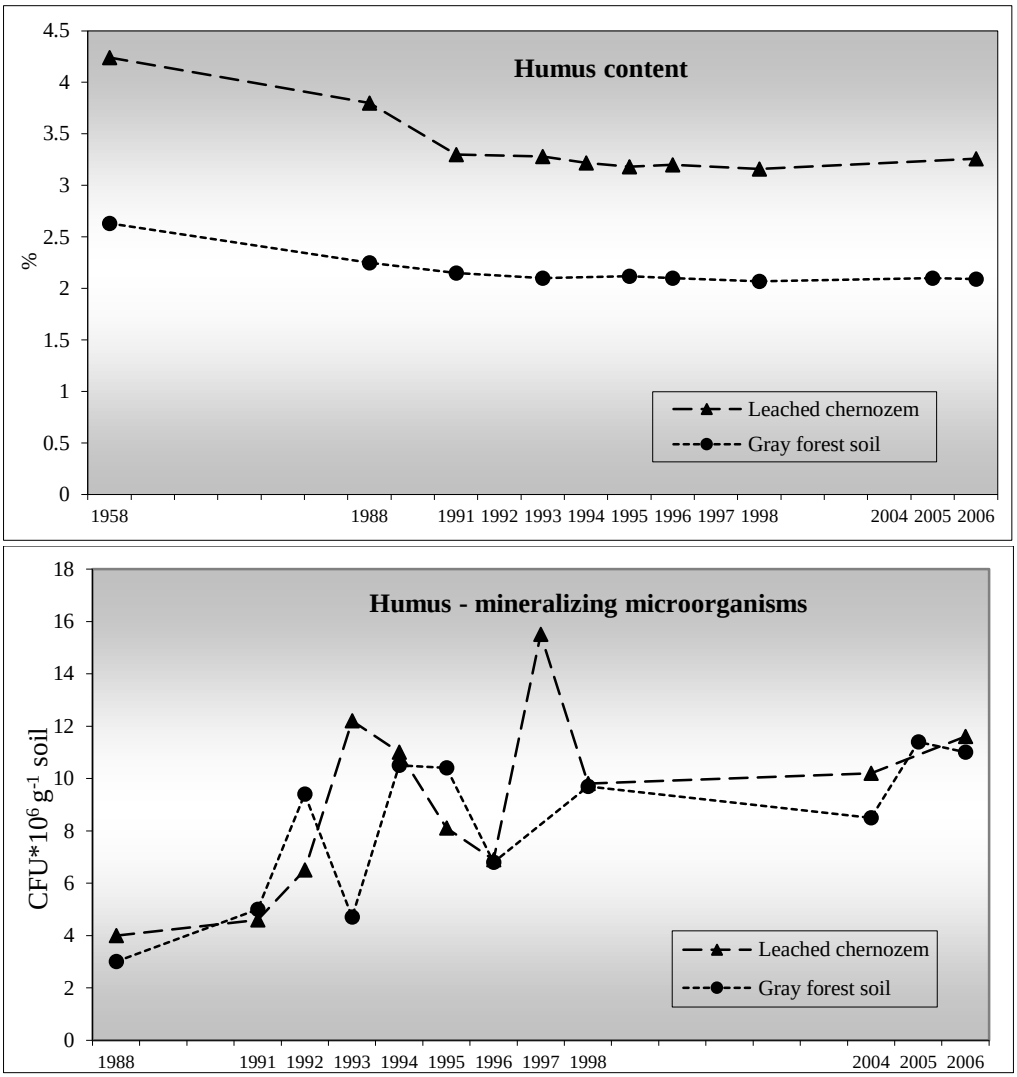

Figure 1. Dynamics of the humus and humus-mineralizing microorganisms' content in arable soils of the Republic of Moldova (0-30 cm)

For the arable soils which were used for a long time under arable it is characteristic the migration of invertebrates into the underlying layers. Layer from 0 to 10 cm practically does not contain invertebrates.

The level of enzymatic activity of modern arable soils for most indicators below in 40-70% compared with the level of the sixties of last century.

There is a tendency to reduce the activity of dehydrogenase and polyphenoloxidase - an enzyme participating in the transformation of organic compounds to humus components, and increase

in activity of peroxidase. This fact indicates about the intensification of mineralization processes of organic matter in arable soils.

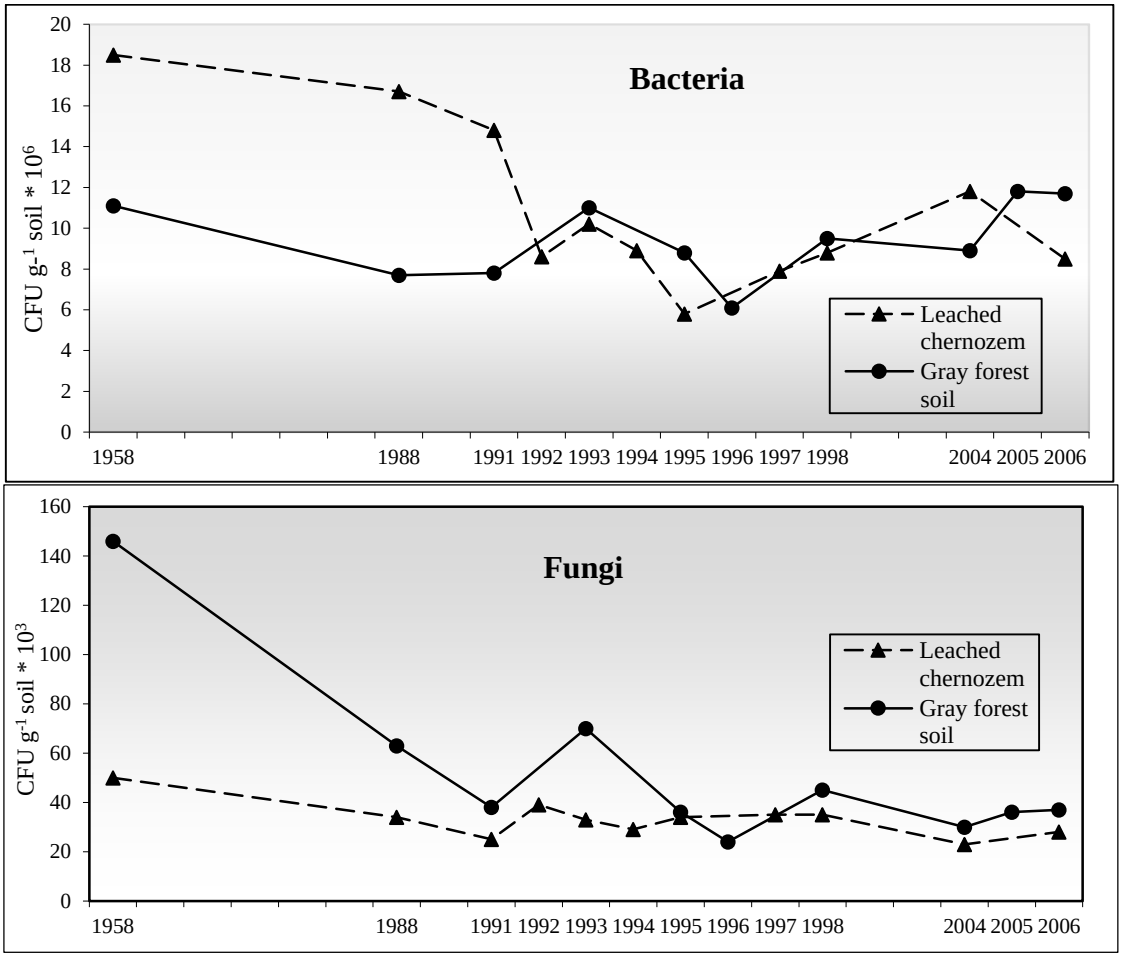

Figure 2. Dynamics of bacteria and fungi in arable soils of the Republic of Moldova (0-30 cm)

Evaluation criteria for biota's stability of zonal soil. Biota of virgin and fallow soils exists in conditions of the high supply of the organic matter and the conservation of resources that have been formed within the limits of the ecosystem. The soil biota of natural ecosystems is characterized by the highest resistance. The virgin and multiannual fallow soils are the place of storage and reproduction of different species of invertebrates and microorganisms, and also they have high levels of biomass and enzyme activity [11]. The values of most biological indicators in zonal soils decrease in the following sequence: natural and long-term fallow land → arable land without fertilizers → arable eroded land. The biological parameters of soils have been grouped according to the humus content. To assess the stability and degradation of arable soils and to carry out the ecological certification we suggest a set of faunal, microbiological and enzymatic criteria. The database of the biota's state of virgin (fallow) soils has a practical importance as the natural standard for the operative evaluation of degradation processes and ecological effectiveness of the land management (Table 1 and 2).

Table 1. Scale of biological parameters for the typical chernozem

Degree of stability	**Humus content, %**	**Invertebrates**		**MB, µ g C g^{-1} soil**	**Humus-mineralising microorganisms, CFU g^{-1} soil*10^6**	**Dehydrogenase, mg TPF $10g^{-1}$ soil $24h^{-1}$**
		number, ex m^{-2}	biomass, g m^{-2}			
Very high	>5.1	>395	>35	>487	4.7-5.4	>3.6
High	4.9-5.1	317-395	24-35	275-487	5.4-7.5	2.2-3.6

Moderate	4.4-4.7	118-165	12-23	266-371	15.2-17.3	1.6-2.3
Low	3.5-3.7	0	0	82-136	2.6-4.7	0.1-0.4

Table 2. The evaluation criteria of biota's stability of the gray forest soil and the leached chernozem

Index	**Gray forest soil (homeostasis zone)**		**Leached chernozem (homeostasis zone)**
	virgin	**arable**	**arable**
Invertebrates			
Total number, ex m^{-2}	169 - 222	47 - 81	75 - 95
Number of *Lumbricidae* family, ex m^{-2}	64 - 102	32 - 54	52 - 71
Biomass of *Lumbricidae* family, g m^{-2}	24 - 59	4 - 14	8 - 11
Microorganisms			
Microbial biomass, µg C g^{-1} soil	687 - 1065	210- 279	287 - 343
Humus-mineralizing microorganisms, CFU g^{-1} soil*10^6	1.1 – 2.8	8.6 – 9.2	7.8 – 11.4
Fungi, CFU g^{-1} soil*10^3	98 - 122	34-48	27– 34
Enzymatic activity			
Urease, mg NH_3 10 g^{-1} soil 24 h^{-1}	5.4 – 9.7	0.9 – 1.9	2.1 – 4.1
Dehydrogenase, mg TPF 10 g^{-1} soil 24 h^{-1}	2.1 – 2.7	0.6 – 0.9	1.2 – 1.7
Polyphenoloxidase,mg 1,4-p-benzoquinone 10 g^{-1} soil 30 min^{-1}	1.1 – 7.1	1.9 – 2.7	3.4 – 4.4
Humus content, %	4.0 – 5.7	2.1 – 2.4	3.2 – 3.8

Impact of *no-tillage* technology on the soil biota. The application of *no-tillage* technology has a positive effect on the biota in the leached chernozem. The rise of the total number of invertebrates and earthworms from 33.3 to 136.0 ex m^{-2} and their biomass from 1.7 to 23.9 g m^{-2} in conditions of *no-tillage* has been observed.

The dominant position in the composition of soil fauna occupies *Lumbricidae* family in *no-tillage* technology. Their share in the total number of invertebrates increases from 84.9% in the plot with conventional tillage to 92.2% in conditions of no-tillage technology. A similar tendency has been established in the indicators of biomass. Their share in the total biomass of invertebrates rises from 71.8% in the plot with plowing to 93.3% in conditions of *no-tillage* technology.

In the leached chernozem in conditions of conventional tillage earthworms are concentrated in the layer of 30-50 cm. On the contrary in the soil under *no-tillage* a major amount of invertebrates (92.6-100.0%) is located in the layer of 0-40 cm. The number of *Lumbricidae* family decreases gradually in the soil profile to a depth of 50 cm.

In the fauna of the leached chernozem *Lumbricidae* family occupies a dominant position also, their numbers amounts to 85.0-100.0%. The average weight of *Lumbricidae* family's representatives increased from 0.05 g on the plot with arable to 0.18 g on the plot with *no-tillage*. *Lumbricus terrestris* is the most typical specie of earthworms in the leached chernozem. *Allolobophora rosea* has been encountered in single copies.

Saprophagous predominated in both methods of tillage in investigated chernozems. The contribution of saprophagous to the total number of invertebrates in the leached chernozem is significant and constitutes 85.0-100.0% for both types of soil tillage. Invertebrates with mixed type of nutrition (*Formicidae* family) are significant in the plot with *no-tillage*. Ecological pyramids are incomplete, but the soil under *no-tillage* is characterized by greater stability compared to the conventional tillage due to larger number of saprophagous.

The increasing trend of microbial carbon content and the ratio between microbial and total carbon content have been recorded in the leached chernozem in conditions of *no-tillage* technology. There has also been indicated the increase of microbial biomass reserves under the application of *no-*

tillage. Reserves of microorganisms' biomass in the 0-40 cm layer are 4796.6-6449.9 kg ha^{-1} in the plot with plowing and 5649.4-6563.9 kg ha^{-1} in the plot with *no-tillage*.

Favorable conditions for the functioning of enzymes in soil under conditions of *no-tillage* have been found. The most powerful impact of the conservation technology on soil enzymes was recorded in the 20-40 cm layer.

Impact of erosion on biota's state. The humus loss as a result of erosion causes a sharp decline in the abundance, biomass and activities of soil biota. Indices of invertebrates' activities decreased in slightly, moderately and severely eroded soils by 15-30%, 31-62%, 63-78% respectively in comparison with the chernozem with a normal profile. The number of saprophagous decreased by 1.5 - 4, predators – by 2-3. An increase in phytophagous activity has also been observed on the basis of their absolute values. Their number may reach 40-48% of the total number of invertebrates. The ratio between saprophagous and phytophagous amounts in the ordinary chernozem with normal profile to 7.3, slightly eroded – 3.4, moderately eroded – 1.3, severely eroded – 1.0.

The total loss of invertebrates amounts to 30.9%, 49.9% and 68.4%. Erosional loss of *Lumbricidae* and *Enchytraeidae* families is quite significant and constitutes 31.7% and 79.5% in slightly eroded chernozems, 62.7% and 100.0% in moderately eroded chernozems, 66.0% and 100.0% in severely eroded chernozems. Some species from the *Formicidae, Curculionidae, Carabidae* family are not encountered in eroded soils.

The content of microbial biomass in the severely eroded chernozem amounts in average to 110.0 μ g C g^{-1} soil, which is 2.6 times less than in the soil with normal profile. The variation coefficient of the microbial biomass index increased from 16.8% to 46.3%, which indicates that the equilibrium and natural resistance of the soil microbial association decreases being higher in the chernozem with a normal profile and lower in the severely eroded soil. The losses of the microbial biomass as a result of erosion processes ranges from 213.6 to 496.2 kg ha^{-1} in slightly eroded, from 609.6 to 866.8 kg ha^{-1} in moderately eroded and from 1025.5 to 1070.5 kg ha^{-1} in severely eroded chernozems. The share of microbial carbon in the organic content falls from 1.66 % for soils with normal profile to 1.16% for severely eroded soils. A similar trend in decrease has been noticed in the confidence intervals of this index. These negative changes reflect the catastrophic effect of erosion processes on soil microorganisms, destruction and loss of the most valuable compounds of soil organic matter – the microbial carbon.

The erosion degradation is manifested in the extreme loss of systematic groups of microorganisms and in the considerable reduction of their biodiversity. Diversity of the *Bacillus* family reduces from 14 to 7-10 species. Sorensen's indicator decreases when the erosion degrees increase from 1.0 to 0.66 and Shannon's diversity index – from 4.18 to 2.05 accordingly. The diversity of fungi species narrows; plant pathogen species of *Penicillium funiculosum, Penicillium purpurogenum, Aspergillus ochraceus* accumulates. *Trichoderma lignorum* species disappear completely in the severely eroded chernozem. The simplification of the actinomycetes species diversity and the accumulation of *Streptomyces* genus occur in eroded soils.

Eroded soils have a low enzymatic activity. The urease activity decreases by 17.5, dehydrogenase activity – by 2.3, polyphenoloxidase and peroxidase activities – from 1.4 to 1.5 in the severely eroded soil compared to the chernozem with normal profile. The losses of the urease activity constitute 68.6-94.3%, dehydrogenase – 19.1-55.6%, polyphenoloxidase – 6.5-32.8% and peroxidase - 10.9 to 28.7% depending on the degree of erosion. The declines in the enzymatic activity caused by erosion represents a complicated process conditioned by the deterioration of physical, chemical and physico-chemical properties of eroded soils, destruction of organic compounds, abrupt reduction in the microorganisms' biomass. When a mass of soil layers are washed away, eroded soils are not only losing the enzymes but also the conditions for their synthesis, immobilization and stabilization in remaining horizons are deteriorating.

Recovery of the biota and humus status under fallow. The eroded chernozem in conditions of a long-term fallow (58-year-old) is characterized by a higher number, biomass, activity and diversity of soil invertebrates in comparison with arable chernozems which are as eroded as a normal profile. Invertebrates (95%) are concentrated in the upper layer, the number and biomass

indices decrease sharply in the soil profile to a depth of 20 cm. In arable eroded soils the base mass of invertebrates is concentrated in the 0-10 cm layer, while in the arable soil with the normal profile – in the layer 0-30 cm.

The volume of invertebrates' biomass accumulated during a 58 years period constitutes 507 kg ha^{-1} or 8.7 kg ha^{-1} annually, biomass of the *Lumbricidae* family – 464 kg ha^{-1} or 8.0 kg ha^{-1} annually. The application of the natural cover of wild grass, led to the restoration of the total number of invertebrates and the *Lumbricidae* family, the annual growth rate is of 4 and 3 ex m^{-2} accordingly.

The application of fallow contributes to the increase of the microbial biomass and humus stocks in eroded chernozem. The microbial biomass content in 0-30 cm layer increased by 2.5, humus content - from 1.57% to 3.14% that represents an increase of 0.027% on average per year.

The reserves of the microbial biomass in 0-170 cm layer increased from 1.6 to 4.3 t dry matter ha^{-1}. The microbial biomass accumulation in the soil was registered in amount of 2.63 t ha^{-1} which represents an average of 45.4 kg ha^{-1} per year. Humus reserves in the 0-100 cm soil layer increased from 74.4 t ha^{-1} to 192.8 t ha^{-1}; the annual growth rate was of 2 t ha^{-1}.

The biological parameters of soils have been grouped according to the humus content. Five of twenty indicators have been selected for the estimation scale. A scale has been developed to estimate the biota' stability as a result of the erosion processes impact on the ordinary chernozem and its ecological certification (Table 3). The scale of the biological parameters can also be used to assess the quality of eroded soil.

Table 3. The estimation scale of biota' stability of the ordinary chernozem following the impact of erosion processes

Degree of stability	**Humus content, %**	***Lumbricidae* family**		**Microbial biomass*, µg C g^{-1} soil**	**Dehydro-genase, mg TPF $10\ g^{-1}$ soil $24h^{-1}$**	**Urease, mg NH_3 $10\ g^{-1}$ soil $24\ h^{-1}$**
		number, ex m^{-2}	biomass, g m^{-2}			
Very high	>3.2	>50	>8.6	417-474	>2.2	>4.0
High	2.9-3.2	43-50	6.0-8.6	266-311	1.3-2.2	3.0-4.0
Moderate	2.4-2.8	35-42	4.2-5.6	184-265	0.9-2.0	0.5-1.7
Low	1.8-2.3	17-21	3.6-4.6	123-196	0.7-1.8	0.2-0.8
Very low	<1.5	10-15	2.7-3.5	<123	<0.7	<0.2

The degree of the soil stability decreases with the raising of the level of its degradation. The size of homeostasis zones and biota's natural resistance in the ordinary chernozem decreases consecutively: chernozem under fallow → chernozem with the normal profile → slightly eroded chernozem → moderately eroded chernozem → severely eroded chernozem.

The level and size of homeostasis zones and therefore the biota stability reached the maximum levels in the fallow soil. Severely eroded chernozems have the lowest resistance.

CONCLUSIONS

The current state of the biota of arable soils in the conditions of agricultural ecosystems of the Republic of Moldova is characterized by a decline in the number, biomass, activity and diversity compared to the virgin and fallow soils of natural ecosystems and with the level of 1960 years. Mineralization processes are dominated in soils, degraded as a result of long-term arable use.

The invertebrates and microorganisms homeostasis is determined by the humus content. The level and size of the homeostasis' zones and consequently the biota' stability for each criterion were highest in the soil of natural ecosystems. The exception is the number of humus-mineralizing microorganisms. The arable soil has the lower stability.

The reduction of the biochemical potential and decrease of the size of the zone of homeostasis of soil invertebrates and microbes leads to the decline of the natural soil stability. To

assess the resistance and degradation of arable soils and to realize of ecological certification we propose a set of faunistic, microbiological and enzymatic criteria.

The application of conservation *no-tillage* practices in conditions of the northern zone of the Republic of Moldova has the positive effect on soil biota. The effect of *no-tillage* on the soil biota manifests by the growth of the number of invertebrates, reserves of microbial biomass, the multiplication and development of the *Lumbricidae* family, increase enzymatic activity. The number of *Lumbricidae* family in the leached chernozem in average was 4.1 times higher compared with the arable plot, the biomass – 14.1 times respectively. The weight of one exemplar of earthworms in chernozems was 3.6 times higher and constituted 0.18g. The characteristic feature of the chernozem with *no-tillage* application is concentration of earthworms in the layer of 0-40 cm and the higher share of saprophagous in the total population of soil invertebrates.

Erosion is disastrous for the soil's habitat: invertebrates and microorganisms. The current state of the eroded chernozems biota is characterized by a decline in indices of numbers, biomass, activities and diversity compared to the soils with a normal profile. The biological indicators of chernozem depend on the degree of erosion. The growth of variation coefficients once the erosion degree increases indicates the reduction of the soil's biota stability.

The catastrophic loss of biomass, of the edaphic fauna diversity and microorganisms represent a particularity of eroded chernozems. The considerable loss of enzymes and their inactivation is one of the typical manifestations of the erosion process. A scale of biological parameters has been proposed to assess the stability of biota of the ordinary chernozem and to develop the national soil quality standards.

Multiannual fallow soils under natural vegetation are a source of the conservation and reproduction of different species of invertebrates and microorganisms; they have a high level of biomass and enzyme activity. The transition of the eroded chernozem from the category of arable land to the category of fallow land promotes regeneration of soil invertebrates, increases microbial carbon stocks and carbon sequestration. This procedure is based on the gradual restoration of natural activities of invertebrates and microorganisms in the soil at the expense of root exudates and vegetal residues of sod-forming grass. The humification processes intensified as a result of the interaction between the root systems and the soil biota.

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USE OF MAXIMUM ENTROPY IN ESTIMATING PRODUCTION RISKS IN CROP FARMS

KEVORCHIAN CRISTIAN[1], GAVRILESCU CAMELIA[2]

Abstract: *The entropic value of the production risk is closely linked to the farmer's aversion to this type of risk. Since risk aversion is difficult to quantify, it is preferable to use the MaxEnt model as a quantitative benchmark in assessing and covering the production risk through adequate financial resources. The classification of the Selyaninov index value as measure of the production risk based on the MaxEnt model utilization makes it possible to evaluate the production risk and the transfer decision to an adequate market implicitly. The authors' previous research investigated the risk coverage through derivative financial instruments that diminish the farmer's exposure to the production risk; the present paper adds to previous research by investigating an equally important issue: sizing the risk that is the object of coverage. Through the utilization of the stochastic methods in estimating the risk measure, a less rigid method is obtained that can be adapted and applied to the risk management processes in agriculture.*

Key words: *production risk, crop farms, Markov models, MaxEnt*

INTRODUCTION

By HMM (Hidden Markov Model) utilization in the continuous evaluation of the weather risk and by the application of advanced computational mechanisms one can evaluate with higher accuracy the weather phenomena that induce agricultural production risks. The random aspects that characterize the dynamics of weather factors determine implicitly the size, quality and price of farm production and make the weather risk be found in the agricultural production risk at farm level. Wheat production variability in Romania in the period 2005-2009 ranged from 50% to 130% (Rutten, 2012); the same source mentions Swiss Re[3], which estimates an 80% extreme weather phenomena risk in Ukraine in the year 2010, compared to only 20% political risk. The performance of insurance schemes mainly in the case of production risk leaves room for significant improvements mainly in the emergent economy area.

Starting from a risk assessment and identifying a special risk (weather risk, for instance), a strategy for this risk management is chosen, practically its transfer in the conditions in which an agricultural insurance product cannot be identified on the agricultural insurance market. The insurance index is a simplified insurance form in which the compensation payment is based on the values of an index that acts as a proxy for losses and not on the losses estimated according to the individual insurance policy. The insured amount is based on the production cost on the basis of convened value (established in advance) and the payments are made on the basis of a pre-established grid in the insurance policy.

In a World Bank document on the agricultural insurances (World Bank, 2011), WII (Weather Index Insurance) is presented, which originates in the weather derivatives market, in a scenario in which the speculative funds take over the weather risk. The interest for WII in agriculture increased on the background of certain non-performant traditional insurance products, mainly in the countries with emergent economies, and where the limited commercialization and the small farm size are major obstacles to the sustainable development of certain performant insurance products for the farm production. In the papers by Hurduzeu (2014) and Kevorchian et al. (2013), the Selyaninov index for wheat is used as weather index insurance:

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[3] The Swiss Re Group is a leading wholesale provider of reinsurance, insurance and other insurance-based forms of risk transfer

$$SHR_{wheat} = \frac{\sum_{April15-June\ 30} \text{Daily rainfall.}}{0{,}1 * \sum_{April15-Jume30} \text{Daily average temperature}}$$

where the impact (e.g. on production) is determined according to the formula:

$$I(SHR) = \begin{cases} \max\{M, (1 - SHR) * \theta\} & SHR \in [0,1) \\ 0 & SHR \in [1,1.4] \\ \max\{M, (SHR - 1.4) * \theta\} & SHR \in (1.4,2) \end{cases}$$

where M is the contract value, and θ being a table variable as index value (Kevorchian et al., 2013). The daily value modelling in the vegetation period can be described on the basis of a Markov model.

Starting from the Markov model described by Kannan et al. (2015), we considered that the stochastic modelling of the Selyaninov index series is important for the management of crop development conditions in the vegetative period. We consider that the stochastic models can be successfully used to describe the development of crops in the vegetation cycle. When the observed available values of the Selyaninov index are inadequate, it is possible to work with the series of index values in a synthetic variant that has statistical properties comparable to those of the existing values.

MATERIAL AND METHOD

A stochastic process with the Markov property is designated as Markov chain.

A Markov chain is a particular case of a finite automaton whose associated transition graph is weighted and for which the entrance sequence is indicating the passage state of the automaton. From the formal point of view we have:

*	$S = s_1, s_2, \ldots, s_n$	family of states
*	$A = \begin{pmatrix} a_{01} & \cdots & a_{0m} \\ \vdots & \ddots & \vdots \\ a_{n1} & \cdots & a_{nm} \end{pmatrix}$	matrix of transition probabilities where a_{ij} represents the probability of transition from state *i* to state *j* and $\sum_{j=1}^{n} a_{ij} = 1$ for any *i=1..n* and s_0 and s_F are the initial and final states respectively of the Markov chain.

In a first-order Markov chain, the probability of a particular state depends only on the previous state in the sequence of states:

$$P(s_i|s_1, s_2, \ldots, s_{i-1}) = P(s_i|s_{i-1})$$

For any a_{ij} a probability $p(s_j|s_i)$ is associated with $\sum_{j=1}^{n} a_{ij} = 1$ for any $i \in \{1,2..n\}$. A Markov chain provides for the probability associated to an observable sequence of events. In the current practice, the investigated events are not always observable. For instance, the production losses on a farm are not observable at a variation of weather factors associated to a Selyaninov index. Practically the evaluation of production losses is hidden (non-transparent) as it is not directly observable. The objective is to use these observations in estimating the losses due to weather factors.

A HMM (Hidden Markov Model) is revealed by the following elements:

*	$S = s_1, s_2, \ldots, s_n$	represents the family of states
*	$A = \begin{pmatrix} a_{01} & \cdots & a_{0m} \\ \vdots & \ddots & \vdots \\ a_{n1} & \cdots & a_{nm} \end{pmatrix}$	matrix of transition probabilities with a_{ij} represents the probability of transition from state *i* to state *j* and $\sum_{j=1}^{n} a_{ij} = 1$ for any *i=1..n* and s_0 and s_F are the initial and final states respectively of the Markov chain.

*	$O = o_1, o_2, \dots, o_l$	A sequence of t probable observations, each of them obtained from V* associated to the vocabulary V={v_1, v_2,…, v_w,}
*	B=$b_i(o_t)$	Sequence of probable observations, each representing the probability of an o_t observation, being generated at the state *i* level.
*	s_0, s_f	Initial state, final state respectively, not associated to observations, together with the transition probabilities a_{01}, $a_{02,\dots,}$ a_{0n} , besides the initial state and a_{1f}, $a_{2f,\dots,}$ a_{nf} , in the final state.

Here is an alternative representation for HMM that is not based on the initial and final states, using an explicit distribution on the set of initial and explicitly accepted states:

$\pi = \pi_1, \pi_2, \dots, \pi_n$	an initial probability distribution over the states, π_i is the probability that the Markov chain will start from the state i. Certain states *j* can have $\pi_j = 0$ which means that it is not an initial state, as well as $\sum_{j=1}^{n} \pi_j = 1$
$SA = \{s_x, s_y, \dots, s_z, \dots\} \subset S$	is the set of accepted states.

A first-order HMM implies complying with the following conditions:

1.	$P(s_i \mid s_1, s_2, \dots s_{i-1}) = P(s_i \mid s_{i-1})$	named ***Markov hypothesis***
2.	$P(o_i \mid s_1, \dots s_i, \dots s_p, o_1, \dots o_i, \dots o_p) = P(o_i \mid s_{i-1})$	also named the output independence hypothesis in which the output o_i is dependent only on the state s_i in which it is obtained.

We can consider two "hidden" states of the Markov chain (P, associated to losses for a certain crop and C, associated to gains in the case of the same crop), and the family of observations **O** corresponds to the Selyaninov index associated to the vegetative period for the respective crop. We should mention that the probabilities of transition between the two states will be non-null, which will lead to a completely connected or ergodic transition graph.

Be it a HMM formally defined by the triplet λ={A,B,π} with the description of relation between the sequence of observations and the sequence of states, so that:

i. The alphabet of states, the alphabet of observations is:

$$S = \{s_1, s_2, \dots, s_n\}$$
$$V = \{v_1, v_2, \dots, v_m\}$$

ii. The sequence of form observations constructed over the alphabet *V*

$$Y = y_1 y_2 \dots y_t \text{ where } y_t \in V$$

iii. A is the transition vector whose components are the transition probabilities from state *i* to state *j*:

$$A = [a_{ij}] \text{ where } a_{ij} = P(q_t = s_i \mid q_{t-1} = s_j)$$

Where $q_i \in Q = \{q_i\ q_2, \dots, q_n\}$ is the family of hidden states.

iv. B is the vector of observations whose components are the probabilities that the observation k is realized in the state j independently of t:

$$B = [b_i(k)] \quad unde\ b_i(k) = P(x_t = v_i | q_t = s_i)$$

v. π is the vector of initial probabilities:

$$\pi = [\pi_{ij}] \quad where\ \pi_i = P(q_1 = s_i)$$

We must emphasize the Markov working hypotheses in which the current state depends only on the previous state (model memory) and that of the independence from the previous states and outputs, the output at the time t being dependent only on the current state.

The probability distribution of states at time *t*:

$$\gamma_t(i) = P(x_t = s_i)$$

can be calculated by a complexity algorithm $\boldsymbol{O}(n^2)$. For each object an application is defined:

$$C: S \to \mathbb{R}$$

for the evaluation of the cost determined by the weather-induced losses, while the risk at the moment t is given by the following formula:

$$R = \sum_{i=1}^{n} \gamma_t\ (i) \cdot C(i)$$

In this context, the following problems must be solved up:

- Be it the sequence of observations $O = o_1, o_2, \ldots, o_T$ and a HMM $\lambda=\{A,B,\pi\}$ for which an efficient calculation algorithm must be provided for the calculation of the probability of supplying by the model of the sequence of objects $P(O|\lambda)$
- Be it the observations $O = o_1, o_2, \ldots, o_T$ and and a HMM λ; a correspondence must be identified between the sequence of states $S = s_1, s_2, \ldots, s_T$ that provides the "best characterization" of the given observations.
- Adjusting the parameters of model $\lambda=\{A,B,\pi\}$ to maximize the probability $P(O|\lambda)$.

RESULTS AND DISCUSSIONS

Be it the random variables $X_1, X_2, \ldots, X_n$ with identical distribution as follows:

$$X_i = \begin{cases} 1 & if\ in\ the\ i-th\ vegetation\ week\ SHR \in [1,1.4] \\ 0 & if\ in\ the\ i-th\ vegetation\ week\ SHR \in (0,2)\backslash[1,1.4] \end{cases}$$

where $i \in \{1..n\}$.

The working hypothesis is:

$$P(X_n = x_n | X_{n-1} = x_{n-1}, \ldots, X_1 = x_1) = P(X_n = x_n | X_{n-1} = x_{n-1})$$

where $x_1, x_2, \ldots, x_n \in \{0,1\}$.

where the probability to obtain a certain level of the Selyaninov index in the week k of the vegetation period depends only on the level of the Selyaninov index of the previous week. Furthermore, the independence of the event from the history makes the stochastic process be of Markov chain type.

The associated transition matrix is:

$$\begin{bmatrix} P_{00} & P_{01} \\ P_{10} & P_{11} \end{bmatrix}$$

where $P_{ij} = P(X_{k+1} = j | X_k = i)$ with $i, j \in \{1,0\}$, $k \in \{1 \dots n\}$ și $P_{00} + P_{01} = 1, P_{11} + P_{10} = 1$. P_{11} provides for the probability that in a certain week of the vegetation period, the favourable weather conditions for the wheat crop come after a week that is favourable for the vegetation growth phase of the crop. A small probability of this situation does not reveal a favourability meant to ensure the production gain that is foreseen in phyto-technical terms. An index can be generated that can provide for the production loss tendency due to the weather factors that are not totally favourable (Alam et al., 2013):

$$LPI = P_{11} \cdot P_{01}$$

with $LPI \in [0,1]$. For the defined Markov chain, the probability associated to the sequence of observations 1.1_1.5_1.6 is calculated only on the basis of associated states and by the multiplication of the probabilities associated to the connection graph. For a HMM, one can determine the probability of obtaining a certain production in the conditions of an observable sequence of the type 1.1_1.5_1.6. For a sequence of states (of unfavourable-favourable-favourable type) we can calculate the probability of the output 1.1_1.5_1.6. Each "hidden" state supplies an observation; hence the sequence of "hidden" states and the sequence of observations are characterized by equal lengths. For a "hidden" sequence of the states $S = s_1, s_2, \dots, s_T$ and a sequence of observations $O = o_1, o_2, \dots, o_T$, we have:

$$P(O|Q) = \prod_{i=1}^{T} P(o_i | s_i)$$

For the calculation of probability associated to the sequence 1.1_1.5_1.6 with the sequence of "hidden" unfavourable-favourable-favourable states we have:

$$P(1.1 - 1.5 - 1.6 | unfavourable - favourable - unfavourable) = \\ = P(1.1 | unfavourable) \cdot P(1.5 | favourable) \cdot P(1.6 | favourable)$$

but it is necessary to calculate the probability of the event 1.1_1.5_1.6 weighted with the associated probability:

$$P(O,S) = P(O|S) \cdot P(S) = \prod_{i=1}^{n} P(o_i | s_i) \cdot \prod_{i=1}^{n} P(s_i | s_{i-1})$$

hence we have

$$P(1.1 - 1.5 - 1.6, unfavourable - unfavourable - favourable) \\ = P(unfavourable | start) \cdot P(unfavourable | unfavourable) \\ \cdot P(favourable | unfavourable) \cdot P(1.1 | unfavourable)) \cdot P(1.5 | favourable) \\ \cdot P(1.6 | favourable)$$

Making a synthesis of the results, the probability associated to observations is:

$$P(O) = \sum_S P(O,S) = \sum_S P(O|S) P(S)$$

For our case we have:

$$P(1.1 - 1.5 - 1.6) \\ = P(1.1 - 1.5 - 1.6, unfavourable, unfavourable, unfavourable) \\ + P(1.1 - 1.5 - 1.6, unfavourable, unfavourable, favourable) \\ + P(1.1 - 1.5 - 1.6, favourable, favourable, unfavourable) + \cdots$$

Starting from the fact that an equiprobable distribution displays maximum entropy:

$$H(X) = -\sum_{x} P(x) log_2 P(x)$$

it intuitively leads us to the idea to construct a distribution by the continuous adding of properties (complying with the "Occam's Razor" rule). Each property is a function that reveals a subset of instructing observations, for instance the "production losses", the "production gain" in the context of the previously constructed HMM. In other words, in order to select a model from a set *C* of probability distributions, we choose the model $p^* \in C$ characterized by maximum entropy *H(p)*:

$$p^* = argmax\ H(p)\ unde\ p \in C$$

Practically, the MaxEnt model is a classifier of sequences that assign a class (e.g. "production losses") by calculating a probability associated to an exponential distribution for a weighted set of properties corresponding to the observation. MaxEnt can be trained by convex optimization methods. A MEMM (Maximum Entropy Markov Model) is an extension of MaxEnt that uses Viterbi decoding algorithms.

CONCLUSIONS

The application of stochastic methods in the evaluation of production risk in agriculture in the technological context opened by cloud computing and machine learning adds further accuracy in the process of obtaining the production levels planned by the farmers, and increases the possibility of an improved risk management. Either derivative instruments or financial products adapted to the agricultural production are used, we need further accuracy in evaluating the production and market risks at farm level.

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DESIGNING A MATHEMATICAL MODEL TO OPTIMIZE THE SIZE ACTIVITIES IN THE PRODUCTION PLAN FOR SC RENTEA SRL

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Summary: *Planning is the process of identifying the present situation, setting goals and define ways to achieve the objectives. Planning is the primary function of business management because of time preparing space for all other aspects of management, is considered a link between past and present [2]. Use of computer technology in agriculture will have a significant effect, provided achieving integrated information systems at macro (national agriculture, ministry) and micro (farm, farms etc.). Expanding use of computers in agriculture will ensure rational use of resources, their savings, the provision of complete and operative information on the conditions of production, the supply-sales market, the cost on profitability, etc. Thus, this work demonstrates the need and applicability of computer systems at the level of companies.*

Keywords: *informatics, planning, goals*

INTRODUCTION

To enhance management practices to ensure high quality products and competitive skills, farms will need to adopt methods of decision support and proper management. Accordingly, holdings want to become and/or remain competitive they need adequate quality resources: financial, material, energy, human and not least information. In order to increase competitiveness of agricultural products on domestic and foreign markets it is imperative to improve existing information flows at the branch level and to provide methods for grounding the business and the use of information technology to innovate the field, taking into account the strategies defined at European level[1].

MATERIAL AND METHODS

AGR4 program allows developing production and business plan at farm level (vegetable farms) by calculating the alternatives on:

- plan culture, technical and economic indicators at the level of the holding as a whole cultures and component technologies for each crop, the necessary material resources, manpower and financial resources annually, months and decades each culture and the whole farm;
- demand for tractors and agricultural machinery months and decades;
- calculating the normal plowing hectares (hantri) to mechanized farming operations executed

AGR4 program can update all the indicators monthly or at any time, information which is realistic, "Today" in the act of operative management, increasing the effectiveness of the decisions. Production plans and budgets, revenues and expenditures have several sections and include objectives that must be completed in a year. These are the main tools in the work of management in agricultural companies and farms components.

The main indicators calculated using the program AGR4 are: list of crops in the plan and the main indicators of materials necessary technical-economic indicators at farm, vegetable farms, calculate the necessary amount per calendar month assignment requisition means calendar month calculating the necessary mechanical means, the necessary operating hours on Monday and decades of agricultural machinery.

In compiling mathematical model was used matrix coefficients characterizing techniques technological alternatives, the crops developed using AGR4 program product, and the product-PROCSMS_SIMPLEX.prg Program, which gives us the opportunity to add interactive

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mathematical model of linear programming. Simplex method for solving the model was used Prog_lin.exe program in Matlab library (subroutine fd_prog_xls_9).

RESULTS AND DISCUSSIONS

Starting from technologies used in SC RENTEA SRL in Dolj County were developed technological options for crops they practice: winter wheat, winter barley, barley, maize, sunflower, alfalfa. Technological descriptions were drawn on the experience of farmers and literature data. These technologies have been included in a linear programming model that offered us by solving solutions for crop structure.

Calculation of technical and economic elements specific to each culture was performed with the Software AGR4, which allows a quick understanding of the economic indicators representative for each technology. The program allows calculating technical key indicators - economic characterizing production technology based on the data sheet mechanical technology on the work, the workmanship, materials and material consumption. These expenses are spread over months, depending on when they were scheduled to be executed.

With AGR4 program was compiled and calculated by calendar month, consumption of mechanical force (mechanical ZN), manual labor (manual ZN) expenditure.

In compiling mathematical model on optimizing gross margin in SC RENTEA SRL, Dolj county, to use technical coefficients matrix characterizing technological alternatives, the crops developed using AGR4 program product, and the product-PROCSMS_SIMPLEX.prg Program, which gives us the possibility of completing interactive mathematical model of linear programming.

We PROCSMS_SIMPLEX product-schedule finalized linear programming model as follows:

- Including economic function (object) (FE)

[Max] Gross margin (lei) = 528x1 + 610x2 + 464x3 + 688x4 + 380x5 + 690x6;

In this way it obtained mathematical model for SC Rent Srl, which is stored in a text file in order to deal with the method simplex. The three model variants corresponding to each of the economic functions (Table 1).

Simplex method for solving the model was used Prog_lin.exe program in Matlab library (subroutine fd_prog_xls_9). This program allows you to retrieve data from a text file generated by AGR4 envelope, address it and display the results in a xls file type.

The model that includes enrollment in xls spreadsheet type (Table 1) ("Sheet1"), resolution, and playback model results, respectively dual solution and the solution first.

The first model interpreting solution for SC RENTEA SRL, Dolj County, get the size and structure of acreage and gross margin value.

Following the data in Table 2 following notice:

- In Sc Rentea Srl, wheat occupies the largest share 28.9% (22 ha) followed by corn and sunflower 25% (19 ha), barley 13.2% (10 ha) and alfalfa 7.9% (6ha);
- The variants crop structure optimization is changed as follows:
- Option 1 proposes a structure with 59 hectares planted, 20 ha maize (33.9%), by 15 ha for alfalfa and sunflower (25.4%) and 9 ha barley (15.2%);
- Version 2 uses 70.7 ha spread over 22.4 hectares barley (31.7%), 19.8 ha maize (28%), 15 ha sunflower (21.2%) and 13.5 ha alfalfa (19.1%);

The third variant uses all the available area, 76 ha with three crops - barley 36 ha (47.4%), 25 ha maize (32.9%) and 15 hectares of sunflower (19.7%).

Table 1 model, transcribed for solving the Prog_lin.exe

6	19	1	0	0	0	0	0	
528	610	464	688	380	690			
3002	3115	2805	3510	2950	2310			
1,125	0,267	0,267	1	1.1	1	132	ZNMAN 3	<
1263	0,234	0,234	0,137	1.17	0,137	132	ZNMAN 7	<
0.059	0.06	0.06	2.81	0,069	2.81	200	ZNMEC 3	<
0.35	0.4	0.4	042	0,118	0.42	100	ZNMEC 4	<
0.22	0.04	0.04	0.196	0.212	0.196	100	ZNMEC 5	<
3.22	3.22	3.22	2.03	0	2.03	200	ZNMEC 9	<
2.23	2.23	2.23	1.44	0	1.44	200	ZNMEC10	<
1.20	120	64	250	150	250	15000	CONSAZOT	<
50	50	50	50	150	50	16500	CONSFOSFOR	<
50	50	64	120	150	140	15000	CONSPOTA	<
38	38	38	73	223	46	6000	RTOTMAN	<
36	40	40	41	68	32	15000	RTOTMEC	<
0	0	0	200	0	0	15000	LUCTERTI	<
1	1	1	1	1	1	76	Total area	<
0	0	0	1	0	1	40	Horing area	<
1	1	1	0	0	0	50	Straw area	<
0	0	0	0	0	1	15	Sunflower	<
0	0	0	0	1	0	15	Alfalfa	<
0	0	0	0	1	0	15	Alfalfa	>
Corn	Barley	Barley	Maize	Alfalfa	Sunflower			

Processed: Evidence of technical and operative SC RENTEA SRL, Dolj County

Table 2 The size and structure of cultivated areas in SC RENTEA SRL in optimized variants (V1, V2) V3)

No. No.		**SC RENTEA SRL**		**V1**		**V2**		**V3**	
		ha	**%**	**ha**	**%**	**ha**	**%**	**ha**	**%**
1	Corn	22	28.9	0.0	0.0	0.0	0.0	0.0	0.0
2	Barley	10	13.2	9.0	15.2	22.4	31.7	36.0	47.4
3	Barley		0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Corn consumption	19	25.0	200	33.9	19.8	28.0	25.0	32.9
5	Alfalfa	6	7.9	15.0	25.4	13.5	19.1	0.0	0.0
6	Sunflower	19	25.0	15.0	25.4	15.0	21.2	15.0	19.7
7	Total	76	100.0	59.0	100.0	70.7	100.0	76.0	100.0

Processed: Evidence of technical and operative SC RENTEA SRL, Dolj Couty

In terms of size and structure Gross margin Sc Rentea Srl it has a value of 607.6 lei / ha, with a total of 46,178 lei (table 3).

- Option 1, the proposed structure brings a total of 35,303 lei, with a gross margin of 598.3 lei/ha;
- Option 2 is at a level of gross margin 604.8 lei / ha worth a total of 42,751 lei;
- An important contribution shown in the third embodiment, a plurality of 49 510 lei and a gross margin of 651.4 lei per ha / ha.

From the analysis it is observed that Alternative 3 is the most advantageous.

Table 3 Gross margin size and structure of SC Rentea Srl, and optimized variants (V1, V2) V3)

No. No.	Specification	MB (euro / ha)	SC RENT SRL		V1		V2		V3	
			ha	lei	ha	lei	ha	lei	ha	lei
1	Corn	528	22	11616	0.0	0	0.0	0	0.0	0
2	Barley	610	10	6100	9.0	5474	22.4	13655	36.0	21960
3	Barley	464		0	0.0	0	0.0	0	0.0	0
4	Corn consumption	688	19	13072	200	13779	19.8	13607	25.0	17200
5	Alfalfa .	380	6	2280	15.0	5700	13.5	5139	0.0	0
6	Sunflower	690	19	13110	15.0	10350	15.0	10350	15.0	10350
7	Total	X	76	46,178	59.0	35,303	70.7	42,751	76.0	49,510
8	Gross margin (lei / ha)			607.6		598.3		604.8		651.4

Processed: Evidence of technical and operative SC RENTEA SRL, Dolj County

In Table 4, we can see the main resource consumption in society and in optimized variants:

- Consumption of days time in March - from an available 132 days, the company consumes 76 variant 1-54, version 2 - 47.82 days and 49.61 days 3- version;
- Normal day in July - where have all the 132 days, the company consumes 48 days, variant 1-24, version 2 - 3 version 14.16 and 13.9 days;
- Regarding the consumption of days mechanized - for all five months, eating the largest we see society, version 1 has the lowest consumption (area less), and variant 3 (same surface), we see greater consumption lower than the actual situation.
- The same results are recorded and cosnumul fertilizer, water, manual and mechanized wages.

It concluding that it optimized version 3 adds lei gross margin/ha on the same surface as the company with a much lower consumption of resources.

Table 4 Consumption of the main resources in SC Rentea Srl and optimized variants (V1, V2, V3)

No. No.	Specification	UM	Resources	Resources consumed Rentea	V1 consumed resources	Resources consumed V2	V3 consumed resources
1	ZNMAN 3	hours	132	76	54	47.82	49.61
2	ZNMAN 7	hours	132	48	24	14.16	13.9
3	ZNMEC 3	hours	100	102	100	108	114.56
4	ZNMEC 4	hours	100	36	20	31	31.2
5	ZNMEC 5	hours	100	14	10	9	9.28
6	ZNMEC 9	hours	100	245	100	200	197.12
7	ZNMEC10	hours	100	171	70	140	137.88
8	CONSAZOT	Kg as	14000	15570	12084	14000.00	14320
9	CONSFOSFOR	Kg as	16500	5350	4450	3801.67	3800
10	CONSPOTA	Kg as	15000	8260	7202	6729.09	6900
11	RTOTMAN	lei	6000	5513	5838	3799.80	3883
12	RTOTMEC	lei	15000	3767	2680	2943.00	2945

Source: Own calculations

For a complete interpretation of the solutions resulting from solving mathematical model uses dual solution that gives us the marginal contributions of resources restrictive (limiting) in four solution results (Table 5).

The dual variable we can see totally consumed resources (become limiting factors) and marginal contribution of each objective function value, as follows:

- In alternative 1 were totally consumed ZNMEC 3 with a marginal contribution from 10946 lei, ZNMEC9 a marginal contribution of 18740 lei and sunflower surface with a marginal contribution of 30 lei. It reaches an objective function value of 35302 lei.
- In the latter were consumed ZNMEC 3 with a contribution margin of 7674 lei, ZNMEC10 with a contribution margin of 24285 lei, RTOTMAN with a contribution margin of 10082 and the area of sunflower with a contribution margin of 711 lei. It reaches a value of 42,751 lei objective function.
- Version 3 has three limiting factors (resources consumed entirely), namely: the total area of 76 ha, with a marginal contribution from 46360 lei. Hoe surface 40 ha, with a marginal contribution from 3120 lei and sunflower area 15 ha, with a contribution margin of 30 lei. Objective function value totaling 49,510 lei.

Table 5 Dual solutions of the three variants

No.	Specification	Option 1			Option 2			Option 3		
		Resource Consumption	**Marginal Cost**	**Marginal contribution**	**Resource Consumption**	**Marginal Cost**	**Marginal contribution**	**Resource Consumption**	**Marginal Cost**	**Marginal contribution**
1	ZNMAN 3	53.92	0	0	55.6	00	0	49.61	0	0
2	ZNMAN 7	24.45	0	0	25.8	00	0	13.9	0	0
3	**EC ZNM 3**	**100**	**109.46**	**10946**	**100.0**	**76.7**	**7674**	114.56	0	0
4	ZNMEC 4	20.07	0	0	25.2	00	0	31.2	0	0
5	ZNMEC 5	10.4	0	0	106	00	0	9.28	0	0
6	**EC ZNM 9**	**100**	**187.4**	**18740**	1,427	00	0	197.12	0	0
7	**ECLO ZNM**	70.45	0	0	**1,000**	**242.8**	**24285**	137.88	0	0
8	CONSAZOT	1208.363	0	0	13409.0	00	0	14320	0	0
9	CONSFOSFOR	4450.04	0	0	4886.6	00	0	3800	0	0
10	CONSPOTA	7201.95	0	0	7621.0	00	0	6900	0	0
11	**RTOTMAN**	5837.98	0	0	**6000.0**	**1.7**	**10082**	3883	0	0
12	RTOTMEC	2680.06	0	0	3105.9	00	0	2945	0	0
13	LUCTERTI	4005.45	0	0	3955.4	00	0	5000	0	0
14	Total area	59	0	0	70.7	00	0	**76**	**610**	**####**
15	Area hoeing	35.03	0	0	34.8	00	0	**40**	**78**	**3120**
16	Area straw	8.97	0	0	22.4	00	0	36	0	0
17	**Tis area**	**15**	**2**	**30**	15.0	47.4	711	**15**	**2**	**30**
18	**Area alfalfa min**	**15**	**186,22**	**2793.3**	13.5	00	0	0	0	0
19	**Area alfalfa max**	**15**	**186,22**	**2793.3**	13.5	00	0	0	0	0
20	Total contribution margin			35302.6			42,751			49,510

CONCLUSIONS

1. The interpretation of entries received, the mathematical model, we get the size and structure acreage and gross margin value

- In Sc Rent Srl, wheat occupy the largest share of 28.9% (22ha) followed by corn and sunflower 25% (19ha), barley 13.2% (10ha) and alfalfa 7.9% (6ha), where gross margin has a value of 607.6 lei / ha, with a total of 46,178 lei;
- In alternate crop structure optimization is changed as follows:
- Option 1 proposes a structure with 59 hectares planted, 20ha maize (33.9%), each 15ha for alfalfa and sunflower (25.4%) and 9 ha barley (15.2%), where gross margin has a value of 35,303 lei with a gross margin of 598.3 lei / ha;
- Version 2 uses 70,7 ha spread over 22.4 hectares barley (31.7%), 19.8 ha maize (28%), 15 ha sunflower (21.2%) and 13.5 ha alfalfa (19.1%), where the gross margin is estimated at 604.8 lei / ha worth a total of 42,751 lei;
- The third variant uses all the available area, 76 ha with three cultures - 36 ha barley (47.4%), 25 ha maize (32.9%) and 15 hectares of sunflower (19.7%), where the gross margin is estimated at 49 510 lei and a gross margin of 651.4 lei per ha / ha.

2. The dual interpretation, namely the marginal costs of resources consumed entirely attached declaration that:

- version 1 were totally consumed ZNMEC 3 with a marginal contribution from 10946 lei, ZNMEC9 a marginal contribution of 18740 lei and sunflower surface with a marginal contribution of 30 lei. It reaches an objective function value of 35302 lei;
- in the latter were consumed ZNMEC 3 with a contribution margin of 7674 lei, ZNMEC10 with a contribution margin of 24285 lei, RTOTMAN with a contribution margin of 10082 and the area of sunflower with a contribution margin of 711 lei . It reaches a value of 42,751 lei objective function;
- version 3 has three limiting factors (resources consumed entirely), namely: the total area of 76 ha, with a marginal contribution from 46360 lei. Hoe surface 40 ha, with a marginal contribution from 3120 lei and sunflower area 15 ha, with a contribution margin of 30 lei. Objective function value totaling 49,510 lei.

3. Promoting the use of scientific methods of planning but especially for agricultural management software, namely to promote the use of information technology to support innovation in agriculture; using programs that can identify risk production has an important role in decision making, both in terms of choosing the optimal and hierarchical level that will be taken. The crowd variants of decision, the decision maker will choose which of them will generate a minimum of maximum foreseeable loss loss [3].

4. We believe that there is significant use of economic-mathematical methods in agriculture: integrated planning of activities and sustainable use of resources, optimizing the size and profile of farms, crop technology optimization, etc., which could help increase labor productivity and economic efficiency.

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THE NECESSITY OF DRAWING UP THE ANNUAL PRODUCTION PLAN AND THE IMPORTANCE OF ESTABLISHMENT CROP STRUCTURE FOR NEXT AGRICULTURAL YEAR

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Summary: *Planning represents establishment and substantiate the objectives, accomplish tasks and necessary resources for appropriate period plan (of perspective, annual, quarterly, monthly). Drawing up annual production plan into a ferm is required primarily for evolution or involution recorded by economical phenomenes, which directly determines the operation of the farm.*
After determining the annual production plan can establish structures and cultures for the next agricultural year using modeling and simulation methods. Following the application of modeling and simulation methods in a farm resulting optimal dimensions of business operations with profit maximization in terms of economic efficiency increased.

Keywords*: production plan , resources, technical and economic indicators, modeling and simulation.*

INTRODUCTION

Economic situation of the year depends on the decisions made about what crops will be set up in the spring and the judicious use of the land, the culture plan drawn up.

In the decisions we take, there are some mandatory directions that we have to consider, such as:

- The crop in the previous year, according to which we must establish what cultivate to ensure a good crop rotation, knowing that the right choice of prior plants is the cheapest way to combat weeds, diseases, pests

- Restoring soil water reserves after a highly dry autumn and a started winter with little rainfall , which obliges us to orient of crops with less water, so resistant to drought;

-Establishing the structure of crops for the next agriculture year is important because activities must be dimesnsionate optimally to ensure a positive result of the exercise with minimal expenses.

MATERIALS AND METHODS

For establish the annual plan of crop one material is indispensable, this is the data sheet technological , this is a document in which they are listed in chronological order all agricultural work (manual and mechanized) - being executed for a certain culture.

Technological sheet helps us to determine: need for agricultural machinery and equipment, the need for manual labor and mechanized, the necessary raw materials and the necessary financial resources setting will help us in forecasting average production to be obtained in culture respective.

In the technological sheet are found only direct costs.

To determine the structure of crops for next agricultural year we used two methods of modeling and simulation:

1) Method logical variants -Method modeling and simulation of activities within a company and serves to determine the optimal structure of company activities in order to profit maximization. To use this method starts from the surface and consumption, the method consists in building the "x" alternatives taking into account the consumption indicator lines is considered bigger and consider indicators that are restrictive.

   These variants were made using calculations necessary human days in months and to the economic and financial cultures, all this information was obtained from annual production plan.

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Tables variants have changed crops in rotation surfaces, respecting restrictions to choose, what brings the greatest profit.

2) Linear programming optimization method size and structure of farm crops

- Parts of the mathematical model
    a. lens- function may be to maximize profit or minimize costs
    b. technical and economic-matrix coefficients
    c. Resources
    d. non-negativity condition (CNN)-any activity of the company must be greater than 0

3) The mathematical model to optimize the size farm.

After determining the activities and resources, creating the mathematical model and algebraic form of a matrix can build notepad file by using the file we run the simplex to determine first solution and dual solution.The optimization algorithm using farm size SIMPLEX- that schedule is represented by a number of determinants, calculations, signs, conditions and restrictions.

RESULTS AND DISCUSSION

Making a model of annual production plan

The annual plan production on a farm is a support to farmers, it helps to better management of activities in society. : Development plan is done taking into account several criteria:

- The favorable land available for different culture
- Crop rotation
- Impact on soil and the environment
- Net profit (per parcel and per holding)
- Restrictions in preparing crop rotation

Knowing the cost of the necessary human resources, materials and equipment, consequential helps anticipation of such holding planned and will be able to ensure the optimum functionality.

Whereby the Company issued annual production plan is fictitious located in Prahova - Ciorani ,cultures prevalent for this area are: wheat and rye, maize, sunflower, sugar beet, potatoes and vegetables.

Table 1. Cultures were grown in the plan at the company analyzed

No.	**Culture**	**Previous Year**		**Year Plan**		**Next Year**	
		ha	**%**	**ha**	**%**	**ha**	**%**
1	Pease	4	6.25%	**5**	**7.81%**	3	4.68%
2	Wheat	28	43,75%	**29**	**45.31%**	30	46,88%
3	Maize	18	28,12%	**14**	**21,88%**	19	29.68%
4	Sunflower	14	21,87%	**16**	**25%**	12	18,76%
	Total	64	100%	**64**	**100%**	64	100%

With technological sheet for each crop we Calculation of man days in months and cultures, data were extracted from column No. 11 and based on the work carried ha is possible that day man will be represented in the same month several times, in this case the data obtained are gathered in that month multiplied by the total number of hectares for each crop

Table 2. Calculation of man days per month and culture

No.	**Month**	**Total holding**	**Wheat 29 ha**	**Maize 14 ha**	**Sunflower 16 ha**	**Peas 5 ha**
1	January	-	-	-	-	-
2	February	2,9	2,9	-	-	-
3	March	7,065	-	-	5,28	1,785
4	April	75,804	23,9	3,024	48,48	0,4
5	May	42,42	-	42,42	-	-

6	June	96,42	4,64	42,42	48,96	0,4
7	July	10,43	3,48	-	-	6,95
8	August	27,57	21,17	-	6,4	-
9	September	51,42	2,9	48,02	-	0,5
10	October	63,13	6,09	55,44	1,6	-
11	November	-	-	-	-	-
12	December	-	-	-	-	-
13	Total	377,16	65,08	191,32	110,72	10,035

Source: own processing -conform sheet technology

After achieving this table I found that analyzed holding permanent workers will have 2 and 4 laborers (for the whole year) which is employed only where required to do so months (April, June, September, October).

Still using sheet technology have established and the necessary normal day of mechanized and the demand for tractors, data were extracted from column No. 7, according to the work carried ha are likely day of mechanized be represented in the same month several times in this case the data obtained are gathered on the month and multiplied by the total number of hectares for each crop and divided to 8 (this being the number of hours worked per day)

Table 3. Establishing the necessary days and the necessary time mechanized tractors

No.	**Month**	**Total holding**	**Wheat 29 ha**	**Maize 14 ha**	**Sunflower 16 ha**	**Peas 5 ha**
1	January	-	-	-	-	-
2	February	1,381	1,381	-	-	-
3	March	6,525	-	-	5,128	1,397
4	April	7,948	1,359	5,467	0,888	0,234
5	May	0,56	-	0,56	-	-
6	June	6,251	3,292	0,87	1,744	0,345
7	July	20,072	8,856	-	5,596	5,62
8	August	1,892	1,892	-	-	-
9	September	17,819	11,662	2,814	-	3,343
10	October	17,932	8,098	4,834	5	-
11	November	-	-	-	-	-
12	December	-	-	-	-	-
13	Total	80,38	36,54	14,544	18,356	10,939

Source: own processing -conform sheet technology

Using the table above we found that we needed one tractor to be completely independent of equipment outside the company.

Table 4. The needs of diesel per hectare

No.	**Month**	**Total holding**	**Wheat 29 ha**	**Maize 14 ha**	**Sunflower 16 ha**	**Peas 5 ha**
1	January		-	-	-	-
2	February	1,527	1,527	-	-	-
3	March	30,293	-	-	16,021	14,272
4	April	26,786	1,29	21,206	3	1,29
5	May	2,2	-	2,2	-	-
6	June	13,979	4,62	2,979	4,29	2,09
7	July	66,614	16,266	-	-	50,348
8	August	27,008	1,968	-	25,04	-
9	September	78,724	27,66	9,974	-	41,09
10	October	63,028	14,263	26,659	22,106	-
11	November	-	-	-	-	-
12	December	-	-	-	-	-
13	Total	310,159	67,594	63,018	70,457	109,09

Table 5. Requirement retributions per hectare

No.	Month	Total holding	Wheat	Maize	Sunflower	Peas
1	January	-	-	-	-	-
2	February	4,1	4,1	-	-	-
3	March	32,4	-	-	17,6	14,8
4	April	140,9	3,3	8,9	125,4	3,3
5	May	125,4	-	125,4	-	-
6	June	261,9	6,6	125,4	126,6	3,3
7	July	62,5	5,0	-	-	57,3
8	August	47,3	30,7	-	16,6	-
9	September	128,4	0,4	124	-	4
10	October	175,5	8,4	163,1	4	-
11	November	-		-	-	-
12	December	-		-	-	-
13	Total	978,4	58,5	546,8	290,2	82,9

Source: own processing -conform sheet technology

The need for retributions is shown in column no.13 of sheets technological and represents the amount of money spent on certain activities per hectare.

Following those discussed above will be calculated expenses, revenues and financial results for the entire farm.

Table 6. Distribution of expenses per per hectare per crop area

No.	Activity	Surface	Direct Expenses		Indirect Expenses		Total expenses	
0		**ha**	**ha**	**Surface**	**ha**	**Surface**	**ha**	**Surface**
1	Wheat	29	3.293,1	95.499,9	131,72	3.820	3.424,82	99.319,9
2	Maize	14	3.241,8	45.385,2	129,67	1.815,41	3.371,47	47.200,61
3	Sunflower	16	2.923,9	46.782,4	116,96	1.871,30	3.040,86	48.653,70
4	Peas	5	4.097,4	20.487	163,90	819,48	4.261,30	21.306,48
5	Total	-	-	**208.154,5**	-	**8.326,18**	**-**	**21.6480,7**

Source: own processing -conform sheet technology

Direct expenditures are drawn from technological sheet and indirect costs represent 4% of direct expenses. Analyzing the structure of total expenditures reveals that the highest values were recorded by Expenditures of the wheat crop lei 99319.9. At the opposite pole pea crop, accounting value of 21306.48.

Table 7. Calculation economic and financial results

No.	Activity	Surface	Production (tonnes)		Production Cost	Sale Price	Revenue	
0		ha	ha	Surface				lei/ Surface
1	Wheat	29	5	145	684,96	700	3.500	101.500
2	Maize	14	6	84	561,91	650	3.900	54.600
3	Sunflower	16	4	64	760,21	1.400	5.600	89.600
4	Peas	5	4,5	22,5	946,95	1.200	5.400	27.000
5	Total	-	-	-	-	-	-	**272.700**

Expenses		Profit / loss without subsidies		Profit / loss with subsidies	
lei/ha	**lei/Surface**	**lei/ha**	**lei/ Surface**	**lei/ha**	**lei/ Surface**
3.424,82	99.313,9	75,17	2.186,1	779,17	22.596,1
3.371,47	47.200,61	528,52	739,39	928,52	12.999,39
3.040,85	48.653,7	2.559,14	40.946,3	2.691,14	43.058,3
4.261,29	21.306,48	1.138,70	5.693,52	1.270,70	6.353,52
-	**325.123,5**	**-**	**56.225,32**	**-**	**85.007,32**

Source: own processing -conform sheet technology

In the annual production plan we have the following steps:
• Establishing crop
• The location of the crop in the previous year plan, the planyear and the following year plan
• Establishing the necessary mechanized and manual ruledays
• Evaluation of prices and tariffs
• Calculation of revenue and financial results at farm leveland for each activity

Development of *a model to optimize* the size and structure of farm crops by methods of modeling and simulation

Multiple logical method variants - is the construction of "x" variants that are given values each activity so as to comply with certain requirements on total arable area, crops to rotation requirements, the availability of labor. This is a method of modeling and simulation and is designed to determine the optimal structure of company activities in order to obtain maximum profit.

Variant logic no.1

		Profit		**consumption man days / ha**		**consumption m.d/surface**		**available man days**		**available m.d.consumption /surface**	
Activity	Surface	ha	Total	Month	Total	Month	Total	Month	Total	Month	Total
Wheat	28	779,17	21.816,93	0.16	1.5	4.48	42				
Maize	18	928,52	16.713,5	3.03	13.66	54.54	245.88				
Sunflower	14	2.691,14	37.676,02	3.06	7.02	1.12	98.28				
Peas	4	1.270,70	5.082,81	0.08	2.007	12.24	8.028				
Total	64		**81.289,26**			72.38	394.188	46	414	-26.38	19.812

Variant logic no.2

		Profit		**consumption man days / ha**		**consumption m.d/surface**		**available man days**		**available m.d.consumption /surface**	
Activity	Surface	ha	Total	Month	Total	Month	Total	Month	Total	Month	Total
Wheat	29	779,17	22.596,1	0.16	1.4	4.64	40.6				
Maize	14	928,52	12.999,39	3.03	13.66	42.42	191.24				
Sunflower	16	2.691,14	43.058,3	3.06	7.02	48.96	112.32				
Peas	5	1.270,70	6.353,52	0.08	2.007	0.4	10.035				
Total	64		**85.007,32**			96.42	354.195	46	414	-50.42	59.81

Variant logic no.3

		Profit		**consumption man days / ha**		**consumption m.d/surface**		**available man days**		**available m.d.consumption /surface**	
Activity	Surface	ha	Total	Month	Total	Month	Total	Month	Total	Month	Total
Wheat	23	779,17	17.921,05	0.16	1.4	3.68	32.2				
Maize	19	928,52	17.642,03	3.03	13.66	57.57	259.54				
Sunflower	16	2.691,14	43.058,3	3.06	7.02	48.96	112.32				
Peas	5	1.270,70	6.353,52	0.08	2.007	0.4	10.035				
Total			**84.974,9**			110.61	414.095	46	414	-64.61	-0.095

Variant logic no.4

		Profit		**consumption man days / ha**		**consumption m.d/surface**		**available man days**		**available m.d.consumption /surface**	
Activity	Surface	ha	Total	Month	Total	Month	Total	Month	Total	Month	Total
Wheat	**19**	779,17	14.804,34	0.16	1.4	3.04	26.6				
Maize	**20**	928,52	18.570,56	3.03	13.66	60.6	273.2				
Sunflower	**16**	2.691,14	43.058,3	3.06	7.02	48.96	112.32				

Peas	**8**	1.270,70	10.165,63	0.08	2.007	0.64	16.056				
Total			**86.598,84**			113.24	428.176	46	414	-67.24	-14.176

I realized logical variants using tables 2 and 5, the tables have changed variants crops in rotation surfaces, respecting restrictions to choose, what brings the greatest profit. Thus, we obtained the 4th variant as the best option. With this variant, a profit of 86598.84, conducted by two workers for 23 days per month during 9 months.

Linear programming method to optimize the size and structure crop farm

Linear programming is directed to a particular class of optimization problems which are often found in the economic applications. These problems consist of maximizing or minimizing a linear function called objective function, whose variables must satisfy:
• relations system data in the form of equations and / or non-strict linear inequalities, collectively restrictions;
• requirement to take only non-negative numeric values (≥0).

Components of the mathematical model:
1. The objective function, which is to maximize profit or minimize costs
2. The technical and economic matrix coefficients
3. resources
4. The condition of non-negativity

Table 8. Activities and resources

					resources
Activity	**Wheat**	**Maize**	**Sunflower**	**Peas**	64ha
Profit	779,17	928,52	2691,1	1270,7	
consumption man days / year	65,08	191,32	110,72	10,035	
consumption man days june / ha	4,64	42,42	48,96	0,4	
consumption mechanized days/year	36,54	14,54	18,35	10,93	
consumption mechanized days june/ha	3,29	0,87	1,744	0,345	
retributions	58,5	546,8	290,2	82,9	16000

- **algebraic form of the mathematical model**

O.F =profit= surface
*O.F=779,17*x1+928,52*x2+2691,1*x3+1270,7*x4*

L1 SURFACE TOTAL = X1+X2+X3+X4 ≤ 64 Ha
L2 STRAW SURFACE = X1 ≤ 32 Ha
L3 SURFACE.SUNFLOWER (25%) = X3 ≤ 16Ha
L4 SURFACE MAIZE(30%) = X2 ≤ 20Ha
L5 SURFACE VEGETABLES (15%) = X4 ≤ 11Ha
L6 consumption man days / year = 1,4x1+13,66x2+7,02x3+2,007x4 ≤414
L7 consumption man days june / ha = 0,16x1+3,03x2+3,06x4+0,08x4 ≤ 46
L8 consumption mechanized days/year = 3,22x1+1,63x2+1,11x3+2,18x4 ≤ 414
L9 consumption mechanized days june/ha = 0,11x1+0,602x2+0,109x3+0,069x4 ≤ 46
L10 retributions = 58,5x1+546,8x2+290,2x3+82,9x4 ≤ 16000

- **matrix form of the mathematical model**

O.F.. [779,17;928,52; 2691,1;1270,7]

L1	1	1	1	1	≤	64
L2	1	0	0	0	≤	32
L3	0	0	1	0	≤	16
L4	0	1	0	0	≤	20
L5	0	0	0	1	≤	11

Following the completion of two forms, algebra and matrix, a mathematical model can be built using notepad file which can run simplex algorithm, used to optimize the size of the farm to reach maximum profit. After running the program will give two solutions:

a) PRIMARY solution - this is reflected in the structure and activities are eaten each restriction placed

VARIABILE PRIMALE:

Variabila:	Denumire:	Marime :	Valoarea in Func. Ob.:	Aport la Func. Ob.:
X 2	Porumb	2.61	928.52	2426.68
X 3	Floarea Soa	16.00	2691.10	43057.60
X 4	Mazare	11.00	1270.70	13977.70

Variabila:	Denumire :	Cantitatea ramasa:	Cantitatea initiala :	Cantitatea consumata:
L 1	suptot	34.39	64.00	29.61
L 2	SUP PAI	32.00	32.00	0.00
L 3	SUP Pb	17.39	20.00	2.61
L 6	ZO TOT	243.90	414.00	170.10
L 7	ZMEC TOT	356.24	414.00	57.76
L 9	ZMEC IUN	41.92	46.00	4.08
L 10	RETRIBUTII	9015.84	16000.00	6984.16

My example is done for a unit with an arable area of 64 ha which is manual labor two workers standing for 23 normal days per month for nine months and has two machines for 23 normal days per month period of 9 months.

To get maximum profits can grow on the 64ha area: 32 hectares of wheat, 20 hectares of maize, 16 hectares sunflower and 11 hectares peas. Of the four selected crops were grown only 2.61 hectares of maize, 11 hectares over the surface of peas and corn 16 hectares.

The contribution activities in this holding is as follows: the 2.61 ha planted with maize intake of 2426.68 lei (2.61 * 92.52) fl.soarelui area has 16ha planted with a contribution of 43,057.60 lei (16 * 2691.10) on 11ha planted peas are obtained 13977.70 lei (11 * 1270.70).

b) DUAL solution - it contains only the resources that are consumed entirely

VARIABILE DUALE:

Variabila:	Denumire:	Valoare duala :	CANTITATE:	APORT marginal :
L 4	SUP Fls	2058.795	16	32940.72
L 5	Sup Mz	28.87559	11	317.6315
L 8	ZO IUN	569.6442	46	26203.63

VALOAREA FUNCTIEI OBIECTIV = 59461.98

Interpretation dual solution

Restrictions that condition for chosen cultural :

- L4 SUPFls (16 ha),
- L5 SupMz (11),
- L8 JUN ZO (46),

which are wholly consumed in the multitude of restrictions, resulting in maximum profit. (resources of this solution are limiting factors) .

Noteworthy is that the value of 59461.98 O.F. product yield and 11ha * 28.87559lei + 16ha * 2.058,79+ 46 * 569.6442 lei

- parameterization is achieved by modifying restrictive factors and aims to optimize its tasks efficiently in order to obtain maximum profit.
- By modifying restrictive factors in dual solution namely man days june (from 46 to 115 days ie from 2 to 5 workers) and man days / year (from 414-621, ie from 2-3 permanent workers)found that all four cultures were cultivated sunflower and pea areas being cultivated in toatalitate, corn surface area being cultivated in 88% - 17.62 ha, the area cultivated least 43.2% -13.83 wheat.

The contribution to the objective function for each crop being 10776.72 - wheat, 16362.50-corn, 43057.60-sunflower, 13977.70-peas. O.F.→ 84174.53

- I noticed it is that the value of O.F. increased from 59461.98 to 84174.53 after parameterization

CONCLUSIONS

The production plan of the farm includes all the results expected to be obtained on production sectors and categories of activities and material and human resources necessary to fulfill them.

For the preparation of production and business at farm level (vegetable farms) can also use the program AGR4 it allows updating all indicators, monthly or at any time, which is information realist "Today" in the act of operative management, increasing the effectiveness of the decisions.

Although both methods of modeling and simulation profit realized I recommend the method of modeling and simulation through linear programming, even if it does not bring a profit as high as the profit obtained by the method variants logical believe that this profit is made safe since it established more restrictions.

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CLIMATE CHANGE IN RELATION TO AGRICULTURE

SLAVE CAMELIA
VIZIREANU IOANA[1]

Abstract: *Climate change in Romania, will affect all sectors of the economy will lead to changes in vegetation periods and displacement the line between woods and meadows. Extreme weather events (storms, floods, droughts) will occur more frequently, and related risks and damages may become more significant. The areas affected by drought have expanded in the last decades the most exposed being in southeast and most of the country was affected by long lasting dry period. Together with floods, long periods of drought lead to significant economic losses in agriculture, transport, energy, water management, health and activity of households*.

Keywords: *agriculture, climate, climate change, greenhouse environment.*

INTRODUCTION

Today we have a number of environmental problems, many of which are closely related. The most important issue is climate change. During Earth's history, the climate has changed many times, sometimes dramatically. The ages of warmer replaced and superseded always been glacial. However, the climate of the past about 10 000 years has been particularly stable. During this period has developed the human civilization. In the last about 100 years - since the beginning of industrialization - the global average temperature has increased by approx. 0.6 ° C (after IPCC (Intergovernmental Panel on Climate Change)), faster than ever in the past 1000 years.(fig 1)

Climate changes observed during a period of time comparable to the early industrial era is the result of human activities directly or indirectly for change the composition of the global atmosphere and which adds to the natural climate variability.

Global warming affects both physical systems and biological ones. Among the direct effects can be mentioned: average global temperature increase to significant variations regionally, reducing the volume of the polar ice caps and thus increase ocean levels, changing hydrological cycle, the increasing area of arid changes in the course of the seasons, increased frequency and intensity of extreme weather events, biodiversity loss, etc.

The Intergovernmental Panel on Climate Change recommends the need to establish policies and measures to reduce emissions of greenhouse gas (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride), as without these measures there will be increases global temperature. Limiting average global temperature increase with a maximum of 2 °C above the pre-industrial period 2100, requires reducing greenhouse gas emissions by at least 50% toward current level.

The United Nations adopted the United Nations Framework Convention on Climate Change, in Romania it was transposed into Law no. 24/1991 - ratification of the United Nations Framework Convention on Climate Change.

The Kyoto Protocol was transposed into Law No.3 / 2001 - ratification of the Kyoto Protocol of the UN Framework Convention on Climate Change; It became mandatory on 16 February 2005.

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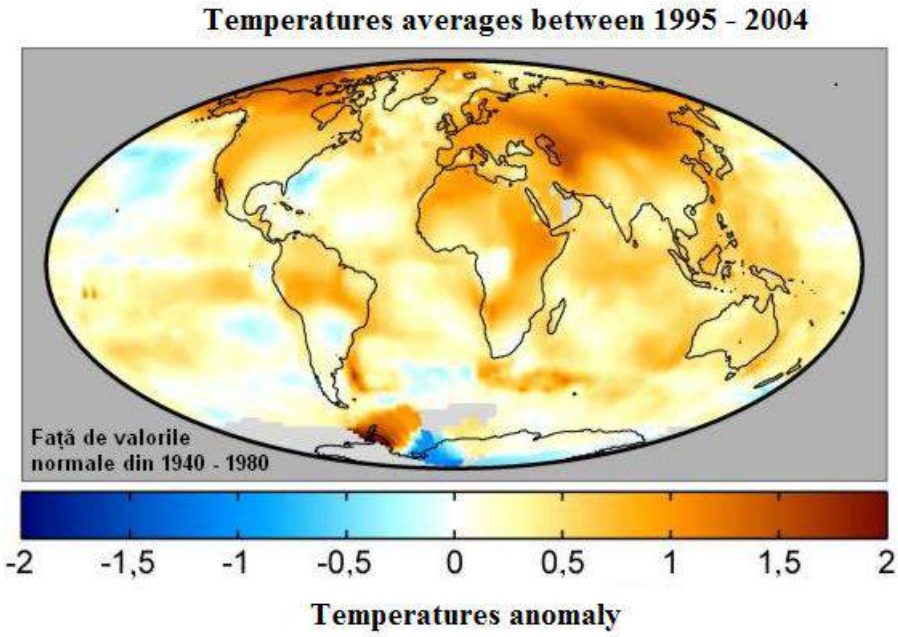

Fig.1 Global average temperature between 1995-2004

The Directive of European Community 2003/87 / establishing the scheme for the trading of emission allowances for greenhouse gas emissions issued in the European Community, as amended by Directive 2004/101 / EC, the so-called The Directive Contact, linking scheme emissions trading within EU to other emissions trading schemes and CO2 reduction projects (JI - JI and Clean Development Mechanism - CDM).

Romania, by participating in the - Third Conference on Climate Change in Kyoto has taken place in Japan in December 1997 adopted a legislative framework within which the activities relating to climate change.

The characterization of climate factors for Romania

Air temperature

The average annual temperature ranges in our country from 11 °C to 8 °C in the south and north. The isotherm annual averages are 11 °C and limit the Danube valley along a wide strip of 20-30 km. In coastal and Danube Delta average temperatures above this level. Most of the North Dobrogea and Tisa plain had annual average temperatures between 10 ^{0}C and 11 ^{0}C. From 10 °C isotherm the highlands annual average temperatures decrease depending on altitude, reaching the isotherm 0 ^{0}C to meet at 2000 m altitude.(fig 2)(Busuioc, 2003)

The annual average values are lower in the north and on the slopes with northern exposition along river valleys while large average temperatures are higher than in the corresponding high areas.

An extreme temperature (maximum and minimum) as well highlights the continental climate in our country. The highest maximum temperature (40 °C) was recorded in Bărăgan and lowest minimum (below -30 °C) in the region Gheorghieni – Vatra Dornei.

Precipitation regime

Climatic analysis of data has led to the amount of 637 mm average annual rainfall quantity falling on our country. If we analyze the geographical distribution of rainfall is a noted significant difference: thus, there are differences between western regions, subjected of invasion humid air, and eastern, driest; between the highlands, with high rainfall (1000 - 1400 mm), and bass poorer in precipitation between slopes with different orientations.

Differences are reported and where depressions safe from Western currents (Gheorghieni, Ciuc, Braşov) where quantities are falling below 600 mm. In the Piedmont Plateau fall about 600 mm and in northern and central Moldavian Plateau 500-600 mm. In the south of the Getic Plateau, in Baragan Plain and Dobrogea fall below 500 mm and the Danube Delta and coastal below 400 mm. In Tisa Plain annual fall about 600 mm, while in the Western Hills 700-800 mm.

Some of the causes of these differences is the position in relation to the movement of the Carpathian peaks western fronts intensified activity in their passage over the mountains, intense thermal convection of warm weather, and more.

Analysis of rainfall distribution in both seasons shows that are differences between the warm and cold season and between different regions of the country. In summer, due to the predominance of north-west movement in high mountain areas in Transylvania Plateau fall about 70% of the total annual rainfall. In the remaining countries fall between 55 and 65%, except Black and Delta, where 55% fall southwest Oltenia and Banat, where fall below 50%. In the winter, due to the anticyclone regime fall less precipitation, excepted southwest of Oltenia and Banat.

Rainfall is the highest parameter variability in time and space and this is supported by the outstanding amounts from the annual average recorded in some years. Thus, in regions characterized by moderate amounts of precipitation, as the Romanian Plain values were recorded 1160 mm (Vidra), 1048 mm (Mărculeşti), 1014 mm in Rm. Sarat, etc. In dry years the amounts of rainfall in the Romanian Plain amounted just 120 mm (Drăgăneşti-Vlaşca, Tămădău). Another problem noted above is the heavy rains, frequent especially during the summer, giving exceptional water quantities and pursued enhancing thermal convection

The snow, due to geographical location of our country, is a significant part of the annual rainfall. The number of snowy winter days grows gradually from the plains to the mountains. A special importance is the thickness of the snow, but for which no assessment can only be very general, because in this case local conditions, especially wind direction and strength, leading to differentiated deposition of snow. It accepts, however, increase the thickness of snow with altitude: 5 cm in Dobrogea at 5-20 cm in the plains and hills and over 1 m in the mountains.

Global warming affects our country, the most pronounced effects are hot and dry winters. Romania is significant increased frequency of extreme weather events and rare: hot summers, tornadoes, floods. Meteorological records for more than 100 years shows a clear trend of desertification on an area of 3 million hectares in the east of the country (Dobrogea), East Muntenia and southern Moldavia, of which 2.8 million arable hectares (20% of Romania's agricultural fund). For the last century was highlighted average increase of the temperature 0,3 °C until, with an increase made after 1960. The increases are differentiated being more pronounced in the southeast with values of 0,8 °C stations Bucharest - Filaret and Constanta. The increases are lower in the central and northern part of the country except Baia Mare depression were highlighted where values of 0,7 °C. Data recorded at the main meteorological stations in the country and weather stations in Southern and Western Carpathians, located at altitudes between 1090 and 2504 m for the period 1961-2000 reveal the following:

- The trend of increasing global average air temperature at earth surface, accelerated in the last 25 years;
- A slight increase in mean annual temperature and decreased precipitation quantities for mountain areas;
- A slight increase in mean annual temperature stations Vf. Omu (2504 m) and a clear increase in Stâna de Vale for the period 1979-2000;
- The Scărişoara Glacier melt and reducing it by 2.0 m in the last 100 years, of which the most significant reduction was reported in the last 25 years;
- Raising the water level in different sections located on the Black Sea coast up to 45 cm in a period of 130 years;
- The occurrence of extreme temperatures, such as those recorded on 5 July 2000 data station 43,5ºC Giurgiu and Bucharest 42.4 C in 1984.

As examples of changes to the climate, 2000 was characterized by the generalized drought and excessive temperatures. Recordings carried out revealed that summer of 2000 was the driest in the last 100 years, preceded by spring range which was also extremely dry. In terms of rainfall, significant regional differences are reported with a slight increase in the south, west and east and annual decreases in the remaining territory. It is clear accentuation of torrential rainfall which is manifested by the fall of large amounts of rainfall in short periods followed by a long period of drought. Even in dry years produce the major floods rainfall during spring snowmelt when combined with in summer. The most destructive flood was produced on rill Pârâul Mare (Retezat Montain) on 11 July 1999, which result 13 victims, 21 people injured and two blocks was destroyed. Rapid alternation of rainy periods with dry periods, a significant example in this respect was 2000, when after a spring in which there were major floods followed a very dry period in June and July. (Sandu, 2010)

For example, year 2005 rains fall between rainfall floods which caused major in Moldova and Banat and many type flush floods in hilly and mountainous area. For winter we have highlighted significant warming, combined with melting snow pronounced shift to spring suddenly being made. For autumn a slight cooling of the climate of the western half of the country, and in summer temperature variations are recorded with long oscillations falling into the general trend of variation.

RESULTS AND DISCUSSION

Weather climate change in Romania agriculture

Drought is one of the most severe effects of global warming and this phenomenon is present in Romania. Catalin Simota - Director of the Institute of Soil Science in Bucharest says that "On the basis of global warming arising from human activity, areas that were at risk in case of water shortages are facing a higher risk, they become desert. When become desert, it changes the whole balance radioactivity, all vapour flows in the area, leading to an accentuation of global warming which, in turn, affects even more land. "

For evidence negative effects of climate change has been proposed several scenarios.

Under climate change scenarios in Romania for the next 20 years is projected a temperature increase between 0.7 ^{0}C - 1.1 ^{0}C, the highest values are recorded in the mountainous area. Rainfall will present a fall in the winter months - december and february, an increase in october, the month of June will bring the significant decreases in the plain. From these estimates it follows that with an increasing temperatures will have processes of degradation of lands favouring the effects of drought: - destruction of vegetation, soil erosion - water and wind, damage soil structure, compaction of soil crust and filling porosity and soil salinization. (Busuioc, 2003)

In case of an increase in average annual temperatures cumulated with the absence of rainfall during the growing season result possible losses to agricultural production.

CONCLUSIONS

According to data from the National Institute of Meteorology for the period 2021 - 2050 provided for a multi annual average temperature increases by 1.4 C compared to the reference period 1961 - 1990. For the century temperature rise will be 3.1 C.

For rainfall is expected to decrease in the summer months throughout the country average of 20%. Extreme events - droughts and floods - climate change accompanying this aspect.

In the last years Romania has succeeded to halve the emissions of greenhouse gases, although climate change recorded globally continues to affect us by extremely high temperatures, said Monday the Minister of Environment, Water and Forestry Graţiela Gavrilescu conference

presentation of the report 'the European environment - state and the perspectives 2015 ~ - SOER 2015 prepared by the European Environment Agency. As for climate change, even with the reduction of gas emissions greenhouse, they still affect the Romania.

Regarding climate change, even with the reduction of gas emissions greenhouse, they still affecting Romania. Last week, our country went through a difficult period marked by extremely high temperatures. Like other European countries, Romania has registered between 1988 and 2010 average annual temperatures increased by about 0.5 ^{0}C, a value very close to the global average of 0.6 ^{0}C. This increase is the source of today's problems; keenly felt not only in agriculture but also in discomfort and health of the population, "said Environment Minister.

The data 18th of September 2015, Member of the European Union States had reached an agreement on the goals that they will support the International Conference on Climate Change (COP21) taking place in Paris between November 30 to December 11 - 2015. Ministers of environment have decided to advocate that emissions of greenhouse gases is reduced globally by 40% by 2030 and by 50% by 2050, and should be close to zero by 2100 so that the average temperature increase global does not exceed 2 ^{0}C in 2100 compared with the pre-industrial times.

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DEVELOPMENTS IN THE EUROPEAN MARKET OF ORGANIC AGRICULTURAL PRODUCTS

ALECU IOAN-NICULAE[1], ANGELESCU ANDA-IRINA[2], MĂRCUȚĂ ALINA[3], ANGELESCU CARMEN[4]

Summary: *This paper represents an analysis of the development of the European organic agricultural product market, taking into account especially the consumption of organic agricultural products and some aspects regarding the consumers' behaviour. The period between 2000 and 2012 was analysed, with particular attention to the situation existent in 2012 and with references to the global situation. The tendencies that are foreseen for the future of this market segment are also considered. The conclusions of this analysis emphasize the idea that, in an era when the population is increasingly more informed and interested in its health and of the environment it is living in, the organic food market, which is still a niche market, has real opportunities of development. The only condition is that all of those involved in this sector of organic farming (producers, processors and retailers) join forces in order to develop concepts and strategies for the organic farming of the future.*

Key words: *Consumption, organic product market, distribution channels.*

INTRODUCTION

In recent years, the demand of organic goods and services has registered an upward trend resulting in changes of the consumers' behaviour, on the one hand, and of the policy of the manufacturing industries, on the other hand.

Therefore, it is fair to speak about an increasingly higher interest for quality agricultural and food products created by a special type of agriculture, named "organic farming". Because the population is increasingly better informed and interested in health issues and of the excessive chemicalization of the agricultural output with the aim of increasing the production and streamlining the activity, the market shows a higher demand for the "clean" products of the organic farming.

It has to be emphasized that the organic farming may represent a possible solution for problems such as: meeting the demand for natural products, obtained with methods that do not imply the use of chemical substances, and the agricultural sector diversification, in the general context of environmental protection.

MATERIAL AND METHOD

In the developed countries, with a higher standard of living of the population, the organic farming has had a quicker pace than in the less economically developed countries, fact that is visible in Europe also. Together with the development of this sector, the market for these organic products has also developed, and its development is analysed in this article. Aspects regarding this market, for the period 2000-2001, based on the statistical data from the European Commission and IFOAM are analysed in this paper. The conclusions at the end of this article are also based on the interpretation of the statistical data provided by these sources.

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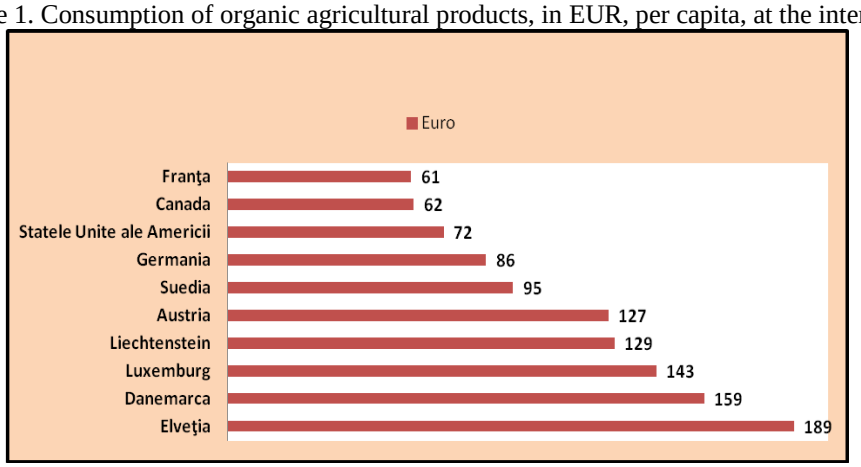
RESULTS AND DISCUSSIONS

In 2012, the consumption of organic products at the international level was assessed to be, in average, of US $ 9.08. As regards the situation at the European level, it can be stated that there is a well formed marked, as long as in Switzerland, the consumption raised to a value of € 189.1, in Denmark of €158.6 and in Luxembourg of € 143. Also, the market trend is upward year after year and 7 European countries are included in the top of the countries with the highest consumption of organic products.

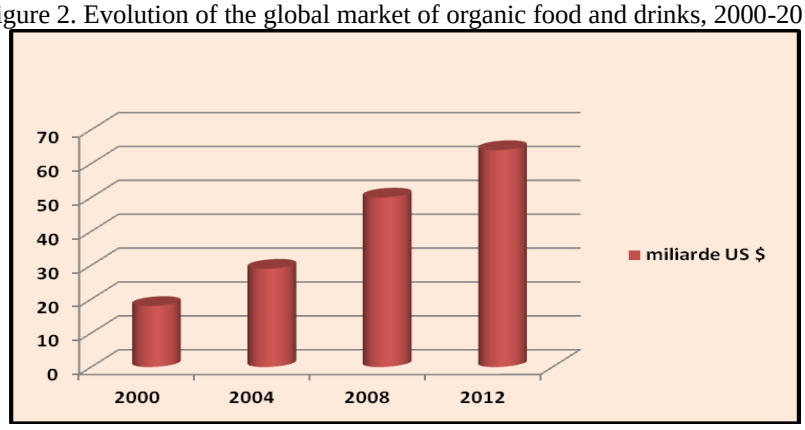
Figure 1. Consumption of organic agricultural products, in EUR, per capita, at the international level



But the situation is different among the EU member states. Thus, within the period 2006-2007, the expenses for organic food of the retail sector of EU-15 have reached EUR 14.4 billion, with more than 80 % in four member states: Germany, Great Britain, France and Italy. The organic food market is significant in Austria (almost 5 % of the food market), in Germany, Denmark and Luxembourg (the weight here is of 3.7-3.8 %).

In 2012, the organic food market has reached a value of 29 billion dollars.

Figure 2. Evolution of the global market of organic food and drinks, 2000-2012



In the EU-12 member states, the weight of the organic sector in the total consumption of food products is much lower, of 0.2 % for most of them and reaches a maximum of 0.5 % in the Czech Republic. In these member states, the main restriction for the market growth is the purchasing power of the consumers, because the organic food products are more expensive. In fact, the Czech Republic represents a particular case because, even it is one of the former communist countries, and its agriculture has adapted on the fly to the requirements of the European Union, it developed quite rapidly the organic production sector. Thus, the organic food products have reached a weight of 0.75 % of the total sales in 2010, increasing gradually during time. Actually, the main objective of the Ministry of Agriculture of the Czech Republic was that those sales to reach 3 %, until the year of 2015. The main distribution channels for organic products are the supermarkets (21

%), specialized organic product stores (13 %), direct sales from the farm (13 %) and agri-food markets (5 %). The effective value of the organic products consumed in the Czech Republic is of approximately EUR 83 million, 3.5 times the value registered in 2005.

A survey performed in 2010 by the Czech Ministry of Agriculture emphasized that the most demanded organic food products the consumers have purchased were: milk and dairy products, vegetables, fruits, meat and meat products, bread and pastry products, drinks (juices), confectionery, flour, and other grain mill products, pasta products.

During this survey, the portrait of the typical consumer of organic food was also made, respectively: women, educated, with high incomes. The most frequent purchased organic food products are: milk and dairy products (24 %), vegetables (23 %), fruits (19 %), meat and meat products (12 %). Only 1/3 of those who buy organic food do this regularly, in general once per week. The amount per month spent for these products is of EUR 20.6, representing approximately 17 % of the total expenses for food of a household.

It also has to be noted that approximately 60 % of the organic products existent on the Czech market are imported, the main suppliers being the Western European countries, Germany and Austria respectively. Bringing up an extremely important issue, especially in countries with a lower purchasing power, such as the Czech Republic, it has to be emphasized that the organic products have higher prices on the domestic market due to the higher costs of production. Compared to the traditional products, the organic products have prices higher, in average, with 40 %.

A study performed in Spain, in Carrefour type hypermarkets, indicated that for a shopping cart with 17 food products, the total price difference between the organic products and the regular ones is of approximately € 14.4, meaning, in average, € 0.84 per product, showing that here, the costs of production are lower and that Spain imports less, but produces more in this sector.

In countries like the Netherlands, Denmark, Germany, Austria, the effects of the organic food consumption on human health is increasingly emphasized. Therefore, in the Netherlands, there are studies showing that the advocates and consumers of organic products are healthier than the other consumers, and the consequences are seen in the savings made by the national health system.

The research indicates that the clients of EkoPlaza type supermarkets have a healthier life style than the rest of the Dutch population: less obesity, fewer diseases related to smoking, the result being approximately 30 % less hospital care and 25 % less medicines. They have a significantly lower body mass index than the rest of the Dutch population (23.3 compared to 25.5). The clients of EkoPlaza suffer less frequently from overweight and obesity. The clients of EkoPlaza have a lower likelihood to experience several medical symptoms, such as heart diseases, difficulty to breathe, high blood pressure and high level of cholesterol and they also have fewer nuisances caused by obesity, such as headache and cold symptoms.

It is estimated that the clients of these food stores could probably save EUR 50 million/year for the Dutch society. Apparently, an informed, healthy life style also brings financial advantages.

In general, a dynamical increase of the consumption of organic food products may be noticed in EU. In four large EU markets (France, Germany, Great Britain and Italy), the increases are impressive: the average increase rate has been of 18.1 % for France during the period 2005-2009, 14.0 % for Germany during the period 2000-2008, 8.7% in Italy, during the period 2001-2009 and 11.9 % for the United Kingdom, during the period 2000-2008. In 2009, the economic recession has affected the organic food consumption in Great Britain (decreasing from 13.6 %), but the market was more stable in Germany and still increasing in France and Italy.

Table 1. The importance of the organic sector in population's consumption, during the period 2006-2007

Country	Expenses for organic food cons. (mil. €)	% of total food expenses	Expenses for organic food per capita (€)
Belgium	283	1.3	26.6
Bulgaria	1	0.0	0.1
Czech Republic	52	0.5	5.0

Denmark	434	3.8	79.8
Germany	5300	3.7	64.4
Greece	60	0.2	5.4
Spain	200	0.2	4.5
France	2069	1.4	32.4
Italy	1387	1.0	21.4
Cyprus	2	0.1	1.9
Luxembourg	41	3.7	86.4
Hungary	20	0.2	2.0
the Netherlands	519	1.8	31.7
Austria	739	4.8	89.0
Poland	50	0.1	1.3
Portugal	70	0.4	6.6
Romania	2	0.0	0.1
Slovenia	4	0.2	2.0
Finland	65	0.6	12.3
Sweden	379	2.2	41.7
Great Britain	2835	2.7	41.9
EU-15	**14,381**	**1.9**	**35.9**

The analysed data indicate that there is a higher increase of the demand for organic products than of the supply. Also, some goods cannot be made in somewhere else due to climate or geographical reasons. That is why it is not in the least surprising that the trade between the member states and imports from third countries have increased with such a rapid pace. Intra-EU trade and imports from third countries represent an important part of the domestic consumption of organic products in the majority of the member states.

Fruits and vegetables represent the most important category of food products that are purchased by consumers, with weights in the total sales of organic products of 15-36 % in the four large EU markets.

Dairy products represent the second most important category, with 16-24 %. Meat products represent approximately 10 % of the consumption expenses. Because the birds (poultry) for meat production have a quite limited weight, they represent only 3 % of the organic market in France and Great Britain, and eggs represent a top product, with 4-8 % on the four large EU markets.

It must not be overlooked that EU is also an exporter on other markets. Thus, EU produces a wide range of foods, especially high quality products, in order to meet the demands of other countries. These products are increasingly organic and include cheese, wine, alcoholic beverages and baby food. The export markets, such as USA, Japan, Switzerland and Canada are already recognizing the organic standards of the EU. Recognition on other markets except EU represents a priority for the future.

Developments of the European organic farming

At the international level, food that is produced by strictly observing the rules of organic farming covers approximately 1-2 % of the total food sales. The trend is the increase of the sale of organic food globally. In fact, the global organic food market has constantly increased since 1990 with approximately 20 % annually.

European Union supports the organic farming, that is why in Austria, for example, the farmers within this sector receive aids, and the experts estimate that 10 % of all food products will be produced locally. In Germany, almost all baby food products are organically produced, and, in some regions, up to one third of all breads are made using organic ingredients. In 2005, the Italian Government, in order to be sure that young people eat organic food, passed a low stipulating that the entire food for pupils' lunch is to be organic.

In the United Kingdom, more than 600.000 ha have been plated by observing the organic standards, and the sales of organic food have increased from approximately 100 million pounds to more than 1.2 billion in only 10 years.

The last decades witnessed the evolution of the organic sector of agriculture in what it is today. In fact, organic certifications exist in 164 countries. The progress made in the scientific research and in the management of farmers' knowledge has led to significant developments in the agricultural methods of this sector.

It must not be forgotten that organic farming still represents a niche sector, with less than 1 % of the agricultural lands in the entire world, but successes are registered in a series of countries, such as: 20 % of the agricultural lands of Austria are organically farmed, the majority of cocoa exported from the Dominican Republic is organic and 20 % of the eggs and fresh bread on the Swiss market are organic. In some countries, more than 80 % of baby food products are organic. These examples indicate that the market of organic products has not reached its limits yet. However, its increase and development continue to be necessary, the organic farming being a viable alternative to the environmental and social challenges.

The organic producers, retailers and processors must join forces and develop concepts and strategies for the organic farming of the future. These concepts have to support growth without endangering the quality and environment, to promote sustainability and, at the same time, to increase the credibility of organic systems among the consumers.

CONCLUSIONS

- Because the importance of organic farming has gradually increased in the eyes of the consumers and the organically farmed areas have had a constant growth, in the last years, the organic agricultural product market also had an upward trend;
- The higher the development level and the standard of living of the population are, the more developed the organic product market is in the European Union countries, and not only;
- The organic food market is significant in Austria (almost 5 % of the food market) and in Germany, Denmark and Luxembourg (the weight here is of 3.7-3.8 %);
- As regards the organic food consumption, seven European countries are included in the top of global consumption, certifying the strong development of the sector in the last years, and also the acknowledgement by the consumers of the benefits of consuming this type of products;
- In the newer EU member states, the main restriction to the market growth is the purchasing power of consumers, considering that these products are more expensive than the regular ones;
- The most demanded products on the organic food market are: milk and dairy products, vegetables, fruits, meat and meat products, bread and pastry products, drinks (juices), confectionery, flour, and other grain mill products, pasta products etc.;
- Taking into account the fact that organic food market has constantly increased in the last 20 years, the outlook for the next years is the increase of organic food sales, globally. This is a result of the information era in which we are living, and of the popularization, especially in the developed countries, of using this type of agriculture with all the effects it has on the environment and population health.

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COMPARATIVE STUDY ON THE MILK PRODUCTION AT GOATS AUTOCHTHONOUS BREEDS

CHETROIU RODICA[1], CĂLIN ION[2]

Abstract: *The paper presents the research results on milk production, conducted in the goat farm of S.C. AGROFAM HOLDING Feteşti, at the two autochthonous breeds: Alba de Banat and Carpatina, for a period of 3 years, between 2012 - 2014. Thus, the productive levels of the two breeds show very significant statistic differences, Alba de Banat breed being upper than Carpatina with 40.94 to 46.05%. Also, there are productive differences between lactations, the highest milk production being obtained in lactation 3 of each year under study, with an upward trend from the first lactation. After the 3rd lactation, milk production declines, being near the amount of the first lactation. During the period under study, the average farm yields of the both breeds fall on downward curves, due both to the shifting from mechanical milking to manual milking and to decreasing of the lactation duration. Practicing the mechanical milking is a technological factor of prime importance both in terms of achieving increased milk production and for producing a hygienic product and switching from mechanical milking to manual milking is a factor of production decrease, affecting the economic results of the farm.*

Keywords: *milk, goats, lactations, breeds.*

INTRODUCTION

The main exploitation direction of goats in our country is the milk production, this product being a food product with a high biological value and therapeutic properties. The two autochthonous breeds which are exploited in Romania are Carpatina and Alba de Banat. Carpatina breed is an ancient, rustic, resistant breed, which was created through natural selection, while Alba de Banat is an ameliorated breed, with a higher productive potential compared to Carpatina. The researches in this paper were carried out in the goat farm of S.C. AGROFAM HOLDING Feteşti.

MATERIAL AND METHOD

To determine the quantitative milk production, it was considered the period of suckling and the period of milking. The assessment of the milk quantity sucked by kids was done for two successive periods: the period of suckling from calving until the age of 28 days (the specific consumption is 5.5 kg milk sucked, for 1 kg weight gain), followed by the second period - from the age of 28 days to 45 days, when the kids weaning occurs (the specific consumption is 4.5 kg milk sucked, for 1 kg weight gain). From the summation of the milk quantities sucked in the two periods, has resulted the amount of milk during lactation.

Determination of the milked quantity of milk was done by the official control of milk production, applying the standard method A_4, for all lactating goats, on different lactations, performing 6 official controls, from April to September. The calculation of lactation period and of milk production per lactation was conducted using the method Fleichmann (Pascal, 2007):

$$MS = I_0M\left(\frac{M_1 + M_2}{2}\right) + I_1\left(\frac{M_2 + M_3}{2}\right) + \ldots + I_{n-1}\left(\frac{M_{n-1} + M_n}{2}\right) + I_nM_n$$

In which:
MS – milk production per lactation;
M_1, M_2, M_n – milk quantity at the control of 24 hours;
I_0 – period in days between the beginning date of milking and the date of the first control;

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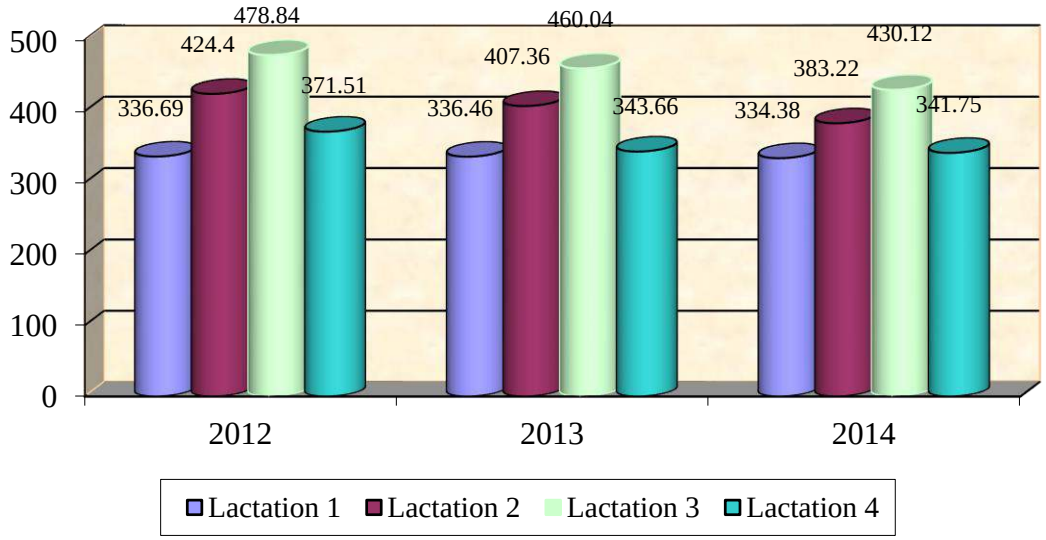
I_1, I_2, I_{n-1} – number of days between 2 controls;
I_n – number of days between the date of the last control and the date of ending lactation.

The evolution of milk quantity was monitored for a period of three years, during 2012-2014, on 4 lactations. Testing the statistical significance of differences between averages was performed by using *ANOVA Single Factor*, from Excel 2007 program.

RESULTS AND DISCUSSIONS

Chart 1 shows the comparative evolution of milk production at Alba de Banat breed, on different lactations, in the dynamics of the three years studied (2012, 2013, 2014).

Chart 1 – Productions of milk on lactations, at Alba de Banat (kg)



The highest milk yields were obtained at lactation 3 of the each year under study, with an upward trend from the first lactation. After the 3rd lactation, the milk production declined, near the amount of the first lactations. Taftă V. (2002) shows that at the first lactation, the milk quantity is 20-30% lower compared to the 3rd lactation, as confirmed by the outcome of this research study.

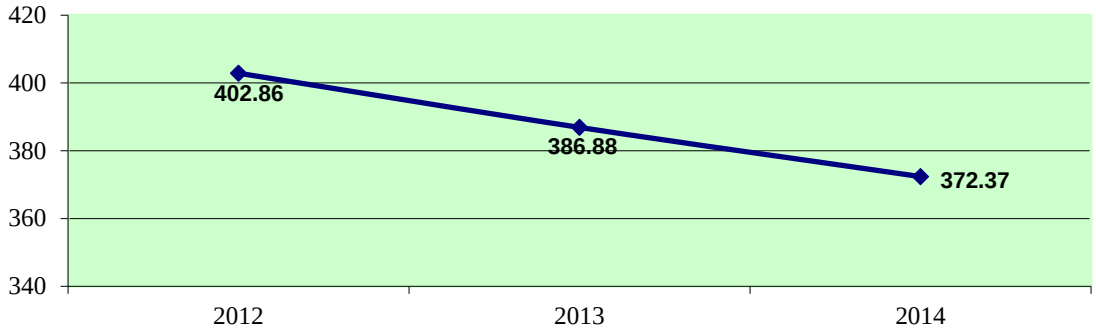
Testing the statistical significance of differences between the averages of milk productions using *ANOVA Single Factor* shows that, at Alba de Banat, between the 3 years studied, there are insignificant differences NS in terms of the average milk yields (P> 0.05). Using the same statistical test for testing the difference between lactates, there are very significant differences*** between the milk production of the four lactations (P <0.001).

Table 1 – Average milk production (kg/head) at Alba de Banat – statistical indicators

Year	Average ± standard error of the average	Coefficient of variability	% of 2012
2012	402,86 ± 31,09	15,43	100
2013	386,88 ± 29,13	15,06	96,03
2014	372,37 ± 22,05	11,84	92,43

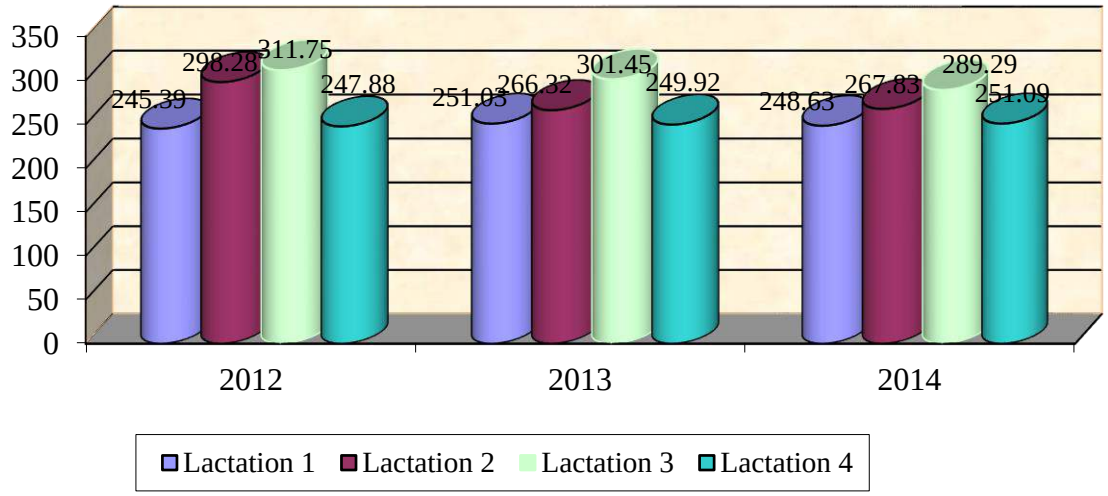
In Table 1 and Chart 2 are presented the averages of lactations of the 3 years studied, showing that the most average production was achieved in 2012, followed by a diminish in the coming years, as follows: 2013 decreased by 3.97% compared with 2012 and with 7.57% in 2014 compared to the same year.

Chart 2 – Evolution of average milk production at Alba de Banat (kg/head)



In Chart 3 is presented the evolution of milk productions at Carpatina breed, on different lactations, in the dynamics of the three years studied (2012, 2013, 2014).

Chart 3 – Milk productions on lactations at Carpatina (kg/head)



Like Alba de Banat breed, the largest milk productions at Carpatina were obtained at the lactation 3 of each year under study, with an upward trend from the first lactation.

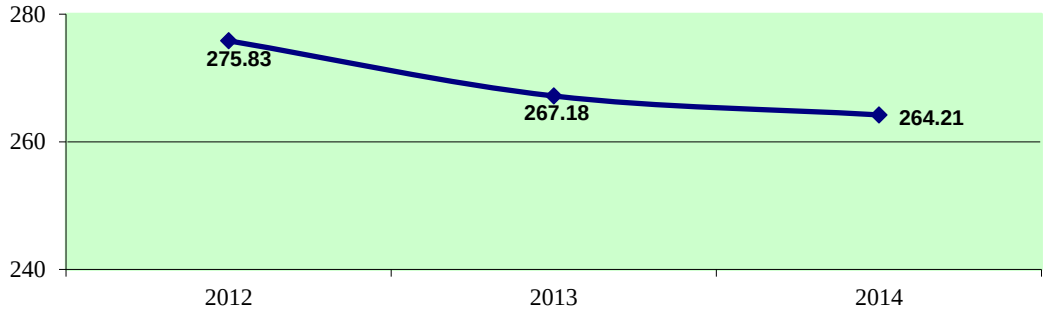
Testing the statistical significance of differences between the averages of milk production using ANOVA Single Factor, shows that at Carpatina, between the 3 years studied, there are insignificant differences NS in terms of average milk yields (P> 0.05). Using the same statistical test for testing the difference between lactations, there are very significant differences*** between the milk productions of the four lactations (P <0.001).

Table 2 – Milk production (kg/head) at Carpatina – statistical indicators

Year	Average ± standard error of the average	Coefficient of variability	% of 2012
2012	275,83 ± 17,08	12,39	100
2013	267,18 ± 12,02	9,00	96,86
2014	264,21 ± 9,39	7,10	95,79

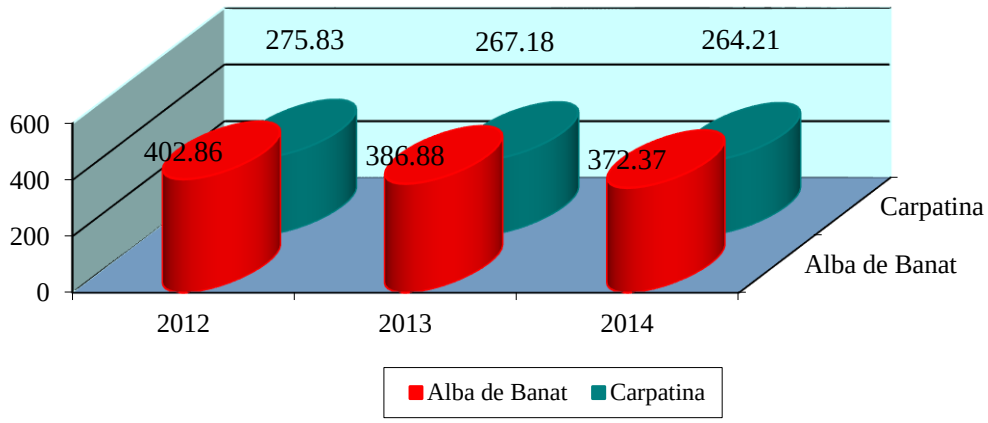
Table 2 and Chart 4 present the dynamics of the average milk productions from the years 2012, 2013, 2014, at Carpatina.

Chart 4 – Evolution of average milk production at Carpatina (kg/head)



In comparison, the average yields of the two breeds, in the evolution of the 3 years, are shown in Chart 5. In statistical terms, ANOVA Single Factor test shows that there are very significant differences between the average production levels of both races (P <0.001), but between on-farm production of the three years studied no significant differences (P> 0.05).

Chart – Dynamics of average milk productions at the two breeds (kg/head)



Analyzing the evolutions of milk productions at the two breeds, it appears that, at Alba de Banat, the milk production levels are superior to Carpatina with 46.05% in 2012, with 44.80% in 2013 and with 40.94% in 2014. They also showed a downward trend from one year to another, the causes of these evolutions being, in general, technological, and, among them, the main causes being the transition from mechanical milking to manual milking and decreasing of the lactations period from one year to another. It should be noted that the company has a parlor with a milking plant with a capacity of 120 seats, which was not functional since 2013 because of malfunction. Therefore, it was switched to manual milking, finding thus reducing yields.

CONCLUSIONS

In conclusion, the productive levels of the two breeds show very significant statistical differences, a fact confirmed by other researchers (Călin, 2004; Taftă, 2008), Alba de Banat breed being productive superior to Carpatina breed with 40.94 to 46.05%.

Also, there are very significant differences between lactations production, the largest milk production being obtained at lactation 3 of each year under study, with an upward trend from the first lactation. After the 3rd lactation, milk production declines, hovering near the amount of the first lactation.

Another conclusion is that the practice of mechanical milking technology is a factor of prime importance both in terms of increased milk production and to obtain a hygiene product that complies

with the rules in the veterinary field. The transition from mechanical to manual milking is a factor of production decrease, affecting, ultimately, the economic results of the farm.

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THE DYNAMICS OF THE ECONOMIC EFFICIENCY INDICATORS AT ALBA DE BANAT AND CARPATINA BREEDS

CHETROIU RODICA[1], CĂLIN ION[2]

Abstract: *The paper presents the research results on the evolution of indicators of economic efficiency in the milk production at Alba de Banat and Carpatina breeds, for a period of 3 years, during 2012-2014, at S.C. AGROFAM HOLDING Feteşti. Indicators studied are: average yield, total output value, total costs, unitary cost, variable costs, labor productivity in terms of value, costs for 1,000 lei main production, profit per unit of product, rate of return, breakeven point in physical and value units, rate of operational risk. Thus, their values are entirely superior for Alba de Banat goats, compared to Carpatina. Also, due to the downward curves of the milk production in the succession of the years studied, the levels of indicators are largely decreasing from year to year, with limits that support the efficiency of production activity.*

Keywords: *milk, goats, indicators, efficiency.*

INTRODUCTION

The economic efficiency is one of the criteria for scientific substantiation of the decisions. In animal husbandry, the economic efficiency may refer to the whole branch, to the animal species or categories, or to products of animal origin. To determine the economic efficiency of the goats raising and exploitation activity from the two indigenous breeds - Alba de Banat and Carpatina, it was used a system of indicators that quantify both the allocation of factors to obtain the milk production and the effects resulting from these efforts, in order to develop an analysis and elaborate conclusions on the directions of increasing economic efficiency

MATERIAL AND METHOD

In the light of its applicative aspect, the efficiency (e) can be defined as a quantitative ratio between effects (E) and resources or efforts (R) spent to obtain them, or, in other words, achieving the maximum effect, with a determined level of consumptions, or reaching the determined effect with minimum consumptions:

e =E/R max;
(maximizing the effects obtained per unit of resources allocated, consumed);

e =R/E min;
(minimizing the resource consumption per unit of effect obtained).

The indicators are instruments for monitoring, assessment, forecasting and decision support, whose main quality is the capacity to illustrate, in a concise way, the complexity of the phenomenon studied. They were calculated using the formulas established in the specialty literature.

RESULTS AND DISCUSSIONS

The indicator of the average production shows that its value is higher at Alba de Banat, followed of the average on farm and, last, of the average for Carpatina. Thus, the average production per farm decreased by 6.2% in the period studied; compared to the farm average, the milk production at Alba de Banat is up to 18.7% higher and at Carpatina is lower with the same rate. Between Alba

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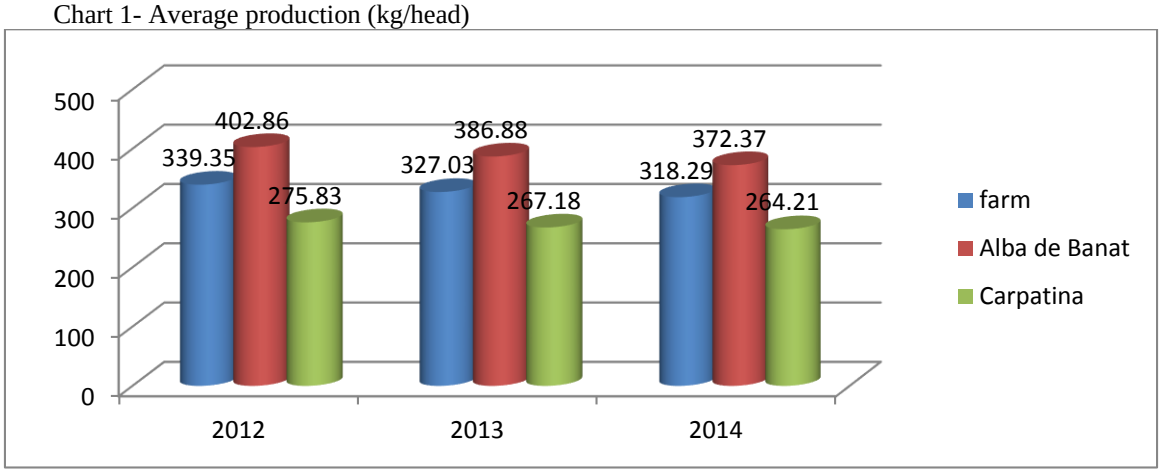
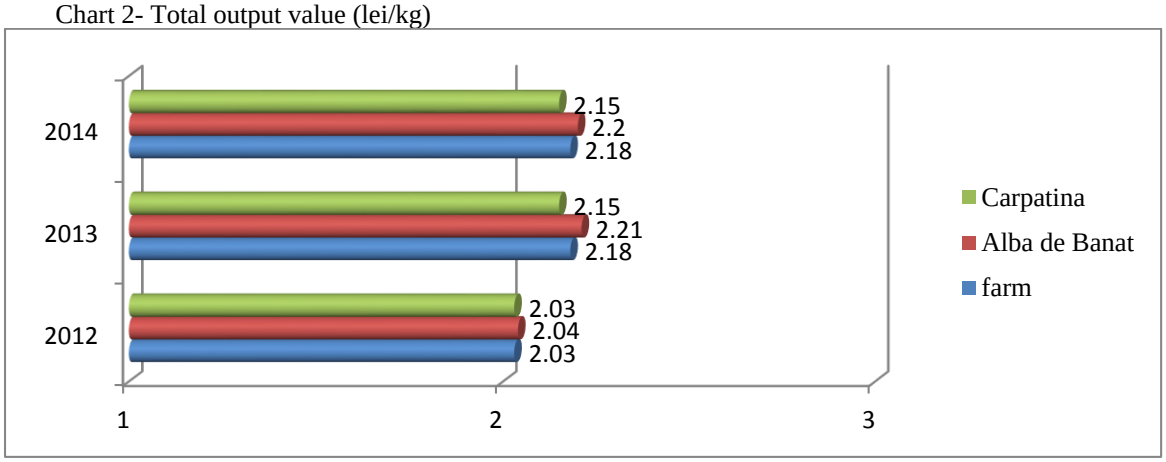
de Banat and Carpatina, there is a difference of 41- 46% in the level of production in the favor of the first breed (Chart 1).

Chart 1- Average production (kg/head)



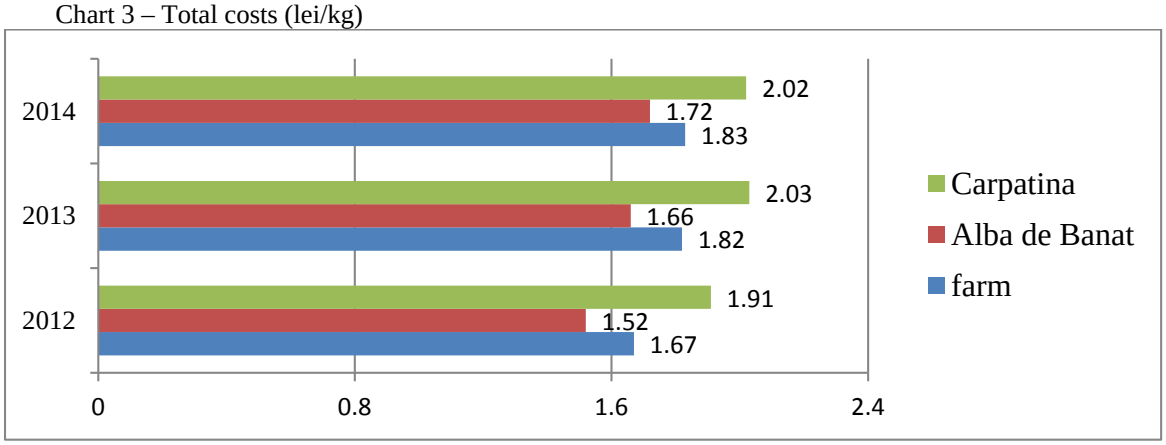
Total output value (per unit of product), consisting of the value of the main and secondary production value is the highest at Alba de Banat, with 0.5-2.3% over Carpatina, being, in the same time, by 0.5 to 0.9% higher than the average per farm and following a sinuous curve in the evolution of the 3 years, with a slight increase in 2013 compared to 2012, then remaining at the same level. (Chart 2).

Chart 2- Total output value (lei/kg)



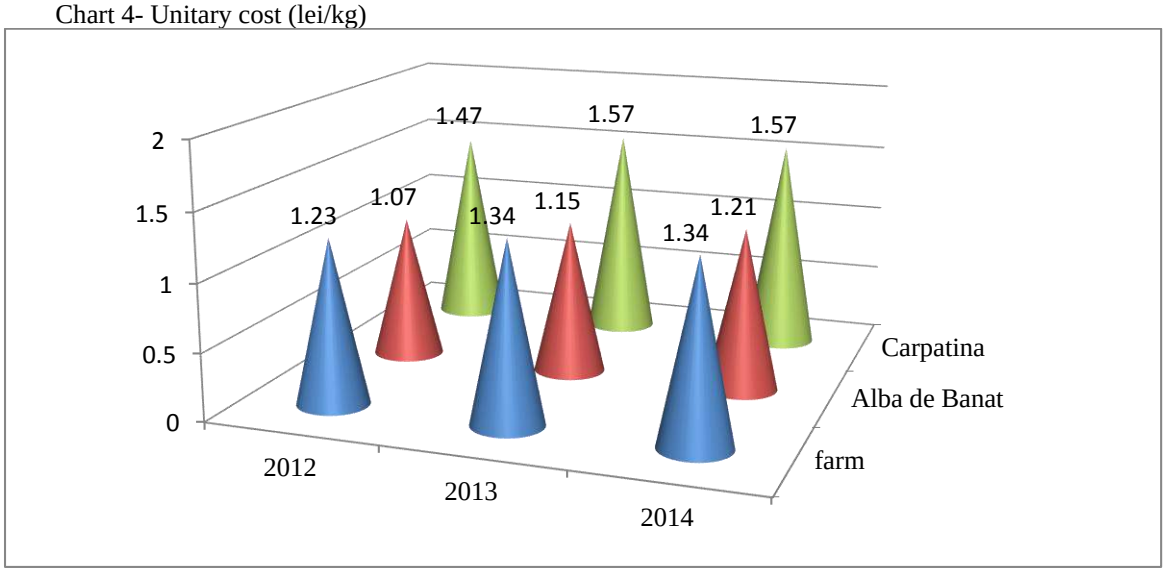
Total costs per kg milk were situated on an upward curve, between 1.67 to 1.83 lei, as average on farm, and by breed, the lowest expenditures were done for Alba de Banat, between 1.52-1.72 lei, from 14.8 to 20% lower compared to Carpatina (Chart 3).

Chart 3 – Total costs (lei/kg)



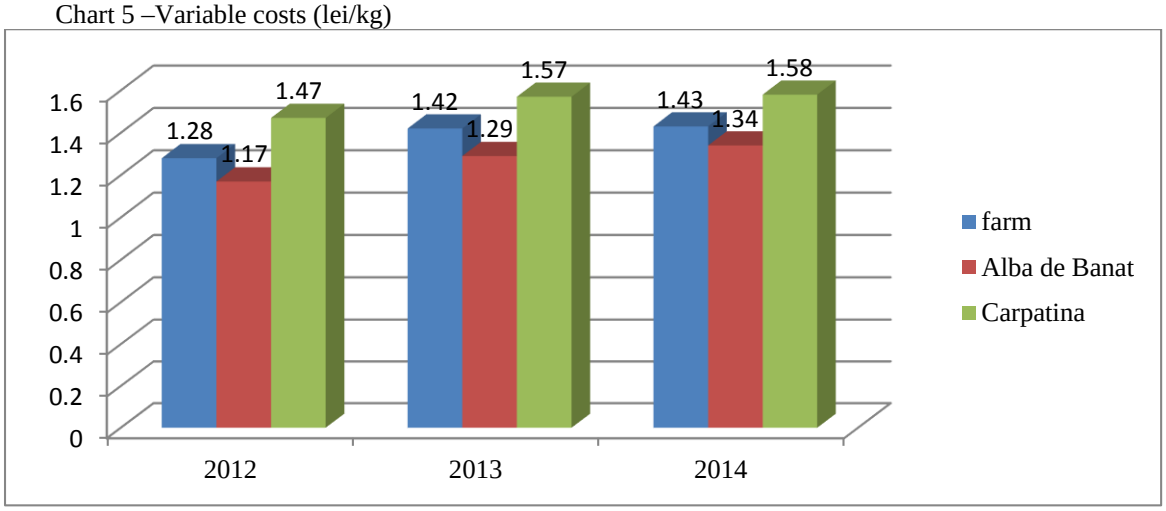
The unitary cost per kg of milk at the farm level has increased by 8.2% in 2013 compared to 2014, stationary in the third year, ranging from 1.23 to 1.34 lei / kg, the lowest being the unitary cost at Alba de Banat - 1.07 to 1.21 lei / kg. Due to the average yield decreased over the period studied, stopping the unitary cost in the third year is a result of the management actions taken in the farm for developing activity in terms of efficiency (Chart 4).

Chart 4- Unitary cost (lei/kg)



The indicator of variable costs has the highest value at Carpatina breed, with 15.2 to 20.4% higher than Alba de Banat, average per farm being 1.28 to 1.43 lei / kg milk. At Alba de Banat, this indicator is 6.3 to 9.2% lower than the farm average. Also, in the period studied, the variable expenses per farm have increased by 11.7%, while the average production decreased, affecting, ultimately, the profitability rate of activity (Chart 5).

Chart 5 –Variable costs (lei/kg)



The productivity is the efficiency that the production factors are combined and used with in the production process, being a qualitative indicator of economic performance, whose evolution reflects, in a summary form, the technologies and organization of production improvement, labor qualifying and training.

The labor productivity in terms of value at Alba de Banat is superior to Carpatina and to farm average, by 17% and increased by 6.1% in the period studied (Chart 6).

Chart 6- Labor productivity in value (lei/man-hour)

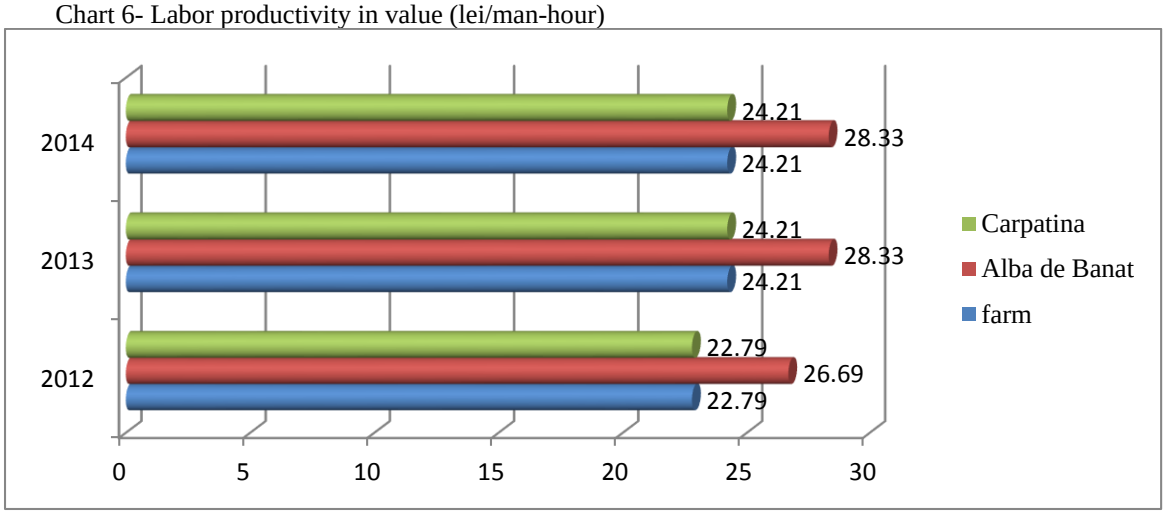
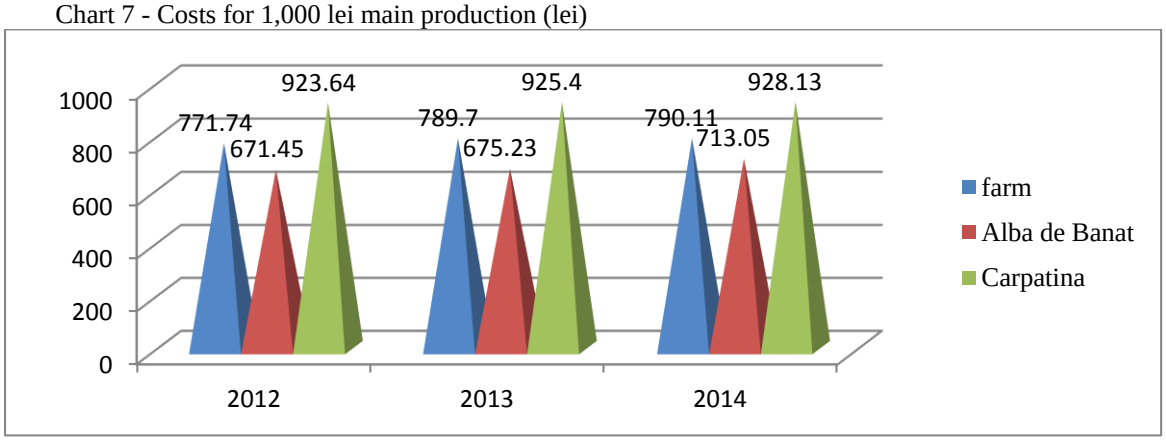


Chart 7 illustrates another indicator of efficiency – the costs for 1,000 lei main production, indicating that the lower costs were at the goats of Alba de Banat, followed by the farm average and, last, by Carpatina. Thus, the indicator value at Carpatina is 30 to 37.5% higher than at Alba de Banat, showing that the allocations of factors and costs are shared more effectively if there are high levels of production.

Chart 7 - Costs for 1,000 lei main production (lei)



The calculations also show that profit per kg milk is highest at Alba de Banat (0.49 to 0.55 lei) versus Carpatina breed, where is only 0.12 to 0.13 lei / kg of milk, per farm average being 0.36 lei / kg milk (Chart 8). Consequently, the net rate of return is superior to Alba de Banat (49.27 to 41.19%), compared to Carpatina (16.37 to 15.18%), but in the analyzed period, was on a declining curve, due to continuous decrease of milk productions (Chart 9).

Chart 8 - Profit per unit of product (lei/kg)

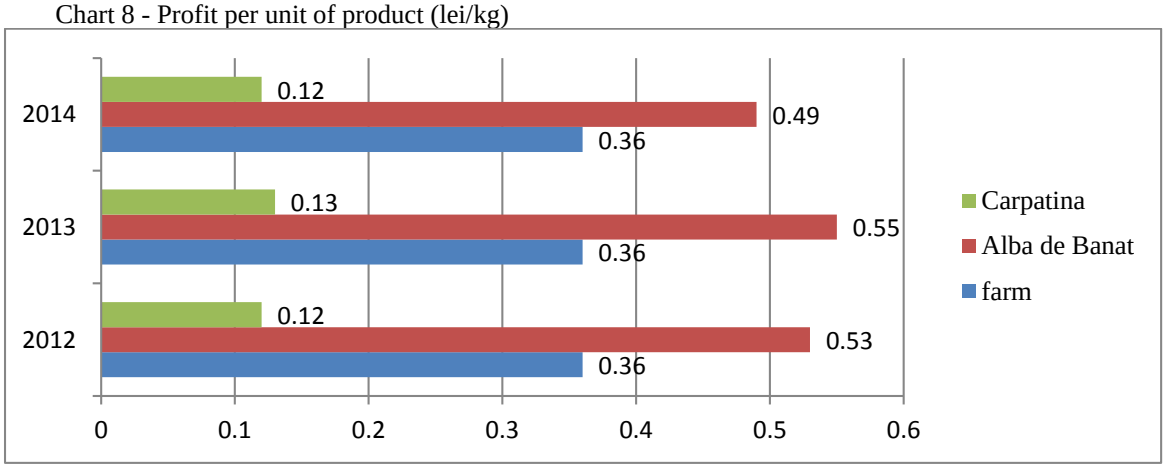
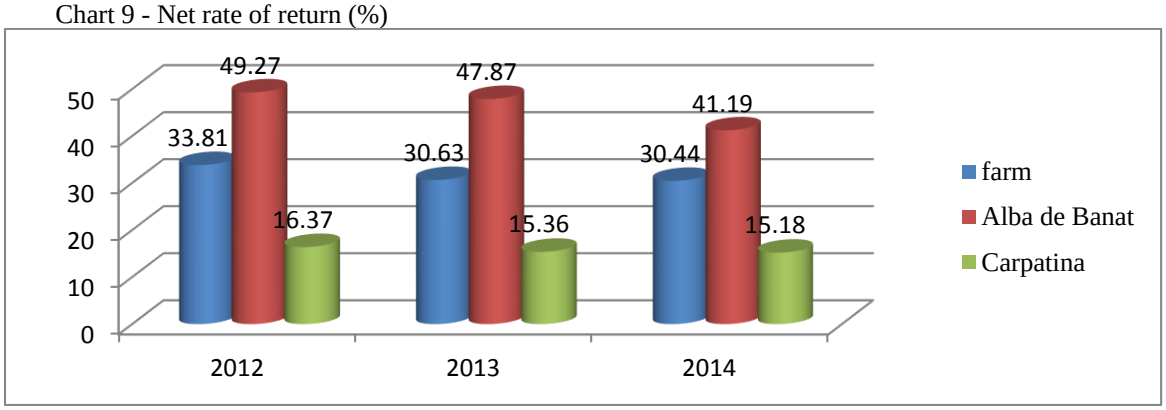


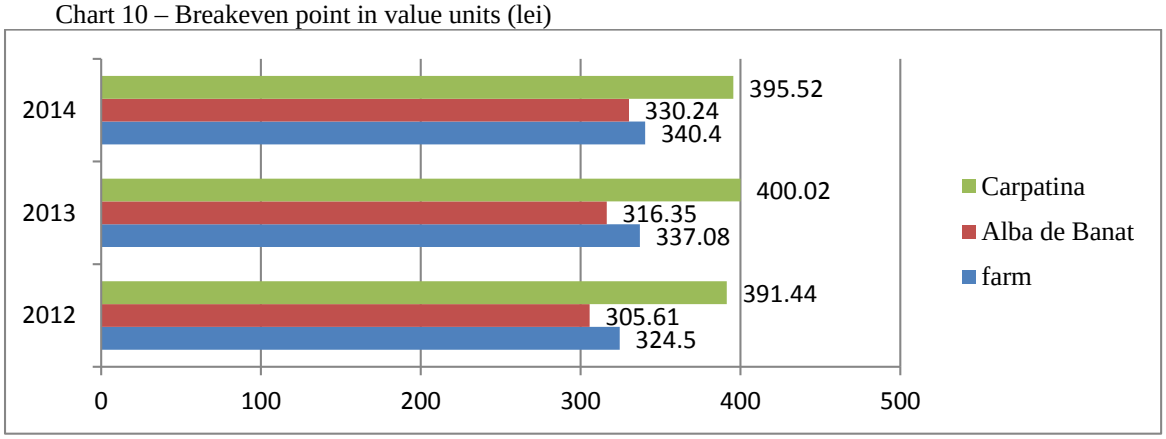
Chart 9 - Net rate of return (%)



It is important to mention that, without valuing the secondary production (kids, youth, reform), even if the farm receives subsidies, farm operation is not profitable, because the total costs per kg milk are higher than the income derived solely from delivering milk.

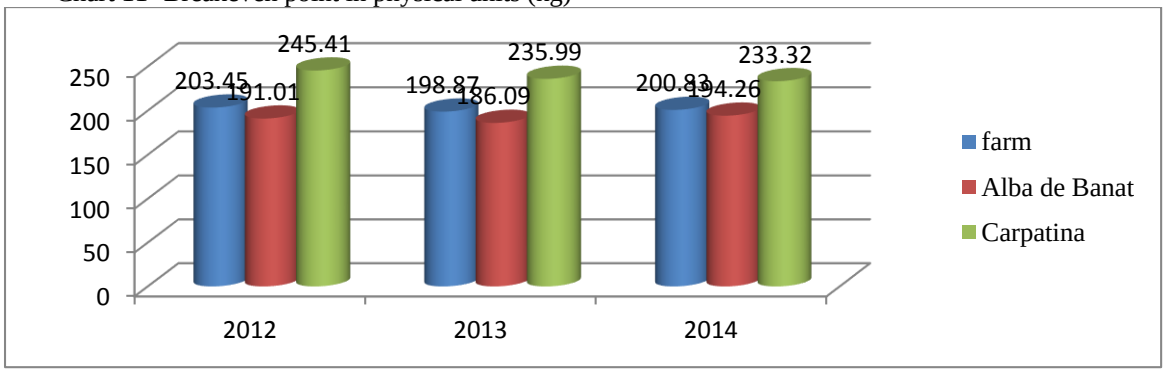
Calculations show that the value of the lowest breakeven point is at Alba de Banat (305.61 to 330.24 lei / head) compared to Carpatina (391.44 to 400.02 lei / head), meaning that over these values of sold production per animal, the activity at this breed starts to produce profit. We note that at Carpatina breed, as the level of production is less compared to Alba de Banat, the breakeven point has higher values, harder to reach, with greater efforts. On farm, the breakeven point is 324.5 to 340.4 lei / head (Chart 10).

Chart 10 – Breakeven point in value units (lei)



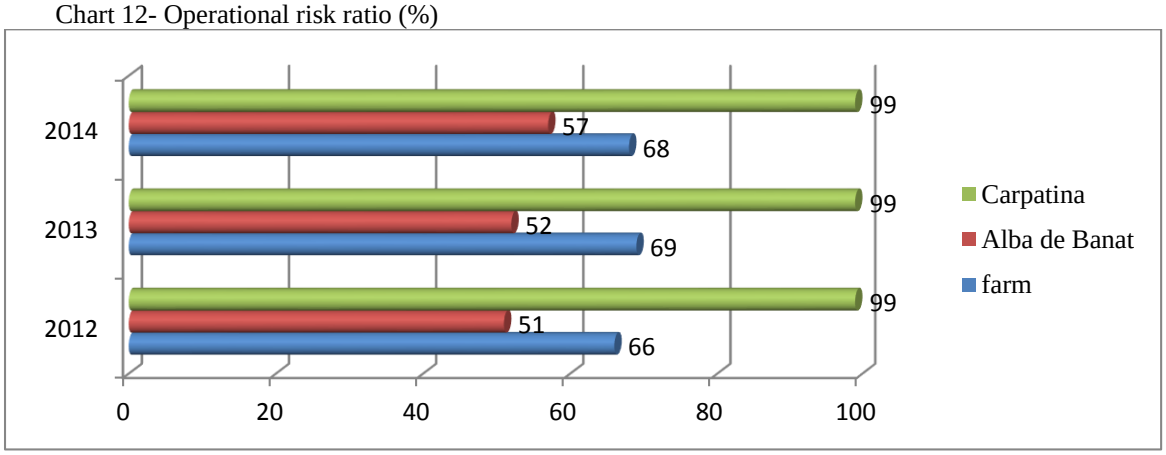
Also in physical units (kg), the same indicator has the lowest value at Alba de Banat (191.01 to 194.26 kg), representing the minimum amount of milk sold per head, below which could record losses. By comparison, the breakeven value at Carpatina is 233.32 -245.41 (with 20-28% higher) (Chart 11).

Chart 11- Breakeven point in physical units (kg)



The risk of activity depends not only on general factors (sale price, cost, revenues) but also on the level of fixed costs, the same level of fixed costs being better covered by a higher level of incomes (given that the fixed costs must be paid even without sales) (Vintilă Georgeta, 1999). On the other hand, the breakeven level is lower, the operating risk is lower. The operational risk ratio as the ratio between breakeven in value and the main production value, illustrated in Chart 12 shows that, in the present study, the highest risk is for Carpatina breed (99%), the value being 51-57 Alba% for Alba de Banat. On farm, the average risk is 66-69%.

Chart 12- Operational risk ratio (%)



CONCLUSIONS

The research results presented in this paper indicate that the indicators of economic efficiency in the production of goats' milk are totally superior to Alba de Banat versus Carpatina breed. Also, due to the downward curves of milk production in the succession of the years studied, the levels of indicators are largely decreasing from year to year, but within the limits of economic efficiency.

In the conditions of reduced milk productions, the costs per unit of output increase and profitability declines. In the study period, the levels of indicators have shown that the decreased milk productions, for various reasons, did not leave indifferent the farm management, taking measures to decrease production costs, reflected, for example, by the unitary cost indicator, that had maintained the same level over the last two years analyzed. Stopping the production level is an urgent need of measures to be taken, by implementing the levers at the disposal of technological engineers: breed selection, intensive breeding, proper feeding, ensuring technological factors and microclimate.

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TWO ESSENTIAL AMINOACIDS OBTAINED FROM THE TURDA 250L AND FUNDULEA 345L CORN SEEDS, RECOMMENDED FOR CONSUMPTION

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Abstract: *This paper is a continuation of studies made in 2011 [„ Maize contains tryptophan and methionine – two acids essential for human health" Olimpia Pandia, I.Saracin, Magazine Metalurgia International, nr.5, 2013], to determine the amounts of protein in corn and especially some of the essential amino acid, necessary for the human body, and the establishment of hybrids in the study with high biological value to be used more in crops.*
Were included in the study 2 corn hybrids Turda 250 L and Fundulea 345 L,which were analyzed existing amino acids in grains, but especially content of lysine and threonine, as well their adaptation in hilly zone where were placed experiences; there is a temperate continental climate, where absolute maximum temperatures are 40 ^{0}C, and minimum -30^{0}C and average annual precipitation about 600-700 mm/year.

Key words: *amino acids, threonine, proteins, lysine, hybrids.*

INTRODUCTION

For field crops,corn [Zea Mays], is one *of* the most common crops, with a rich dowry genetic and a wide use both for humans as well as food, medicine and pharmacy.

Corn, is an important source of energy used as human food, with a high content in kilocalories, include: proteins, vitamins, fats, carbohydrates [Banu C. (2009)].

Therefore, it is recommended to use the seeds of maize both for healthy individuals and especially for those with cardiovascular disease, those who are likely to get fat, diabetes, etc [Segal, R. Et al.(2010)].

Proteins are essential constituents of the body in their turn being formed of the essential amino acids, can not be produced by the organism and must be brought by food in various combinations and non-essential amino acids a body which can be produced, and caloric needs can be filled from vegetable or animal food with complete and incomplete biological values [Costin G.M. & Segal R. (2001)].

Lysine, is an essential amino acid that is found in almost all proteins in the body, having a major role in increasing the molecular weight and calcium absorption, hindering the elimination of urine, so, lysine prevents osteoporosis, positively influence the central nervous system, helps collagen production and participating in the production of enzymes, antibodies and proteins [Pandia Olimpia & I.Saracin & I. Bozga & F. Bogdan. (2013)].

By eating foods of plant and animal origin,those amino acids can be found naturally on corn seeds which are rich in lysine and can cover the daily requirement of lysine for the body [Frigiou A.D.et al. (2007)].

Threonine, is also an essential amino acid which is designed to maintain protein balance and it helps in the cleaning of the liver, being nesintetizabil by the body, must be acquired through food, and vegetable food is low in this amino acid and threonine requirement is higher in children than in adults, make this important study, to establish if in corn of the two hybrids can be found the amino acid threonine [Strmiska F. & Segal R. & Sega B].

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MATERIALS AND METHODS

Experiments were located in 2012-2013 with 2 corn hybrids: Turda 250 L and 345 L Fundulea, (with high content of lysine) belonging to the group 200 (middle) where the amount of thermal units is between 1200 - 1400^0 C, in the N-V Oltenia, more precisely Greek village, Dolj County, at a reddish-brown soil (preluvisols redheads) covering platforms and hills, after a preliminary winter wheat, where due to higher temperatures two hybrids can adapt existing thermal requirements in the area of culture, existing natural conditions as well as the organization of production, and how mechanized harvesting work or in the form of ears and kernels.

Table 1 The chemical properties of the soil reddish brown [preluvisols redheads] from experimental lots Greek village of the hybrid Turda 250 L

Nr. Par	pH		N_t %		P_2O_5 mg/100g		K_2O mg/100g		Ah m.e./100g		SB m.e./100g		Humus %		Depth (cm)	
	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013
1	6,4	6,15	0,075	0,085	7,5	8,1	5,7	6,3	1,56	1,99	15,4	18,4	0,69	0,74	0-20	0-20
2	6,5	6,14	0,069	0,085	7,4	7,9	4,8	5,1	1,49	1,89	14,9	17,9	0,68	0,72	0-20	0-20
3	6,4	6,15	0,067	0,086	6,9	7,8	4,8	5,2	1,51	1,92	14,9	17,9	0,68	0,71	0-20	0-20
4	6,04	6,10	0,069	0,095	7,2	7,9	5,3	5,9	1,45	1,89	14,5	17,7	0,65	0,68	0-20	0-20
5	6,5	6,14	0,068	0,090	7,1	7,9	4,9	5,3	1,52	1,95	14,6	17,9	0,63	0,69	0-20	0-20
6	6,43	6,12	0,080	0,094	7,2	7,8	6,9	8,8	1,94	2,34	17,9	20,3	0,72	0,97	0-20	0-20

Under the conditions of observations in the two years, seeding density was 50,000 plants / ha in irrigated system, in 6 randomized plots with an area of 24 m^2, sowing was made in late April, with certified seed, distance between 70 cm rows and between grains of 28.5 cm at a depth of 4-5 cm with SPC8.

Before sowing on the surfaces taken in the study have been taken from the ground, and chemical analyzes were performed in the laboratory of the faculty.

RESULT AND DISCUSSIONS

For determining soil reaction in the two years of experimentation chemical soi analyzes were performed determining soil pH in aqueous suspension of the ground, these soils fall into the category of soil weak acid and neutral with pH values from 6.43 to 6.15, these soils are preferred by maize plants.

Table 2 The chemical properties of the soil reddish brown [preluvisols redheads] from experimental lots Greek village of the hybrid Fundulea 345 L

Nr. Par	pH		N_t %		P_2O_5 mg/100g		K_2O mg/100g		Ah m.e./100g		SB m.e./100g		Humus %		Depth (cm)	
	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013
1	6,5	6,15	0,073	0,084	7,5	8,1	5,8	6,3	1,53	1,98	15,3	18,3	0,68	0,72	0-20	0-20
2	6,4	6,13	0,068	0,085	7,3	7,9	4,8	5,2	1,48	1,89	14,9	17,9	0,67	0,71	0-20	0-20
3	6,4	6,13	0,067	0,084	6,9	7,7	4,8	5,2	1,50	1,91	14,8	17,8	0,68	0,71	0-20	0-20
4	6,03	6,10	0,068	0,093	7,1	7,8	5,2	5,8	1,45	1,89	14,5	17,5	0,63	0,66	0-20	0-20
5	6,4	6,13	0,069	0,090	7,0	7,9	4,9	5,3	1,51	1,93	14,7	17,9	0,61	0,69	0-20	0-20
6	6,45	6,11	0,080	0,095	7,2	7,9	6,8	8,7	1,93	2,31	17,6	20,1	0,71	0,98	0-20	0-20

In order to determine the level of nitrogen supply using the direct method of total nitrogen supply by the Kjeldahl method, Nt is existing between the values of 0.067 to 0.095, and for assessment of indirect soil nitrogen supply eas determined amount of exchangeable bases (SB) using Kappen method, SB with values between 14.5 to 20.1.

Humus was determined by the oximetry metod being 0.61 - 0.98. The level of phosphorus supply The spectrophotometric measurements were made, Where P_2O_5 has values between 6.9 to

7.9 and potassium supply was determined with means of photometry with K_2O existing between the values of 4.8 to 8.7 (Table 1).

Chemical analysis of the corn grain from the two hybrids hybrids were revealed by different amounts of amino acids existing in the grain.

Measurements analyzes was performed by means of spectrophotometry and chromatography. Among the acids monoaminomonocarboxilici - were determined: alanine, valine, leucine, isoleucine, aspartic acid, glutaminele, and derivatives oxidrilați and sulphide of acids from group monoaminomonocarboxilici been studied: serine, threonine, cysteine, methionine.

Diaminomonocarboxilici acid group: arginine and lysine. A very important aromatic amino acid studied studied were tyrosine, and the amino heterocyclic afost studied: tryptophan, proline and histidine.

Table 3 The content of amino acids studied in corn hybrid Turda 250 L in 2012

Nr crt.	Amino acids determined	Non-irrigated system g/100g s.u.	The content of amino acids [kg/ha]
1. N	Aspartic	0,670	2,021
2. E	Treonina	0,423	1,241
3. N	Serina	0,484	1,452
4. N	Glutamina	1,30	3,885
5. N	Prolina	0,65	1,928
6. N	Cisteina	0,380	1,139
7. N	Glicozina	0,42	1,235
8. N	Alanina	0,795	2,389
9. E	Valina	0,492	1,479
10. E	Metionina	0,143	0,428
11. E	Izoleucina	0,330	0,991
12. E	Leucina	0,930	2,795
13. N	Tirosina	0,612	1,840
14. E	Fenialanina	0,632	1,901
15. E	Histidina	0,395	1,187
16. E	Lizina	0,615	1,250
17. N	Arginina	0,635	1,910
18. E	Triptofanul	0,116	0,150
	Total amino acids	10,022	29,221
	Total essential amino acids	4,076	11,422

Non-essential Aminoacidul Aspartic had values of 0,670 g/100 g s.u. ,and Glutamina of 1.30 , while essential amino acids reach their small values between 0,143 methionine Triptofanul bear the 0,116 and 0,632 [Table3].

Table 4 The content of amino acids studied in corn hybrid Fundulea 345 L în anul 2012

Nr crt.	Amino acids determined	Non-irrigated system g/100g s.u.	The content of amino acids [kg/ha]
1. N	Aspartic	0,670	2,025
2. E	Treonina	0,675	1,251
3. N	Serina	0,431	1,459
4. N	Glutamina	1,34	3,891
5. N	Prolina	0,69	1,933
6. N	Cisteina	0,384	1,145
7. N	Glicozina	0,46	1,241
8. N	Alanina	0,799	2,398
9. E	Valina	0,498	1,482
10 . E	Metionina	0,149	0,434
11. E	Izoleucina	0,339	0,997
12. E	Leucina	0,935	2,803
13. N	Tirosina	0,619	1,847
14. E	Fenialanina	0,643	1,911
15. E	Histidina	0,402	1,193

16. E	Lizina	0,615	1,260
17. N	Arginina	0,644	1,919
18. E	Triptofanul	0,118	0,152
	Total amino acids	10,235	29,341
	Total essential amino acids	4,135	11,483

Table 5 The content of amino acids studied in corn hybrid Turda 250 L in 2013

Nr crt.	Amino acids determined	Non-irrigated system g/100g s.u.	The content of amino acids [kg/ha]
1. N	Aspartic	0,673	2,023
2. E	Treonina	0,428	1,248
3. N	Serina	0,487	1,457
4. N	Glutamina	1,31	3,887
5. N	Prolina	0,66	1,930
6. N	Cisteina	0,381	1,142
7. N	Glicozina	0,41	1,235
8. N	Alanina	0,796	2,397
9. E	Valina	0,495	1,479
10 . E	Metionina	0,147	0,432
11. E	Izoleucina	0,334	0,997
12. E	Leucina	0,935	2,799
13. N	Tirosina	0,615	1,843
14. E	Fenialanina	0,637	1,906
15. E	Histidina	0,399	1,189
16. E	Lizina	0,613	1,253
17. N	Arginina	0,639	1,914
18. E	Triptofanul	0,118	0,152
	Total amino acids	10,077	29,283
	Total essential amino acids	4,106	11,455

In unirigated sistem maize crop Hybrid Turda 250 L, cultivated in 2012 significant values are observed the amino acid aspartic acid, proline, alanine, leucine, tyrosine, phenylalanine, arginine, [g/100g su] amounting to 10.22 and all the essential amino acids to 4,076 ratio [kg / ha] is 11.42.

Hybrid Fundulea 345 L,in year 2012 had better values than other hybrid that managed under irrigation to have appreciable values in raported amino acids [kg / ha] of 29.283 in which 11,455 are the values of the esential ones. [Table 5].

Table 6 The content of amino acids studied in corn hybrid Fundulea 345 L in 2013

Nr crt.	Amino acids determined	Non-irrigated system g/100g s.u.	The content of amino acids [kg/ha]
1. N	Aspartic	0,674	2,025
2. E	Treonina	0,427	1,246
3. N	Serina	0,488	1,456
4. N	Glutamina	1,34	3,889
5. N	Prolina	0,69	1,932
6. N	Cisteina	0,384	1,143
7. N	Glicozina	0,46	1,239
8. N	Alanina	0,798	2,392
9. E	Valina	0,495	1,482
10 . E	Metionina	0,146	0,431
11. E	Izoleucina	0,333	0,994
12. E	Leucina	0,934	2,799
13. N	Tirosina	0,616	1,846
14. E	Fenialanina	0,635	1,907
15. E	Histidina	0,398	1,191
16. E	Lizina	0,619	1,254

17. N	Arginina	0,643	1,918
18. E	Triptofanul	0,117	0,151
	Total amino acids	10,197	29,295
	Total essential amino acids	4,104	11,455

2013 crop year the two hybrid experiment in the hilly area, results obtained the amount of the existing amino acids is present in the corn material, because 2013 was a year with favorable conditions for development of maize, t here was thus obtained an increase of aminoacids at hybrid Turda 250 L of 17.84 kg / ha, and hybrid Fundulea 345 L of 17.858 kg / ha.

CONCLUSIONS

Importance of proteins necessary for human body makes it possible to select the most valuable vegetable products protein-rich to be studied and suitable living conditions.

Due to climate change to the high temperatures in this region, two hybrids behaved very well although they are part of the middle group, but their genetic heritage content in high lysine have been the subject of their experiment, obtaining significant results.

The influence of the difference of protein content of the corn is given by the hybrid and conditions necessary for its development.

Due to the rich in amino acids, recommended cultivation of these hybrids is in the N-V Oltenia.

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VEGETABLE CONSUMPTION IN ROMANIA CORRELATIONS WITH PURCHASING POWER AND SUPPLY

CORNELIA ALBOIU[1]

Abstract: *The paper makes an analysis of socio-economic factors that influence food consumption levels in terms of income evolution at regional level and also a comparison with EU average and several regions from Poland; it also presents the dispersion of regional GDP per inhabitant and its influence on consumption taking into account the level of polarization among several EU countries. The research analyses the level of expenditure per household in Romania; in addition comparisons with EU countries are made along with the structure of total average expenditure per person per month at macro region development levels in Romania. An in depth analysis is dedicated to the level of expenditures for vegetables and tinned vegetables and the structure of expenditure on the purchasing power for various types of vegetables by regions and social categories. The results show a quite high level of income dedicated for consumption and important disparities among social categories as far as the vegetable consumption is concerned. Also there is a high polarization among the EU countries concerning the income dispersion and its impact on vegetable consumption.*

Key words: *consumption, expenditure, purchasing power*

INTRODUCTION

The level of consumption is very much influenced by evolution of income in a certain country or region. In literature scientists are particularly interested in the relationship between consumption and income, and therefore in economics the consumption is studied very often. Different schools of economists define consumption differently. According to mainstream economists, only the final purchase of goods andservices by individuals constitutes consumption. Following this definition this research focuses mainly on factors that influence consumption. According to the UN, "today's consumption is undermining the environmental resource base and it is exacerbating inequalities. And the dynamics of the consumption-poverty-inequality-environment are increasing. This is the reason why this research makes a comparison of Romanian situation with GDP development in several regions from Poland.

MATHERIAL AND METHODS

The analysis is based on data retrieved from National Institute of Statistics, Eurostat and Faostat. The analysis covers the period 2007-2013 for certain indicators and is accompanied by qualitative analysis. Several indicators were calculated such as: purchasing power parity per capita, dispersion of regional GDP per inhabitant and comparison with Poland was made. The expenditure evaluation at region level is analysed as well as the structure of expenditure on the purchase of various types of vegetables. The consumption is a function that expresses consumer spending in terms of its determinants and in this paper its main determinants are analyzed.

REZULTS AND DISCUSSIONS

Socio-economic factors that influence food consumption levels

The evolution of income in Romania was different from one region to another. Gross domestic product growth was highest in the Bucharest- Ilfov, that rose by 17 % in 2007-2011. Lower increases were recorded in the South- East, South - Muntenia , South-West Oltenia and West. However, there were reductions in GDP in the North -West, Central and North- East.

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Table 1 : Evolution of GDP by region in Romania , in 2012 (mil. EUR)

	2007	2008	2009	2010	2011	Dinamica 11/07	Average
North West	15132	15905	13637	14079	14401	-5%	14630.80
Centrum	14637	15565	13450	14028	14498	-0.95%	14435.6
North -East	13596	14927	12810	13234	13458	-1%	**13605**
South-East	13348	14646	12452	13400	14007	4.93%	13570.6
South - Muntenia	15613	17584	15405	15716	16479	6%	16159.4
Bucharest- Ilfov	29762	36374	29304	31144	34994	17.50%	**32315.6**
South-West Oltenia	10165	10965	9437	9981	10480	3%	**10205.6**
West	12364	13678	11598	12590	13042	5%	12654.4

Source: Eurostat 2014

In terms of purchasing power parity per capita expressed in % of the EU 28 , it can be said that the Bucharest- Ilfov Region, recorded the highest level, exceeding the EU average practically. The region with the lowest purchasing power is the Northeast, followed by the South-West Oltenia.

Table 2: Purchasing power parity per capita % of the EU 28

	2007	2008	2009	2010	2011
North West	40	42	43	43	42
Centrum	42	44	46	46	45
North -East	**26**	**29**	**30**	**30**	**29**
South-East	34	37	38	40	39
South - Muntenia	34	39	40	40	40
Bucharest-Ilfov	**96**	**117**	**112**	**114**	**122**
South-West Oltenia	32	35	36	37	37
West	46	51	52	54	54

Source: Eurostat

In comparison, per capita purchasing power parity as a percentage of average EU 28 , in regions from Poland , it is noted that the Bucharest-Ilfov region has a higher power than the richest region in Poland. However, in 2011, in other regions of Romania, the purchasing power recorded was below half of the European average except the West Region, unlike in regions from Poland where the purchasing power were higher. In Romania there is practically a income polarization between regions in terms of GDP growth , the Bucharest-Ilfov region being above the EU average .

Table 3: GDP (purchasing power parity per capita % of the EU 28) regions Poland

	2007	2008	2009	2010	2011
Lódzkie	50	52	56	59	60
Mazowieckie	87	89	97	103	107
Malopolskie	47	49	52	54	56
Slaskie	58	61	66	68	70
Lubelskie	37	39	41	43	44
Podkarpackie	37	39	41	42	44
Swietokrzyskie	42	45	47	48	49
Podlaskie	40	41	45	46	47
Wielkopolskie	57	59	65	66	68
Zachodniopomorskie	49	51	53	55	55

Lubuskie	48	48	52	53	54
Dolnoslaskie	59	61	66	71	74
Opolskie	45	48	51	51	52
Kujawsko-Pomorskie	47	49	51	53	54
Warminsko-Mazurskie	40	42	44	46	47
Pomorskie	54	54	59	60	62

Sursa: Eurostat

The figures in the table above are determined by the evolution of regional GDP and they demonstrate practically that the poorest region is Nord - Est . This affects the purchasing power of the region and income level dedicated to food consumption .

Table 4: Evolution of regional GDP (purchasing power parity per capita)

	2007	**2008**	**2009**	**2010**	**2011**
North West	9900	10500	10100	10500	10500
Centrum	10400	11100	10700	11200	11400
North -East	**6500**	**7200**	**6900**	**7200**	**7200**
South-East	8400	9300	8900	9600	9900
South - Muntenia	8500	9600	9500	9700	10000
Bucharest- Ilfov	23900	29100	26100	27800	30700
South-West Oltenia	8000	8700	8400	9000	9300
West	11500	12800	12100	13300	13500

Source: Eurostat

Table 5: Dispersion of regional GDP per inhabitant

	2007	**2008**	**2009**	**2010**	**2011**
Romania	36.1	38.2	37.4	37.8	40.0
Ungaria	40.7	42.0	43.7	43.0	44.0
Franta	23.9	25.8	25.7	26.8	26.9
Grecia	24.0	24.5	25.6	26.2	27
Germania	30.0	29.0	28.3	28.3	28.4
Bulgaria	42.7	44.4	46.7	47.6	45.5
Polonia	34.4	33.5	34.5	35.1	34.9

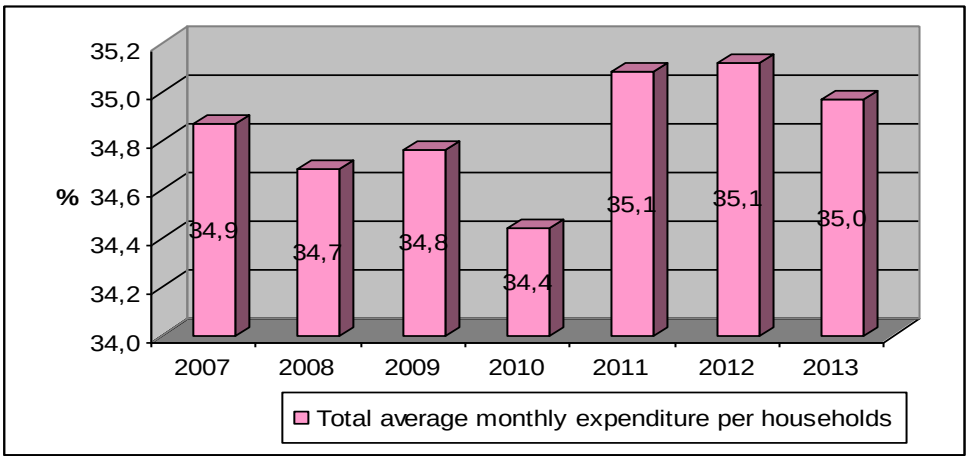
Sursa: Eurostat

Polarization we discussed above is reflected on the indicator dispersion of regional GDP / capita , observing that in the group of countries analysed, Romania, Bulgaria and Hungary record the highest dispersion. On the opposite side are countries like Germany, France and Greece in which the polarization is lower.

The evolution of expenditures

Total average monthly expenditure per household in Romania is about 35 %. The average in the European Union ranges from 18 to 25 % (Figure 1).

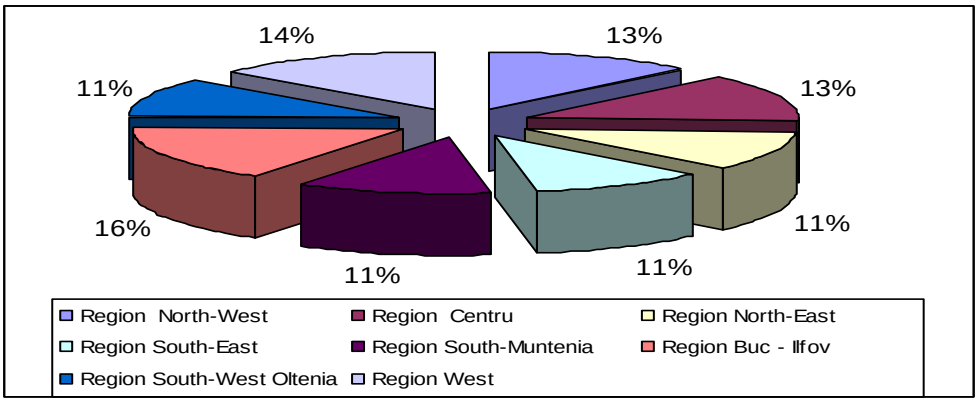
Figure 1 : Total average monthly expenditure per household



Source: INS, tempo online

As regards the structure of total average expenditure per person per month at macro region development level, it appears that the higher expenses are incurred in the Bucharest- Ilfov , followed by the West Region.

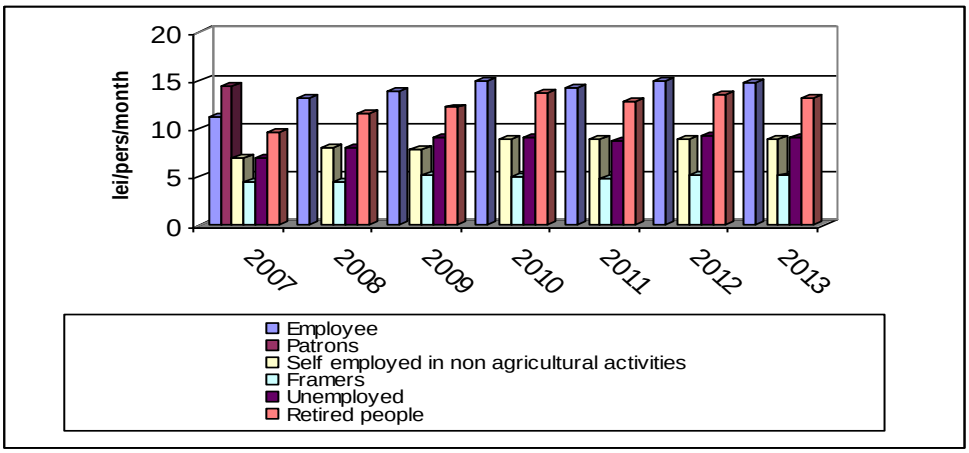
Figure 2: Total average monthly expenditure per person at macro region development level (lei/person/month)



Source: INS, tempo online

Employees and employers have the highest expenditure for the purchase of food products. The expenditure level had risen steadily since 2007, the maximum was recorded in 2012.

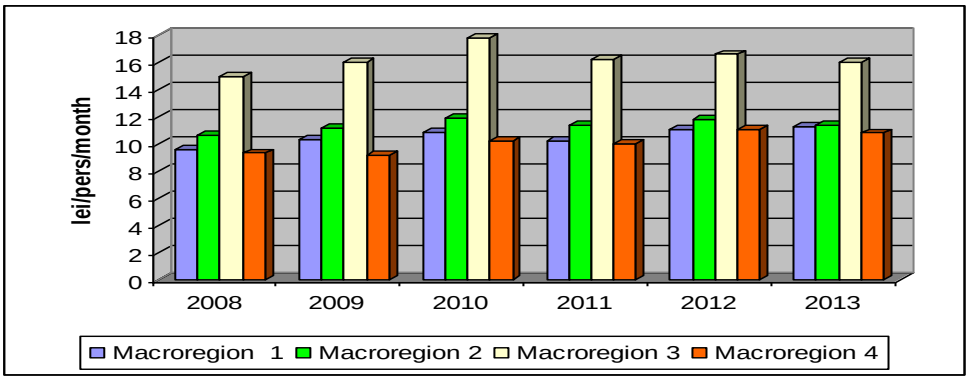
Figure 3: Expenses for buying vegetables and canned vegetables by main social categories and areas - monthly average per person



Source: INS, tempo online

At the macroregion level, the highest levels of expenses for food are observed in Macroregion 2 (the N -East and South -East) and Macroregion 3 (Ilfov and Bucharest). Macroregion 4 (South - West Oltenia and West) recorded the lowest expenses for the purchase of food products (Figure 4)

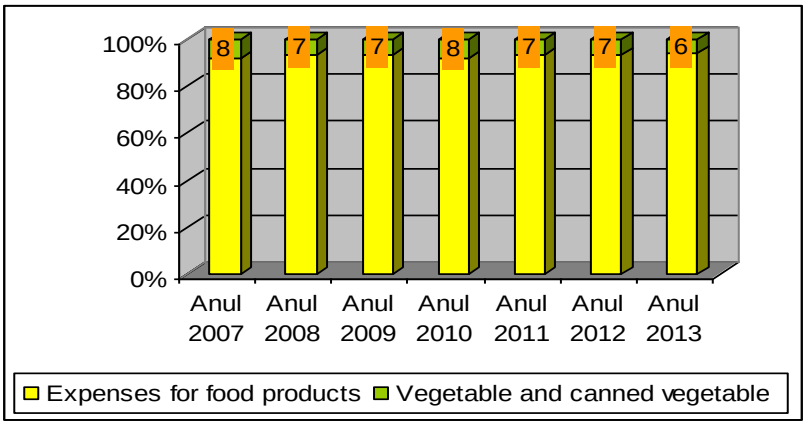
Figure 4: Expenses for buying vegetables and canned vegetables, the macro - monthly average per person



Source: INS, tempo online

The share of expenditures for purchase of vegetables and tinned food products in total expenditure declined from 8% in 2007 to 6% in 2013. This can be justified to a certain extent by the increase of consumption of vegetables and tinned vegetables.

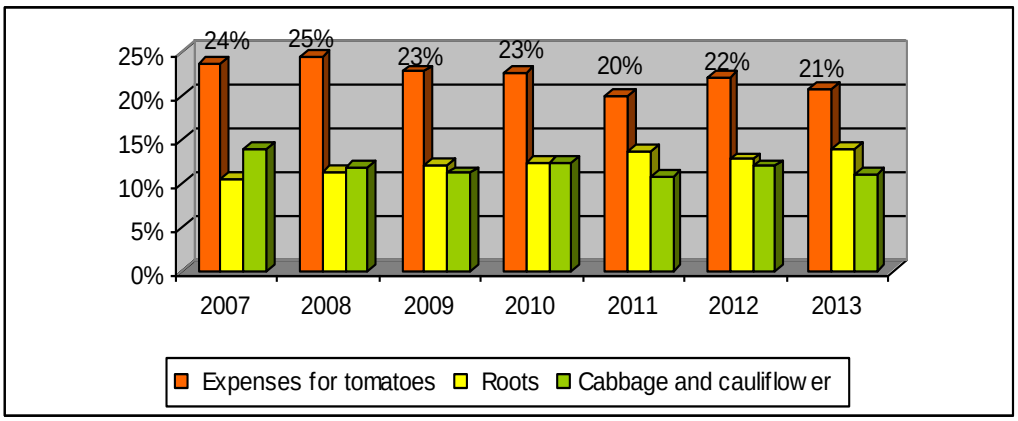
Figure 5: Share of expenditures for vegetables and tinned vegetables



Source: INS, tempo online

As regards the spending structure for vegetable consumption, the highest share of total spending is given for tomatoes (21 % in 2013), followed by expenses on roo , cabbage and cauliflower. There is a tendency to reduce expenses for vegetables and canned vegetables, tendency justified given that the theoretical level of spending on food should decline from the 35% currently to 15-20%.

Figure 6: Structure of expenditure on the purchase of various types of vegetables



Source: INS, tempo online

CONCLUSIONS

Policy makers should meet the requirements of this market sector by reducing price fluctuations and the imbalance between supply and demand and encourage consumption of fruits and vegetables, while ensuring the competitiveness of products. Supporting local production by consistent legislative measures, facilitating access to European funds and the creation of an organized distribution chain.

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WAYS TO INCREASE THE VEGETABLE PRODUCTION IN ROMANIA

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Abstract: *Vegetable growing, as sector of horticulture, has a strategic role within the national economy, whereas vegetables is a component of great importance for the nutrition of the population. This work aims to identify ways to increase national production of vegetables in order to increase the average annual national consumption. Currently, the average consumption of fresh vegetables in the equivalent, in our country, is around 150 kg/capita. Ways to increase production of vegetables consist both in surface growth of vegetables in protected spaces and in the field and also the average yields per hectare, by improving technologies. We emphasize that these measures may result in the development of our country vegetable growing, increase employment of rural population and reducing imports of vegetables.*

Keywords: *growing vegetables, production, consumption*

INTRODUCTION

Vegetables are a component of great importance for the population alimentation and therefore the vegetable growing, as sector of horticulture, has a strategic role. It can be noted that in Romania, the vegetables are consumed in amounts that are about. 50% higher compared to the total consumption of fruits and grapes.

Vegetables means products mandatory the food strategy, primarily through the acid-base balance, high in carbohydrates, as well as through the presence of vitamins from the vast majority of known classes. To these are added the content rich in mineral elements, the reaction in general basic of most vegetables and the rich in fiber content.

Until 1990 the country had developed a growing vegetables sector, with significant amounts of vegetables for export (in 1986 were exported approx. 600,000 tons/vegetables).

MATERIAL AND METHOD

In the paper were used the following indicators: arithmetic mean, standard deviation, coefficient of variation.

Formulas used to calculate these indicators are presented below[5; 6]:

For arithmetic mean = $\overline{x} = \frac{\sum xi}{n}$; where: X = the arithmetical mean of furniture; Xi = average production values on a number of years (i); n = number of years taken into account.

For the annual rate of growth[7]=;

$$r2010\text{–}2014=\sqrt[8]{\prod(p1/p0)}-1$$

r 2003-2014 = annual rate; ∏ p1/po = chained indicators of growth.

For the standard deviation = $\partial = \sqrt{\frac{\sum(\bar{x}-xi)\wedge 2}{n-1}}$; where: ∂ = standard deviation; Xi = average production values on a number of years; n = number of years taken into account

Coefficient of variation = $C = \frac{\delta}{\overline{X}} x100$

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where: C = coefficient of variation (expressed in percentages)
Coefficient of variation can be: 0-10% small variation; between 10-20% middle variation ; more than 20%-high variation
The data used had as source: Statistical Yearbook of Romania, INS, data in the literature.

RESULTS AND DISCUSSION

From the data presented in table no. 1 it can be highlighted the fact that the total area occupied with vegetables in the period 2010-2014, showed a tendency to decrease at an annual rate of-2.29%, so that in the year 2014 it decreased by 8.2% compared with 2010.

The most important share was owned by tomatoes, which have been cultivated on the 18.3-19.6% of the total surface area, in 2014 is more reduced by 11.9 % towards the first year of the period, registering a decrease at an annual rate of-3.11%.

White cabbage was cultivated on the 17.9-21.2% of the total vegetable area. The trend has been of increase until the year 2013, and in the following year the surface fall with 12.9%.

Along with onion garlic held within the total surface of vegetables, a share of 16.5-17.7% with a decreasing trend, so that in the year 2014, the area was reduced by 12.1 % compared with 2010.

Table No. 1

The area occupied by vegetables cultivated in the field and in protected areas in the period 2010-2014

Main crops	2010	2011	2012	2013	2014	Average	Annual rhythm	Standard deviation	Var. Coef.
	HA						%	HA	%
Vegetables-total	262,692	263,359	258,910	259,029	239,474	256692.80	-2.29	9371.49	3.65
Tomato	49767	51754	49655	48369	43857	48680.40	-3.11	2905.13	5.97
Eggplant	10315	10020	9577	9359	9209	9696.00	-2.80	342.74	3.53
Dry onion	33842	33125	33050	32245	30305	32513.40	-2.72	1184.38	3.64
Dry garlic	12803	12128	11367	10616	10703	11523.40	-4.38	686.74	5.96
White cabbage	47043	47016	49089	54907	47837	49178.40	0.42	3134.49	6.37
Peppers	21005	20002	19947	19491	18241	19737.20	-3.47	776.75	3.94
Edible roots	18227	18678	16846	18014	17683	17889.60	-0.75	664.99	3.72
Vegetables grown in the field	159,364	161,355	157,622	153,799	136,815	153791.00	-3.74	9487.83	6.17
Vegetables in greenhouses and solariums	2545	3506	3275	3422	3997	3349.00	11.95	337.40	10.07
Vegetables fresh from the domestic gardens	92384	89688	88385	93181	90017	90731.00	-0.65	1809.96	1.99

Source: National Statistic Institute, Vegetal production for the main agricultural crops Years 2011-2015 ;

Crops of eggplants and peppers together have been cultivated on 11.1-11.9% of the total vegetable area. The same trend of decreasing surface, so that in the year 2014, they represent 87.6% compared to 2010.

Vegetables grown in the field have seen a continuous reduction of areas with an annual rate of -3.74%, occupying in 2014, with 14.2 percent less land, compared to the first year of the period. The main cause of this was represented by the character increasingly fluctuating and unstable of the climatic conditions which have determined many producers to forego growing vegetables in the field and to turn its attention to producing them in protected areas, particularly in the solarium. As a result, the surface of vegetables in protected areas has reached a figure of 57% higher at the end of the period compared to the year 2010, registering an annual growth rate of 11.95 %.

Average yields obtained from the main vegetable species in the field, are presented in table no. 2, where it is noted that all recorded an annual rate of increase.

Table No. 2

Average production reached the main vegetable species in the field in the period 2010-2014

Main crops	2010	2011	2012	2013	2014	Average	Annual rhythm	Standard deviation	Var. Coef.
	kg/ha						%	kg/ha	%
Tomato	15443	17602	13761	15488	16102	15679.2	1.05	1377.68	8.79
Dry onion	10908	11904	10449	12152	12770	11636.6	4.02	870.65	7.48
Dry garlic	5250	5492	5223	5855	5865	5537	2.81	278.09	5.02
White cabbage	20858	21807	20125	21062	23478	21466	3.00	1237.53	5.77
Peppers	11592	12674	10381	11682	12531	11772	1.97	912.78	7.75

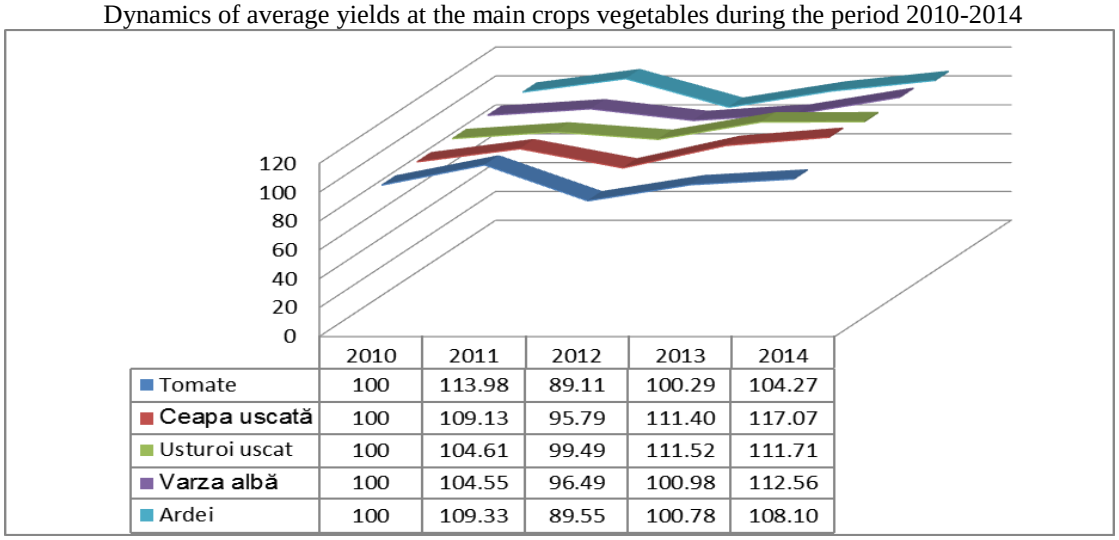
Source: National Statistic Institute, Vegetal production for the main agricultural crops Years 2011-2015 ;

With regard to the production of tomatoes and peppers, they wavered between 13,700-17,600 kg/ha and 10,400-12,700 kg/ha, depending on the climatic conditions that have characterized those years and the decrease in cultivated areas, during the analyzed period, registering an annual growth rate of 1.05 percent, 1.97 percent, respectively.

Onions and garlic, the largest yields were obtained in the year 2011, and reduced production from next year was followed by increases in the other two years of the period.

Figure No. 1

Dynamics of average yields at the main crops vegetables during the period 2010-2014



The culture of white cabbage manifested the same phenomenon presented at tomatoes and peppers, and in 2014 the average production has exceeded with 12.6 percent the one in 2010.

As a general remark, it can be said that the average yields of vegetables grown in the field were not at the level of the production potential of soils, both because of climatic conditions, and because of the failure to meet the technological links established by scientific research.

Table 3

Agricultural production of vegetables produced in the period 2010-2014 (to)

Cultures	2010	2011	2012	2013	2014	Average	Annual rate	Standard deviation	Var. Coef
	to						%	to	%
Vegetables-total	3,863,617	4,176,302	3,535,316	3,960,990	3,802,494	3,867,744	-0.40	233810.18	6.05
Tomato	768,532	910,978	683,282	749,128	706,200	763,624	-2.09	88988.33	11.65
Eggplant	144,391	160,010	126,005	123,278	127,578	136252.4	-3.05	15108.05	11.09
Dry onion	369,142	394,305	345,340	391,837	386,989	377522.6	1.19	20074.13	5.32
Dry garlic	67215	66602	59368	62156	62773	63622.8	-1.69	2731.88	4.29
White cabbage	981,219	1,025,293	987,900	1,156,436	1,123,132	1,054,796	3.43	71319.70	6.76
Peppers	243,493	253,505	207,072	227,690	228,576	232067.2	-1.57	16700.96	7.20
Cultivated mushrooms	9973	7661	9311	8785	9758	9097.6	-0.54	812.90	8.94
Edible roots	241,578	275,145	212,438	242,265	251,589	244,603	1.02	22481.50	9.19
Of the total vegetables: vegetable field and under	2,479,315	2,877,686	2,472,115	2,706,616	2,631,752	2,633,497	1.50	150849.19	cleaner V5.73

Vegetables grown in the field	2,388,781	2,753,054	2,373,957	2,594,394	2,479,134	2,517,864	0.93	144378.34	cleaner V5.73
Vegetables in solariums	90534	124,632	98158	112,222	152,618	115632.8	13.95	21011.26	18.17
Vegetables fresh from the kitchen gardens	1,384,389	1,298,616	1,063,201	1,254,374	1,170,742	1,234,264	-4.10	97266.78	7.88

Source: National Statistic Institute, Vegetal production for the main agricultural crops Years 2011-2015 ;

In table 3 we can see that the largest production of vegetables was achieved in 2011, surpassing with 8% the year 2010, followed by a less favorable year, but still recorded a slight growth trend until 2014, where production was set at the level of the first year of the period.

Vegetables grown in the field realized fluctuating productions, but except for the year 2012, in all other years have exceeded the year 2010 with a percentage ranging between 3.8-15.1%.

A favorable situation was that of the productions obtained from vegetables grown in solariums, where yields were higher than in 2010 with values between 8.4%-37.7% peaking in 2014 at a rate of 68.6% higher in relation to the first year of the period, registering an annual growth rate of 13.95%. This is also the explanation for the fact that in recent years, producers are turning more and more towards vegetable production in protected areas, being eliminated the risk of crop losses due to climatic phenomena.

In addition to the production obtained from the areas of vegetables grown in the field and solarium, a high share between 30.1-35.8% is owned by the vegetables produced in domestic gardens. In the period under review, was manifested a decreasing trend, so that in the year 2014, production of vegetables was lower with 15.4% compared to that obtained in the first year of the period.

To determine population demand for vegetables, to the year 2014 (11.9 million inhabitants), with an average annual consumption per capita. 150 kg/capita and to arrive at a consumption of 170 kg/capita, it was made the following calculation:

Table 3

The annual requirement of vegetables

Average-consumption per capita	150 kg	170 kg
The vegetables necessary for 19.1 Mil Inh.	2,865,000 t	3,247,000 t
Exports, approximately	100,000 t	100,000 t
Total requirement of vegetables	2,965,000 t	3,347,000 t
Provided domestically	2,632,000 t	2,632,000 t
Assured from import	333,000 t	715,000 t

Own calculations

Taking into account an average production of 38.2 t/ha on an area of greenhouses and solariums in 2014, it appears that demand for vegetables, without resorting to imports, it is necessary to increase the surface of solariums with 8717 ha , having a total required of 12714 ha greenhouses and solariums (table 3).

To ensure an average consumption of 170 kg/capita vegetable, it is considered a possible average production of 45 t/ha, from which it follows that in order to waive the imports, it is necessary to increase the surface of solariums with 15890 ha in total being required of 19890 greenhouses and solariums ha. In this case, it is necessary to increase annually with 3180 hectares the protected vegetable surface by 2020.

Constructions, as well as the application of new technologies in the field of protected vegetable crops have a number of advantages, namely: providing fresh vegetables and of good quality all the year , the reduction of losses of water and nutrients from the soil, reducing the attack of pests and diseases, reduction of specific energy consumption over 30%.

CONCLUSIONS

Ensuring sustainable agriculture involves the use of varieties and hybrids with high genetic potential, adapted to local conditions; limiting the use of chemical substances using preventive crop protection; exploitation of rational agricultural land and conservation of soil fertility status. This proves to be a viable alternative to intensive farming with a role in the economy, and by practicing the "friendly" technologies with environmental protection and ensure the existence of future generations.

Also, for the application of appropriate technologies concerning conditions of different areas, it must be developed a complex system concerning the biological stability of plants, conserving and protecting natural resources, in parallel with the introduction and expansion of technologies economically viable on a long time, to achieve high yields with lower costs.

Vegetables are a basic component in the diet of the population, so the vegetable may be regarded as an area of strategic interest. Noted that typically, in Romania consumes annually 50% vegetables more than fruit and grapes together.

On the average of the past five years, Romania has cultivated a. 257 thousand hectares of vegetables, meaning 0.013 ha/inhabitant.

In the EU-28, the average area cultivated with vegetables in the period 2010-2014 was of 2350 thousand hectares, which reported to the population meant 0.047 ha/inh. If we refer to the average yields achieved in this period, in Romania there were only 15.1 to/ha, representing 54.3% of 27.8 to/ha production at the level of EU-28 countries. This was due to both the application of weak technologies and also unfavorable weather conditions.

In the last 2-3 years has increased the area of vegetable crops, which is the best insurance against climatic risks.

Worthy to be mentioned are qualitative aspects, knowing that from this point of view of Romanian vegetables are superior to those produced in the European Union. It is necessary to pay more attention to the domestic use of valuable biological material existing in research establishments, which is adapted to the conditions concerning Romania, gradually dropping the imported varieties and hybrids, even if the present acquisition prices are more advantageous for producers.

In terms of food consumption in Romania was about 150 kg/inhabitant, assuring an average daily consumption of over 400gr/day/capita, higher relative to UE-28.

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COMPARATIVE ISSUES ON THE EVOLUTION OF POTATO-GROWING AREAS AND OF CROPS OBTAINED IN ROMANIA AND IN OTHER EUROPEAN COUNTRIES

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Summary: *This paper represents an analysis of the way in which the potato-growing areas and the European production have evolved, compared to the situation existent in Romania. The international situation is also mentioned, taking into account the special importance of potato in the diet of people in different areas of the Earth. The period between 2007 and 2012 is analysed, with a special focus on the situation existent in 2012 and with references to the global situation, as it was mentioned before. For Romania, the period from 1938 to 2012 is analysed, taking into account the high consumption of potatoes that, for Romanian, is practically "another bread". Although, at the European level, these areas are decreasing, potato continues to have a special importance in the diet of people from many countries, some of them reaching remarkable productions: the Netherlands, Germany, and Poland.*

Key words: *cultivated areas, consumption, productions, tubers, producers*

INTRODUCTION

Due to its nutritional value and chemical composition, potato has a particular importance in human alimentation. Besides it can be used in animals' diet, it has several uses in industry also. The phytotechnical importance of this plant has to be also taken into account.

Originating in South America, potato has spread and it is now cultivated on all the continents, being present in 183 countries, according to FAO. It is found from the Northern areas, where barley is barely grown, being also present in Greenland, to Northern Africa or in equatorial areas, at considerable heights.

The large spreading area of potato may be explained, on the one hand by its importance in relation with the people's diet, and, on the other hand, by its physiological features, meaning tubers may be kept in special storage areas for a long period of time from their harvesting.

Although the date supplied by FAO indicate that, at the international level, potato-growing areas are steady around the figure of 18-19 million ha, they have continued to and its consumption is still high in many areas of the world.

MATERIAL AND METHOD

In the European developed countries, with a high degree of technology in agriculture, the potato-growing areas have decreased considerably in the last years, but, the yields per hectare have increased. It is also the case of the Netherlands that grows potatoes on approximately 25 % of the agricultural land and has yields of 45 tons per hectare. This country is an important producer and supplier of certified potato seeds at the international level. Examples may continue with Germany, Poland etc. The data that were analysed and interpreted in this document were supplied by FAO and the Romanian National Statistics Institute. The conclusions at the end of this article are also based on the interpretation of the statistical data provided by these sources.

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RESULTS AND DISCUSSIONS

Roots have been traditionally at the base of food consumption in general, in many countries with a low level of consumption, and, especially in Sub-Saharan Africa and in Latin America and Caribbean. The changes in the production of these crops represented an important factor in the changes of the national average of food consumption.

Table 1. Distribution of potato-growing areas by geographical areas

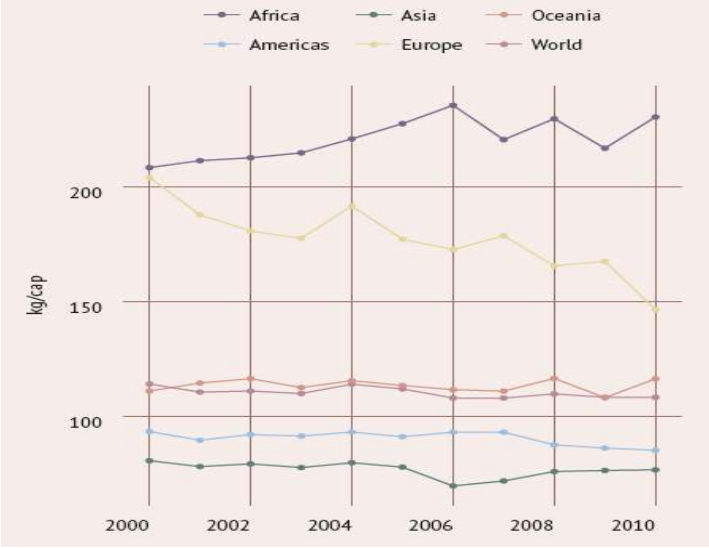
Geographical area	Area, thousand ha		
	1999	2000	2010
Europe (35 countries)	9,162.2	9,144.2	6,100.3
North America	694.8	702.5	544.9
Latin America & Caribbean	1009.9	1092.9	926.7
Africa	901.6	896.3	1808.3
Asia	7,094.3	6,856.6	9,183.6
Oceania	55.3	55.3	47.3
Global total	**19,099.6**	**18,764.5**	**18,693,6**

Thus, several types of products within the group of roots show divergent trends as regards production, in different regions, with a different economic status.

For example, in Europe, potato production per capita has had a long time decline, while the production in Africa and Asia has registered an important increase in the last decade, although is started from a smaller base.

On the other hand, sweet potatoes have registered a swift decline: The production per capita is now a third of that at the end of 1970, a trend that reflects a rapid decrease of the demand of sweet potatoes in China, especially as animal feeding (Figure 1).

Figure 1. Evolution of root and tuber consumption per capital, 2000-2010



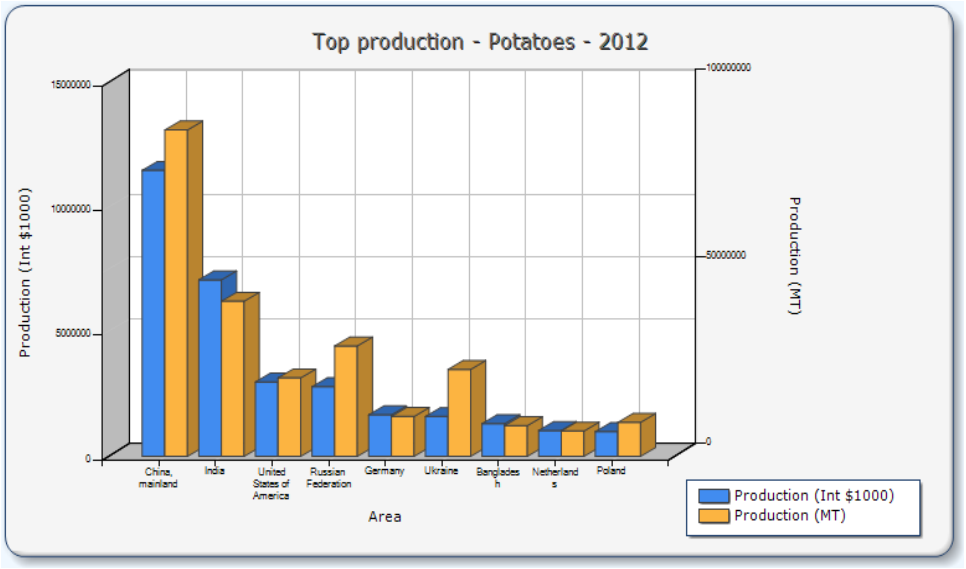
The situation in the large potato-growing countries is shown in Table 2.

Table 2. Large potato-growing country in the world

	Area, thousand ha			Average production, t/ha			Total production, thousand t		
	1999	2000	2010	1999	2000	2010	1999	2000	2010
Russian Federation	3,226.7	3,250.0	2,109.1	9.7	10.0	10.0	31,343.85	29,532.53	21,140.54
China	4,065.9	3,801.9	5,207.5	13.8	16.3	15.6	56,141.09	87,260.00	81,594.18
Poland	1,267.8	1,200.0	490.8	15.7	18.9	17.8	19,926.71	9,091.90	8,765.95
Ukraine	1,551.1	1,560.0	1411.9	8.2	8.3	13.2	12,723.00	23,250.20	18,705.00
Germany	309.0	304.3	255.2	38.9	41.8	39.9	12,031.20	10,665.60	10,201.90
USA	539.2	546.9	405.0	40.2	42.7	45.2	21,691.50	20,990.73	18,337.53
the Netherlands	183.0	183.0	156.9	46.2	44.8	43.5	8,331.00	6,765.61	6,843.52
United Kingdom	177.6	166.0	138.0	40.1	39.9	43.8	7,130.90	6,636.00	6,056.00

FAO data for the last years indicate that the global potato-growing area is steady at 18-19 million ha (19.3 million ha in 2007, out of which 7.4 million ha in Europe). It has to be also noted that, in 1965, the area exceeded 23 million ha, out of which 16 million ha were cultivated in Europe and USSR (70 % of the global areas). During that year, Germany (DRG and FRG) cultivated 1.5 million ha (compared to 302 thousand in 2000 and 255 thousand in 2010), and Poland 2.8 million ha (compared to 491 thousand ha in 2010), (Table 2).

Figure 2. The largest potato producers, at international level, in 2012



Analysing the evolution of potato-growing areas that registered, according to the data submitted by FAO, a significant decrease, especially among the European Union countries, it can be considered that one of the causes could be the spectacular increase of the yield per ha, and a second possible cause could be the development of a food industry that offers value to the processed potato. The fact that potato was replaced with cereals in animal feeding has to be taken into account also.

It has to be also noted that, while at the European Union level, a decrease of potato--growing areas was registered, an increase of the production/ha was also registered, especially in the countries with a technology based agriculture, and also in countries such as Poland, where the agriculture was supported after accession. The situation is shown in the next table.

Table 3. Evolution of potato production in several European countries, large potato-producers

Country	Cultivated areas Thousand ha			Total production Thousand t			Average production T/ha		
	2007	2010	2012	2007	2010	2012	2007	2010	2012
Poland	569.60	490.85	373.00	11,791.07	8,765.95	9,091.90	20.7	17.8	24.3
Germany	274.96	255.20	238.30	11,643.76	10,201.90	10,665.60	42,3	39.9	44.7
The Netherlands	161.00	156.96	149.77	7,200.00	6,843.52	6,765.61	44.7	43.5	45.1
France	145.00	157.08	154.22	6,271.00	6,622.04	6340.80	43.2	42.1	41.1
Great Britain	139.00	138.00	149.00	5,635.00	6,066.00	4,553.00	40.5	43.9	30.5
Romania	267.03	246.98	229.05	3,705.69	4,003.98	2,465.15	13.9	16.2	10.7
Belgium	68.10	81.76	64.50	2,877.68	3,455.80	2,929.80	42.3	42.2	45.4
Spain	89.00	79.16	73.90	2,502.30	2,326.65	2,168.80	28.1	29.3	29.3
Italy	71.96	62.40	61.00	1,837.84	1,558.03	1,597.80	25.5	24.9	26.1
Denmark	41.20	38.50	39.50	1,625.60	1,357.80	1,664.20	39.5	35.2	42.1
Ireland	12.30	12.20	9.00	454.80	419.68	232.00	37.0	34.4	25.7

In 1970, Poland was the country that obtained more than 50 million ton of potatoes/year, at that time being outrun only by the Soviet Union. Today, Poland is still among the top 10 producers in the world. However, the yield has decreased in the last years, from 36 million ton in 1990 to 24.2 million ton in 2000, and then, it dropped to a minimum of less than 9 million ton in 2006. In 2007, the yield of approximately 11.8 million ton was a starting point for the recovery of production in Poland. Potato still remains very important for the Polish agriculture. Recent forecasts indicate that almost a half of the potato yield is used as fodder in farms, and 25 % are for human consumption.

At one century from their entry in the Netherlands, in 1600, potatoes were one of the most important crops in the agricultural farming of this country. Today, the Netherlands is in the top 10 potato producers of the world, with a yield in 2007 of 7.2 million ton (6.7 million ton in 2012).

While potato production is still decreasing in most part of Europe, the Dutch still cultivate potatoes on almost 25 % of their arable land and, at international level, they have reached the average yields of more than 45 ton per hectare. The potato production field is highly mechanized, approximately 250 certified varieties being cultivated.

Only half of the potato harvest in the Netherlands is used for the direct food consumption. Approximately 20 % represent potatoes for seeds, and the rest of 30 % are processed for starch. Approximately 70 % of the Dutch potatoes are exported as tubers and potato products, such as chips and powder. The Netherlands is an important international supplier of certified potatoes for seeds, the exports exceeding 700,000 ton per year.

Germany is the seventh larger producer of potatoes of the world and the largest in the Western Europe, with yields of more than 11.6 million ton in 2007. Even so, in 1960, potato production in Germany has registered a decrease; the crop was of approximately 33 million ton, with an increased farmed area, of 10 % of the total arable lands, compared to less than three percentages today.

Germany is an important processor and exporter of potatoes. For example, in 2005, it has processed 6.5 million ton of potatoes, including 3.3 million ton transformed in starch and has exported 1.3 million ton of fresh potatoes and 2 million ton of processed products. It is also a top importer of early potatoes (almost 500,000 ton, the largest part of France, Italy and Egypt, in 2005).

In France, the potato has registered ups and downs, from its introduction into the diet at the end of the 18th century, when A. A. Parmentier has recommended it as the solution to the endemic hunger ravaging the country and until today. The production was at its peak in 1960, with a yield of almost 14 million ton. Since then, it has decreased constantly, the yield in 2007 being of only 6.3 million ton. 2 million ton of the potatoes grown in France are for the domestic market, fresh, and one million ton for the processing industry. France is the No. 1 exporter of fresh potatoes, with almost 1.5 million ton in 2005/2006 and it grows 14,500 ha for the production of tubers for seeds.

Potatoes still have and important role in the national diet: French eat almost 30 kg of fresh potatoes and 25 kg of processed products per year per capita.

Among the large potato producers in Europe, the following are to be mentioned: Russian Federation and Ukraine, with farmed areas of 2.1 million ha and 1.4 million ha respectively, in 2012. The biggest potato consumer is Belarus, with 185.2 kg per capita.

As regards the direct consumption of potatoes, it ranges from 13.9 kg per year in Africa to 87.8 kg in Europe (Table 4).

Table 4. Potato consumption per region, in 2007

Area	**Population**	**Total production (t)**	**kg per capita**
Africa	904 388 000	12 571 000	13.9
Asia/Oceania	3 934 644 000	94 038 000	23.9
Europe	739 203 000	64 902 000	87.8
Latin America	562 270 000	11 639 000	20.7
North America	330 400 000	19 824 000	60.0
Total consumption	**6 484 792 000**	**202 974 000**	**31.3**

In Europe, the biggest consumers are Belarusians, with 185. 2 kg, while the Romanians eat only 99. 3 kg of potatoes/per capita yearly.

For many countries, including Romania, potato is “another bread”, the tubers being used directly in the diet, or as semi-processed food.

Table 5. Evolution of potato consumption per capita, in Europe, during the period 2008-2011

European country	**MU**	**2008**	**2009**	**2010**	**2011**
Austria	kg	57.2	57.4	56.8	58.3
Belarus	kg	193.2	185.8	185.2	185.2
Belgium	kg	85.2	82.6	84.3	105.9
Bosnia and Herzegovina	kg	76.2	75.9	76.4	75
Bulgaria	kg	40	33.3	31.3	31.1
Croatia	kg	61.4	63.4	47.1	42.3
Czech Republic	kg	68.7	65.7	62.2	66.2
Denmark	kg	74.6	75.8	58.9	59.7
Switzerland	kg	38.8	37.3	35.8	34.9
Estonia	kg	85.3	100.6	111.3	114
Finland	kg	68.5	66.7	67	66.7
France	kg	57.5	52.8	56.1	54.5
Germany	kg	69.8	70.3	62.1	70.7
Greece	kg	69.9	72.8	64.8	65.4
Ireland	kg	96.6	92.7	92.5	90.1
Italy	kg	37.4	39.7	39.9	38.5
Latvia	kg	111.2	112.2	93.5	92.6
Lithuania	kg	98.4	104.3	96.2	102
Luxembourg	kg	45.2	42	61.7	61.3
Macedonia	kg	56.2	63.5	59.3	57.5
Malta	kg	69	56.2	63.7	60.8
Great Britain	kg	52.6	53.7	53.3	55.6
Moldova	kg	58.2	59.2	57.3	60.3

Montenegro	kg	45	47.4	47.4	47.5
Norway	kg	67.2	60	57.5	55.5
the Netherlands	kg	91.7	89.9	92.5	93.9
Poland	kg	119.3	117.2	112.7	114.7
Portugal	kg	75.6	61.7	60.4	58.2
Romania	**kg**	**99.9**	**94.2**	**99.1**	**99.3**
Russia	kg	112.3	113	105.1	111.5
Serbia	kg	37.6	38.8	39.1	39.6
Slovakia	kg	54.1	53.5	53.4	52.7
Slovenia	kg	32.2	28.7	32.3	33.1
Spain	kg	58.5	58.1	57.2	58.4
Sweden	kg	43.1	43.9	43.4	41.8
Ukraine	kg	104.9	104.4	99.1	100.8
Hungary	kg	63.9	51.3	42	59
European Union	**kg**	**73.4**	**72.6**	**69.6**	**71.9**

The table indicates that large consumers in Europe are also countries such as: Poland, Estonia, Russia, Belgium, Ukraine, and Lithuania.

The smallest consumers are: Slovenia, Bulgaria, Italy, Serbia, with an estimated consumption of less than 40 kg/per capita.

Dynamics of areas and yields for potato-growing in Romania

Romania is among the first 20 potato producers in the world. It is, also, one of the few European countries where the potato production has increased - from 2.8 million ton in 1961 to approximately 4 million ton in 2005, and the potato consumption per capita almost doubled in 1990.

Potato is an important crop for the Romanian agriculture and for the national economy, a production of 2.4 million being obtained per year (in 2012). Almost the entire potato production from Romania is traded as fresh potatoes and only 2 % of the production is processed.

In the last years, remarkable results have been obtained regarding the use of potatoes as ethanol source for fuel. The tubers produced in the Southern part of the country, using irrigation, have a sufficient content of starch to allow the obtaining of 4,000 l of ethanol per hectare.

In our country, between the two world wars, the potato-growing area was of 144 thousand ha. Only from 1950, more substantial increase of potato-growing areas has been registered.

The area and production of potatoes in Romania in different periods is indicated in Table 6. As someone could see, the largest potato-growing area in our country was registered in 1989, of 351.4 thousand ha, with an average yield of 12,395 kg/ha.

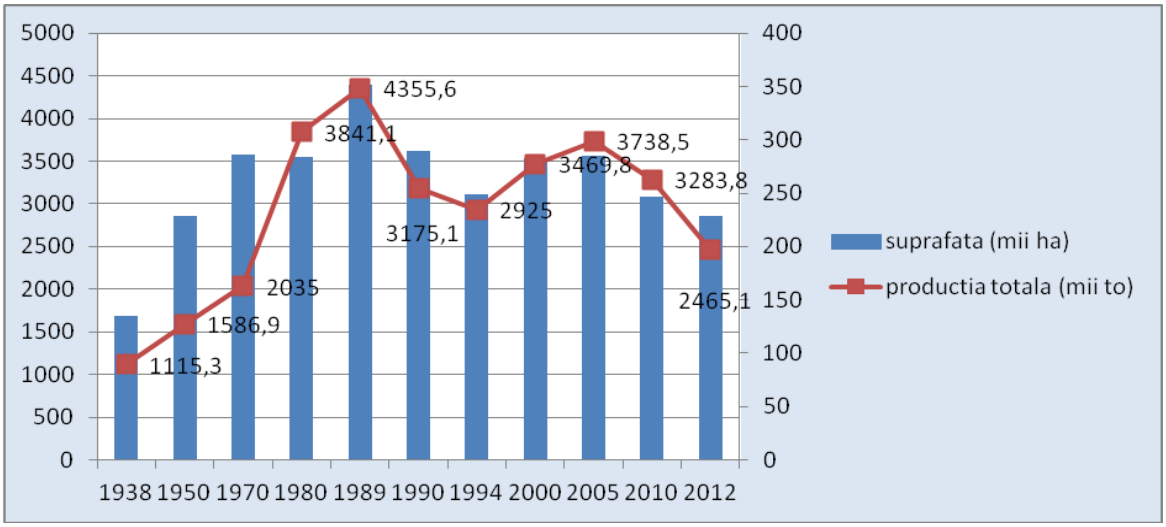
Table 6. Evolution of potato-growing areas and production in Romania

Specification	**Years**										
	1938	**1950**	**1970**	**1980**	**1989**	**1990**	**1994**	**2000**	**2005**	**2010**	**2012**
Area **Thousand ha**	135.10	228.50	286.10	286.40	351.40	289.60	248.60	282.70	285.31	246.98	229.05
Total production **thousand t/ha**	1115.38	1586.9	2035.02	3841.19	4355.60	3175.17	2925.02	3469.80	3738.59	3283.86	2465.15
Average production **t/ha**	8,256	6,945	7,113	13,412	12,395	10,964	11,766	12,273	13,103	13,296	10,762

From 1990, the farmed areas have decreased drastically, the smallest farmed area being registered in 1994, meaning 248.6 thousand ha.

The situation has improved, reaching in 2005 a farmed area of 285.31 thousand ha. Some could see that the areas vary significantly, and in 2012, in our country, only 229.05 thousand ha were cultivated with potatoes.

Figure 3. Dynamics of potato-growing areas and production in Romania, during the period 1938-2012



It has to be also noted that the yields in our country are the lowest in Europe (approximately 13 t/ha), being one of the reasons for the diminishing of the areas, considering that in Romania, large quantities of imported potatoes have entered, having more competitive prices.

CONCLUSIONS

1. In Europe, the potato consumption has the highest level in the world.
2. The global potato-growing area is stable, at around 18-19 million ha.
3. The significant decrease of potato-growing areas, especially in the European Union countries, is mainly a result of the spectacular increase of the yield per ha, and a second possible cause is the development of food industry that offer a totally different value to the processed potatoes.
4. In the European Union, a decrease of the potato-growing areas was registered, while the yield per hectare has been increased, especially in the country with technology based agriculture.
5. Romania is among the first 20 potato producers in the world.
6. The larges potato-growing area in our country was registered in 1989, of 351.4 thousand ha, with an average yield of 12.395 kg/ha.
7. The yields in our country are the lowest in Europe (approximately 13 t/ha), and the Romanian market was penetrated by large quantities of imported potatoes, with more competitive prices.

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DIVERSIFICATION USING ASSORTMENT OF LOCAL VARIETIES OF RED WINES

EMIL RUSU[1], OBADA LEONORA[2], GAINA BORIS[3], GROSU OLGA[4]

Abstract: *The assortment of winesproduced in Moldova iscurrently dominated by cosmopolitan varieties, mainly of the French. Global wine market study hasshownthat consumers are more attracted to wine-surprise, unknown. In this context many countrie shave resorted to valorisation of indigenous varieties and new varieties of selection. Since ancient times an assortment of vine varieties adapted to local conditions has been created in Moldova. Unfortunately, in the the 40's and 50's of last century, whith the collectivization was emphasized on European varieties spreading, local varieties being forgotten. Takinginto account all mentioned, research of 13 local red varieties for industrial purposes have started. In terms of microvinification according to classical technology, experimental wines were produced, the organoleptic, physico-chemical composition, including content phenolic compounds and anthocyanins profile were determined. Methods for analysis recommended by the OIV were used and the profile of anthocyanins in wine samples studied using high performance liquid chromatography method (HPLC) was determined. The research results showed that the dry red wines made from indigenous varieties are distinguished by different content in phenolic substances and anthocyanins. On the researche basis 4 grape varieties (Fetească neagră, Rara neagră, Negru de Căuşeni and Codrinschi) for quality dry red wines producin gwere recommended.*

Keywords: *local varieties, anthocyanins, phenolic compounds, physico-chemical composition, anthocyanin profile.*

INTRODUCTION

As a result of the policy pursued by the competent bodies of the Soviet period, Moldova inherited an assortment of grape varieties grained black consists mainly of classical French and from clones of these varieties such as Cabernet Sauvignon, Merlot, Pinot noir, etc. . From such varieties it is difficult to create a Moldovan national symbol of red wine.

In the current tough competition in the wine market, several countries promotes wines from indigenous varieties. An example may serve Georgia with Rkatiteli and Saperavi, Bulgaria - Mavrud, Rubin and Melnik, Romania - Feteasca neagra and Tamîioasa românească, Azerbaijan - Şirvanşah and Baian Sirei [1,2,3].

In some countries, climate change of recent years have led to an increased focus on attracting local clones that are adapted to local conditions and ensures quality wines [4].

For more perspective and promising Russian Federation is considered indigenous varieties Crasnostop zolotistîi, Ţîmleanschii ciornîi, Plecistic, Sibircovîi [5]. French consultants from Krasnodar region, Russian Federation, believes that a third of the vineyards must be established with native varieties [6]. About increasing interest in local varieties mentions british oenologist Djensis Robinson [7]. Portuguese oenology aim to promote local varieties blended with international [8]. In the current climate and soil, native varieties managed to flaunt November virtues, reaching that in good years even exceed quality wines made from varieties recognized worldwide [9].

Note that in the not too distant period in Moldova assortment consisted of native varieties: Rara neagră, Plăvaie, Galbenă, Zghihara, Batuta neagra, Ţîţa capreai, Pasareasca, Cabasma, Feteasca neagra and others. Many local varieties such as Rara neagra, Feteasca neagra had a profound influence on the country's history and created the typical wine vineyards.

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At the moment local varieties, except for some practically no longer used in the wine industry. Currently in ampelographic collection of IŞPHTA are 41 varieties, including 10 varieties with red grapes.

Although Moldova has some native varieties tomatoes, which are invaluable, unfortunately, they have not been subject to thorough research regarding the potential phenolic substances and coloring efficient processing technology grapes study the dynamics of phenolic substances and coloring stage and maturing wine storage. The purpose of the research is highlighting the existing assortment of grape varieties indigenous black grain to produce red wines.

Although Moldova has some local varieties of red grapes, which are invaluable, unfortunately, they have not been subject to thorough research regarding the potential phenolic substances and coloring, efficient processing technology grapes study the dynamics of phenolic substances and color retention stage and maturing wine. The purpose of the research is highlighting the existing assortment of grape varieties indigenous black grain to produce red wines.

MATERIAL AND METHODS

For research were used 10 varieties of grapes indigenous from the collection IŞPHTA namely: Rara neagra, Breaza, Kopceak, Batută neagră, Seina, Feteasca neagra, Ciorcuţa neagra, Negru de Akkerman, Negru de Căuşeni. Here was added Codrinschi, relatively young local variety, cultivated in the south. For experimental variations as a control was used Merlot, grown on plantations Institute (wine region Centre).

From a climate perspective, 2011 was characterized by the following indicators: amount of active temperatures - 3428 °C, rainfall - 349 mm. The grapes were performed following measures: carbohydrate content, tirabili acids, phenolic substances and coloring substances.

Processing and obtaining samples of wine grapes was made after the classical scheme for the production of red wines: sulphite pulp dose 70-75 mg / kg total SO_2; fermentation maceration at 25-28 °C, sulphite wine yeast pulled off dose of 20-25 mg / L SO_2 free form. The wine samples obtained were determined the main physical and chemical indicators: alcohol, sugar, titratable acidity, volatile acidity, pH, phenolic substances, antocians, non-reducing dry extract being used standard methods; total phenolic substances - with the Folin-Ciocalteu reagent; antocians by method OIV. After three months samples were subjected wine organoleptic assessment.

Profile of anthocyanins was determined by high performance liquid chromatography (HPLC) method MD-MA-AS315-11 ANCYAN. The chromatograms were recorded at Hewlett-Packard 1100 chromatograph with UV-VIS detector type using Li Chrosher separation column 100 RP 18.

RESULTS AND DISCUSSIONS

Fig. 1 shows the results of investigation of titratable acids and glucides during maturation of black grapes in local varieties. From the results it can be concluded that indigenous varieties differ in different storage capacities of glucides content and reducing organic acids. In investigations with a low potential for accumulating glucides are characterized by Batuta neagra (155g / L), Negru de Akkerman (164 g / L) and Breaza (190g / l). In other varieties glucides varies between 197-230 g / L. Thus, the technological maturation in Fetească neagra, Rara neagra, Kopceak and Codrinschii content of the glucidea was 227, 217, 213 and 230g/L, the values given in the reference to control variety or higher (218 g / L). Referring to titratable acidity, that varieties containing low in glucides have also the lowest values of titratable acid content, which varies between 5.5 and 6.4 g / L. Other

varieties have a titratable acid content, which varies between 7.0 and 8.8, with the exception of black variety Rara neagra, which has the highest value of this index - 9.2 g / L.

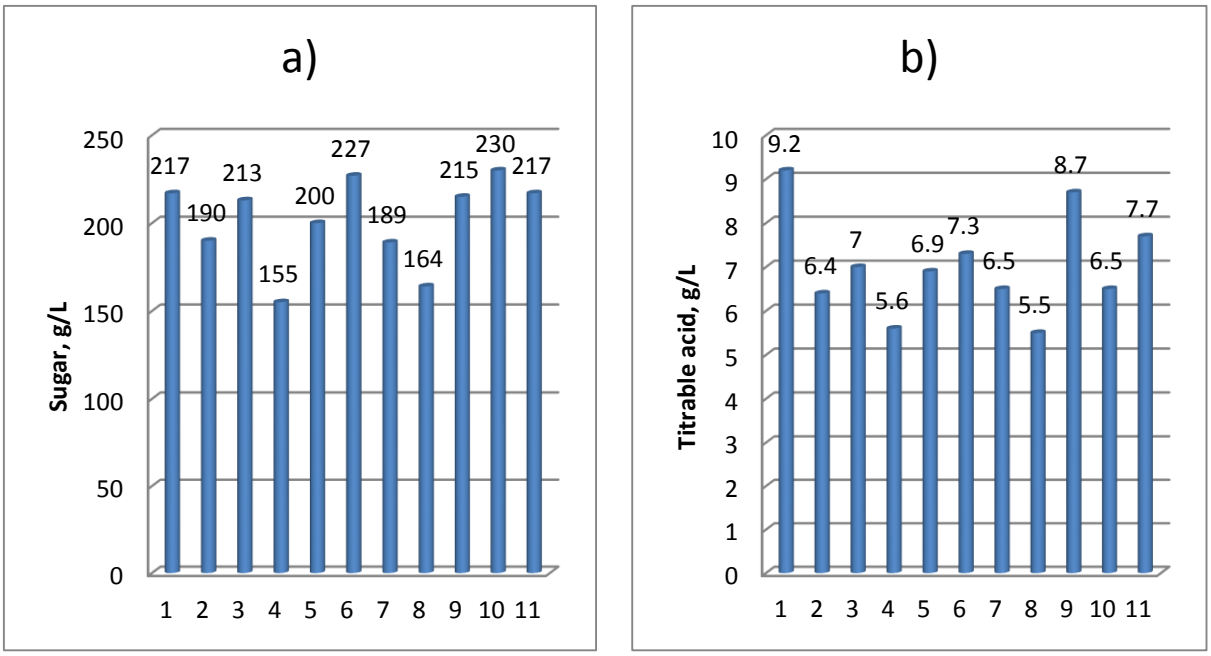

Fig. 1 The sugars (a) and titratable acids (b) local varieties at technological maturation stage.

Caption: 1-Rară neagră; 2-Brează; 3-Kopceak; 4-Bătută neagră; 5-Seina; 6-Fetească neagră; 7-Ciorcuță neagră; 8-Negru de Akkerman; 9- Negru de Căușeni; 10- Codrinschii; 11- Merlot.

Figure 2 presents data on phenolic substances and anthocyanin content in local varieties.

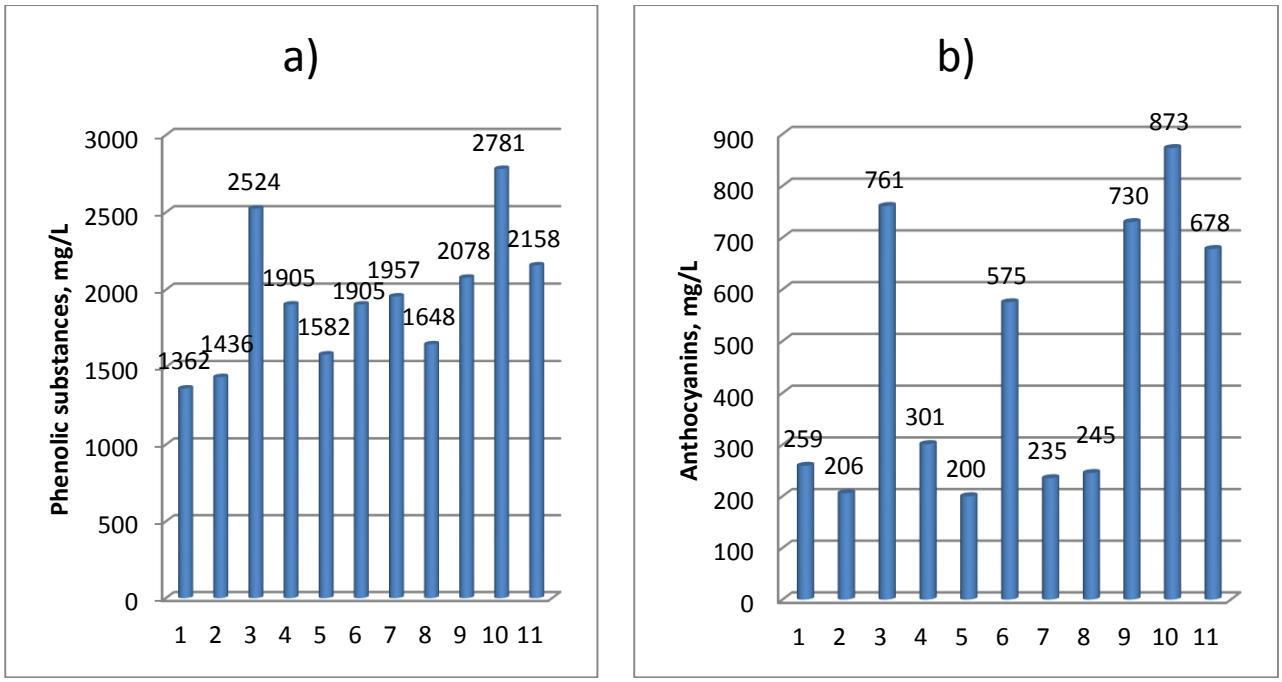

Fig.2 content in phenolic substances (a) and anthocyanins (b) local varieties at technological maturation stage.

Caption: 1-Rară neagră; 2-Brează; 3-Kopceak; 4-Bătută neagră; 5-Seina; 6-Fetească neagră; 7-Ciorcuță neagră; 8-Negru de Akkerman; 9- Negru de Căușeni; 10- Codrinschii; 11- Merlot.

The research results show that local varieties are characterized with very different potential of phenolic complex.

After the content in phenolic substances and coloring substances are placed as follows:

- coloring content below 300 mg/L and phenolic substances below 1600 mg/L: Ciorcuţă neagra - 235/1957 mg/L; Negru de Akkerman - 245/1648 mg/L; Rara neagra - 259/1362 mg/L; Breaza -206/1436 mg/L; Seina - 200/1582 mg/L.
- Average content (colored substances 300-500 mg/L and phenolic substances - 1600 to 1900 mg / L: Batuta neagra - 301/1905 mg/L.
- Containing more (coloring more than 500 mg/L and phenolic substances more than 1,900mg/L): Codrinschii - 873/2781 mg/L; Negru de Căuşeni - 730/2078 mg/L; Feteasca neagra - 575/1905 mg/L; Kopceak -761 / 2524 mg/L.

After complex phenolic only varieties Kopceak, Negru de Căuşeni, Feteasca neagra and Rara neagra (wine region South) indicated close to the control - in 2158 and 678 mg/L, and the variety Codrinschii is characterized by the highest values - 2780 mg/L phenolic substances and 870 mg/L anthocyanins.

Table 1 presents physico-chemical indexes of red wines made from indigenous varieties, harvest of 2011. The data presented in Table 1 may be mentioned that red wines from indigenous varieties have a high alcohol between 12.0 and 14.9% vol., except those produced from varieties Batuta neagra (9.5% vol.) and Negru de Akkerman (9,7 % vol.). Titratable acids in the wine investigated ranges between 6.1 and 9.4 g/L, the lowest value recorded in Seina wine, and the highest in Negru de Căuşeni wine. The pH values vary from 3.2 up to 3.62. Residual sugar content, although high alcohol level not exceeding 2.1 g/L and is below the maximum allowed for red wines.

Tabelul 1 *Physico-chemical indices in red wines made from indigenous varieties and classic variety – control, the harvest of 2011*

Nr. d/o	Name of the variety and variant	Alcohol, % vol.	Sugar, g/L	Titratable acid, g/L	Volatile acid, g/L	pH	Phenolic substance, mg/L	Anthocyans, mg/L	Dry nonreducing extract, g/L	Note organoleptic, points
1	Rara Neagră	13,5	1,8	7,7	0,33	3,45	1053	211	25,0	7,80
2	Breză	12,0	1,0	6,4	0,26	3,20	995	95	20,1	7,80
3	Kopceak	13,8	1,6	9,2	0,26	3,37	2340	634	25,8	7,92
4	Bătută Neagră	9,5	0,8	7,4	0,26	3,54	1170	85	17,2	7,71
5	Seină	12,7	1,4	6,1	0,40	3,59	1346	127	21,3	7,84
6	Fetească Neagră	14,4	1,7	7,6	0,26	3,62	1814	391	24,6	7,94
7	Ciorcuță Neagră	13,0	1,4	7,0	0,26	3,45	1463	180	22,1	7,88
8	Negru de Căușeni	13,7	1,3	9,4	0,26	3,14	2048	793	27,4	7,96
9	Negru de Akkerman	9,7	0,8	7,3	0,20	3,23	1463	116	19,5	7,81
10	Codrinschi	14,9	2,1	7,5	0,26	3,43	3159	634	27,1	8,02
11	Merlot (martor)	12,8	1,0	6,5	0,26	3,47	1697	296	23,2	7,98

The volatile acidity in wines is investigated within 0.2-0.4 g/L, denoting compliance with production technology experimental samples. Nonreducing dry extract reaches between 22.1 and 27.1g/L, except for varietal wines Batuta neagra, Negru de Akkerman, Breaza and Seina, where this index is only 17.2; 19.5; Respectively 20.1 and 21.3 g/L, which is not enough for a young red wine.

Investigated wines are distinguished more by the content of phenolic compounds. Obviously, phenolic substances and coloring substances are in smaller quantities in wines made from low varieties in these compounds.

It is known that the content of the coloring matter of red wines must be not less than 200 mg / L, and the phenolic substances - not less than 2000 mg / L.

Considering the above, we can say that wine samples obtained from experimental varieties Seina Breaza, Negru de Akkerman, Batuta neagra and Ciorcuţă neagra not meet requirements for this category of wines.

It should be noted that from all investigated wines, Codrinschii has the highest content of phenolic substances - 3159 mg / L and anthocyanin - 634 mg / L. The wine is characterized with deep red color, rich aroma with notes of fruit, harmonious taste, noble tannins and organoleptic was rated at 8.02 points. With high values of the content in phenolic compounds are distinguished wines from the variety Kopceak - 2340 and respectively 634 mg/L, followed by the variety Negru de Căuşeni - 2048 and 793 mg/L.

Kopceak wine has dark red color, pure flavor, made with fruit nuances, organoleptic grade being 7.92 points. The sample obtained from the variety Negru de Căuşeni has a red, pure flavor, rich; The taste is full, extractive, harmoniously (7.96 points). The last three wines can be placed in category extractive wines with rich content of phenolic substances and antocians.

Fetească neagra wine obtained by the content in phenolic compounds and organoleptic peculiarities is located closer to the control. Thus, the content of phenolic substances that are 1814 and 1697 mg/L, while the coloring matter - respectively 391 and 296 mg/L. This wine has a deep red color, rich aroma with notes of red fruit, moderate flavor mining, soft, harmonious. Organoleptic assessment notes were high and constituted 7.94 and 7.98 points respectively. After complex phenolic Fetească neagra wine is part of extractive medium red wines. Regarding the Rara neagra wine variety may be mentioned that it is characterized by a lower content in phenolic substances - 1053 mg/L and anthocyanin - 211 mg/L. It has red, pure varietal aroma, with notes of red berries light, clean taste, slightly astringent. After phenolic constituents of this wine is part of lighter red wines.

The data presented in the literature (Cotea V.D. 2009) we notice that the color formation grapes and red wines participating various forms of anthocyanins - anthocyanidins, antocianosides and acylated anthocyanins. So particular interest is the research profile of anthocyanins of red wines made from indigenous varieties in relation to classic Merlot variety, the results presented in Table 2.

Data Table 2 shows that wines made from indigenous varieties are distinguished and compared to the control wine of Merlot, with a distinct anthocyanin profile. The main component of anthocyanins in wine determined experimental and control the harvest of 2011 is malvidina 3-monoglycoside, but its percentage ratio of the amount of anthocyanins differ greatly.

Thus, Rara neagra wine value of this index is 70%. This index has higher values in varieties: Seina - 64.5%, Ciorcuţă neagra - 59.4%, Kopceak - 55.7%, Batuta neagra - 52.9% and Negru de Căuşeni - 50.6%. Malvidin-3-glucoside and sample wine predominant Fetească Neagra - 53.6%. Codrinschii wine is distinguished with the lowest share of malvidine 3-monoglycoside - 48.1% and in the control sample Merlot index is 34.9%. Besides malvidina 3-monoglycoside a significant share in creating color has petunidin-3-monoglycoside. The varietal wines Breaza, this compound has higher percentage values (12.7%), Fetească neagra (11.2%) and the variety Kopceak (10.1%). In other wine samples petunidin- 3-monoglycoside share is below 10% and the lowest values were determined in Negru de Akkerman wines (1.9%) and Batuta neagra (3.4%). The sample Merlot value ratio petunidin-3-glucoside is 4.8% and is lower against most experimental wines.

Table 2 *Reports values of anthocyanins in red wines made from indigenous varieties and classic variety - witness the harvest of 2011,% of total*

Nr. d/o	Name of the variety and variant	Delfinidina-3-glicozid	Cianidina-3-glicozid	Diglicozid-malvidol	Petunidina-3-glicozid	Peonidina-3-glicozid	Malvidina-3-glicozid	∑ antocia-n free and acylates	∑ antocia-nin glicosides
1	Rara Neagră	2,4	<0,5	<0,5	5,6	2,5	70,0	17,4	81,5
2	Brează	9,3	1,2	<0,5	12,7	4,7	51,7	18,4	80,1
3	Kopceak	7,8	0,8	0,9	10,1	5,2	55,7	15,9	80,5

4	Bătută Neagră	1,9	<0,5	<0,5	3,4	3,6	52,9	37,1	62,8
5	Seină	2,7	<0,5	<0,5	5,6	4,6	64,5	21,4	78,4
6	Fetească Neagră	6,7	1,3	<0,5	11,2	5,3	53,6	17,6	78,6
7	Ciorcuţă Neagră	2,3	1,4	<0,5	4,6	2,0	59,4	28,9	70,2
8	Negru de Căuşeni	8,9	<0,5	<0,5	9,9	2,7	50,6	22,6	73,1
9	Negru de Akkerman	2,2	0,5	0,6	1,9	3,5	36,4	46,8	45,1
10	Codrinschi	6,6	1,5	2,7	6,4	3,2	48,1	29,8	68,5
11	Merlot (martor)	4,6	<0,5	<0,5	4,8	2,8	34,9	48,1	48,1

Higher values of delphinidin-3-monoglycoside identified in varietal wines Condrinschii (6.6%), Breaza (9.3%), Negru de Causeni (8.9%) and Feteasă neagra (6.7%). The lowest values of this compound were found in wines Negru de Akkerman - 2.2%, Seina - 2.7% and Rara Neagra - 2.4%. The control sample weight of delphinidin-3-monoglycoside is the level of 4.6%. Monoglycoside-3- peonidina content in wine samples investigated in this varies are between 2.0 and 5.3%. The value of control wine Merlot peonidinei- 3-monoglycoside is low and is 2.8%. In most samples malvidol-diglicozid content in the wine is less than 0.5%, with allowance for Codrinschii and Kopceak varieties that have higher values of the index. The data in Table 2 it can be concluded that the amount of anthocyanin glycoside is very different depending on the grape variety used. The largest share of the amount recorded in the wine glycosides anthocyanins Rare Black - 81.5% and in the variety of Kopceak - 80.5%. The higher values of the amount of anthocyanins glycosides are distinguished wines made from varieties: Seina - 78.4% Breaza - 80.1%, Ciorcuţă neagra - 70.1% and Fetească neagra - 78.6%. In Codrinschii wine - 68.5%. The samples investigated with lower values of the amount of anthocyanin glycosides wine variety is accentuate Negru de Akkerman - 45.1% and the value is closer to the control Merlot wine samples - 48.1%.

In conclusion we can say that the color formation Merlot wine made from less participating glycosides anthocyanins. It is predominantly acylated forms, and to free the anthocyanins. However, it is known that the acylated anthocyanins are beneficial for color quality red wines (Cotea V.D., 2009). Acylation glucoside residues, particularly the hydroxy acids, anthocyanins increases stability and ability to dye molecule, a phenomenon known as copigmentation. In this context, the analyzes demonstrated that the acylated anthocyanins ratio proportionate amount and free in Merlot wine sample is 48.1% and is higher than the experimental wines. The red varieties investigated, wine produced from the variety Negru de Akkerman value is highlighted by closer control - (46.8%).

The lowest values of this index were detected in wines Kopceak - 15.9%, Fetească Neagra – Rara neagra 17.6% and - 17.4%. We assume that this is explained by more advanced color intensity in wine produced from Merlot and its higher stability this wine. From the local varieties of wine, Codrinschii differs by a richer color and intensity. Given that dyes are subject to frequent changes, it was examined their behavior in the storage of the wine made from indigenous varieties and witness for 12 months.

Table 3 presents the results of research on the dynamics of acylated anthocyanins and the amount glycosides at the initial stage and after 12 months of storage. From the data of Table 3 we can see that during 12 months of storage there is a percentage increase of the share acylated anthocyanins and that a reduction in all forms glycosides wine samples subject to investigation. Acylated anthocyanins increase the amount varies quite high in value from wine Codrinschi constituting 6.8% and Rara neagra up to 23.6%. The Feteasca neagra wines index is 18.9% and in Negru de Căuşeni - 21.8%.

Table 3 *The dynamic acylated anthocyanins and glycosides in red wines made from local varieties after 1 year of storage, the harvest of 2012,% of total*

Nr d/r	Name of wine	Initial		1 year		The increase free anthocyanins and acylated% of the total
		Σ anthocyanins acylated	Σ anthocyanins glycosides	Σ anthocyanins acylated	Σ anthocyanins glycosides	

1	Rara neagra	13,2	84,1	36,8	61,8	23,6
2	Fetească neagră	17,8	78,5	36,7	58,9	18,9
3	Kopceak	17,9	78,0	28,5	70,5	10,6
4	Negru de Căuşeni	18,6	76,8	40,4	58,2	21,8
5	Codrinschii	24,8	73,5	31,6	66,1	6,8
6	Merlot	36,8	57,0	61,0	33,7	24,2

After a year of storage of the Kopceak wine, acylated anthocyanins increase amount is 10.6%. In acylated anthocyanins control wine Merlot is increased by 24.2%.

Based on investigations it appears that during a year of storage of red wines from indigenous varieties, both in experimental wine samples and in control wine, there is an increase of acylated anthocyanins percentage party.

CONCLUSIONS

1. After complex phenolic potential, producing red wines from indigenous varieties Codrinschii, Fetească neagra, Kopceak, Negru de Căuşeni and Rara neagra perspective is considered.
2. Wines investigated indigenous varieties are distinguished by the content in phenolic compounds. Codrinschii wine variety has the highest content of phenolic substances - 3195 mg/L and anthocyanin - 634 mg/L. Kopceak variety wines - 2340 mg/L and 634 mg/L are distinguished by high values of the content in phenolic compounds, followed by the variety Negru de Căuşeni - 2048 mg/L and 793 mg/L. These three wines can be placed in category extractive wines with rich content of phenolic substances and antocians. After the content in phenolic compounds and organoleptic peculiarities, the wine Fetească neagra is located closer to the control and is part of the mining environment. The variety Rara neagra characterized by a potential phenolic more modest, yield a wine with a lower content of phenolic substances - 1053 mg/L and antocians - 211 mg/L, which can be placed in the category of red wines light.
3. Wines made from indigenous varieties of anthocyanins have a different profile, both among themselves and against the control. The wines produced from local varieties predominate glycosides anthocyanins, the amount of which varies from 68.5 to 80.5%, excluding wine Negru de Akkerman, the value of this indicator is 45.1% and is closer to sample wine control-48.1%. The color of Merlot wine is made mostly of acylated anthocyanins forms, actually explaining color intensity most advanced and stable.
4. During 12 months of storage of red wines from indigenous varieties, both in experimental samples and in control wine occurs acylated anthocyanins increase the percentage party, leading to the stabilization of color.

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NEW VARIETIES OF VINE RULES IN RELATION TO THE EUROPEAN UNION THE REQUIREMENTS COMPARED BY BIOCHEMICAL

ALEXANDROV EUGENIU[1]

Abstract. *The process of obtaining distant hybrids, as well as any crossing of cultivars of V.vinifera L. with representatives of species possessing the necessary qualities (resistance to diseases and pests, low temperature, etc.) may change the spectrum of chemical and biochemical compounds responsible for flavour, colour and taste of grapes, obtained juice and wine. Botanical description of distant hybrids was performed during all phases of the vegetative stages; the organs of the plants were studied from spring, at bud unfolding, until early autumn, at the fall of the leaves. For the determination of diglucoside-3,5-malvidin, the fluorimetric method, for determining the methyl anthranilate, the gas chromatographic method was applied. Based on the analyzes of biochemical constituents of grapes of the distant hybrids: DRX-M4-578; -502; -571; -660; -609; -580; etc., compared to the traditional cultivars „Feteasca albă", "Neteasca neagra", „Rară neagră" and "Negru de Ialoveni", it has been found that these varieties are similar. So, the distant hybrids of grapevine haven't inherited unwanted characters for vines, some of them are strictly limited (diglucoside-3,5-malvidol). These hybrids don't have the specific characteristics of direct production hybrids, characterised by the foxat taste of the grape berries, caused by the presence of the methyl anthranilate. The distant hybrids studied according to the classical uvologic and technological principles can be classified as follows: distant hybrids are attributed to the table vine species (DRX-M4-502; DRX-M4-512 etc.) and distant hybrids have mixed properties (DRX-M3-3-1; DRXM4-580; DRX-M4-640 etc). According to the physical and biochemical indices of the grapes of the studied distant hybrids, their characteristics are similar to European vine species.*

Keywords. *berry, diglucozide-3,5-malvidol, methl anthranilate, hybrids, resistnce.*

INTRODUCTION

The development of culture of the vine throughout of his evolution has known multiple methods of improvement, such as natural selection or directed (intraspecific, interspecific, clonal, genetic engineering etc.). Today it is very necessary to obtain vine varieties productive and qualitative characters, and absolutely resistant to attack by phylloxera (root and leaf).

The process of obtaining hybrids of vines, as well as any cross varieties of *Vitis vinifera* L. with representatives from the donor species of qualities necessary (resistance to diseases and pests winter low temperatures etc.) can bring to the changing spectrum chemical and biochemical compounds responsible for flavor, color and taste of berries, juice and wine obtained.

According to European Union requirements in the production of wine products, the chemical composition of the raw material must meet some strict requirements, for example diglucozid-3,5-malvidol not exceed the limit of 15 mg/dm^3.

Recently the World Organisation of Vine and Wine discussed the issue of reducing the index wines at the limit of 5 mg/dm^3, which requires to be monitored in the selection of vines to try and approve only varieties with low content of this phenolic - diglucozid-3,5-malvidin [7].

Another important compound juice berries vine distance hybrids of any order, including the is methyl anthranilate (3,4-benzoxazole), which has the main role in the creation of taste and smell (aroma) of frame (naphthalene and / or phenol) [9].

Methyl anthranilate is a chemical compound benzoxazoles group, formed in grapes (especially direct producer hybrids) in amounts of 0,2 to 3,5 mg/dm^3 of must (juice). It is found in the wine with the same concentrations of volatile aromatic another chemical compound - ethyl isoamyl [9]. That is why this important chemical compound in the juice of berries new hybrids intraspecific selection requires determined, studied and taken as a criterion for selection [13].

International Organisation of Vine and Wine in 2004 established the methanol concentration limit of 250 ml/l for white wines and 400 ml/l for red wines.

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MATERIAL AND METHODS

In this study were included and distant hybrid of vine *Vitis vinifera* L. x *Muscadinia rotundifolia* Michx., created in the Botanical Garden (Institute) of the ASM, (DRX-M3-3-1; DRX-M4-502; - 512; -571; -578; -580; - 609; -660). These new strains were tested for resistance to attack the root and the leaf phylloxera, as well as mildium, oidium, botrytis. Berry juice and the wine were tested on content: methyl anthranilate, diglucozide-3,5-malvidin, phenolic substances etc. [1, 2, 3, 11].

The study included ten varieties of vines created of the VCR (Vivai Cooperativi Rauscedo, Italy, Udino), including five varieties of grapes with white berries (Fleurtai (UD-34.111), Soreli (UD-34.113), Early Sauvignon (UD-76.026); Petit Sauvigon (UD-55.098); Sauvignon d´ore (UD-55.100) and five varieties of red berries with juice (Petit Cabernet (UD-58.083); Royal Cabernet (UD-32.078); Royal Merlot (UD-31.125); Petit Merlot (UD-31.122); Julius (UD-36.030) [1].

As compared the traditional varieties were used ”Feteasca alba”, ”Feteasca neagra”, ”Rara Neagra” and ”Negru de Ialoveni”.

For the quantitative and qualitative determination of the diglucoside-3,5-malvidin, the quantitative and qualitative fluorimetric method was applied. For determining the methyl anthranilate, the gas chromatographic method was applied [4, 5, 6, 8, 9, 11].

At the biochemical and uvologice analyzes were used methods disclosed in the technical regulations "Analytical methods in the manufacture of wines" [10, 12].

RESULTS AND DISCUSSIONS

In the contemporary agro biological science are the achievements carried in the field of intraspecific selection, beginning with the second half of the XXI century resulted in obtaining new varieties with increased resistance to biotic and abiotic acceptable qualities such as the those in Germany, Hungary, Italy, France, Romania, Moldova, Ukraine, Russia etc.

Appreciating the true value of these achievements agrobiologic characters specific of varieties obtained, it should be noted that the cultivation of these varieties imposes mandatory the grafting protaltoi their North American (resistant to phylloxera), which considerably raises the cost of the planting material production and that of the establishment of a unit - plantation of vines. In addition most of the above mentioned varieties are relatively resistant to the main the contaminants during the growing season (mildium, mildew, botrytis), and lately is observed sensitivity to *Agrobacterium tumefacium* (cancer bacterial vine) and *Flovecence d'or* (drying the golden of the arms).

It is judged increased the resistance to low temperatures this winter varieties, which allow them to cultivating on the espaliers and fertile buds diminish loss of in years old with frosty winters. Some of these varieties, however, in some years, are the attacked by phylloxera leaf under the conditions which the harvest matures weak and the immature the young shoots enters into winter.

The investigations were aimed at to check whether by obtaining distant hybrids have not transmitted specific to features direct producer hybrids varieties, of which indexes methyl anthranilate to the concentration of varies from 0,30 mg/dm^3 up to 3,6 mg/dm^3. The data obtained attest to similarity between the distant hybrids and the classical the varieties: the varieties with the berries green-yellow or green straw distant hybrids, this index attesting 0,08 to 0,17 mg/dm^3. These results attest to resemblance of the distant hybrids DRX-M4-571; -578; -609; DRX-M3-3-1 the content of methyl anthranilate with the classic of grapes the variety of ”Feteasca alba” of the species *Vitis vinifera* L.

And new varieties of the distant hybrids - DRX-M4-660 and DRX-M3-3-1 with the berries red-violet (pomegranate), the content of that constituent biochemical values from 0,21 to 0,24 mg/dm^3 - is attest to similarity to the classic variety ”Rara neagra” of the species *Vitis vinifera* L., the fresh juice that has accumulated 0,27 mg/dm^3 of methyl anthranilate (tab. 1.).

Table 1.
The content of methyl anthranilate, diglucoside-3,5-malvidin and anthocyanins in grapes of distant hybrids of grapevine (*Vitis vinifera* L. x *Muscadinia rotundifolia* Michx.)

Form	***The content of the compounds, mg/dm³***		
	Methyl anthranilate	***Diglucoside-3,5-malvidin***	***Anthocyanins***
Distant hybrids of grapevine (V.vinifera L. x M.rotundifolia Michx.)			
DRX-M4-502	0,08	-	-
DRX-M4-580	0,09	-	-
DRX-M4-512	0,13	-	-
DRX-M4-578	0,15	-	-
DRX-M4-609	0,16	-	-
DRX-M4-571	0,17	-	-
DRX-M4-660	0,21	7,7	640
DRX-M3-3-1	0,24	9,3	513
Varieties of the Vitis vinifera L.			
Feteasca albă	0,11	-	-
Feteasca neagra	0,19	7,4	737
Rară neagră	0,27	4,9	469
Negru de Ialoveni	0,49	74,0	861

The organoleptic assessments of the quality of berries to the eight distant hybrids and the classical varieties have allowed us to note the absence of the flavoring (of smell) and taste typical of "foxat" direct producer hybrids, but especially of the North American varieties of *Vitis labrusca* (Concord, Isabella, Noah, Lidia, Delaware, Othello etc.).

Only the "Negru de Ialoveni", intraspecific hybrid was determined by the same method gaseous phase chromatography, an increased concentration of methyl anthranilate 0,49 mg/dm^3, what reaches values close to direct producer hybrids [7].

Another important characteristic of the hybrids of any origin is the concentration of diglucozid-3,5-malvidol, which is strictly limited to the export wine to the European Union to the limit of $\leq$ 15 mg/dm^3. In this order of ideas, it went on the determination of this component anthocyanins (in berry colorant) as the method widely known and used in the European Union.

The results obtained demonstrates that this index in the fresh juice of distant hybrids varies between 7,7 mg/dm^3 and 9,3 mg/dm^3 of diglucozid-3,5-malvidol (DRX-M4-660; DRX-M3-3-1) and the classical variety of "Rara neagra" ("Cricova", c. Lucesti, r. Cahul) it is found just 4,9 mg/dm^3 of diglucozid-3,5-malvidol. These results allow us to state that after the index values the concentration of diglucozid-3,5-malvidol, F4 distant hybrids of varieties obtained from Botanical Garden (Institute) of the ASM do not differ practically of the classic variety "Rara neagra".

Exception in the investigations carried out, make the intraspecific hybrid "Negru de Ialoveni" with 74,0 mg/dm^3 of diglucozid-3,5-malvidol this variety of berries juice of vines collection of Practical Scientific Institute of Horticulture and Food Technology.

After the content of the phenolic compounds, including antocianelor, berries from the juice direct hybrids in comparison to that of the classic varieties *Vitis vinifera* L. (Feteasca alba and Rara neagra), these varieties not radically different, but just within the limits of 184-260 mg/dm^3 phenolic compounds in green-yellow berries (straw) DRX-M4-571; DRX-M4-512 etc. and 1987-2316 mg/dm^3 of distant hybrids DRX-M3-3-1 and DRX-M4-660.

And the index of the anthocyanins concentration in stained the varieties does not attest to fundamental difference between the distant hybrids and the classic varieties of the Rara neagra: from 513 mg/dm^3 to 640 mg/dm^3 for the distance hybrids and a content (regular) of the 469 mg/dm^3 the Rara neagra from the group of *Vitis vinifera* L.

The juice of berries of the variety of vines "Negru de Ialoveni" contains high quantities of phenolic compounds (about 2790 mg/dm^3) and anthocyanins (861 mg/dm^3).

The organoleptic appreciation of the fresh juice obtained from the distant hybrids created at the Botanical Garden (Institute) of the ASM in comparison with the berries juice of the classic varieties "Feteasca alba" and "Rara neagra" from "Cricova" S.A. made during the harvest of 2014 [the appreciation the flavoring (of smell) and taste etc.] have enabled us to certify a likeness of berries color, of the flavoring and taste the juice extracted from them, with small nuances at every variety under investigation.

Table 2.

Acidity

Hybrids	***titratable acidity, g/dm^3***	***pH***	***tartaric acid, g/dm^3***	***malic acid, g/dm^3***
DRX-M$_3$-3-1	5,5	3,6	4,7	2,9
DRX-M$_4$-502	6,0	3,5	3,7	2,4
DRX-M$_4$-512	6,8	3,1	4,1	3,1
DRX-M$_4$-571	6,6	2,9	4,1	2,7
DRX-M$_4$-578	6,1	3,3	3,2	2,1
DRX-M$_4$-580	6,2	3,1	4,3	2,4
DRX-M$_4$-609	5,9	3,4	3,7	1,9
DRX-M$_4$-640	6,4	3,0	4,5	2,9

At general the score for have been highlighted gustatory-olfactory the hybrids with green-yellow berries: DRX-M4-609 with 9.5 points and DRX-M4-502 with 9.0 points. Among the hybrids with red-purple berries (pomegranate) was highlighted the hybrid DRX-M3-3-1 with 9.3 points.

Evident, the representatives of the species *Vitis vinifera* L. (Feteasca alba, Rara neagra) were gained 9,9 points, respectively, 9,8 points, which shall be entered in their traditional values and typical.

The intraspecific variety of "Negru de Ialoveni" the score for did not exceed 8.9 points, too tannic taste and practically neutral in flavoring.

Table 3.

Sugars

Hybrids	***Sugar, g/dm^3***	***Glucose, g/dm^3***	***Fructose, g/dm^3***
DRX-M$_3$-3-1	166	84,2	80,5
DRX-M$_4$-502	163	85,5	74,1
DRX-M$_4$-512	159	82,0	70,3
DRX-M$_4$-571	144	77,1	65,8
DRX-M$_4$-578	158	81,3	69,7
DRX-M$_4$-580	167	84,8	80,7
DRX-M$_4$-609	163	83,7	78,3
DRX-M$_4$-640	151	78,8	70,5

As for the physico-chemical and biochemical indexes after the concentration of organic acids (tartaric and malic acid), for all hybrids distances can be attested at European of vines species *Vitis vinifera* L., tartaric acid ranging within the limits of 3.2 g/dm^3 to 4.7 g/dm^3, and malic acid: from 1.9 g/dm^3 to 3.1 g/dm^3 (tab.2.).

The concentration of the glucose and fructose in the medium constitutes 95.5 to 99.3% of the total concentration of the sugars (100%).

The report of the glucose/fructose it is typical of the European vines varieties and ranges from 1.04 up to 1.17 (tab. 3.).

The concentration of the phenolic substances demonstrates that distant hybrids meet the criteria of vines variety rights for consumption.

The amount of these substances of distance hybrids of the vine with the green-yellow berries varies between 201-293 mg/dm^3 and hybrids with berries blue-violet nuance - from the 777 mg/dm^3 to 809 mg/dm^3.

It is gratifying that the concentration of resveratrol, as biological compound for human nutrition, it is relatively increased in comparison with the classic of vines the varieties (4,1 to 5,3 mg/dm^3), and distant hybrids varies in boundaries of 5,7 mg/dm^3 to 11,7 mg/dm^3 (tab. 4.).

Table 4.

Chemical properties

Hybrid	***Phenolic substances, mg/dm^3***	***Resveratrol, mg/dm^3***	***Pectins, mg/dm^3***
DRX-M$_3$-3-1	809	8,5	714
DRX-M$_4$-502	292	8,1	580
DRX-M$_4$-512	288	6,6	517
DRX-M$_4$-571	263	5,7	703
DRX-M$_4$-578	274	7,3	647
DRX-M$_4$-580	293	6,8	439
DRX-M$_4$-609	201	7,7	516
DRX-M$_4$-640	777	11,7	697

According to the physical and biochemical the indices berries distant hybrids studied their characteristics are similar to the european of vines variety rights: total nitrogen varies in the range of 563 mg/dm^3 up to 740 mg/dm^3, phosphorus - 179-263 mg/dm^3, calcium - 107-156 mg/dm^3, potassium - 1367-2013 mg/dm^3, magnesium - 103-144 mg/dm^3 (tab. 5.).

Tabelul 5.

Chemical properties

Hybrid	***N, mg/dm^3***	***P, mg/dm^3***	***Ca, mg/dm^3***	***K, mg/dm^3***	***Mg, mg/dm^3***
DRX-M$_3$-3-1	563	263	156	2013	109
DRX-M$_4$-502	590	199	117	1710	123
DRX-M$_4$-512	591	240	109	1907	151
DRX-M$_4$-571	621	213	121	1415	103
DRX-M$_4$-578	640	240	131	1800	110
DRX-M$_4$-580	611	179	127	1881	144
DRX-M$_4$-609	583	186	141	1919	119
DRX-M$_4$-640	740	223	107	1367	127

International Organization of Vine and Wine in 2004 has established of the methanol the concentration limit of the 250 ml/l for white wines and 400 ml/l for red wines (Directive 19/2004 OIVV).

In order not to mix the red grapes of vines *Vitis vinifera* L. direct producer hybrids in the European practice has started to the establishment of a limit in component - test, which is a blue-violet anthocyan of the old chemical name malvidina (Malvinas), and the new - diglucozid-3,5-malvidol. He is a natural component innocuous, clean and not possesses harmful properties. (fig.1.).

According to the European Union requirements the concentration of the diglucozid-3,5-malvidol juice of the berry do not have to exceed the limit of 15 mg/l. (fig. 2.).

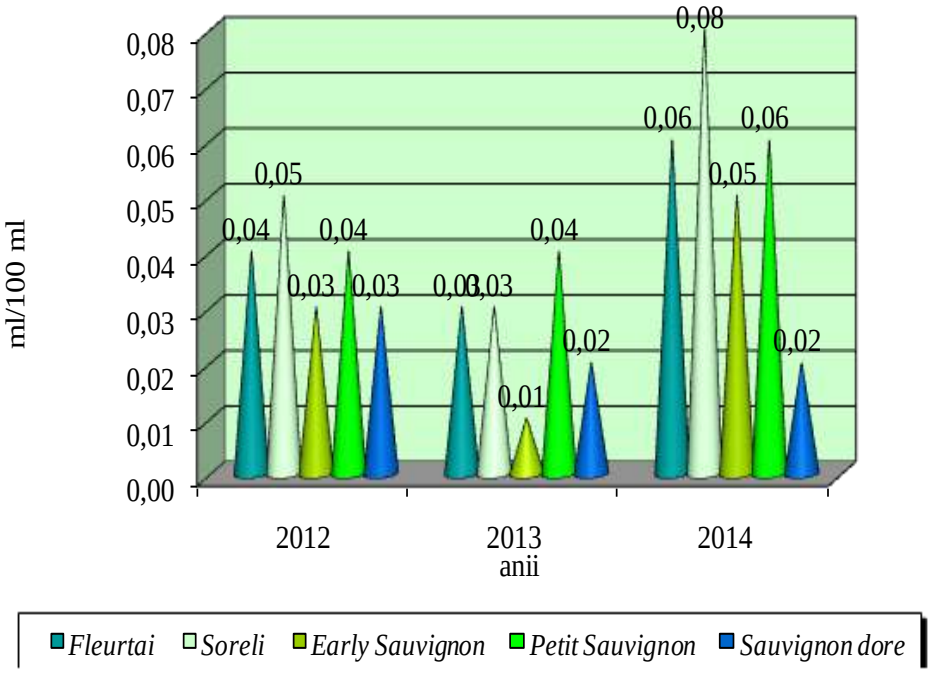

Fig. 1 The methanol concentration in varieties with the white berry.

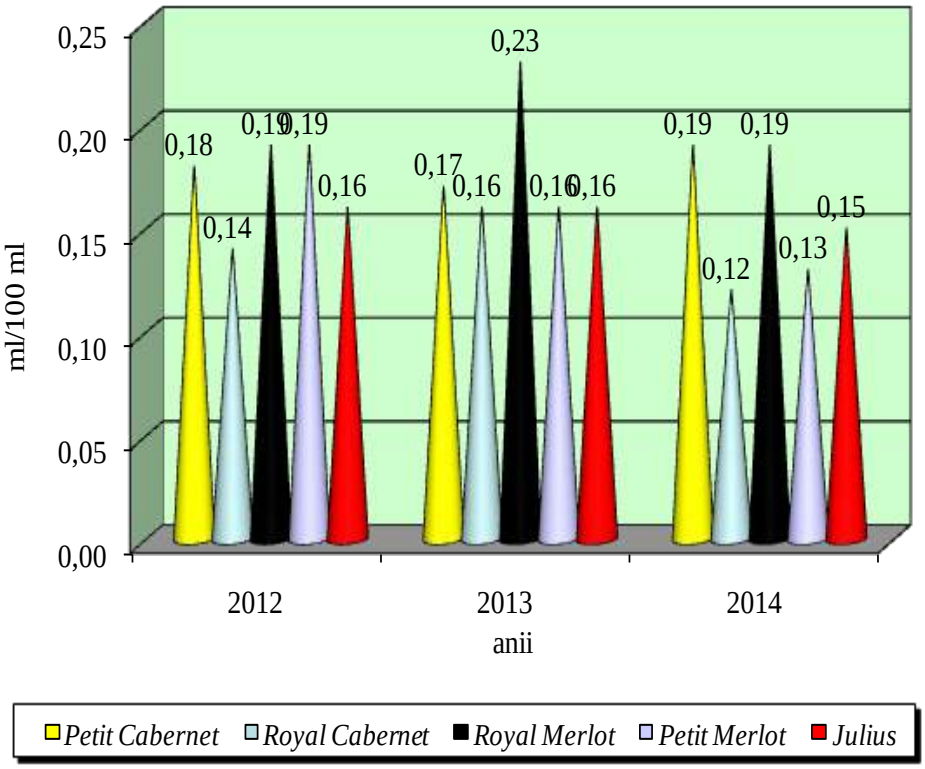

Fig. 2 The methanol concentration in varieties with the red berry.

From the results presented in Fig. 3 found that the only in the new variety Petit Cabernet of the diglucozid-3,5-malvidol concentration does not exceed the limits set of 15 mg/l and entered the in the cluster in such a way varieties of *Vitis vinifera* L.

As regards the varieties of Julius, Petit Cabernet, Merlot Petit Royal Merlot, Cabernet Royal attesting to a high concentration of this anthocyan innocuous and harmless, but which may currently just create impediments to their approval in some countries European Union.

Nutritionists and dietology says that the human body in its evolution has created sufficient enzymatic systems recovery, metabolism of anthocyanins and other compounds derived turning them into necessary and useful

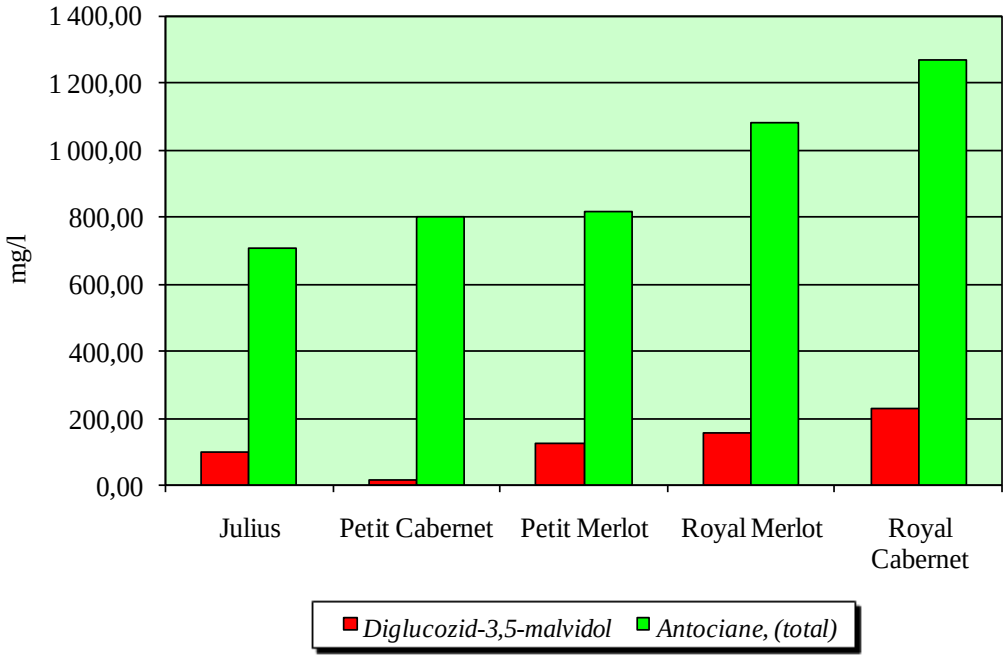

Fig. 3 The concentration of diglucozid-3,5-malvidol the total amount of anthocyanins.

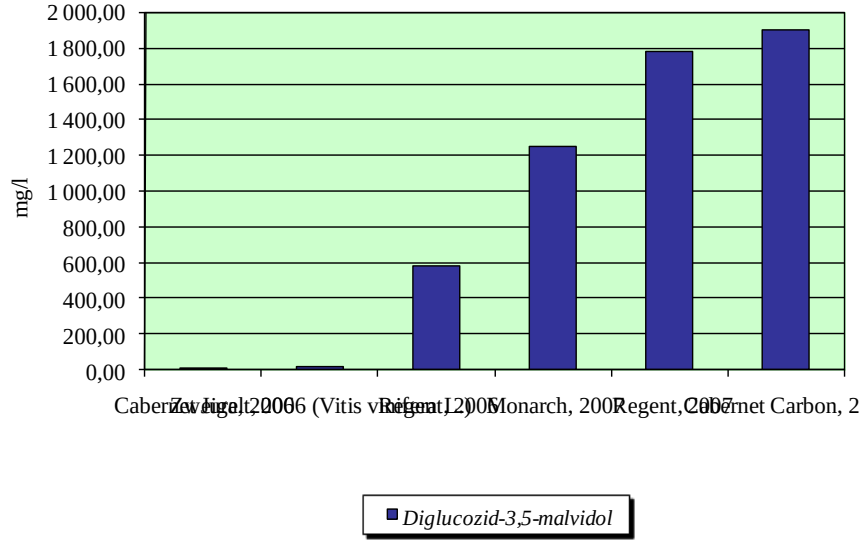

Fig. 4 The concentration of diglucozid-3,5-malvidol of the juice berries of vines varieties (red) created in Germany.

Interesting results from the view point uvologic and oenological have been obtained by the specia of new varieties of vines from Germany, which proves that us can be get the character the selection agrobiologic intraspecific important (resistance, productivity and quality), but with the a high content in diglucozid-3,5-malvidol (580 mg / l in the wine variety Regent and 1,900 mg / l in wine Cabernet Carbon).

Interesting results from the view point uvologic and oenological have been obtained from of vines the varieties created in Germany, proves that which we can be get the important agrobiologic character of the selection intraspecific (resistance, productivity and quality), but with the a high content in diglucozid-3,5-malvidol (580 mg/l in the wine variety Regent, and 1900 mg/l Carbon Cabernet wine).

Of course in comparison with the varieties of *Vitis vinifera* L., Cabernet (Jura, France) and Zweigelt (Rhein, Germany) investigated the index not exceeding the limits 15 mg/l, established by the specialized international organizations (fig. 4).

CONCLUSIONS

1. The creation of varieties of vines resistant to phylloxera root and foliar in mildium powdery mildew, gray mold and other biotic and a high resistance to low temperatures in winter and drought, will enable truly solving the problem of producing table grapes and for industrial processing biological (ecological). Due to their high agro biological properties, these varieties treated during the season - moderate and limited (strictly in accordance with European legislation "bio") will allow to ensure high hygiene and berries and grapes curativitate.

2. The new varieties must have the a period precocious maturing of the grapes to ensure the planting and nurturing their at the frontiers of northern of viticulture various continents, ensuring at the same time and maturation chord plants for the wintering success, allowing their cultivation on the espalier with medium and high stem to the maximum possible mechanized and automated cutting processes agro- technical bound, sprinkled, manually or mechanically with combine harvesting etc.

3. It is desirable that the grapes varieties of grapes for current consumption to possess high transportability order to be exported at great distances, and the technical - capacity low absorption of oxygen in the air and protection of berries, juice and wine at oxidation (redox processes reductive low).

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THE CULTURE TECHNOLOGY OF GRAPE-VINE FROM THE MONASTERIES OF THE ARCHDIOCESE OF BUCHAREST LOCATED IN DEALU MARE VINEYARD BETWEEN PAST AND FUTURE

UNGUREANU FLORIN, GUTUE CĂTĂLIN[1]

Summary: *The paper presents a study of the culture technology of grapevines at "Saint Nicholas" Chiţorani - Valea Călugărească, "Saint Mary" – Urlati and "Saints Constantine and Elena" – Ceptura monasteries from the Archdiocese of Bucharest holding in property areas planted with grapevines in Dealu Mare vineyard. The culture technology is presented comparatively when the ground works were made traditionally, manually and hypo (Figure 1) and the revive period of vineyards, 2009-2014, through the Agency for Payments and Intervention in Agriculture (APIA) by the implementation of restructuring / reconversion (Figure 2). Before 2009 it was achieved on average a quantity of 4 tons of grapes/ha, and currently yield an average of 8 tons of grapes/ha. Regarding the culture technology applied after 2009, together with introduction of valuable varieties from Dealu Mare, they permit the production of quality wines with denomination of controlled origin (DOC) and geographical indications (GIs).*

Keywords: *vines, crop technology, retraining*

INTRODUCTION

The history of grape-vine cultivation in Dealu Mare is inseparable from the history of monastic establishments from the "Ungrovlahia" Mitropoly recognized as Mitropoly by the Synod of Constantinople in 1359 [1]. Thus, monasteries like Snagov, Căldăruşani, Cernica, Ghighiu, Turnu held planted areas with grape-vines organized in monastic brances[2] in Dealu Mare vineyard, where grape-vine culture was the main concern of local residents. The current village Valea Călugărească from Prahova county has its origin in the Valea Călugărilor, alleging on the existence of Călugăreni village, attested since 1464. During the ruler Vlad the Monk (1482-1495), elevated to the trone by Stephen the Great, Valea Călugărească appears with this name as both a village and a vinegrowing center. The ruler had large areas of grape-vines in Valea Călugărească, the obtained wine production allowing the intensification of trade in wine [7]. Christianity gave a new impulse to viticulture, due to the use of wine as the religious symbol, and along with bread constitutes the matter of the Holy Eucharist instituted by Christ Himself as such, which was used in the Last Supper [2].

Wine is used at other sacraments[3] and religious services[4]: at weddings, at the church divine service, at the consecration of the church, at memorials [4]. The hierarchy of the shurch and of all the Romanian monasteries monks represent true promoters of viticulture.

MATERIAL AND METHOD

The paper carried a study on the technology culture of grape-vine from the monasteries of the Archdiocese of Bucharest that own areas planted with vines. As such, the winegrowing culture was studied by comparative analysis during ante and post 2009. The monasteries that were subject of the research are monasteries of tradition in viticulture: Monastery "Saint Nicholas" Chiţoran – Valea Călugărească, Monastery "Saint Mary" – Urlati, Monastery "Saints Constantine and Helena" - Ceptura.

[1] Drd. USAMV Bucharest.

[2] Agricultural household or a real property of a monastery (building or group of buildings) that serves as a guest room, administratively subordinated to a bigger.

[3] Church services by means of which people undersand in a special way the grace of God in the most important moments of life (baptism, anointing with chrism, Confession, Communion, Marriage, Priesthood, Holy Unction).

[4] Religious services and prayers for human blessing in different moments and circumstances of his life, and for the blessing of the surrounding nature and different things or objects of human use (blessings, consecration, dispensations, exorcisms).

RESULTS AND DISCUSSIONS

Period ante 2009. The grapevine lovingly maintained for nearly a century by the monks of three monasteries crossed a struggle of historical turmoil, by combining harmony between prayer and labor - ora et labora[5] [5].

The total area cultivated with grape vines that monasteries hold is 45 ha, as it follows:
- Monastery "St. Nicholas" Chiţoran - Valea Călugărească → 12 hectares;
- Monastery "St. Mary" - Urlati → 10 ha;
- Monastery "St. Constantine and Helen" - Ceptura → 23 ha.

This period has also meant a protected technology culture system, characterized by using the low-form of leading hubs to allow a total or partial cover of the ground hub in winter, a work which is being executed in autumn after leaves fall [6].

Planting distances were 1.6m between rows and 1.2-1.3m between hubs, ensuring densities of 4.807-5.208 hubs / ha. Soil tillage is performed exclusively hypo and manually due to the small distance between rows, mechanization was impossible, also smaller distances between rows and the highlight influence of the hub. The grape-vine is a plant with high demands to light. The process of photosynthesis is more intense in the direct sunlight with a chlorophyll assimilation higher than in the shade. Insufficient light was a determining factor in reducing photosynthesis, debilitating hubs, sensitizing them to disease, reducing buds and, consequently, low production and low quality grapes [3].

Fig. 1 – Grapevine plantation before reconversion

Fig. 2 - Grapevine plantation after reconversion

Initial plantations were pure in terms of diversity of varieties such as: black Horn, Afuz Ali, white and black Babeasca, ink Traminer, Pinot Gris, Muscat Ottonel, filling the voids in time was conducted without further taking into account of the initial variety, leading to impure plantations. There was such an inconvenience to determine when to harvest the grapes caused by staggered ripening varieties in the plots.

Phytosanitary treatments against pests and phytopathogenic agents were executed with a manually pump sprayer. The application of these treatments relatively few in number (4-5 / season) were insufficient to ensure rational measures to combat noxious agents (diseases, pests) at the best time and with the best results. The inability to execute phytosanitary treatments on time has produced a significant loss of crop quality. All these elements of plant protection involved a heavy workload, multiple staff numbers, higher costs and more time spent on the links in crop maintenance program.

Harvesting grapes is held at all 3 monasteries, successively, all the monks and day workers were finishing harvesting at a monastery, then in an organized way, they continued harvesting at other monasteries. The grapes were harvested into baskets or buckets and hand-carried to the end of the row where horse carts had taken and had brought them to the winepress. Harvesting began with the white grapes and continue with the red obtaining the two categories (white wine and red wine) and with obtaining table wine (consumer), light, anonymous, without claims of identity or vineyard variety [6], with an alcoholic strength of 8.5-9% volume.

The year of 2009 represented for the monasteries mentioned a moment of change in the technology culture of grape-vines. The program of restructuring / reconversion implemented by APIA was an eligible measure or all three monasteries which led to changes in crop varieties with superior varieties existing in terms of quality.

The reconversion program was conducted over the entire surface of 45 ha, staggered as it follows:

Table 1

Reconversion distribution in 2009-2014

Year of planting	Monastery	Area(ha)
2009	"St. Constantine and Helen "– Ceptura	3,0
	”Saint Mary” – Urlați	2,0
2010	"St. Constantine and Helen "– Ceptura	4,0
2011	"St. Constantine and Helen "– Ceptura	16,0
2012	”Saint Mary” – Urlați	8,0
2013	”Saint Nicholas” - Chițorani – Valea Călugărească	2,0
2014	” Saint Nicholas” - Chițorani – Valea Călugărească	10,0
Total		**45,0**

The establishment of new plantations aimed at obtaining an increased production of quality grapes through the use of modern technology culture of grape-vine, based on the technical execution projects.

Previous work of replanting with varieties of noble grape-vine pursued to ensure optimal conditions for the development of roots and shoots growth of freshly planted vines. The following works were performed:

- grubbing up vines from old-vine plantation;

- removing wooden trellis and concrete and wire port;

- removal of roots and land scarification depth of 70cm;

- 30-40 cm deep plowing and land leveling disc harrow through two passes perpendicular.

For pedological characterization there were performed soil profiles in which soil samples were collected, while for agrochemical characterization of soil samples were collected at 0-30 and 30-60 cm depth from 5 different locations.

The fertilization of soil was done in accordance with recommendations issued by I.C.D.V.V. Valea Călugărească6 after agrochemical mapping. From the data analysis about the main agrochemical features of the soil, after the application of basic fertilization, it results that the soil plots studied showed a high fertility. The high content of mobile phosphorus and potassium forms have the effect that the basic fertilization was carried out properly. Table 2 illustrates, for example, agrochemical mapping result before plantation establishment of "St. Constantine and Helen "- Ceptura in 20117

Table 2

Results on agrochemical mapping

No. sample	Depth (cm)	$N\text{-}NH_4$			$N\text{-}NO_3$			P mobil ppm			K mobil ppm		
		Initial Mapping	Final Mapping	Dif.	Initial Mapping	Final Mapping	Dif.	Initial Mapping	Final Mapping	Dif.	Initial Mapping	Final Mapping	Dif.
1	00 - 30	2,62	2,76	0,14	1,40	1,48	0,08	40	368	328	120	392	272
	30 - 60	2,40	2,49	0,09	1,82	1,88	0,06	32	264	232	104	348	244

2	00 - 30	2,95	3,11	0,16	1,90	1,98	0,08	28	352	324	160	416	256
	30 - 60	2,72	2,81	0,09	1,31	1,37	0,06	42	260	218	112	320	208
3	00 - 30	2,11	2,24	0,13	1,71	1,75	0,04	28	292	264	148	392	244
	30 - 60	2,72	1,79	0,07	1,23	1,25	0,02	30	266	236	120	348	228
4	00 - 30	2,38	2,53	0,15	1,77	1,85	0,08	60	420	360	112	328	216
	30 - 60	2,30	2,39	0,09	1,33	1,37	0,04	32	302	270	104	304	200
5	00 - 30	2,62	2,79	0,17	1,59	1,72	0,13	48	340	292	148	352	204
	30 - 60	2,71	2,82	0,11	1,74	1,84	0,10	36	416	380	144	312	168
Average values	**00 - 30**	**2,54**	**2,69**	**0,15**	**1,67**	**1,76**	**0,09**	**41**	**354**	**313**	**138**	**376**	**238**
	30 - 60	**2,37**	**2,46**	**0,09**	**1,49**	**1,54**	**0,05**	**34**	**302**	**268**	**117**	**326**	**210**

Planting cuttings was executed manually and mechanized with planting distances of 2.2 m between rows and 1.0 m between plants in the row, ensuring a density of 4.545 vines / ha. The main support consists of concrete and metal trellis with 3 wires bearing fixed at heights of 70 cm, 110 cm and 150 cm from the ground and plant support tutors made with bamboo.

Phytosanitary treatments are administered at the time of warnings issued by the County Agricultural Directorate Phytosanitary Unit.

The varieties used in plantations in the period 2009-2014 are: Merlot (19 ha), Cabernet Sauvignon (7 hectares), Black Fetească (10 ha), Royal Fetească (3 hectares), Muscat Ottonel (1 ha), Sauvignon Blanc (5 hectares). These varieties allow a category of wine with denomination of origin (DOC) and geographical indications (GIs).

CONCLUSIONS

The post 2009 period brings to the life of monasteries that hold large areas with grape-vine from the Archiepiscopate of Bucharest a major change. It went from tillage performed manually and hypo to mechanization tractors and performant equipment. Phytosanitary treatments are mechanized according to warnings issued by the Department of Agriculture. Maintaining soil in plantations is done with a grass strip system - alternating grass field intervals with intervals maintained as black field. If in past it was achieved on average a quantity of grapes 4 tons / ha, currently it is registered an average of 8 tons of grapes / ha. The cultivation technology applied after 2009, together with introduction of valuable varieties from Dealu Mare vineyard ensure the production of top quality wines.

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THE STUDY OF PLANT SAMBUCUS EBULUS L. (CAPRIFOLIACEAE) FROM SPONTANEOUS FLORA- AND ITS BENEFIC OBTAINED EFFECTS

[1]JIANU SORIN, [2] DANIELA LAURA BURUIANĂ, [3]TĂNASIE ȘTEFANIA ELIZA, [4]ALEXANDRU CHIRIAC

Abstract: *In this paper, the authors had presented a study made on the leaves of Sambucus ebulus L. and they tried to give a higher trust of naturist products, especially because these are plants from the spontaneous flora of our country. Because the results obtained over the time from these plants are satisfactory, with the condition of rational consumption, the determinations made at this plant fit in normal ranges, in order to be used with trust, especially against constipation and emetic in certain cases [Olimpia Pandia., Sărăcin I, Dinu Mariana, Chiriac Al.,]. The marketing of these products, in different forms, also comes to complete a sure income and easy to be obtained.*

Key words: *flora, spontaneous, chlorophyllian pigments, naturist product*.

INTRODUCTION

The small elder (*Sambucus ebulus L.) Fam. Caprifoliaceae* is known under the name of bozie, boj, small elder. In Romania, *the species Sambucus ebulus L.* is common; being met in all zones of country, in different places and it is not pretentious at climate and soil. This plant is found in the spontaneous flora of our country in three species [Geissman T. A.]: Sambucus nigra L. (black elder); Sambucus ebulus L. (small elder); Sambucus racemosa L. (red elder).

From the species of Sambucus genus are used in medicine, the flowers and sometimes the fruits. The black elder flowers have an ancient usage in scientific and popular medicine. They have an sudorific, diuretic, galactogen, expectorant action, are used against obesity, cold, cough [Berger FR; Constantinescu C.,; Davidek C., Titin N. V]. Externally, black elder flowers have emollient, being recommended in baths, poultices, boils, pharyngitis, laryngitis, and the small elder ones have anti-phlogistic effects [Berger FR;]. The black elder flowers are parts of anti-rheumatic, depurative and sudorific tea [Davidek C.,].

The small elder is a perennial plant, known as the step-brother of elder, and it measures up to 1.6 m, the flowers are white and the fruits are black. The radicular system is strong and presents a deep rooting; being the most used part in therapeutic interest.

The small elder is usually used in diets, it is a very good diuretic, painkiller, inflammatory, antispasmodic, emetic, expectorant.

The small elder also contains: fatty acids, phytosterols, ursolic acid, glycosides, iridoid compounds. It is distinguished by a repulsive smell of leaves, stems and roots.

MATERIAL AND METHOD

Because the leaves have purgative and emetic proprieties, for establishing their importance for naturist medicine there were made studies in 2013, on 10 lots of small elder plants, harvested from 10 different places from S-V Oltenia area, more precisely from Grecești village, Dolj county, in august, and preponderant soil in this area is argic chernozem.

For the determinations there were made soil analyses and analyses of *Sambucus ebulus L.* leaves, in order to determine the chlorophyll pigments, nitrogen, phosphorus, potassium and dried substance. 10 soil samples were taken from the places where the small elder leaves will be harvested.

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Table 1. Determination of chemical proprieties of argic chernozem harvested from the study area

Sample no.	pH	Nt	P_2O5	K_2O	Ah	SB	Humus
1.	6,15	0,191	4,1	11,5	2,71	16,8	2,16
2.	6,34	0,224	5,4	21,4	1,80	19,4	2,19
3.	6,46	0,21	5,2	14,8	2,16	19,2	2,14
4.	6,20	0,211	4,2	16,9	2,76	16,8	2,21
5.	6,25	0,216	3,8	17,5	2,14	18,0	2,24
6.	6,18	0,188	5,5	16,6	3,60	15,5	2,19
7.	6,20	0,210	4,2	16,8	2,72	16,7	2,20
8	6,22	0,214	4,3	17,1	2,65	16,9	2,21
9	6,27	0,219	4,0	18,1	2,17	17,6	2,26
10.	6.30	0,222	5,1	20,8	1,92	19,1	2,17

The preparation of plants samples for analysis

The harvested samples (leaves) do not present visual symptoms of nutrition disorders and they are prepared for the established analyses program. Some leaves which have presented slight traces of dust have been wiped with a gauze or cotton pad softened in distilled water.

The mineralization of vegetal material for determining nitrogen

For determining nitrogen was been used Kjendal method, by mineralization with sulfuric acid.

Procedure

From the sample of dried vegetal material and finely chopped it is weighed at analytical balance 1 g of material and it is introduced in a 250 ml Kjendal disintegration balloon. 5 g of catalyst mixture and 12.5 ml of concentrated sulfuric acid are added. The balloon is covered with a pear or glass funnel and the violent boil is avoided. The mineralization is considered done when the balloon content fades from brownish-yellow to colorless or slight green hue.

The determination of gross protein. Total nitrogen

Total nitrogen content from the vegetal material is determined by wet mineralization, the sulfuric acid being widely used, in different variants of classical Kjendal method.

The calculation and results expression

For the calculation of N content in % the next formula is used:

$$\mathbf{N_t\ \%}\ \text{from DS} = (V_1 - V_2) \cdot f \cdot 1000 \cdot 100 / m \cdot 1\,000\,000$$

where:

- DS = dried substance
- V_1 = ml of sulfuric acid used at titration of the analyzed sample
- V_2 = ml of sulfuric acid n/14 used at titration of the blind sample
- f = the factor of n/14 sulfuric acid solution
- m = the quantity of vegetal material taken for analysis in g
- 100 = the factor of percent reporting
- 1000= the factor for transformation of micrograms of N in g of N

In these conditions, the formula has the simplified form:

$$N_t\ \%\ \text{from DS} = (V_1 - V_2) \cdot f \cdot 0{,}1$$

The determination of phosphorus

The prepared materials are determined and read at the spectrophotometer when they are yellow, using the formula:

$$P\% = C \times Vt \times 100 / Va \times m \times 1\,000\,000$$

where:

C – the content of P in micrograms of the aliquot part used at color metering

m –the quantity of vegetal material used at mineralization in grams

Vt – the total volume of extract obtained at mineralization in ml
Va – the volume of aliquot part used in color metering
100 –the factor of percent reporting
1 000 000 – the factor of transformation of micrograms in grams

Figure 1. The determination of phosphorus from small elder plant

The determination of K is made by calcination, and the dosage of K is made by photometry of flame emission or potentiometry with selective electrode ion.

Figure 2. The extracts and the equipment used for determining K with flame photometer

The results obtained at the total K dosage from the vegetal material are expressed in percent from the dried substance.

$$K\% \text{ from DS} = C \times V \times r \times 100 / m \times 1000\,000$$
$$K\% \text{ from DS} = C \times V \times r / m \times 10\,000$$

where:
C – the concentration in micrograms K per ml, found on the calibration curve
V – the volume of diluted solution used at the dosage in ml
r – the dilution report used
m – the quantity of vegetal material used at mineralization in grams

The determination of carotene and chlorophyll pigments

5 g from the fresh substance from the analyzed plant sample is weighted and milled very well, then 25-30 ml of ethyl alcohol are added, in small glasses of 50 ml.
The next day this is filtered and brought at the sign (50 ml) with alcohol. The readings are made at the photo-colorimeter and the results are introduced in the calculation formula.

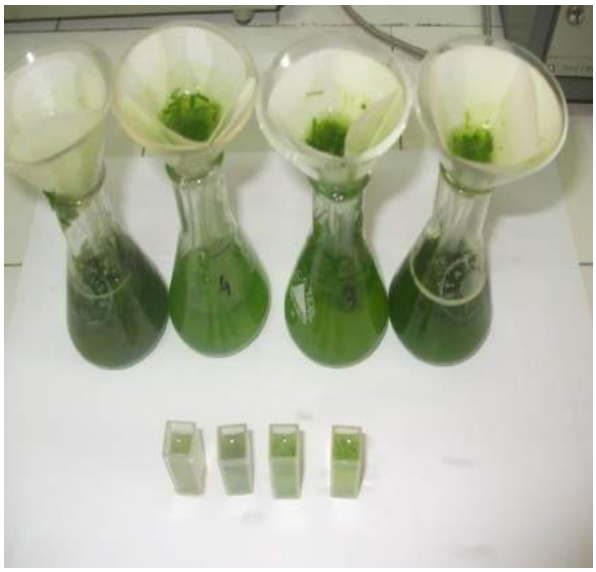

Figure 3. The preparation of samples for determinations

Figure 4. The sample reading at the photo-colorimeter

Figure 5. The extract used for determining the carotene

RESULTS AND DISCUSSIONS

Table 2

The biochemical determinations obtained from *Sambucus ebulus* plant

Variant	**Nitrogen %**	**Protein %**	**P_2O_5 %**	**K_2O %**	**Chlorophyll pigments**			**Dried substance g %**
					Ca	Cb	K	
1	3,11	19,4	1,96	1,65	10,615	4,722	3,962	28,53
2	3,02	19,4	1,91	1,58	10,215	4,658	3,891	28,51
3	3,07	19,5	1,93	1,61	10,428	4,719	3,944	28,54
4	3,11	19,02	1,95	1,64	10,602	4,718	3,955	28,52
5	3,09	19,2	1,94	1,63	10,602	4,709	3,951	28,50

6	3,12	19,01	1,96	1,65	10,617	4,720	3,949	28,52
7	3,07	19,5	1,93	1,62	10,528	4,702	3,953	28,52
8	3,09	19,6	1,94	1,63	10,609	4,711	3,952	28,53
9	3,13	19,2	1,90	1,65	10,587	4,723	3,950	28,51
10	3,10	19,01	1,92	1,64	10,602	4,718	3,900	28,50

CONCLUSIONS

- The biochemical substance from the leaves of indigenous species of Sambucus genus were studied qualitative and quantitative.
- From leaves a 5% infusion can be made, being used as diuretic, sudorific, for cough and for cleaning heavy throat.
- A certain limit must not be overcome because it becomes emetic.
- For laxative purposes a cup of infusion per day can be served.
- The small elder effect is very strong, because of that must not overcome the recommended dosage.
- The small elder, as plant used like naturist remedy, is contraindicated for weak persons, suffering of diarrhea, IBS, hyperacid gastritis, persons with stressed emetic sensation.

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GREEN LEAVES OF ALFALFA USED IN THERAPEUTICAL PURPOSES

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Abstract: *Medicago Sativa, also known as fodder for animals, has the propriety to increase the content of organic substance from the soil. After the biological, chemical and biochemical research on this plant, there was found an important/significant content of nutritive substances necessary for the human body and, used in various forms (as tea, juice, salads etc.), contributes in the same time as naturist medicine for human organism, or just in therapeutic forms for treating or improving diseases (as tinctures, capsules, powder etc.).sent the results obtained in order to determine the optimal moment for harvesting green leaves of Medicago sativa and the establishment of the maximum content in nutritive substances. Medicago sativa distinguished by the high content in enzymes, phytoestrogen, protein, Calcium, iron, magnesium, phosphorus, potassium, essential amino acids and vitamins C, B6, D, A, K and E (biologist Frank Bouer).*
Because the quantity of vegetal protein existing in the green leaves of the plant is higher than the one existing in the animal protein and the vitamin C is four times higher than in citrus (Gillian Mc Keith, 2008), the values of the two nutrients are determined in two different moments of leaf harvesting.

Key words*: evolution, milk production, NW Region, Romania, trends.*

INTRODUCTION

The medicine obtained naturally and their beneficial role for the human body are searched in old treatment recipes and naturist cures used for hundreds of years but forgotten through time, are rediscovered today by research and are people seek and use them more and more.

The completion of the nutritive substances necessary for the human body by day-by-day nutrition gives importance for the knowledge of other sources for obtaining them besides the known ones [Pârvu C.,2003].

Thus, besides the consumption of many plants, fruits and vegetables, *Medicago sativa* is studied and recommended by phyto-therapists as a naturist medicine for treating and improving various diseases but also for the completion of the necessary of essential amino acids which cannot be synthesized by the human body and which are found in this plant in number of eight (Mc Keith, 2008). The content in chlorophyll existent in *Medicago sativa* leaves has an anti-bacterial effect for the consumer and has a beneficial effect for the consuming organism by fortification of the immune system for elders, the decrease of cholesterol level and the prevention of cardiovascular diseases and myocardial infarction, if it is added in nutrition.

Also, the consumption of green leaves of this miraculous plant supports the fortification of osseous system and dentition at children. The quantity of vitamin C existent in these leaves is four times higher than in citrus and the calcium is absorbed and assimilated easier by the organism, being the essential nutrient that every cell in the human body needs in order to resist, to be strong and healthy and which can be taken by consuming the leaves [Giurgiu O., Giurgiu C., 2005; Olimpia Pandia, Sărăcin I, Dinu Mariana, Chiriac Al., 2010].

The plant is also used as general tonic and hardener for the immune system. The treatment with *Medicago sativa* is recommended by specialists for detoxification and stimulation of liver function and purification of blood.

Due to its high content in fibbers, the plant has the power to absorb and eliminate the toxins inside the body [Mc.Keith Gillian 2008]. "In case of consuming the plant before meals, the gastro-intestinal functions are supported because it facilitates the release of gastric compounds which help the digestion. Equally, it can support the assimilation of nutritive

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substances from aliments if consumed at the end of the meal", [Mc.Keith Gillian 2008].

Because the proteins are components of every cell in the organism, being involved in its every functioning process, it is very important to know the quantities of vegetal proteins existent in each aliment, because the daily necessary is 1g/body, depending on sex and age, and the *Medicago sativa* leaves have in their composition high quantities of protein (above 18,9% protein), compared to the animal proteins [WHO, 1999].

MATERIALS AND METHODS

Research and studies were made in 2013 in the north of Oltenia, specifically in Grecești village, where favourable natural conditions exist. *Medicago sativa* improves soil fertility, being par excellence an ameliorative plant, and is the most extended culture existent in the area. It is used by people especially as fodder for animals, without being aware of its agro-technical value and its propriety of aliment and naturist medicine and without accounting the seed purity or the mandatory maintenance works, respectively weed control.

Therefore, the appliance of technology at alfalfa for seed is indicated for its usage as food and naturist medicine.

To realize the proposed objectives, we have taken in study a surface of 100 m^2 cultivated with alfalfa, where we have made the maintenance works for weed control in the spring and we harvested eight samples for each separate development moment, at the end of April and the beginning of May, specifically at the end of budding and the middle of blooming phase of the plant, for determining protein and vitamin C from these plants.

The sample preparation for analysis is made in this way: before establishing the analyses program to be made, the plant leaves harvested before budding are carefully examined in order to be healthy and not to contain impurities (straws, soil particles), and numbered for each sample.

The work method for determining vitamin C (volumetric) in *Medicago sativa* leaves consist in: 5 g of fresh substance from the sample plant are milled and washed with 50 ml hydrochloric acid 2%, in 250 ml large glasses by philtering. 10 ml of extract are taken, 5 ml of IK 1%, 5 ml HCl 2%, 30 ml distilled water, 2-3 drops of starch. It is titrated with potassium iodate 0,001 n and a slightly blue solution results.

The results of the titration are multiplied by an 8.8 coefficient. The result is expressed in mg of ascorbic acid/100 g fresh substance/mg%.

Work method for determining the content in protein from *Medicago sativa* leaves was made on the principle of classical method Kjendal, where 1 g of vegetal material is weighed and introduced in a Kjendal balloon.

10 ml of concentrated H_2SO_4 are introduced in the balloon and are left until the next day when the balloon is covered with a glass funnel and boiled for 4-5 hours.

When the liquid from the balloon has bleached (from black to light brown) the balloon is taken from the flame and left to cool for 20-30 minutes. After this, 4-5 ml of perhydrol are added. The mineralization is continued until the liquid becomes colorless.

The cooled solution is completed with distilled water and is passed through a 100 ml ranked balloon, and is brought to the sign. The obtained solution represents the nitrogen from the analysed plant which will be dosed by distillation and, after the nitrogen is calculated, the percent of gross protein from the analysed vegetal material is calculated by multiplying the N_2 total content calculated with a convert factor which represents the quantity of protein in grams which corresponds to a gram of nitrogen.

In this case, the calculated factor has a value of 6.00.

$$\text{Protein} = Nt \times f \qquad (1)$$

Where:

Nt – represents the total nitrogen from the analyzed plant

f – the convert factor

RESULTS AND DISCUSSIONS

The effectuated analyses and the obtained results are shown in the tables down, these being harvested in two different methods, eight samples each.

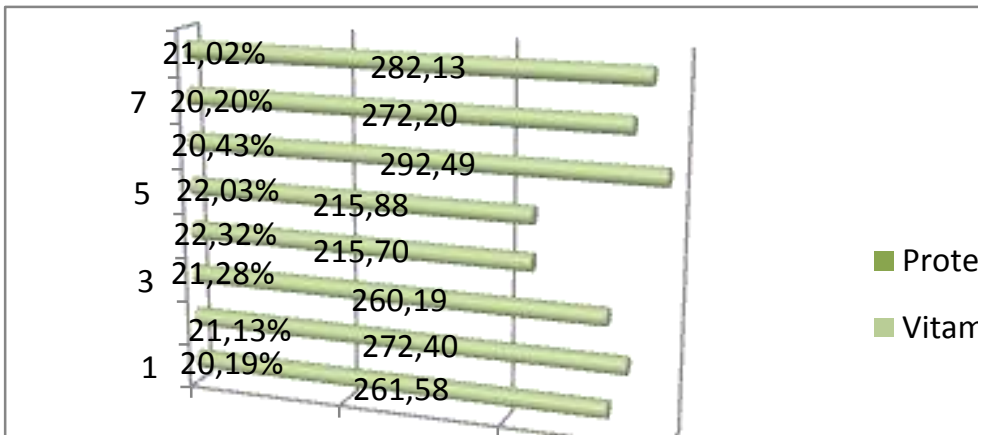

Fig. 1. Determination of protein and vitamin C during budding
Source: Own determination.

From the results obtained after determinations it was found that the higher percent of protein is in the leaves harvested at the end of blooming (22.32%), which leads to the assumption that the harvest of *Medicago sativa* leaves in this period is very good, so that they can be used at their maximum yield both as food and medicine. The vitamin C has significant values (292.49 mg of ascorbic acid) and the consumption of these leaves in green state is a new source of nutritive substances needed by our organism.

Figure 2. *Medicago sativa* harvest plants for making determinations
Source: own results

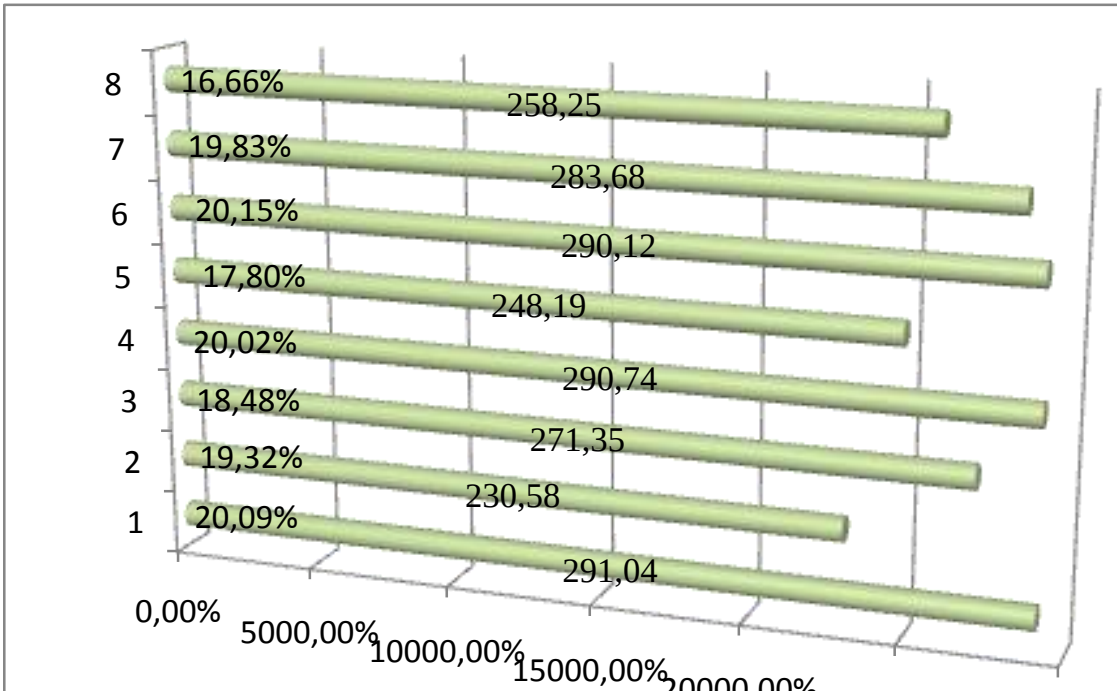

Figure 3. Determination of protein and vitamin C during blooming
Source: Own determination.

After making the determination for the second moment (the plant blooming one), the results obtained for the two determinations are positive, but the alfalfa leaves are richer in vitamin C in this period, having values comprised between 230.58 and 291.04 mg of ascorbic acid and the protein has the highest value of 20.09%.

CONCLUSIONS

The results obtained by biochemical determinations are necessary materials which will make the study object for obtaining naturist products which have as active substance components obtained from alfalfa leaves, being known that the replacement of chemical-obtained products with naturist ones is tried with success.

The researchers continue the studies and put into practice the obtained results for the promotion of naturist products both in alimentation and naturist medicine as well as in beauty industry.

The studied active principles obtained from these leaves are more efficient, even if they act slower, being easy to procure on a larger period of time, cheaper and at hand for people who want raw alimentary supplements, drugs and naturist treatments.

ACKNOWLEDGEMENTS

Medicago sativa can be a sure source of profit for many commercial entrepreneurs who can transform the known fodder plant in alimentary supplements and naturist products as tea, tinctures, powders, capsules.

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COMBATING THE ROSE TIP-INFESTING SAWFLY- ARDIS BRUNNIVENTRIS HTG.

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Summary: *For its great decorative value, the rose is present in parks and gardens as an ornamental plant isolated or in groups. Along with biotic factors, pests can affect the decorative value of these plants. Among them are Tenthredinidae wasps. The paper presents data on Ardis brunniventris attack frequency on rose plants from four landscape designs. It is also presented the negative impact of this pest on rose plants in suggestive images. Control measures are applied depending on the specific arrangements (public, private or with closed circuit). The urban environment influence the pest management. By applying preventive measures in association with the chemicals ensures a good protection against this pest.*

Keywords: *rose, pests, wasp, control.*

INTRODUCTION

Rose plants have a significant share both in particular landscaping designs and in public ones [1, 3]. They are frequently attacked by many pests, including the *Tenthredinidae* wasps family. Of all these, *Ardis brunniventris HTG*. produces a significant damage to landscaping aesthetics.

MATERIAL AND METHOD

The detection of this pest was done by observing the rose plants from Kiseleff Park, the Park of Patriarchal Residence and private gardens.

Control methods used by us were preventive and curative measures (Table 1). These were applied only to private ornamental gardens and ornamental gardens with narrow circuit (Park of Patriarchal Residence).

Experimental options of control were based on biology of this species. The attack frequency was determined (F%) in several options of combat (Table 1) and in locations (Figure 1) in the period 2012-2014.

Table 1

Experimental options of controlling the rose tip-infesting sawfly - *Ardis brunniventris* Htg.

Option	Location
O_1 – witness	Kiseleff Park
O_2 – prophylactic measures (cutting and destruction of attacked shoots + digging soil)	Particular garden
O_3 – prophylactic measures (cutting and destruction of attacked shoots + digging soil + chemical treatment of adult emergence (Actellic 50 EC - 0.15%)	Park of Patriarchal Residence
O_4 – prophylactic measures (cutting and destruction of attacked shoots + digging soil) + chemical treatment of adult emergence (Fastac 10 EC - 0.02%)	Particular garden

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Notations were made on the frequency of attacks on shoots in the tested options (Figure 2).

Fig. 1 – Rose rabate (Kiseleff park)

Fig. 2 – Notes refering to *Ardis brunniventris* Htg. attack (Kiseleff park)

The attack frequency (F%) was determined following the form: $F\% = \frac{nx100}{N}$ where:

n = the number of attacked plants;
N = total number of examined plants.

RESULTS AND DISCUSSION

On the plants attacked by the the rose tip-infesting sawfly, larvae destroy the piercing rose buds and enter in sprouts where they form a downward to 5 cm in length gallery. (Figure 3). The attacked shoots wither, lose turgor, and dry (Figure 4). Rose plants with strong infestation the first wave of flowering is lost [2].

Fig. 3 – *Ardis brunniventris* Htg. larva in gallery

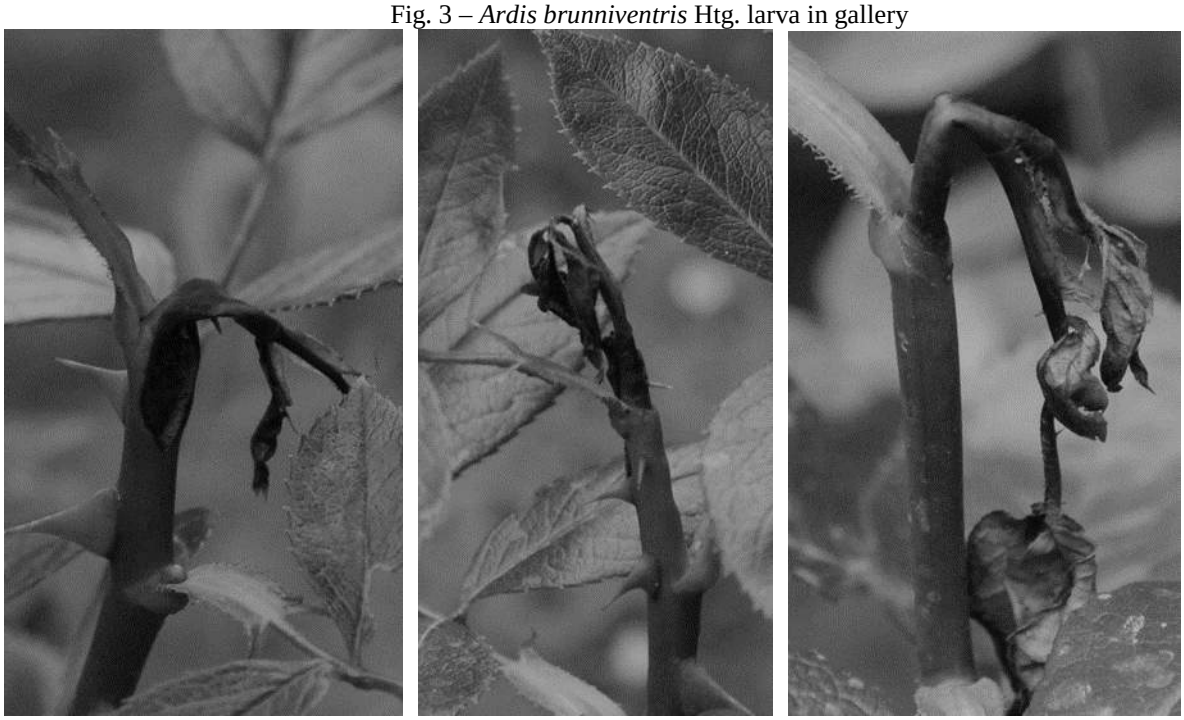

Fig. 4 – Rose shoots attacked by *Ardis brunniventris* Htg. (original)

By applying prophylactic measures to combat, cutting and destruction of infested shoots before the larvae descend into the ground and before autumn digging, f their destruction frequency attack decreased from 77.27% in 2012 to 22.72% in 2013 and 5, 71% in 2014 (table 2). Also, prophylactic measures in association with the chemical ones ensure a good protection for this pest.

Table 2

Data refering to controlling the rose tip-infesting sawfly – *Ardis brunniventris* Htg.

Option	Location	Frequency of attacked shoots (F%)		
		2012	2013	2014
O_1 – witness	Kiseleff Park	93,88	94,44	91,66
O_2 – prophylactic measures (cutting and destruction of attacked shoots + digging soil)	Particular Garden	77,27	22,72	5,71
O_3 – prophylactic measures (cutting and destruction of attacked shoots + digging soil + chemical treatment of adult emergence (Actellic 50 EC - 0.15%)	Park of Patriarchal Residence	34,28	11,22	2,50
O_4 – prophylactic measures (cutting and destruction of attacked shoots + digging soil) + chemical treatment of adult emergence (Fastac 10 EC - 0.02%)	Particular Garden	32,00	15,36	2,70

CONCLUSIONS

1. The *Ardis brunniventris* attack of the plant drops the decorative value of the rose .
2. The rose wasp is a pest that can be kept under control through control measures.
3. In particular ornamental gardens, where there is possibility of application of phytosanitary measures, the frequency of attacks is reduced by 30% in the first year of application, reducing to under 10% in the third year.

4. Prophylactic measures in association with the chemical ones ensure a good protection for this pest.
5. The management of controlling this pest in public parks is influenced by urban environment (place of rest and relaxation, playground for children, ground cover, isolated plants).

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DEFINITION OF TERMS AND PRESENTATION OF PROCESSES REGARDING THE COLLECTION, RECYCLING AND CAPITALIZATION OF WASTE PACKAGING FROM AGRICULTURAL ACTIVITIES

ALIN-ANGELIN IORGA[1]

***Abstract**: Packaging, packaging waste and agriculture are separate, distinct concepts for Romania in 2015; they seem to have nothing in common. By bringing these words together and thoroughly studying the areas which they represent, we noticed that they are the starting point in defining a new concept: "Agriculture Waste Packaging". This concept is in fact a new issue which Romania will have to face and can bring great harm to the country's natural heritage no later than in 2020.*

***Keywords**: packaging, packaging waste, packaging waste from agriculture*

INTRODUCTION

The need to feed the growing global population and the pressure that it exerts on agriculture has become a serious issue.

In this context, although currently Romanian agriculture is rather extensive than intensive, as is the case in most Western countries, there are certain signs showing that on medium term mechanization and innovations in this field will be similar to the Western ones. This clear shift from extensive agriculture to the intensive system will have both a positive impact, expressed in terms of agricultural productivity, and a negative aspect, in terms of environmental protection.

Thus, while economically Romania will benefit and will become an increasingly important exporter of agricultural goods, intensive farming impoverishes soil nutrients, reduces humus and at the same time its performance affected.

This problem is already reported by numerous European countries; unfortunately, the only natural and sustainable solution is to "let the soil rest." However, this method requires a significant level of financial losses due to the non-usage of agricultural areas annually allowed "to rest". In these circumstances, we can say with certainty that if the highly industrialized Western countries cannot afford to do so, or do not want to apply these measures which will inevitably lead to some economic losses, Romania will not use this method either.

Another less sustainable option, but with a less visible economic impact, is the permanent supply with fertilizers, herbicides and chemical pesticides. The problem is that using these chemicals, which are more or less dangerous, involves a number of risks which generate, in turn, a series of obligations on persons, companies or institutions who resort to the use of these chemicals.[1]

The biggest risk is polluting the soil, water and air by letting packaging waste from these products in nature, temporary or permanently. Therefore, packaging waste arising from the use of chemical fertilizers should be subject to strict regulation which obviously should be observed. In reality, however, due to the fact that these packages are subject to special regulation, producers, users and even the authorities are not cautious with this regard; they all prove to be ignorant rather than interested in this matter as they should be. What is even worse is that some manufacturers or users do not know what they are supposed to do with waste packaging from the activities they carry out.

This is why research and documentation on "Improving the collection, capitalization and recycling management of packaging waste from agricultural activities" is necessary for the sustainable development of the agricultural industry in Romania, affecting as little as possible the natural heritage of the country.

[1] PhD student, U.A.S.M.V. Bucharest

MATERIALS AND METHODS

In terms of defining specific terms that can be found in the concept of integrated management of packaging waste, there are several definitions in the literature. The definitions which the Romanian law is based on are also included in the Government Decision No. 621/2005 on the management of packaging and packaging waste with additions and amendments represent the starting point of the personal research.

RESULTS AND DISCUSSION

Packaging is any object, regardless of the material which it is made of or its nature, whose purpose is the retention, protection, handling, distribution and presentation of products, from raw materials to processed goods, from the producer to the user or consumer. Non returnable items made for the same purposes are also considered packaging. The criteria defining an object as packaging are [6]:

a) Items shall be considered packaging if they meet the definition without prejudice to other functions they may additionally perform, provided that it is not part of the product, being necessary to contain, support or preserve the product throughout its lifetime and all elements are intended to be used, consumed or disposed of with the product.

b) Items designed and intended to be filled at the point of sale, as well as "disposable" items sold filled or designed to be filled at the point of sale, shall be considered packaging if they have a packaging function.

c) Packaging components and other elements integrated into packaging shall be considered as part of that packaging. Other elements directly hung or attached to this product, fulfilling a packaging function, shall be considered packaging if they are not part of the product and if not all the elements are intended to be used, consumed or disposed of with the product.

Categories of packages considering their *use* are:[8]

- **Primary packaging** - sales packaging - packaging designed and made to act as a sales unit, for the final user or consumer, at the point of purchase;
- **Secondary packaging** - grouped packaging, over packaging designed to constitute a grouping of a number of units for sale at the point of purchase, whether it is sold as such to the final user or consumer; it can be separated from the product without affecting the product's characteristics
- **Tertiary packaging** - transport packaging - packaging designed to facilitate handling and transport of a number of sales units or grouped packaging, to prevent damage during handling or transport.
- **Reusable packaging** - packaging reused for the same purpose, whose return by the consumer or trader is ensured by paying a sum as a deposit system, through repurchases or otherwise.

Reusable packaging shall be considered packaging waste when it is removed at the end of its useful life. Reusable packaging shall not be considered packaging waste when it is returned to be reused.

Waste is represented by any substance or object which the holder disposes of or intends to throw away or is required to discard.

Packaging waste is defined as packaging or materials that do not satisfy the requirements and purpose which they were designed and manufactured for and which remain after the packaged product was used.

Generated packaging waste is the packaging that becomes waste after being used.

Integrated management of packaging waste means all activities of organizing and managing waste

Packaging waste management involves waste prevention, collection, transportation, capitalization, recycling and disposal, including the supervision of such operations and subsequent maintenance of the collection and disposal sites.

Prevention means measures taken before a substance, material or product becomes waste, thus reducing:

a) the amount of waste, including reuse of products or extending their life;

b) the adverse impacts of the generated waste on the environment

c) the content of harmful substances in materials and products

Pre-collection is the activity that takes place prior to collection. This comprises all actions necessary for the disposal of waste to the place where the collection services lift it up.

Collection consists of lifting up, composting and / or regrouping, including preliminary waste storage prior to transport to a waste treatment facility;

Selective (separate) collection is collecting packaging waste by type of material and / or material - a waste stream is kept separately by type and nature of the waste in order to facilitate a specific treatment

Waste transportation represents all processes that start after waste collection and end with handing them over to the point of treatment, recycling and capitalization.

Treatment is all physical, chemical and biological processes performed at the collection centres, which change the waste characteristics in order to reduce the volume and dangerous nature with a view to capitalize, recycle or dispose of them.

Recovery of packaging waste consists of any process applied to packaging waste by industrial procedures so as to turn it into a secondary raw material which helps replace other raw materials that are used in the production process.

Energy recovery of packaging waste requires the use of combustible packaging waste as a means to generate energy through direct incineration, with or without other waste, but with energy recovery.

The recovery or incineration objective at waste incineration plants with energy recovery is the total amount of packaging waste recovered or incinerated at waste incineration plants with energy recovery, reported to the total amount of packaging waste generated.

Packaging waste recycling is the reprocessing operation in a production process for packaging waste to be reused for the original purpose or for other purposes.

The recycling target is the total quantity of recycled packaging waste, reported to the total amount of packaging waste generated;

Presentation of the packaging waste collection processes, capitalization and recycling

Waste management is one of the major issues Romania faces in terms of environmental protection. Waste management includes the following: collection, transport, recycling, capitalization, disposal of waste, including the supervision of such operations and care after closing their storage areas, and, as a final process, elimination of amounts that cannot be recycled or capitalized.[9]

The packaging waste collection - collection and transport of waste and recyclable materials is an important link in the waste management; although it is often undervalued, it represents between 60% -80% of the total cost of waste and recyclables management, therefore any improvement to this element can greatly reduce this cost.

For the efficient and optimal organization of the collection and transport of waste and recyclables certain characteristics of reference will be considered, namely: the size of the collection area, the economic structure of the collection area, urban conditions, customer requirements, choosing the suitable collection scheme.

The container type, its volume, the container combination and frequency of waste collection waste affect the composition, the quantity and quality of recyclables collected separately.

Packaging waste transportation[7]

Waste transportation means all processes that start after waste collection and end with delivering them to recycling, treatment or disposal plants. Waste transportation is of two kinds: short distance transport and long distance transport. After collecting the waste from the place where it was generated follows a short transport to the nearby waste recycling treatment and / or disposal facility or at a transfer station. From the transfer station waste gets to a central facility for recycling, treatment and / or disposal by sea transport.

Material recycling involves: intermediate processing, such as sorting, shredding and / or compacting; transportation, material recovery; final processing.

The recycling benefits are preserving natural resources and reducing storage space. However the collection, transport, capitalization and the final processing require additional energy and most recycling programs would economically subsidize.

Fundamental recycling problems are related to: identification of recyclable materials; identification of reuse and recycle opportunities; identification of markets for recovered materials.

A primary goal in waste management is to maximize the service life and minimize waste deposits. To this end, materials that can be withdrawn from the waste stream to achieve this objective have to be identified.

Recycling and development programs should consider markets for recovered materials, collection infrastructure and general costs. In most cases, recovered materials are of inferior quality compared to the original ones, so that the market price should be attractive to potential buyers.[2]

Waste incineration capitalization

Waste packaging that cannot be reused or recycled are not considered raw material for industrial combustion systems but can be used as alternative fuels. Using industrial waste combustion systems is called co-incineration.

Waste and alternative fuels produced from it through various methods of treatment are accepted as energy sources and are increasingly used as substitutes in industrial processes, mainly in cement factories and power plants.

Co-incineration in cement kilns - A key aspect in making cement is clinker production in rotary kiln. [1] The starting material for the production of clinker is dried and heated to 1400 ° C and due to chemical reactions cement clinker forms. Whichever method of manufacture, obtaining clinker is a conversion process in which used materials (fuels and raw materials) are consumed or integrated into the final product.

Due to high temperatures in the cement kiln, the organic content of alternative fuels is totally destroyed. Some characteristics of clinker manufacturing, in case of using alternative fuels, are:

- extending the residence time of waste gases in the rotary furnace at temperatures of over 1200 ° C;
- using the ash resulting from burning alternative fuels as part of clinker with other materials;
- chemical and mineralogical fixing in the clinker of the elements found in very low concentrations.

Burning in power plants - power plants as electricity producing plants are designed for efficient use of conventional fuels. However they can be adapted to alternative fuels.

Using waste and alternative fuels is limited by the following elements:[3]

- storage possibilities in power stations;
- waste pre-treatment requirements to bring them into a usable form of particular combustion systems used in power plants;
- waste behaviour during the combustion process, respectively reducing the combustion process by filing the kiln walls, corrosion and influencing waste gas abatement systems.

Incineration of waste in Romania is used mainly in the cement industry. This is due to increasing demand from the cement manufacturing industry and relatively small demand from

electric power industry, as electricity is mainly produced by the numerous hydropower plant located on the main rivers of the country. The advantages of co-incineration are:

- reducing waste deposited;
- waste energy recovery where material recovery is not possible;
- conservation of raw materials needed to produce energy.

CONCLUSIONS

Waste management is a major issue that Romania will face in terms of increasing intensive agriculture.

The activities related to waste management should be carried out with due regard to environmental standards that are consistent with the requirements of EU legislation.

EU policies in the field of waste management highlight the importance and as such they need an integrated approach to waste management.[5]

Waste management involves the collection, transport, treatment, capitalization and disposal of generated waste.

The collection, recycling, recovery through incineration are waste processing methods commonly used in most countries. Such methods are intended both for factors such as environment protection and for the rational and effective economical exploitation of natural resources.

Recycling focused on two fundamental objectives: - neutralize toxic waste in order to reduce air, water and soil pollution as much as possible, and cause no harm to living organisms as well as reduce waste mass and volume for safe storage.

Total or partial capitalization of packaging waste from agriculture can be made by obtaining fuel or secondary energy that can be used in other industries.[10]

In conclusion, the issue of the negative environmental impacts resulting from the constant trend to increase the quantities of packed chemicals and hence the rise in volume of the used packaging waste and will be used in modern agriculture by increasing intensiveness will be the challenge for which Romania needs to be prepared to sustainably manage considering its natural heritage.

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THE MAIN INDICATORS ANALYSIS THAT CHARACTERIZE THE FOOD CONSUMTION EVOLUTION IN ROMANIA IN COMPARISON BETWEEN THE PERIOD 2001-2006 AND 2007-2014

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Abstract: The a*nalysis on the food consumption is particularly important because it helps us to discover information about the individual's health and economic differences between the two periods studied, outlining the economic impact on human food consumption and the worldwide food trends impact on the food transit that's going on within our country. It have been also noticed changes at the level of urban and rural areas and the differences between the two environments, which illustrates on the one hand the existence of changes in feeding with the accession to the European Union, the tendency being to decrease the number of calories, and the differences between environments demonstrating a higher food consumption for the countryside.*

Keywords : *food consumption, calories, protein, carbohydrates, lipids*

INTRODUCTION

From FAO sources (Quarterly Bulletin of Statistics no. 2, 3, 4/1994), European Community (Eurostat Agriculture, Brussels, 1994) and Romanian (MAA data, 1994) the Romania's place within the Member countries of the European Union in 1994 after the food availability expressed in calories per person per day , we occupy the last place (about 3000) after United Kingdom and Netherlands. The top three are Greece and Ireland, and Spain with approximately 4000 calories per person per day. In the classification by number of grams protein per person per day, Romania (almost 100 gr) is ahead of Netherlands and United Kingdom (85-90 gr). The first three places being occupied by Ireland, France and Greece (approx. 120 gr).

MATERIAL AND METHODS

In the paper were used the following indicators: arithmetic mean, mean square deviation, standard deviation, coefficient of variation.

Food consumption expressed in calories and nutritional factors is the correspondent in calories and some nutrients (proteins , lipids, carbohydrates) of alimentary products in a person's consumption in a given time period (usually one day).

Main groups of nutritional principles which enters in the chemical composition of food are: proteins, lipids, carbohydrates, vitamins, mineral salts and water. Of these, proteins, lipids and carbohydrates are substances which provide the body trophicity, respectively, allow the cells of living organisms tissues to maintain specific structure needed for a normal metabolism.

Measuring the food consumption

• Net average daily food consumption per capita, expressed in calories (Cc)-content in calories of net daily average food consumption per capita; is calculated according to: Cc = (ADC * cc)/1000 where: cc = the number of calories contained in 1000 grams alimentary product, edible part.

• Net average daily food consumption per capita, expressed in proteins (Cp)-protein content of the net daily average food consumtion per capita; shall be determined as follows: Cp = (ADC * cp)/1000 where: cp= the number of proteins contained in 1000 grams alimentary product, edible part.

• Net average daily food consumption per capita, expressed in lipids (Cl)-the content of lipids of net average daily food consumption per capita; shall be determined according to: Cl = (ADC * cl)/1000 where: cl represents average content in fat to 1000 grams alimentary product, the edible part.

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• Net average daily food consumption per capita, expressed in carbohydrates (Cg)-the content of glucides (carbohydrates) of net average daily food consumption per capita; shall be determined on the basis of the following relationships: Cg = (ADC * cg)/1000 where: cg represents average content in carbohydrates to 1000 grams, the edible part.
The formulas, which can calculate these indicators are:

For arithmetic mean = $\overline{x} = \frac{\sum xi}{n}$; where:

X = the arithmetical moving average ; Xi = average production values on a number of years (i);n = number of years taken into account.

The average annual rate of increase = $r2000-2008 = \sqrt[8]{\prod (p1/p0) - 1}$;

For the standard deviation $\partial = \sqrt{\frac{\sum(\bar{x}-xi)\wedge 2}{n-1}}$; where:

∂ = standard deviation; xi = average production values on a number of years; n = number of years taken into account

For mean square deviation = $\partial x = \sqrt{\frac{\sum(\bar{x}-xi)\wedge 2}{n(n-1)}}$; where:

∂x = mean square deviation;

Coefficient of variation = $C = \frac{\delta}{\overline{X}} x100$ where:

C = coefficient of variation (express in percentages)
Coefficient of variation can be: 0-10% variation- small variation; between 10-20%- middle variation ; more than 20%- high variation
The data used had as source: Statistical Yearbook of Romania, INS, data in the literature.

RESULTS AND DISCUSSIONS

1. Comparison between the evolution of food consumption in 2001-2006 and the period 2007-2014 at the country level.

As it can be seen from table 1, the number of total calories at the country level, for the period 2001-2006 falls within the boundaries of 2449 and 2521 calories, with an average of 2484 calories, with a declining annual rate and a coefficient of variation showing very small oscillations between data.

Table No. 1. The main indicators characterizing the evolution of food consumption in the period 2001-2006 COUNTRY-level

Components expressed in calories and nutritional factors	MU	2001-2006						
		min	**max**	average	annual rate	St. Dev. (σ)	Coef of var.	
		UM	UM	UM	%	UM	%	signification
Total CALORIES:	**No**	2449	2521	2484.0	-0.3	23.6	0.95	*small*
of vegetal origin	**No**	1876	1967	1929.0	-0.8	32.2	1.67	*small*
of animal origin	**No**	534	573	555.0	1.4	17.5	3.15	*small*
Total PROTEIN of which:	**GR**	78.7	80.7	80.0	0.4	0.9	1.08	*small*
of vegetable origin	**GR**	44.2	46.9	45.9	-1.1	1.0	2.27	*small*
of animal origin	**GR**	31.9	36.2	34.1	2.6	1.6	4.78	*small*
Total LIPIDS of which:	**GR**	79.5	82	81.1	0.6	1.2	1.52	*small*
of vegetable origin	**GR**	41.5	42.5	42.0	0.1	0.4	0.84	*small*
of animal origin	**GR**	37.7	40.4	39.1	1.1	1.2	2.94	*small*
Total CARBOHYDRATES	**GR**	319.3	335	329.1	-0.9	5.7	1.74	*small*

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Proteins, also for the period 2001-2006, are located around the average of 80 grams of which 28.5 grams are of vegetable origin and 34.1 grams of animal origin, with small variations per year.
Lipids, as in the case of proteins have a higher share of vegetable origin, i.e. an average per year of 42 grams of 82.1 total and 39.1 grams of animal origin, and total carbohydrates are between 319.3 grams and 335 grams, the annual rate being of decrease, -0.9%.

Table No. 2. The main indicators characterizing the evolution of food consumption in the period 2007-2014 at the country level

Components expressed in calories and nutritional factors	The period 2007-2014						
	min	**max**	average	annual rate	St. Dev. (σ)	Coef of var.	
	MU	MU	MU	%	MU	%	signification
Total CALORIES:	2400	2487	2438.9	-0.35	31.6	1.29	*small*
of vegetable origin	1783	1873	1822.9	-0.65	30.9	1.70	*small*
of animal origin	600	623.6	616.1	0.55	4.6	0.75	*small*
Total PROTEIN of which:	80.7	83.1	81.6	-0.14	0.8	0.98	*small*
of vegetable origin	40.7	43.6	41.9	-0.98	0.8	1.84	*small*
of animal origin	38.2	40.3	39.7	0.77	0.4	1.07	*small*
Total LIPIDS of which:	82.8	85.2	84.0	0.20	0.8	0.98	*small*
of vegetable origin	40.3	42.2	41.3	-0.14	0.6	1.54	*small*
of animal origin	41.8	43.3	42.7	0.50	0.3	0.74	*small*
Total CARBOHYDRATES	302	318.8	309.4	-0.77	5.4	1.75	*small*

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With respect to the period 2007-2014, the indicators characterizing the food consumption at the country level, show the next situation:

- the total number of calories varies very little around the average of 2438.9, the annual rate being of decrease ,-0.35%, standard deviation of 19.6 calories. It can be noticed a decrease in calories relative to the period 2001-2006.
- Compared to the first period surveyed, the protein number increased at 80 grams, years average at 81.6 for 2007-2014, raising in particular the share of animal proteins.
- We can observe an increase also at the number of lipids, at 84 grams, the media in particular increasing at animal origin lipids.
- Carbohydrates are the ones that fell, the average showing almost 20 carbohydrates grams less in food consumption.

Table No. 3. The main indicators characterizing the evolution of food consumption in comparison between 2001-2006 and 2007-2014 at the country level

Components expressed in calories and nutritional factors	Deviations (+/-) period (2007-2013)-(2001-2006)							
	Average 2001-2006	Average 2007-2014	Average	Annual rate	St. Dev. (σ)	Coef of var.		
	UM	UM	UM	%	UM	%	tcal/average	significance
Total CALORIES:	2484.0	2438.9	-45.1	-0.06	8.0	0.3	1.94	N
of vegetable origin	1929.0	1822.9	-106.2	0.13	-1.3	0.0	5.05	***
of animal origin	555.0	616.1	61.1	-0.87	-12.8	-2.4	6.26	***
Total PROTEIN out of which:	80.0	81.6	1.7	-0.57	-0.1	-0.1	0.46	N
of vegetable origin	45.9	41.9	-4.0	0.16	-0.3	-0.4	1.44	N
of animal origin	34.0	39.7	5.6	-1.79	-1.2	-3.7	2.37	*
Total LIPIDS of which:	81.1	84.0	3.0	-0.42	-0.4	-0.5	0.80	N
of vegetable origin	42.0	41.3	-0.7	-0.28	0.3	0.7	0.27	N
of animal origin	39.1	42.7	3.6	-0.64	-0.8	-2.2	1.42	N
Total CARBOHYDRATES	329.1	309.4	-19.7	0.10	-0.3	0.0	2.57	*

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As table 3 shows, the differences between the two periods are quite high, dropping the number of calories with 45.1, the large differences can be observed at the calories of vegetable origin, growing the interest for the animal origin for both protein and lipids.

2. Trends in food consumption in comparison between the period 2001-2006 and 2007-2014 at the URBAN residence level

As regards the indicators characterizing the evolution of food consumption at the urban level, the analysis can be seen in the following three tables.

Thus, table 4 characterizes food consumption for the period 2001-2006 in urban environments, where it becomes evident that:

- Towards the level of the country, urban areas consume fewer calories per capita, an average of 2385.7 for this period, where the maximum reaches at 2410 calories, with an slow annual rate of increase of 0.1% variation between the data is small c% = 0.72%;

Table No. 4. The main indicators characterizing the evolution of food consumption in the period 2001-2006 in URBAN area

Components expressed in calories and nutritional factors	**UM**	2001-2006						
		min	**max**	average	annual rate	St. Dev. (σ)	Coef of var.	
		MU	MU	MU	%	UM	%	MU
Total CALORIES:	No	2357	2410	2385.7	0.1	17.3	0.72	*small*
of vegetal origin	No	1819	1881	1852.7	-0.6	22.6	1.22	*small*
of animal origin	No	505	567	533.0	2.3	23.4	4.40	*small*
Total PROTEIN out of which:	GR	75.2	78.6	77.0	0.9	1.4	1.81	*small*
of vegetal origin	GR	41.2	43.5	42.6	-1.1	0.9	2.04	*small*
of animal origin	GR	31.7	37.4	34.4	3.4	2.1	6.07	*small*
Total LIPIDS of which:	GR	79.9	83.6	81.6	0.9	1.4	1.74	*small*
of vegetal origin	GR	44	45	44.6	-0.2	0.4	0.85	*small*
of animal origin	GR	35.2	39.1	37.0	2.1	1.4	3.91	*small*
Total CARBOHYDRATES	**GR**	303.8	314.9	310.3	-0.7	4.1	1.32	*small*

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- The average number of protein consumed is of 77 grams, of which over half are of vegetable origin, 42.6 grams and 34.4 grams of animal grams;
- In total, is consumed for this period, approximately 50.7 grams of lipids, as well as the preference is for the vegetable origin, but the rate is of decline;
- It should be noted also the total number of carbohydrates consumed, so that the average of 310.3 grams is smaller than the total country, showing a decrease in the consumption of carbohydrates.

Table No. 5. The main indicators characterizing the evolution of food consumption in the period 2007-2013 in URBAN

Components expressed in calories and nutritional factors	The period 2007-2014						
	min	**max**	average	annual rate	St. Dev. (σ)	Coef of var.	
	MU	MU	MU	%	UM	%	MU
Total CALORIES:	2340	2442.4	2390.9	-0.15	34.3	1.44	*small*
of vegetable origin	1738	1817.1	1774.8	-0.44	27.3	1.54	*small*
of animal origin	598	629.6	616.1	0.68	10.3	1.68	*small*

Total PROTEIN of which:	78.8	82.4	80.5	0.02	1.1	1.38	*small*
of vegetable origin	38.5	40.5	39.5	-0.72	0.6	1.52	*small*
of animal origin	39.7	42.2	41.1	0.74	0.7	1.80	*small*
Total LIPIDS of which:	83	87	85.3	0.20	1.3	1.58	*small*
of vegetable origin	41.9	44	43.1	-0.23	0.8	1.83	*small*
of animal origin	41	43.1	42.2	0.65	0.7	1.70	*small*
Total CARBOHYDRATES	292.3	304.7	298.1	-0.45	4.4	1.48	*small*

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The period 2007-2014 represented a period of profound economic and administrative changes, of course, with repercussions on the food consumption.

The total number of calories consumed per day in the urban area is oscillating between 2340 calories and 2442.4 calories, with an average of 2390.9 calories, the annual rate is of decrease -0.15%, while the variation is small, 1.44%.

The protein consumption expressed in grams is situated within the limits of 78.8 grams and 82.4 grams with an average of 80.5 grams, of which over half are those of animal origin 41.1 and 39.5 grams protein of vegetal origin.

The proportion of lipids of different origins is similar, from 85.3 grams, 43.1 grams are of vegetal origin and 42.2 grams of animal origin. The vegetal origin lipids are dropping, with an annual rate of-0.23%. The carbohydrates grams make for a day an average of 298.1 grams for the period 2007-2014, with variations between 292.3 grams and 304.7 grams.

Table 6. The main indicators characterizing the evolution of food consumption in comparison between 2001-2006 and 2007-2014 period in the URBAN area

Components expressed in calories and nutritional factors	Deviations (+/-) period (2007-2013)-(2001-2006)							
	Average 2001-2006	Average 2007-2014	Average	Annual rate	St. Dev. (σ)	Coef of var.		
	MU	MU	MU	%	MU	%	tcal/average	significance
Total CALORIES:	2385.7	2390.9	5.3	-0.20	17.0	0.7	0.23	N
of vegetable origin	1852.7	1774.8	-77.8	0.17	4.7	0.3	3.88	N
of animal origin	533.0	616.1	83.1	-1.66	-13.1	-2.7	8.22	***
Total PROTEIN of which:	77.0	80.5	3.6	-0.87	-0.3	-0.4	0.99	N
of vegetable origin	42.6	39.5	-3.1	0.36	-0.3	-0.5	1.17	N
of animal origin	34.4	41.1	6.7	-2.62	-1.3	-4.3	2.79	*
Total LIPIDS of which:	81.6	85.3	3.7	-0.66	-0.1	-0.2	0.99	N
of vegetable origin	44.6	43.1	-1.5	-0.05	0.4	1.0	0.55	N
of animal origin	37.0	42.2	5.2	-1.48	-0.7	-2.2	2.08	N
Total CARBOHYDRATES	310.3	298.1	-12.2	0.23	0.3	0.2	1.66	N

Processed: INS, accessed may 2015 Online TEMPO **, BUF112I** t_{teor} (0.001:4.31; 0.01:3.05; 0.05:2.17); GL = 12

Table 6 shows the evolution of food consumption compared between the two periods, 2001-2006 and 2007-2014 where it is noticed:

- it has increased the total number of calories with 5.3 calorie difference between the two periods, of which has decreased the vegetal origin calories with 77.8 calories and increased consumption of animal origin calories with 83.1 calories;

-in the case of proteins, an increase of 3.6 grams can be observed, being preferred the animal origin protein at the expense of those of vegetal origin;

- also has increased the consumption of lipids with 3.7 grams per capita, while maintaining the growth of animal origins lipids with 5.2 grams and has dropped those of vegetal origin with 1.5 grams;

-Carbohydrates have suffered a decrease, from 310.3 grams at 298.1 grams, a decrease of 12.2.

3. The food consumption evolution in comparison between the period 2001-2006 and 2007-2014 at the RURAL residence level.

We have also characterized the indicators that characterize food consumption in rural areas, both for the period 2001-2006 and for the period 2007-2014.

So table 7 outlines the evolution of food consumption for the period 2001-2006 where we find that the total number of calories consumed per day was between 2643 and 2526 calories, with an average of 2597.2 calories, the variation being determined by the coefficient of variation, namely 1.53%, representing a small variation.

Of this total number of calories, the vegetal origin ones occupies a share of over 77%, namely 2017 calories.

Table No. 7. The main indicators characterizing the evolution of food consumption in the period 2001-2006 in the RURAL area

Components expressed in calories and nutritional factors	MU	2001-2006						
		min	**max**	average	annual rate	St. Dev. (σ)	Coef of var.	
	MU	MU	MU	MU	%	MU	%	MU
Total CALORIES:	No	2526	2643	2597.2	-0.6	39.8	1.53	*small*
of vegetable origin	No	1946	2061	2017.0	-0.9	42.8	2.12	*small*
of animal origin	No	562	603	580.2	0.5	14.9	2.58	*small*
Total PROTEIN of which:	GR	82.5	84.5	83.4	0.0	0.7	0.88	*small*
of vegetable origin	GR	47.8	50.9	49.8	-1.1	1.2	2.44	*small*
of animal origin	GR	32.1	34.7	33.6	1.6	1.1	3.30	*small*
Total LIPIDS of which:	GR	78.9	82.3	80.4	0.3	1.4	1.69	*small*
of vegetable origin	GR	38.3	39.7	39.0	0.4	0.5	1.27	*small*
of animal origin	GR	40.2	43.7	41.5	0.1	1.3	3.02	*small*
Total CARBOHYDRATES	**GR**	338.1	357.1	350.8	-1.0	7.4	2.10	*small*

Processed: INS, accessed may 2015 Online TEMPO, **BUF112I**

The protein grams have an average of 83.4, with a greater appreciation of vegetal origin, having a share of 59.7% of total proteins.

In exchange, the lipids consumption, with an average of 80.4 grams, is divided into 39 grams of vegetal origin and 41.5 grams of animal origin. Carbohydrate consumption lies at 350.8 grams, oscillating between the limits of 338.1 grams and 357.1 grams.

Table No. 8. The main indicators characterizing the evolution of food consumption in the period 2007-2014 in the RURAL area.

Components expressed in calories and nutritional factors	The period 2007-2014						
	min	Max	Average	annual rate	St. Dev.(σ)	Coef of var.	
	MU	MU	MU	%	MU	%	significance
Total CALORIES:	2443	2554	2497.0	-0.59	33.8	1.35	*small*
of vegetable origin	1828	1952	1881.1	-0.91	37.2	1.98	*small*
of animal origin	602	629.7	616.0	0.41	5.9	0.97	*small*
Total PROTEIN of which:	81.8	83.9	82.9	-0.33	0.7	0.84	*small*
of vegetable origin	43.3	47.3	45.0	-1.25	1.0	2.27	*small*
of animal origin	36.5	38.8	38.0	0.80	0.4	1.13	*small*
Total LIPIDS of which:	81.8	83.2	82.5	0.19	0.4	0.53	*small*
of vegetable origin	38.4	40	39.2	0.00	0.5	1.32	*small*
of animal origin	42.5	44.2	43.4	0.37	0.4	0.98	*small*
Total CARBOHYDRATES	311.6	337.7	323.2	-1.14	7.0	2.17	*small*

Processed: INS, accessed may 2015 Online TEMPO **, BUF112I**

Along with the changes our country has passed, it has been affected also the food consumption in rural areas, so that for the period 2007-2014, the number of calories was located between 2443 and 2554 calories, with an annual rate of decrease of -0.59% change in data being small, c% = 1.35%. Protein consumption were at 51.5 grams, slightly increasing the animal origin one, at the expense of proteins of vegetal origin. In addition , has increased the consumption of animal fats, with a growth rate of 0.37%, while carbohydrates decreased , with -1.14% annually, with an average of 323.2 grams.

Table nr 9. The main indicators characterizing the evolution of food consumption in comparition between 2001-2006 and the 2007-2014 period at the RURAL level residence

Components expressed in calories and nutritional factors	Deviations (+/-) period (2007-2013)-(2001-2006)							
	Average 2001-2006	Average 2007-2014	Average	Annual rate	St. Dev. (σ)	Coef of var.		
	MU	MU	MU	%	MU	%	tcal/average	significance
Total CALORIES:	2597.2	2497.0	-100.1	0.03	-6.0	-0.2	4.17	**
of vegetable origin	2017.0	1881.1	-135.9	0.02	-5.6	-0.1	6.02	***
of animal origin	580.2	616.0	35.8	-0.08	-9.0	-1.6	3.56	*
Total PROTEIN of which:	83.4	82.9	-0.4	-0.28	0.0	0.0	0.12	N
of vegetable origin	49.8	45.0	-4.8	-0.12	-0.2	-0.2	1.66	N
of animal origin	33.6	38.0	4.4	-0.77	-0.7	-2.2	1.86	N
Total LIPIDS of which:	80.4	82.5	2.1	-0.09	-0.9	-1.2	0.57	N
of vegetable origin	39.0	39.2	0.2	-0.41	0.0	0.1	0.09	N
of animal origin	41.5	43.4	1.9	0.22	-0.8	-2.0	0.71	N
Total CARBOHYDRATES	350.8	323.2	-27.6	-0.14	-0.3	0.1	3.44	**

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Comparisons between the two periods for rural areas, demonstrate a decrease in calories with over 100 calories in the second period. It had decreased these calorie-number of vegetal origin increasing those of animal origin. The same trend is maintained for the proteins, where have decreased the vegetal origin one with 4.8 grams and have increased those of animal origin with 4.4 grams.
Differences in consumption of lipids are quite small, slightly increases with 2.1 grams, especially those of animal origin.
A bigger difference can be seen in the consumption of carbohydrates, 16.8 grams, with the rate of the decline being of 0.14%.

CONCLUSIONS

The food consumption characterization per capita per day for the two periods reflected changes taking into account the intense economic differences caused by the economic crisis.

For the period 2001-2006- the country-level presents a number of calories around the average 2484, having an annual rate declining. Proteins are located around the average of 80 grams, the average of years for lipids of 42 grams and total carbohydrates are between 319.3 grams and 335 grams, the annual rate being in decline.

The period 2007-2014,- country-level the total number of calories varies very little around the average of 2438.9, the annual rhythm being of decrease. Proteins have an average of 81.6 grams, lipids revolve around 84 grams and carbohydrates are the ones that fell, the average pointing nearly 20 fewer carbohydrates in the persons food consumption. The differences between the two periods are quite high, dropping the number of calories with 45.1, high differences can be observed at the calories of vegetal origin, growing interest for the animal for both total protein and lipids.

2001-2006 -Urban level. Compared to the country level, in urban areas are consumed fewer calories per capita, an average of 2385.7.

The period 2007-2014 at Urban level when the total number of calories consumed per day are oscillating between 2340 calories and 2442.4 calories with an average of 2390.9 calories.

Between the two periods are observed differences, i.e. have decreased the calories of vegetal origin with 77.8 calories and increased consumption of animal origin calories with 83.1.

The total number of calories consumed daily in **the period 2001-2006, in Rural areas**, it was located between 2643 and 2526 calories, with an average of 2597.2 calories. Of this total number of calories, the vegetal origin calories occupie a share of over 77%, namely 2017 calories.

The calories number for **the period 2007-2014, in Rural areas**, it was located between 2443 and 2554 calories, with an annual rate of decline.

Comparisons between the two periods for rural areas, demonstrate a decrease in calories with over 100 calories in the second period. Subtract from these calorie-number of vegetal origin increasing those of animal origin. The same trend is maintained for the proteins, have dropped the proteins of vegetal origin.

It can be concluded that in rural areas for both periods food consumption is higher in relation to food consumption in urban areas, the differences being noticed in the number of calories and carbohydrates, important to note the fact that in urban areas has increased the number of grams of protein of vegetal origin, the orientation towards a more balanced nutrition is more pronounced in this environment.

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ASPECTS REGARDING THE EVOLUTION OF ORGANIC FARMING IN THE EU MEMBER STATES: AREAS, AGENTS, MANUFACTURERS

ALECU IOAN-NICULAE[1], ANGELESCU ANDA-IRINA[2], MĂRCUȚĂ LIVIU[3], ANGELESCU CARMEN[4]

Abstract: *This paper represents an analysis of the way in which the organic farming has evolved in the EU member states, focusing on the crop production. The analysed period is 2000-2011, years for which a full set of data was found. Data regarding the following have been analysed and interpreted: organically farmed areas, number of farms, number of the manufacturers in the system and the main utilization categories for the organically farmed lands. The conclusions reinforce the idea that, in an era when the society is increasingly concerned with the health of its members and of the environment, the organic farming has gathered pace in the last years having an extremely dynamical evolution in Europe and not only.*

Key words: *Organic farming, organically farmed areas, organic farms.*

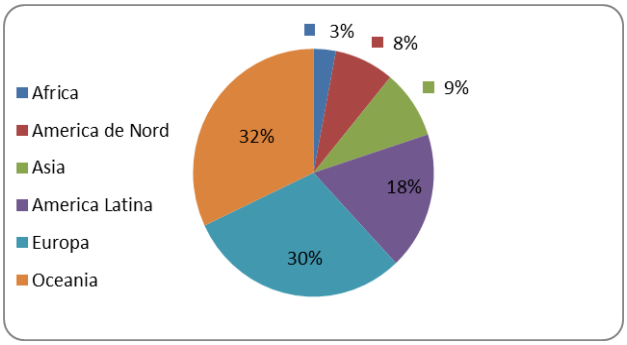
INTRODUCTION

Having as its main purpose the accomplishment of sustainable, diversified and balanced agricultural systems that protect the natural resources and the consumers' health, the organic farming emphasizes the natural quality of products, the quantitative and productivity issues taking a secondary place.

A series of problems occurred in the last decades has led to the fact that the organic farming is increasingly accepted as the only viable alternative for producing healthy food and for a sustainable environmental protection, and the organically farmed areas are constantly extending year after year. Thus, currently, at the international level, 37.5 million hectares are organically managed (at the end of 2012).

The region with the largest area of organically farmed lands is Oceania, with 12.2 million hectares, followed by Europe, with 11.2 million hectares, Latin America (6.8 million hectares), Asia (3.2 million hectares), North America (3 million hectares) and Africa (1.1 million hectares).

Figure 1. International distribution of the organically farmed lands (%)



Against this backdrop, it can be noticed that Europe has a leading position and many European Union countries support and are focused on the further development of this extremely dynamic sector.

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MATERIAL AND METHOD

Organic farming, being an important part of a sustainable agriculture, contributes to the long term evolution of the rural area. The effects of using this agricultural system are reflected in the sustainable development of the environment, in the rural economy but also in the society, in general. On the other hand, it can be stated that in the developed countries, with a higher standard of living, the organic farming has had a quicker pace than in the less developed countries, fact that is also visible in Europe. This paper presents all these aspects with the help of an analysis of the evolution of organically farmed lands, of the number of agents and manufacturers within this field of activity, in the European Union member states, from 2000 to 2011, analysis that was based on the statistical data from the European Commission. The conclusions of this analysis were drawn from interpreting the statistical data from the European Commission.

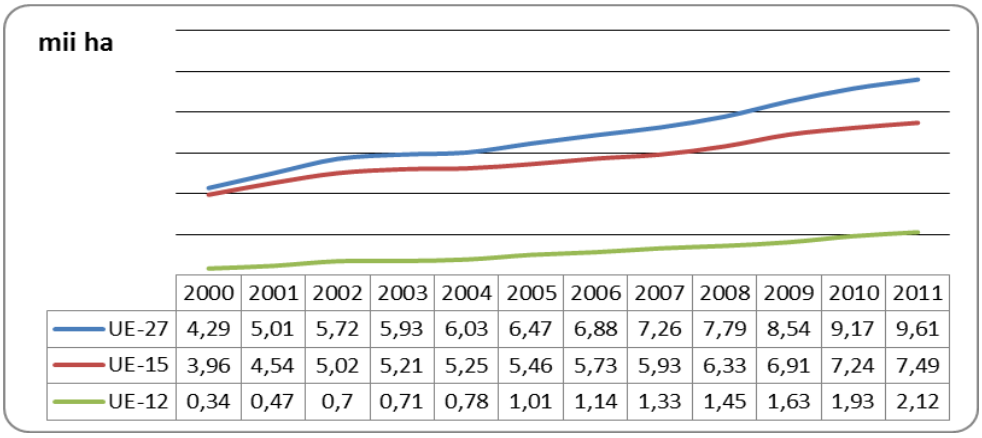
RESULTS AND DISCUSSIONS

Evolution of the organically farmed areas

In Europe, the evolution of the organically farmed areas may be described as follows, in absolute figures:

- In 1993, the organically farmed area in Europe was of 0.8 mil. ha.
- During the period 2000-2011, the organically farmed areas have increased considerably, from 4.3 mil. ha to an estimated level of 9.6 mil. ha (+18.6 %/year).
- The growth rate was more spectacular for EU-12, where the area has increased from 0.34 mil. ha to 2.12 mil. ha (+52%/year).
- During the same period, in EU-15, the area has increased from 3.96 mil. ha to 7.49 mil. ha, with a lower growth rate of 15.7 %/year.

Figure 2. Evolution of the organically farmed areas in EU, 2000-2011



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
UE-27	4,29	5,01	5,72	5,93	6,03	6,47	6,88	7,26	7,79	8,54	9,17	9,61
UE-15	3,96	4,54	5,02	5,21	5,25	5,46	5,73	5,93	6,33	6,91	7,24	7,49
UE-12	0,34	0,47	0,7	0,71	0,78	1,01	1,14	1,33	1,45	1,63	1,93	2,12

Table 1 and Figure 3 show the evolution of the organically certified and conversion areas, in the member states, in 2001, 2004, 2007, 2009 and 2011.

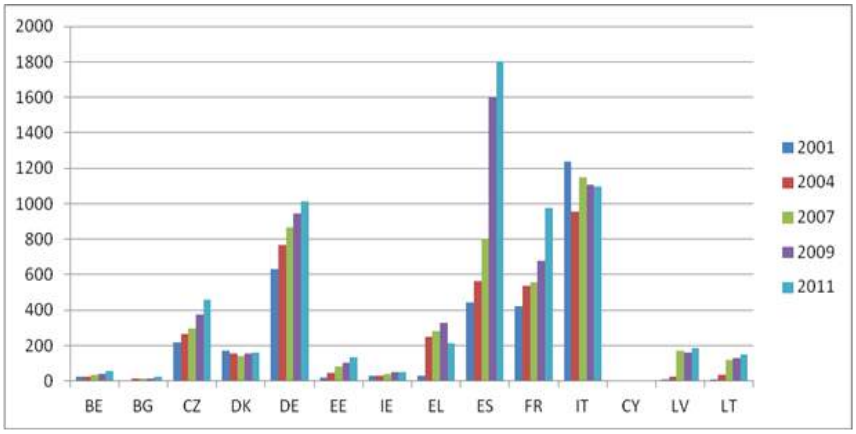
Table 1. Organically certified and conversion areas in the member states (thousand ha)

COUNTRY		BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	IT	CY	LV
YEARS	**2001**	22	1	218	168	632	20	30	31	445	420	1238	0	11
	2004	24	12	263	157	768	46	31	250	562	534	954	1	26
	2007	33	14	294	141	865	80	41	280	805	557	1150	2	173
	2009	41	12	377	156	947	102	48	326	1603	677	1107	3	160
	2011	55	25	460	162	1015	134	48	213	1804	977	1097	3	184

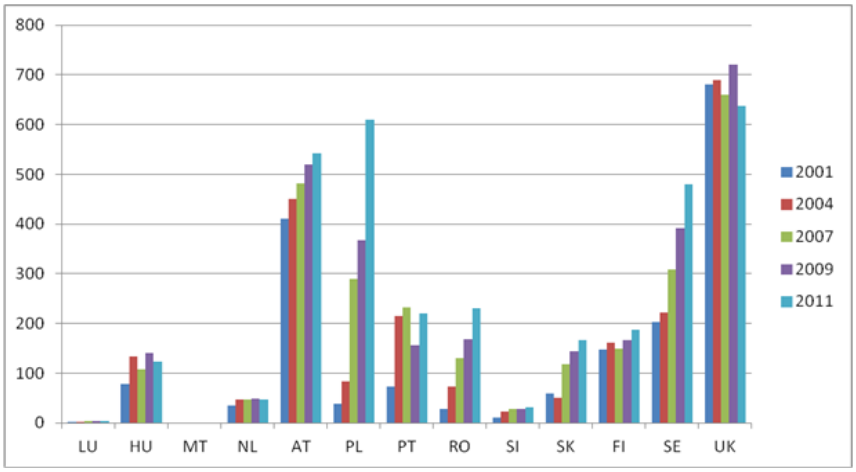
COUNTRY		LT	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE
YEARS	**2001**	6	2	79	0	36	411	39	74	29	11	59	148	203
	2004	37	3	133	0	48	451	83	215	73	23	51	162	222
	2007	120	4	107	0	47	482	289	233	131	29	118	149	308
	2009	130	4	140	0	49	519	367	157	168	29	145	166	392
	2011	152	4	124	0	47	543	609	220	230	32	167	188	480

Figure 3 (a, b). Organically certified and conversion areas in the EU state members during the 2001-2011 period

Thousand ha **(a)**



(b)



In absolute numbers, the member states with the largest areas in 2011 are Spain (1.8 mil. ha), Italy (1.1 mil. ha), Germany (1.01 mil. ha), Great Britain (0.63 mil. ha), Poland (0.6 mil. ha) and France (0.97 mil. ha).All together represent 56.8 % of the organically farmed areas of EU.

During this period, the area is quite stable in several member states (Belgium, Ireland, the Netherlands, Finland and the United Kingdom). The farmed area was constantly declining only in

Denmark and this could have been due to the fact that in this country, the sector reached a certain maturity, its development starting prior to that of the majority of the member states.

In Italy, following three years of growth, in 2008, the organically farmed area has registered a decline of approximately 0.15 mil. ha, visible in the next year also, and in 2011, the area was of 1 mil. ha.

For a larger group of member states (Germany, three Baltic States, Greece, Spain, Poland, Romania and Slovakia), the evolution of the sector may be characterized as dynamic, with a constant increase of the organically farmed areas. Several EU-12 state members are included in this group, the sustained increase being partially explained by the support given to this sector prior to EU accession and by its increase following the accession.

For Spain and Greece, the increasing dynamics probably show a late start of this sector, the catching up effect being present.

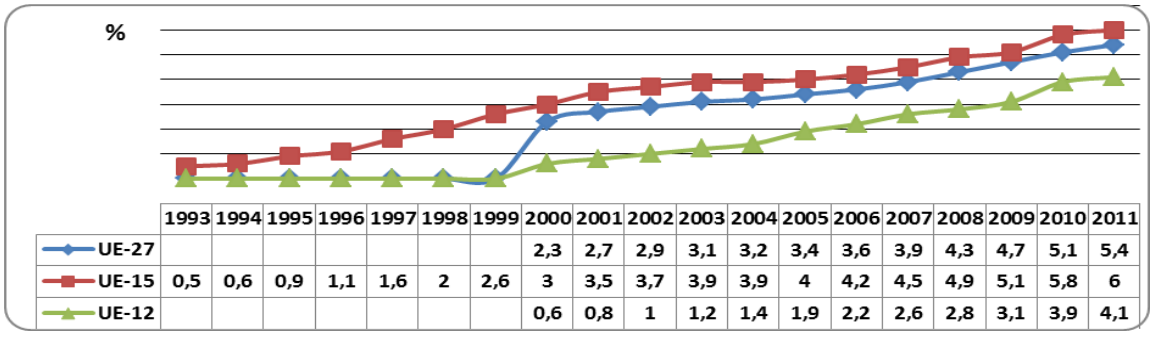
The case of Spain is very spectacular, with an area increase of approximately 0.3 mil. ha between 2007 and 2008 and of 0.2 mil. ha between 2009 and 2011.

Although Germany is not a newcomer as regards the organic farming, it shows a constant interest and support for its development.

Nevertheless, it can be stated that the organically farmed areas have a quite moderate growth in several member states (Check Republic, Austria and Sweden). This can be explained by the fact that these states have reached a certain level of maturity (for example, Austria and Sweden, countries in which the importance of this sector is already high), nevertheless, the sector development continues to be considerably supported (Austria) because there still is a growth potential.

Analysing the diagram above, the figures indicate that the large member states also have larger organically farmed areas. The analysis of the weight of organically farmed area in the total agricultural area indicates clearly the importance of the sector in each member state, and a ranking is also possible.

Figure 4. Evolution of the organically farmed areas in the total UAA of EU (%)

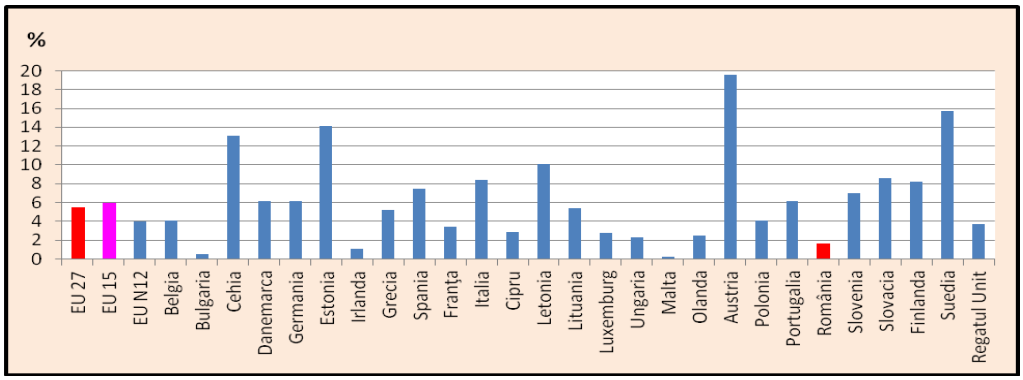


	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
UE-27								2,3	2,7	2,9	3,1	3,2	3,4	3,6	3,9	4,3	4,7	5,1	5,4
UE-15	0,5	0,6	0,9	1,1	1,6	2	2,6	3	3,5	3,7	3,9	3,9	4	4,2	4,5	4,9	5,1	5,8	6
UE-12								0,6	0,8	1	1,2	1,4	1,9	2,2	2,6	2,8	3,1	3,9	4,1

In 2011, in EU-27, the organically farmed area represented 5.5 % of UAA (utilized agricultural area), compared to 5.1% in 2010. For EU-12 and EU-15, the related figures were 4.1 % and 6 %, respectively, also higher than in 2010. For EU-15, in the period 2003-2004, the weight of organically farmed areas had a slight standstill, but after that, in 2005-2008 it has returned to the upward trend.

EU-12 has had a dynamic growth, strengthened starting with 2005 due to the EU accession.

Figure 5. Weight of the organically farmed areas in the total UAA in 2011 (%)



As it can be seen in Figure 5, with a quota of 19 %, Austria is the member state where the importance of the organic farming compared to the total UAA is the highest. It is followed by Sweden and Estonia with 15.7 % and 14.1 % respectively. Czech Republic has a weight of 13.1 %, followed by Latvia with 10.1 %.

It is interesting to note that within EU-12, 5 member states (Czech Republic, Estonia, Latvia, Slovenia and Slovakia) already exceed the average of EU-27 of 5.4 %. In these member states, the development of the organic farming has been extremely rapid. On the other hand, six member states of EU-15 have lower weights than the average of EU: UK and Belgium of approximately 4 %, France, Luxembourg and the Netherlands of 3 % and Ireland of 1.1 %. Here, the situation of our country can also be noted, where this sector has been rapidly growing, but only starting from 2000, together with the foundation of the legal basis for the setting up of production and trading of organic products. This was the Emergency Government Decision no. 34/2000, approved by Law No. 38/2001 and the Government Decision No. 917/2001 on the Methodological standards for the enforcing of the provisions of EGD No. 34/2000. According to the last data from the European Commission, the growth is even higher in Romania in the period 2011-2012, taking into account that in 2011, the weight was of 1.6 %, and in 2012 it already reached 2.1 %, the farmers being attracted by the funds that can be accessed for this type of production.

Evolution of the number of organic farms

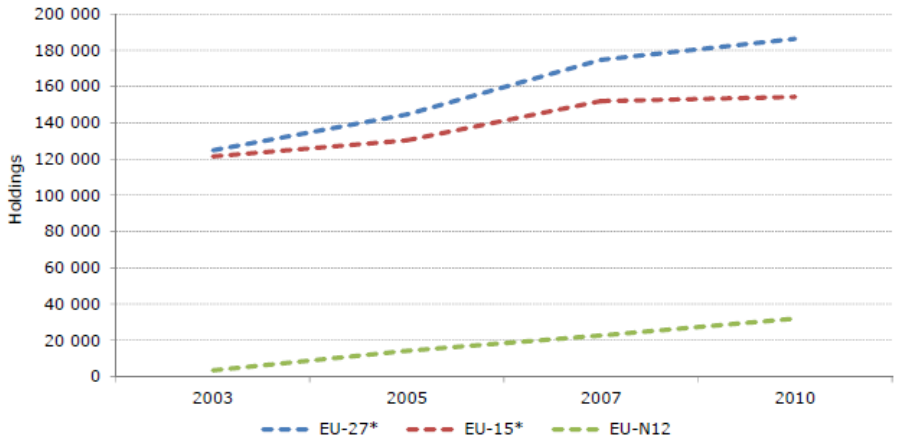
In order to better understand the interest of farmers and of other system agents in the organic farming, the evolution of the total areas of the organic farming has to be analysed together with the number of active farms in this field. Figure 6 shows that there is an upward trend of the number of organic farms for the studied time period.

It is estimated that in 2008, there were approximately 197.000 farms involved in the organic farming in EU-27, 2.9 % of the total number of EU-15 farms, respectively, but only 0.6 % in EU-12.

In EU-27, the weight of organic farms was of 1.4 % of the total number of farms. At the level of member state, it has varied from less than 0.1 % (Bulgaria and Romania) to 12.2 % (Austria).

In 2010, there were more than 186.000 farms in the field of organic farming in Europe, most of them (83 %) belonging to EU-15. Nevertheless, for EU-15, this number represented only 3 % of the total number of farms in 2010. For EU-27, only 1.6 % of the farms were active in the field of organic farming.

Figure 6. Evolution of the number of organic farms in EU



The increase of the number of organic farms can be also noticed for EU-15. For EU-12, during the period 2003-2005, the number of farms has increased with a quarter and reached more than 31.900 in 2010. In EU-15, the upward trend was less spectacular than in EU-12, but it is still in general with 80 % higher than in the newest EU member states.

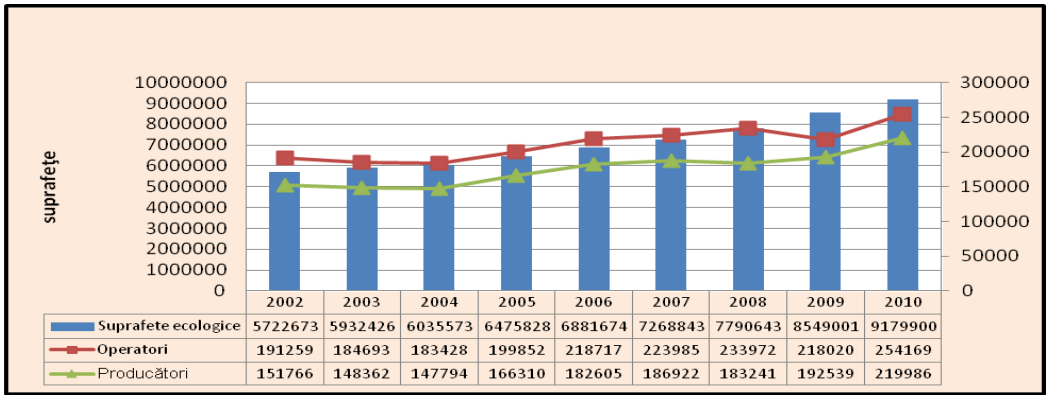
Within EU-15, Italy, Spain, Germany, Greece and France have the highest number of organic farms. Within EU-12, Poland is leading, with levels similar to the other EU member states.

Data on the total number of agents in the organic farming (producers, processors and importers) also show an upward trend.

Thus, the number of producers in the field of organic farming had only an upward trend. Is can also be noted that there are some ins and outs from the sector, but, in general, it seems that the producers have the tendency to rather stay within the organic farming sector than to abandon this type of production.

This aspect could be explained by the fact that farms make an important investment during the three years of the conversion period imposed by the Regulation of organic farming when, in spite of the high costs, the production is traded as in the case of conventional agriculture.

Figure 7. Evolution of the areas, agents and producers involved in organic farming in EU



	2002	2003	2004	2005	2006	2007	2008	2009	2010
Suprafete ecologice	5722673	5932426	6035573	6475828	6881674	7268843	7790643	8549001	9179900
Operatori	191259	184693	183428	199852	218717	223985	233972	218020	254169
Producători	151766	148362	147794	166310	182605	186922	183241	192539	219986

In general, it can be stated that the average size of the organic farms is higher than the average of all the farms (in 2008, it was of 13 ha for the average farm in EU-27 and 38 ha for the organic farms). Besides, the managers of the organic farms are younger than those of the non-organic farms: 56 % of the farmers within the conventional agriculture are older than 55 years, thus being the case for only 36 % of the organic farmers.

In 2010, the average area of the organic farms in EU-27 was of 34 ha. This area varies significantly in the member states (Figure 10). In 2010, Slovakia ranked in the first place, where the total average area is of 453 ha/farm. In the Czech Republic, it is of 169 ha/farm, in Great Britain of

114 ha/farm, followed by Estonia with 91 ha/farm, Sweden with 81 ha/farm and Denmark with 78 ha/farm. The smallest farms are located in Malta (3 ha/farm), Cyprus (6 ha/farm), Greece (8 ha/farm) and Slovenia (14 ha/farm). Among the member states, except Slovakia, Czech Republic and Estonia, figures for Lithuania and Romania show the largest areas for organic farms (55 ha/farm and 47 ha/farm, respectively).

The average area of the organic farms can also be compared to that of the conventional farms. Thus, it can be noticed that the average area of organic farms is larger than that of the conventional farms, within EU-27, the difference being very significant in some member states.

If, for EU-27, approximately 48 % of the total farms have a size of less than 2 ha, only 6.2 % of the organic farms are in the same category. Nevertheless, the conventional agriculture, with farms of 2 ha or less, includes a lot of farmers for which agriculture represents only a part of their activity and are not likely to focus on organic farming. Nevertheless, analysing other sizes, the organic farms tend to be larger than the conventional ones.

The main utilization categories

Within the European Union, the organic farming in the field of plant crops and orchards is very important. Table 2 shows the main types of land utilization for organic plant crops and fruit tree production. Data indicate that organic grain legumes and permanent crops represent more than 15 %, and more than 10 % respectively than the total farmed area in EU-27 for the same crop categories.

Permanent grasslands and green fodder represent approximately 60 % of the entire organic lands. Together with the permanent crops, their weight reaches 73 % of the total organic areas in EU. In the majority of member states, cereal crops follow the above mentioned categories, as regards the area, followed by oilseeds, vegetables and grain legumes.

Table 2. The main utilization categories for the organically certified land in EU-27, in 2011

Utilization categories	Organically certified land (ha)	% of the total organic land	% of the total utilized land
Total crops	9,613,500	100.0	5.4
Cereal crops	1,405,152	14.6	2.5
Grain legumes	211,568	2.2	16.0
Industrial crops (oilseeds)	103,804	1.9	1.4
Permanent grasslands	4,317,205	44.9	7.5
Permanent crops (orchards)	1,529,289	13.1	11.0

CONCLUSIONS

In Europe, there are some key features characterizing the evolution of the organic farming:

- In Europe, the organic farming has been rapidly growing in the last years. This is specific not only to the organic farmed area, but also to the number of organic farms and, in general, to the system agents that are registered in EU-27.
- Although a significant part of the farms and lands are still located in EU-15, the newest EU member states showed encouraging evolutions in this regard, especially in the context of the additional funding provided by EU for this type of production, even prior to the accession.
- In the EU member states, the organic livestock production, and the plant and fruit growing have the same upward trend.
- The organic farms are in average larger than the non-organic farms and their owners are younger than the other farmers.

- The lack of sufficient data regarding some aspects of organic farming and of the organic food chain (especially connected to sales and trade in general) does not allow that a complete and very detailed image to be offered in this moment.

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SECTION 3

RURAL DEVELOPMENT AND AGRICULTURAL POLICY

AGRICULTURAL KNOWLEDGE AND INFORMATION SYSTEM: LESSONS LERAND IN THE POSTSOCIALIST PERIOD IN ROMANIA AND BULGARIA

MARIOARA RUSU[1]
VIOLETA DIRIMANOVA[2]
VIOLETA MARIA SIMIONESCU[3]

Abstract: *The new challenges facing Eastern European rural and agricultural sector impose, among other things, a review of the links between knowledge production and its use to promote innovation. Given that, agriculture is the main source of livelihood for a large part of the rural population in Romania and Bulgaria and its development requires multiple interventions that include, inter alia, ensuring effective transfer of agricultural modern knowledge, technologies, methods and practices to the direct beneficiaries - farmers. Both in Romania and Bulgaria, agricultural knowledge generation (research), transfer (extension) and use (farmers as end users) passed during the post-socialist period through important changes. The main objective of this paper is to analyze the Agricultural Knowledge and Information System (AKIS), in the two countries, in terms of pursued objectives, structure and performed functions. Based on this analysis the authors synthesize the main lessons learned during the post-socialist period in the two countries, and outline the future direction of development of agricultural knowledge, production, transfer and use them in agreement with European requirements.*

Key words: *AKIS, agricultural extension, agricultural research and education, Romania, Bulgaria*

INTRODUCTION

Agriculture is an important branch in the national economies of Romania (RO) and Bulgaria (BG) and it is considering a key sector for economic and social prosperity. According to European statistics, the two countries have important land resources - 14.6 million hectares of agricultural land in RO and 5.5 million hectares in BG, which means 63.0% and 50.0% of the countries total area. Among of the agricultural use categories, arable lands are prevailing - 63.2% in RO and 63.4% in BG. The agricultural workforce is another important resource of both countries: 30.0% of total employment in RO and 19.2% in BG. Although, in recent years it has been a downward trend, it is oversized compared to the EU27 average (5.1%) (EC, 2015). Considering that the share of agriculture in GDP is modest situation shows a low level of labor productivity.

In terms of the farms structure, large farms that were prevalent during the communist regime recorded radical changes after 1989; agricultural land was restituted to private owners and farm structure has changed drastically. Agriculture of the two countries shows a pronounced polarization: in RO, small farms below two hectares have a share of 74.3% in total farms and 13.0% of total agricultural area; in BG farms smaller than 2 hectares has a share of 83.2% of numbers and 4.0% of agricultural land (EC, 2015). These small-scale farmers use modern technologies at low level: they are unable to purchase modern agricultural inputs - seeds, fertilizers, chemicals etc. Accordingly, yields and total production, both in the plant and in animal husbandry, are low and have significant annual variations, closely correlated with climatic conditions (Rusu, 2013). Taking into account the characteristics of agriculture of both countries, where most of the farmers lack adequate knowledge, experience and skills, in terms of agricultural development and the relevant EU requirements, the need for agricultural information and consulting services is pressing. In modern society, knowledge has become an important factor of production alongside land, labor and capital. Balit (1998) pointed out that the cheapest input is knowledge.

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MATERIAL AND METHODS

The main objective of this paper is to analyze the Agricultural Knowledge and Information System (AKIS), in RO and BG, in terms of evolution, objectives, structure and accomplished functions. Based on comparative analysis of the literature concerning AKIS, the authors summarize the main learned lessons in post-socialist period in the two countries, and outline the future direction of development of the generation, transfer and use of agricultural knowledge, in line with European requirements. Statistical data were collected from specialized publications, both in Europe and in the two analyzed countries.

RESULTS AND DISCUSSIONS

Agricultural development is an area of interest to all countries, regardless of their economic development. Economic and social progress has a close correlation with the achievements in agriculture: a competitive agricultural sector is closely linked to an efficient system of information and knowledge in agriculture.

1. AKIS definition

In the sixties, the flow of agricultural knowledge is considered as having a linear path from research to advice and then to farmers. This model was based on an institutional division: research was carried out in research institutes, transfer of new knowledge was the responsibility of consulting organizations and farmers' role was to implement the recommendations. Thus, the concept of Agricultural Knowledge System (AKS) became operational, used to define both a set of public and private organizations dedicated to research, education, consultancy, and their interaction with the users' knowledge, which are traditionally farmers (Hermans, Klerkx and Roep, 2010).

In the 1970s, organizations, such as FAO, introduced the concept of Agricultural Knowledge and Information System (AKIS). It developed from AKS concept by emphasizing the process of generating knowledge and the inclusion of actors outside the research, education and consultancy. Adding an "I" in the acronym, AKS has been linked of increased attention to information. The original wording described a set of organizations and / or persons from the agricultural sector and linkages and interactions between them. These organizations and persons are engaged in the generation, transformation, transmission, storage, retrieval, integration, dissemination and use of knowledge and information in order to support decision-making in solving problems in agriculture (Röling and Engel, 1991). Recently, AKIS concept has evolved and the letter "I" has a secondary meaning acquired, namely, innovation. Important characteristics of an innovation system are institutional infrastructure, funding mechanisms, networking capabilities and market structure (Woolthuis Klein et al. 2005).

In conclusion, linking institutions and persons, AKIS was created to promote mutual learning and facilitated use of modern technologies, agricultural knowledge and information in the participatory manner. The system integrates farmers, agricultural research, agricultural education, and agricultural advisory and private system to capitalize knowledge and information from various sources in order to develop agriculture.

2. AKIS in Romania and Bulgaria: main actors, objectives, evolutions and characteristics

Both in Romania and Bulgaria, AKIS was and is represented by different institutions belonging to the public sector (ministries of agriculture and their territorial structures) and private sector (consultancy private services, independent advisers, trade international organizations, regional suppliers), agricultural organizations (cooperatives and producer groups), research and educational organizations and non-governmental organizations (professional organizations and foundations).

2.1. Agricultural advisory service

Important structural changes that have occurred in agriculture in Romania and Bulgaria, after 1989, have significantly shaped the development of agricultural advisory services as can be seen from the table below.

Table 1. Evolution of farm advisory services in RO and BG in post socialist period

Period	Romania	Bulgaria
Before 1990	**agricultural advisory services :** - benefited from an top-down approach; - served large cooperatives and state farms (thousands of hectares); - technical-oriented to the detriment of economic -oriented; - agricultural education and research transfer of the more knowledge and research results through the network of agronomists employed by large farms; - large state farms and cooperatives, and in Bulgaria agro-industrial complexes, were important actors of knowledge integration, transfer, generation and innovation;	
1990- 2000	- radical changes in agricultural land ownership and land operation - cooperatives agricultural land was restituted to previous owners; - farmland fragmentation occurs - large numbers of small farms (over 4 million in the RO) and a large number of plots;	
	- rapid deterioration of the production means (irrigation systems, machinery and farm buildings destruction etc.) and removal of a large part of the agricultural specialists from the farm system;	- implementation of land reform lead to three types of farms: small farms run by old farmers, cooperatives - many of them with a precarious financial situation and state farms;
	- most small farmers "were on their own", forced to adopt individual strategies to adapt to new conditions and to use informal channels of information;	
	1998 - the National Agency for Agricultural Consultancy (ANCA) and its regional structures (county and local level) were established within a PHARE Project;	1995 - The National System for Agricultural Consultancy was created with financial and technical support of a PHARE Project.
2001-2007	- in the pre-accession period, public advisory service objectives have become more comprehensive and agricultural consultants attended various training courses and participated in different programs with international technical assistance and funding to meet the needs of farmers in relation to the requirements of the CAP..	
	2001 - ANCA was decentralized and its territorial structures were put under the control of local government; 2005 - territorial structures were centralized under ANCA authority. - consulting services quality was questionable because of institutional instability;	2001 - the National Service for Agricultural Consultancy was established under Ministry of Agriculture;
2007-2013	- National Rural Development Programs (NRDP) entered into force; agricultural advisory services begin to provide assistance in the context of Measure 143 „Providing advice and consultancy for farmers ".They assist farmers for four measures: the establishment of young farmers, subsistence agriculture, creation of	

	producer groups and agro-environmental measures.	
	2009 - ANCA is again reorganized; its territorial structures were transformed in County Agricultural Centers subordinated to county councils; 2010 - ANCA is liquidated. Its tasks are taken by Consulting, Extension and Training Department under the Ministry of Agriculture.	

Source: adapted from Dirimanova, 2013 and Rusu,2013

In time, agricultural knowledge transfer, in the two countries, were organized, managed and provided to farmers through the public consultancy services under the Ministries of Agriculture. Those services have a territorial pyramidal structure: in Romania there are 41 centers at county level (NUTS 3) and 500 local centers at rural level (NUTS5) (Ștefănescu, 2012); in Bulgaria there is a central office in Sofia and 27 regional offices (Dirimanova, 2013). The main objectives targeted by advisory services are to support the implementation of state policy in the agricultural sector for the development of a competitive and efficient agriculture. This service, both in RO and BG, aims to support rural population through vulgarization and technical assistance, support the structural funds accessing, promote associative forms, consultancy, information, professional training etc. The main beneficiaries' public advisory services are farmers and / or rural population.

Besides public advisory services, there is also in RO and BG private agricultural advisory services. Recent years have shown that the consultancy offered by private firms followed an upward trend, particularly in response to the financing opportunities offered by European programs. Farmer organizations are working to improve access to production, marketing and management resources for their members. Farmers play an important role not only as producers but also as contributors to the development of AKIS. Inputs suppliers joint sales of products and knowledge transfer. In general, the cost of the extension service is included in the product price.

2.2. Agricultural research subsystem

Agricultural research is the subsystem that plans, manages and implements activities that develop, evaluate, adapt and test agricultural technologies for farmers. A first group of actors in this subsystem is represented by public research and development institutes that in Romania are subordinated to the Academy of Agricultural and Forestry Sciences "Gheorghe Ionescu-Şişeşti" (ASAS) and in Bulgaria to the Agricultural Academy (AA). These public institutions operate in accordance with their statutes. They are in collaboration with Ministry of Agriculture and Ministry of Education and Research. In Romania, ASAS has under its subordination 17 Agricultural Research and Development Institutes and Centers and 51 Agricultural Experimental Research Centers, located in the country. In Bulgaria operates 25 Regional Scientific Institutes and 21 Experimental Research Centers.

Reform process, started after 1989, has brought many disadvantages to research institutions and centers: chronic underfunding has been a constant in the last two decades; research staff aging; unattractive salaries; blocked jobs; loss of agricultural land due to arbitrary political decisions. There are weak linkages with farmers and in general, research subsystem is not properly coordinated and leads to duplication and dissipation of efforts in the two states. Important volumes of research results are in libraries as publications and they are not accessible to farmers and extension providers.

Along with public research in Romania and Bulgaria, also coexist a small number of independent (private) research suppliers. It may also be noted that several large companies in the agrochemistry, seeds, agricultural machinery, etc, conducts their own research and development.

2.3. Agricultural education subsystem

In the two countries, agricultural education is conducted on the three levels: higher, secondary and vocational education. Throughout the period of transition students number has been a downward trend. University education in Romania and Bulgaria has experienced significant structural changes to adapt to the requirements of the Bologna Process. The networks of agricultural schools and universities have both in RO and in BG a regional structure. Many of these schools have demonstration farms and land for practical activities for educational or experimental purposes. The curricula are generally less adapted to the current situation: it overlooks the fact that current farmers have different needs from those of socialist period.

Theoretically, agricultural universities have a triple roll - teaching, research and consultancy. Most, however, are unable to perform effectively these three roles. They often stay separate from agricultural research and farm advisory because are not under ministries of agriculture and develops predominantly type theory-oriented programs.

CONCLUSIONS

After the change of political regime in 1989, AKIS in RO and BG has gone through significant changes in terms of structural consolidation process, objectives, approaches and actors involved. AKIS bears the mark of recent history: it suffered successive changes to meet the new challenges and realities. In the analyzed period lacked coherent policies that concern all AKIS subsystems and sectoral policies prevailed. In the AKIS, connections between subsystems are relatively weak and there is a visible lack of coordination: each subsystem acts independently and pursues their own agenda. Organizations are unequal as status and, thus, the link operates in a management approach from top to bottom. The participation of farmers in decision-making, thematic prioritization and content is more an aspiration than a reality.

Main subsystems – agricultural research, consultancy and education - are still poorly prepared to support implementation of the Common Agricultural Policy in the two countries. Agricultural advisory, have passed many transformations and adjustments, particularly in Romania. In spite of its generous objectives and targets, this subsystem did not carry them because of insufficient and low paid staff, lacking in many cases, expertise and appropriate training. Moreover, Romania is in a position to restore a new functional farm advisory service.

Agricultural research has been affected in particular by the drop in public funding with insufficient funds for salaries, infrastructure investment and implementation of research programs. The number of researchers dropped and attracting young researchers in this area has remained at stage goal. Loss of researchers' mobility and reduced access to external information leading to decreased quality of research outputs'. In this context, a large number of research institutes are increasingly turning to commercial activities to supplement insufficient budgets to the detriment of agricultural research for farmers.

Agricultural education system also faces difficulties in adapting to the requirements of current agricultural sector. Educational programs, although they have suffered a series of changes, still have a theory-oriented structure: missing modules devoted to farmers' education and training. Both the agricultural universities and colleges' curriculum should be reviewed for graduates who can create jobs rather than to prepare graduates seeking jobs.

Throughout the analyzed period, farmers from both countries were seen as being more end users of agricultural technologies rather than as partners in this process. This is an outdated way of thinking which begins with research that develops new agricultural technologies, and then are disseminated to farmers through extension. You cannot teach people without learning from them and about them (Rolling, 1982). The farmers knowledge and experience and the central role they play in the technology development and transfer should be considered landmarks in agricultural advisory service.

Regardless of the path to be followed in the future, policy makers from RO and BG should not neglect that the agricultural sector progress cannot be achieved without the existence of a performant AKIS. In this regard, it requires policy changes, institutional reorganization, organizations consolidation and capacity building to increase link between AKIS subsystems.

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MODELS FOR EVALUATING TERRITORIAL COMPETITIVENESS

CHIȚEA MIHAI ALEXANDRU[1]

Abstract: *The present study aims to highlight the main models for evaluating territorial competitiveness used at international and European level starting from the following premise: despite the difficulties encountered in the process of defining and understanding the competitiveness term and of numerous and different scientific approaches, there are, though, common elements that can be found at the level of the majority of models for evaluating national, regional and local competitiveness. The paper turns to bibliographic study and comparative analysis, highlighting the main theoretical approaches of competitiveness and the models developed on their basis. Although the indices used within the models present certain specific characteristics derived from the theoretical approach on which it is based, but also implied by the selected aggregation level, there are several central elements that can be found at the level o the majority of evaluation models such as: economic performances, investments level, institutions, infrastructure, education, health and population's welfare.*

Key words: *territorial, regional competitiveness, evaluation models, indices.*

INTRODUCTION

The term of competitiveness was and remains one of the most debated issues of the Academic environment in the last decade, the conceptual framework being far from meeting a large consensus, especially that of competitiveness expressed at macro- economic level. The discussions connected to the opportunity of the term use and its implications upon the global or individual performances, at the different aggregation levels, seem to concentrate the different approaches in two groups, which are : first, those who are contesting the role and opportunity attributed to the notion of competitiveness in the assessment and comparison of the performances of the different territorial aggregation levels and, the second, of the supporters, who consider the term, first, as an expression of the productivity and implicitly of the way in which each entity succeeds in best utilizing the resources (natural, human, technological, financial, of knowledge etc) which it owns and to capitalize as result of the „competitive advantage ”. One of best known adversaries of the macro-economic competitiveness, the economist Paul Krugman states that there are three important points in contradiction with the competitiveness term at national level, which are [4]: it is cheating and incorrect the analogy between a nation and a company; while the companies are competing for the market share, the nations instead are creating opportunities rather to destroy them and, third, according to which the competitiveness term has really a significance, this is another way of saying productivity. Porter and Ketels also support the idea or representing competitiveness through productivity [6]: “Competitiveness remains a concept that is not fully understood despite the large acceptation of its role. To understand competitiveness the starting point should be the source of a nation’s prosperity. The standard of living of a nation is determined by the productivity of its economy which is measured by the value of the goods and services produced per human, natural and national capital units…”Also, inside the group of the supporters of macro-economic competitiveness there is a „consensus view” according to which the improvement of the performances of one nation must not be done in the detriment of others and that productivity in this case is a central element. Many of the definitions elaborated throughout the time by different European and international organizations [2] contain a common idea about competitiveness: the measure with which a nation can produce goods and services that meat the requirements of international markets, providing increasing incomes for its citizens (Presidential Commission’s Report 1984, OECD 1992, European Commission 1999).

The differences of opinion are to be found also at the level of the debates regarding competitiveness at regional or local level. At this level there are two big approaches: one that regards competitiveness as the sum of the individual competitiveness of the firms, and the second, which is considering it as derived from the macro-economic competitiveness. There are authors,

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though, who are supporting the idea according to which the term does not integrally pertains neither of the parts; Cellini and Soci are considering that the regional competitiveness term does not have a majority identity, and macro-economic either, and neither micro economic: regions do not represent a simple aggregation of companies, nor these ones represent a version at a reduced scale of one nation [1].

These approaches, sometimes different, other times convergent, referring to the competitiveness expressed at national or regional level are to be put into practiced, into different patterns of assessing the competitiveness utilized at international and European level patterns which are keeping the main characteristics traced by the specific approaches which are sitting at their basis.

MATERIAL AND METHODS

The present papers appeals to the method of the bibliographic study for the evidencing the main scientific contributions in the field of the national and regional competitiveness, of the problems emerged during the process of elaborating a common concept framework for the definition, theoretization and this one's measurement and of the main patterns for the assessment of the national and regional competitiveness at international and European level.

RESULTS AND DISCUSSIONS

As regards the competitiveness expressed at macro economic level, there are more well documented studies and assessment patterns, of which, the best known and influent are: The Global Competitiveness Index, elaborated by the World Economic Forum and the Global Competitiveness Annuary edited by the Management's Development Institute (MDI).

T*he Global Competitiveness Annuary (GCA)* – acknowledges the following fact: "...competitiveness must equilibrate the economic imperatives and the social needs of a nation as it results from the history, the values' system and tradition". Accent is put, in this case on the GDP/inhabitant, as an indicator of the competitiveness. The main characteristics of the Annuary are:

- It evidences and classifies the ability of nations to ensure an environment in which enterprises can compete;
- The researches are focused upon the competitiveness of the economic environment and not upon the economic performance/ competitiveness in ensemble of one nation;
- A total number of 249 de indicators are grouped into eight groups of input factors: domestic economy, internationalization, government, finance, infrastructure, management, science and technology and people ;
- The national economies are classified according to their performance at each group level.

The pattern presents a series of deficiencies linked first to the volume of the groups and the lack of the analysis of regression type, but it is useful for the identification of the factors specific to a competitive economy: basic infrastructure, a technological one, labor force, management efficiency, research-development costs, and capital costs.

Global Competitiveness Index represents the result of the pattern elaborated by the Global Economic Forum and comprises two sets of indicators: the first, The Current Competitiveness Index (CCI), it utilizes micro economic indicators for the assessment of the set of economic, institutional policies and those regarding the market structures which are sustaining a high level of welfare ; the second, The Growth's Competitiveness Index (GCI), has in view the aggregate competitiveness, this one being regarded as the set of economic and institutional policies which sustains the high growth rates on medium term (the next 5years). The Current Competiveness Index represents an aggregate measure of the micro-economic competitiveness and has two sub-divisions: one which is measuring the sophistication/ level of the companies' development and other, which is measuring

the national business environment quality. The Growth's Competitiveness Index is orienting upon the measures linked to technology, public institutions and the macro-economic environment.

According to the annual report regarding the competitiveness at global level, for the period 2014-2015, Romania is on 59-th place out of 144 national economies assessed, with a value of the Global Competitiveness Index of 4.30 (scale from 1-7), position registered also in the previous period 2013-2014.

As regards the competitiveness expressed at regional level, there are two big types of approaches:

- First, which is considering competitiveness as a accumulation effect of the factors,
- The second which is focusing upon one determinative factor of competitiveness.

In the followings, we will present a few patterns, representative for the first category: The Regional Competitiveness Index elaborated by the European Commission, The Regional Competitiveness Great Britain (UK DTI), Joint Venture (Silicon valley Network) – the comparative analysis and ECORYS-NEI – study regarding the regional investment climate.

The main characteristics of the mentioned patterns are:

- *The Regional Competitiveness Index–European Commission* [3] : - was first published in 2010, by the Common Center for Research and the General Directorate for Regional Policies; it assesses the strong points and vulnerabilities of he EU regions at NUTS 2 level, offering a comprehensive image of them ; it includes 11 sizes for the description of the different aspects of competitiveness, classified into three groups: B**asic Group**: 1. Institutions, 2. Macro-economic stability, 3. Infrastructure, 4. Health, 5. Quality of the educational primary and secondary system; E**fficiency group:** 6. Higher education, professional training and continuous study, 7. Labor force efficiency, 8. Market size; I**nnovation group**: 9.Technological training, 10. Business expertise and 11. Innovation. It divides the regions into three development regions, in function of the GDP/inhabitant in comparison with the EU average: medium (<75%), intermediary (75-100%) and high (>100%).
- *The Regional Competitiveness Index– UK DTI* – elaborated by the Department for Trade and Industry of Great Britain ; it includes into analysis 14 indicators which are measuring the effects of the regional competitiveness; it is divided into 5 sections: general competitiveness, labor force market, education and professional training , capital, land resources and infrastructure.
- *Joint Venture (Silicon valley Network)* – is testing the competitiveness of one region/ zone comparatively with other 10 centers of high technology in the United States; it assesses competitiveness in relation with the following elements: innovation (patents, productivity of RD), entrepreneurship spirit, , global access global (technological export, connectivity of internet), capital financial and intellectual capital , the perspectives regarding the cost of activities' development, life quality; identifies a strong connection between inventions-patents, institutional costs for research, the availability of the risk capital and the presence of high tech companies .
- *ECORYS-NEI* – study regarding the regional investment climate– it represents a method for assessment/ testing / quality measurement of a regional *investment climate*; over 40 regions in the North West of Europe are tested comparatively to the results of the surveys developed at the level of the entrepreneurs established in the respective regions; The variables in the survey – 2 categories: market relationships, with direct impact upon the performance of the company and factors of the productive environment– direct impact direct upon performance. The market relationships variables– 5 categories: access to the customers, suppliers' availability, entrepreneurship and innovation spirit, competition level and cooperation level. Productive environment variables– 6 categories: labor force market, land resources and constructions, infrastructure, infrastructure of knowledge, life quality and regional governance. The results permitted the realization of a *typology of regions,* in function of the performance/ economic vitality and density of population– 6 regional

archetypes regional: spread regions, balanced regions, refuge type regions, vital regions, urban specialized regions and urban quiet regions.

CONCLUSIONS

The Concept framework of competitiveness is proved to be one far from the general consensus, determining the emergence of some confusion, especially at the level of that expressed at regional level. Martin considers that, despite the difficulties of conceptualize the notion and the fundamental questions, the specialty literature retains a series of aspects which are important for the understanding of the regional competitiveness [5]:

- There is no single theoretical perspective to compass the whole complexity of the concept of regional competitiveness;
- From a certain perspective, the regional competitiveness is linked to the ability of a region for generating sufficient levels of exports such that it could support the incomes' increase and of the degree of its' population occupation;
- At the basis of the concept sits both the qualitative conditions and factors (un-transactional informal knowledge, trust etc), and quantifiable processes and attributes (trade among firms, patents' cost, labor supply), having a major influence upon the analysis and empirical measure a of the regional competitiveness;
- Competitiveness of one region represents both the result of the individual competitiveness of the firms constituent and of the interactions between them, and in a larger sense, of the own social, economic, institutional and public attributes.

Regardless the aggregation level, national or regional , there are many patterns for assessing competitiveness the results of which must not be compared but interpreted in function of the characteristics of the elements component and the goal of the investigation. Also, especially at regional level, there is an ample space of action for the elaboration of some patterns for assessment adapted to the present realities in the developing countries, as well as of some local patterns, to assess the performances of some certain zones within some regions.

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MANAGERIAL SKILLS OF WOMEN ENTREPRENEURS IN DOBRUDGEA'S RURAL AREA

ELENA SIMA[1]

Abstract: *Women have become more important in the global market, not just as employees, but also as consumers, entrepreneurs, managers and investors. This paper aims to capture the managerial skills of women entrepreneurs in Dobrudgea's rural area and the difficulties that women entrepreneurs are facing, the gender differences and gender diversity in business, as well as their impact on the economy. By approaching this theme, we intend to highlight the problems faced by women both in terms of concepts and education by analyzing the employment rate by age, status and education level. Although women are still a minority in entrepreneurship and entrepreneurial skills and women workforce in rural areas are underused, in recent years there has been a considerable increase worldwide in the number of women who start and run their own business. Moreover, it is a general characteristic of Eastern European countries, which have the lowest levels of women's participation in entrepreneurial activities.*

Key words: *women entrepreneurs, managerial skills, rural area, Dobrudgea*

INTRODUCTION

In the last few years entrepreneurship research has focused on the growing number of women starting and running their own successful businesses, stressing the positive effects, impacts and implications of female entrepreneurship on the economy in general, and it has called for more governmental policies and political support to further encourage the involvement of women in business start-ups. Furthermore, studies demonstrated that the female leadership styles are just as effective and efficient as the male leadership style. Proof of this lies in the statistics that the number of businesses run by female entrepreneurs has globally grown in the ten years. [6]

During the Romanian communist regime, officially men and women had the same professional opportunities. However, it was not until the late 90s that women started climbing the career ladder in companies reaching key leadership positions as department managers, general managers and a few of them going even further by becoming entrepreneurs and starting their own businesses.

In the European Union (EU), even though there are more women than men, female entrepreneurs develop only a third of the self-employed activities because there are some factors (such as reconciling business and family activity) that make entrepreneurship a less attractive option for them than for men. As result, the European Commission is working with EU countries to overcome these and encourage more women start their own businesses. [10]

In this context, in which the entrepreneurship promotion and development represents one of the main directions of Europe 2020 Strategy and a solution to the recent slowdown of the economic growth in several Member States of the European Union, this strategy and set of action plans to identify the distinctive elements that characterise the managerial activity of a woman and to underline their importance on the development and growth of the economy by adopting a regional approach.

MATERIAL AND METHODS

The information and findings in this article were obtained through methods specific to scientific research. The research followed the following process and stages: identification of the researched issue, research framework delimitation, information collection, data processing, analysis and interpretation, drawing up the conclusions. The information sources used can be classified into governmental sources (statistic, ministerial and from research institutes), and non-governmental sources (independent publications). The desk research consisted of the identification of other

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studies and articles on the same subject, and in the processing of some statistical data. This was complemented with field studies in Dobrudgea's rural area. As the statistical data referring to the women's entrepreneurship and its impact upon economy, environment and human society are very few, the research results have at their basis a series of analyses – mainly qualitative – as well as a series of logical reasoning.

Dobrudgea is a Romanian historical province located between the Danube and the Black Sea, consisting of two counties from the administrative point of view: Tulcea and Constanţa. At present, the economic system specificity and the functional typology of Dobrudgea's settlements are determined by the utilization of local resources as well as by the distribution and territorial absorption of the foreign financial support for investments. [1]

As a multifunctional space, Dobrudgea has been and will continue to be mainly a human *living territory* (rural settlements) and a *social space* (resting, recreation, and conviviality/tolerance relations) for the local communities. At the same time, the Dobrudgean space is also an *economic space,* providing agricultural land and other resources as production and existence means. Although at first sight the landscape from Dobrudgea is rather dull, there are natural resources and economic objectives in the rural areas, to support the entrepreneurial environment development.

RESULTS AND DISCUSSIONS

As it results from the "Europe 2020 Strategy" the support and consolidation of entrepreneurship and innovation represent one of the most important methods of approaching the economic issues in the rural communities, materialized under the organizational-juridical form of the small and medium-sized enterprises (SMEs). [10]

The frequency, by which an economy generates new business start-ups, or in other words the increased levels of new business activities, favourably impacts the economic growth of a country or region. For the developing countries, the theoretical economic models are centered upon the idea that entrepreneurship represents the flame and accelerator of the economic growth. [4]

This idea forms the foundation of any government initiative and public policy strategy in order to encourage and develop new businesses with a long-term positive impact on the economy in general. In order to obtain a positive driving effect, and also on long term, the strategic measures must generate positive *economic and social externalities of the local business environment's development.*

The economic externalities of the local business environment development have in view:

- Putting into value the local resources (both natural and human and material capital) by the increase in number and the diversification of the activities of the functional firms;
- Higher incomes for the community through transfers generated by the system of taxes and fees;
- Higher incomes for farms through transfers under the form of wages;
- A bigger, rich and diversified supply of goods and services at community level.

The social externalities of the local business environment development have in view:

- Jobs for the local working-age population;
- Stabilization of the young population and avoiding the depopulation and demographic ageing;
- Improvement of the access of population to different goods and services;
- The inclusion of a larger part of the population in the social systems, because, as employees, they become contributors to the pension, unemployment benefit, health assistance funds;
- The diminution of the incidence of persons depending on the social transfers under the form of minimum guarranteed income, as the development of entrepreneurial initiatives gives them the opportunity to have a job.

As a result, the strategic measures for the development of a community have a direct or indirect impact upon the development of the business environment at community level, and the

theoretical and practical evidence make us state that the economic and social development perspectives of a specific area are directly dependent on the size and dynamics of entrepreneurial initiative.

The number of SMEs increased in Romania until 2008. The formation of new enterprises stalled during the recession and has yet to fully recover. Romanian businesses proved to be less resilient during the recession.

Table 1. Evolution of the number of active enterprises in the national economy, by size category

Year	Total	out of which: by size category according to the number of employees			
		0-9	10-49	50-249	250 and over
2004	410383	362457	36670	9197	2059
2005	450666	399105	40195	9391	1975
2006	480910	424865	44513	9605	1927
2007	520228	459696	48615	9988	1929
2008	555128	495038	48190	9978	1922
2009	541836	485776	45800	8609	1651
2010	491956	438421	43854	8085	1596
2011	452171	394091	47790	8640	1650
2012	472342	413803	48275	8584	1680

Source: Romania's Statistical Yearbook, 2004-2012 data series, NIS.

According to the World Economic Forum, the most problematic factors for doing business in Romania are corruption, tax rates, government bureaucracy and inefficiency, access to finance, tax regulations, inadequate infrastructure, inflation and an inadequately educated workforce. [10]

The rate of generating new business start-ups has had a positive trend due to changes in the legislation on small and medium businesses; however, the rate of business decline and bankruptcy after only one year of economic activity remains higher in the areas where the educational and skills levels of entrepreneurs and managers is lower.

In this context, however, an area in the field of private businesses has developed, in which women, who represent almost half of the employed population (Table 2), are taking more and more initiative and are more empowered. The women empowerment modality is typical for our country, as women proved that they are able to start their own businesses and to assume full responsibilities in the management of the activities specific to them. The phenomenon takes place not necessarily from the need to make proof of skills and abilities similar to those of men, but mainly out of practical, immediate reasons: the economic necessity to sustain a family by themselves or to contribute to the family budget. Very many women (or couples) have decided to be self-employed, in the conditions in which unemployment widely increased or the previous job no longer provided the necessary finance to support a family. [3]

Table 2. Evolution of the workforce, by gender, in the period 2010-2014

Year	Active population thousand persons			Employed population thousand persons			ILO* unemployment thousand persons		
	total	men	women	total	men	women	total	men	women
2010	9965	5549	4416	9240	5112	4128	725	437	288
2011	9868	5457	4411	9138	5026	4112	730	432	299
2012	9964	5546	4418	9263	5126	4137	701	420	281
2013	9977	5568	4409	9247	5128	4119	730	440	290
2014	9243	5228	4015	8614	4844	3770	629	384	245

*International Labour Office

Source: Romania's Statistical Yearbook, 2010-2014 data series, NIS.

In the Romanian countryside, the existing micro-enterprises cover a limited range of production activities and services and do not fully put into value the local resources. Most of them are oriented towards trade (approximately 70% of total micro-enterprises in the sector of services)

due to the quick recovery of investments made and a minimum necessary expertise for the organization of such activities. The processing industry accounts for only 16% of total micro-enterprises in the rural area, while the rural tourism is not developed according to the tourism demand on the domestic and world markets, facing difficulties of technical, financial and educational nature. [6]

The rural area favours the emergence of new enterprises, but it is a vulnerable entrepreneurial environment, which equally depends on external factors (local infrastructure, social, economic environment, cultural environment, traditions etc.) as well as on internal factors (the entrepreneur's capacity, skills and competence).

The promotion of the entrepreneurial initiatives in the rural area starts from the need to diversify the rural economy. In general, no rural development program can be designed without agriculture having an essential role, but the rural economy is more developed and more dynamic if it has a more diverse structure.

In this context, the *target sectors* for the consolidation of the rural entrepreneurship are: agriculture; processing of agricultural products; basic services; tourism.

The *main target groups* for the consolidation of the entrepreneurial spirit in the rural area are the following: young people; women; small farmers who own subsistence and semi-subsistence farms.

It is agreed amongst economic analysts and business start-ups specialists that being an entrepreneur is not just about starting a business and then running it. This is perhaps an oversimplified hypothesis that in order to be an entrepreneur you simply need to start and run a business. However, as many specialists around the world would argue being an entrepreneur is an art requiring identifying a business idea, evaluating if this idea is a business opportunity and if it can be achieved (requires attracting investors or simply selling the idea), and developing the idea which can be called a business only if taking into an account the dynamics of the market and the satisfaction of a set of new needs and wants clients may possess.

An enterprise, be it small or large, is essentially a business. This is defined by the European Regulation 696/93, but no strategy framework has been established, which could be applied in all EU Member States for promoting rural entrepreneurship. The local communities must identify and build the entrepreneurial strategies, according to their local values.

The challenges of rural development in Constanta and Tulcea counties, both located in the Dobrudgea region of Romania, associate entrepreneurship with economic progress, the generation of employment, reducing social inequality and improving the environmental control.

The characteristics of female entrepreneurship in Dobrudgea's rural area are similar to the national characteristics where the number of women involved in entrepreneurship is small and this area of economic activity is dominated by male entrepreneurs. As a general trend it can be noticed that women tend to be an active part in the stages leading up to a business starting up (women tend to be responsible for or involved in designing business plans, finding sources of finance etc.), however, without benefiting financially from these activities.

Research in the Dobrudgea's rural area shows that there *are no major differences between the entrepreneurial activity of men and women*; however *there is still a strong stereotypical perception that the role of a man is to focus on his career, while the role of a woman is to focus on her family.*

Although at present there are both male and females involved in leadership and entrepreneurship, it appears that men are more easily accepted in leadership and management positions. A woman in charge of a business can be easily tagged as aggressive, bossy or selfish.

The women who had the courage to start a business are supportive of the idea that *confidence in their own qualities lies at the basis of success*. This entails other qualities, which are frequently found in the women leaders, namely: determination, professionalism, flexibility, continuous professional development and passion for what they do.

In the specialty literature, it is stated that the most important managerial skills and abilities a woman entrepreneur needs are:

- *Energy* (the strength to initiate a business, to start-up a company and to run it with vigour, initiative, the ambition to succeed, responsibility and tenacity);

- *Mental abilities* (characterised by intelligence, the ability to investigate and analyse complex data, and creative thinking);

- *Expertise* (know-how and expertise in the specific area of the business, but also general marketing and management expertise);

- *Communication skills* (an essential element needed to manage a successful business; communication is a key management skill, needed to make known the result of managerial decisions and to establish a climate of understanding and trust between those who send the information and those who receive it);

- *Decisional capacity* (to allocate resources and to negotiate).

These skills and abilities can be acquired through education and/or experience and are influenced by the following factors:

- *The personal characteristics of the individual*: age, educational and qualifications, management skills and expertise, experience, motivation to get involved in entrepreneurial activities;

- *Environmental factors or socio-cultural factors*: the existence of good examples of entrepreneurship in the social circle of the individual, the fear of failure, the ability to trust and self-confidence in the individuals' own entrepreneurial skills and abilities;

- *The characteristics specific to the business*: the type of ownership (individual or partnership), the sources of finance, the path chosen to develop the business, the level of involvement in international activities, the application of the latest technology in business.

The research on the Dobrugean entrepreneurship in the rural area revealed that:

- There are no major age differences between men and women when starting a business (most of them are aged 30-40 years);

- From the perspective of education and qualifications, both men and women entrepreneurs graduated secondary school and university;

- The level of qualifications of entrepreneurs has greatly improved in the last few years and women have more work experience on the average than men when starting the business;

- The level of managerial experience of entrepreneurs and managers is still quite low; both men and women do not have much previous management experience in leadership positions or technical professions but they compensate with theoretical knowledge on management issues when starting up the business;

- Both men and women have three personal reasons to start a business: the desire to make money, the desire to improve their quality of life and the desire to control their own destiny;

- From a socio-cultural perspective, women are motivated by other successful female entrepreneurs or managers from their own circle of friends, while the male examples in the family influence male entrepreneurs; this demonstrates that entrepreneurship is learnt through informal means rather than the formal (school/university) educational system;

- Women need more time to identify a business idea as well as to start and run the actual business;

- More women than men have used bank loans to finance their business (mortgage credit); more men than women have borrowed money from other family members to start their new business;

- Very few entrepreneurs rely on financial resources from public institutions (such as grants and subsidies), and those who benefited from such public aid are men exclusively.

The main difficulties that the Dobrugean entrepreneurs are facing from the supply point of view are related to identifying and accessing a source of finance and from the demand point of view is related to the limited purchasing power of the potential Romanian clients. These add to the tough market entry barriers that also discourage the new entrepreneurs.

The impact of the commmunity development programs upon the entrepreneurship of the business environment depends on three factors:

- The valorization of the development program importance as perceived by the local leaders;
- The convergence between the business opportunities perceived by the local entrepreneurs and the local development programs;
- The active implication of the local actors in accessing the local development programs.

CONCLUSIONS

Entrepreneurship is a major factor of economic growth, innovation, competitiveness, labour employment and social integration, having been promoted at European level for quite a long time. There is a strong correlation between the entrepreneurial level and the economic development level of a country. The level of entrepreneurial activities, or better said the frequency with which new businesses are created within an economy represent a major source of incomes, of promoting entrepreneurial abilities, of innovation and job creation.

SMEs represent the backbone of the economy and are key drivers of growth, job creation and cohesion. The demographic evolution of small and medium-sized businesses has progressed in an organic way for the Romanian business private sector, relatively new and deeply challenged by the constant transformations and changes Romania has been facing for the last 25 years. In spite of the lack of experience, lack of entrepreneurial skills and know-how, Romanian entrepreneurs not only considered the option of starting their own business but jumped at the opportunity to take advantage of the new market opportunities.

The Romanian rural economy is by tradition associated to agriculture, but in reality it comprises much more types of activities (businesses). Women started to get leadership positions, to start their own businesses, while successfully managing both professional career and family life.

Research shows that both masculine and feminine leadership styles are equally efficient although there are major differences between the management styles of men and women. Men are more interested in success and money, while women are more interested in the human side of the business.

In the Romanian rural area, the scale and success of female-owned and managed businesses are growing, although at lower levels considering the roles women are expected to play in their professional and family life. The failure rate of female entrepreneurship can be explained by the lower level of aspiration, expectation and imbedded perceptions. This is a general characteristic of Eastern European rural areas, where women tend to start and manage smaller business compared to male-led and managed businesses.

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THE ROLE OF SMALL-SCALE AGRICULTURE IN ROMANIAN CONTEXT

MONICA MIHAELA TUDOR[1]

Abstract: *In the last quarter of century (post-communist period after '89) in Romania, rural areas and small rural households were highly stable systems, providing social and economic security. Small-scale agriculture has become and continues to be the main supplier in rural labour market in the absence of other non-agricultural employment opportunities; achieve higher levels of economic performance compared to large farms by diversifying their production structure due to they have an important contribution to the national food security; food self-consumption, supported by small farms has an leverage effect against poverty. If the resilience means the ability of an individual, household, community, region or country to resist, to adapt, and quickly recover after a crisis, shock, change, the economic and social functions and roles assumed in the transition period by small Romanian rural households gives them the attributes of an resilient answer of the entire Romania to the post-communist changes and shocks.*

Keywords: *rural areas; socio-economic changes; small agriculture; resilience; Romania.*

INTRODUCTION

An overview of major phenomena and processes in Romania during the last 25 years revealed that the current stage of economic and social development are the result of the transition process from socialism to capitalism. In all these years, rural areas and small rural farms represented a social and economic safety net against economic and social effects generated through the process of socialist economy restructuring. The most important three factors that influenced the rural areas in transition are:

1. reconstitution of the private ownership on the agricultural land (which meant that landowners can operate the agricultural land on their own). In short, through the process of reconstitution of private ownership, Romania returned to the pre-communist farm structure, which was characterized by a high level of fragmentation. Thus, in 2003, in Romania there were 4.5 million holdings with an average of 3.1 ha Utilised Agricultural Area/ holding;
2. the restructuring of the other sectors of national economy (which meant the closure of socialist enterprises and generated high unemployment in the absence of initiatives to develop new capitalist enterprises). As a result, we have witnessed a process of returning to rural areas of the urban populations who lost their jobs from the socialist economy;
3. lack of non-agricultural occupational opportunities in the rural areas. These realities were perpetuated during the entire post-communist period and maintained the dependence of the rural population on agriculture and on small farms production.

As cquonsequences:

- the Romanian rural area represents the place of residence for around 45% of entire population;
- the small rural farms have become one of the main means to meet the subsistence needs of the rural household members (the holdings under 5 ha represent 93% of the total number of holdings). Because of this, the concentration in agricultural land use run slowly with negative consequences upon the productivity of the primary sector of the national economy;
- almost 80% of Romanian holdings are considered as subsistence or semi-subsistence holdings; they use more than a half of their own farm production for self-consumption.

MATERIAL AND METHOD

The "resilience" means the ability of an individual, household, community, region or country to resist, adapting, and quickly recovering after a crisis, shock, change (Gallopin, 2006). Starting from these theoretical approach, the paper objective is to analyse the Romanian rural

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households, from the perspective of the economic and social functions and roles assumed in the transition period, on account of which the small Romanian agriculture could by considered as an resilient answer to the post-communist changes and shocks of the entire country, not only for rural areas.

The methodological basis of the cognitive approach consist of a literature review related to the main socio-economic roles assumed by Romanian small farm that could proved theirs resilience and the analysis of secondary statistical information that could support the theoretical arguments reflecting the resilience of small-agriculture.

RESULTS AND DISCUSSIONS

The small farms have a "social buffer" role, which enabled Romania to go through the difficult period of the 1990s without major social disturbances. The negative effects of long-term unemployment resulting from the process of deindustrialization were attenuated in the subsistence farming practice (Luca, 2013). In addition, these farms contribute to Romania's food security, if we take into consideration the high share of self-consumption on the Romanian households (according to the data of the Household budget survey, 30% of total food consumption expenses at household level are represented by the value of self-consumption – NIS, 2014). The small farms have an important contribution to food security not only for rural population but even for the urban households, due to the family relationships on the basis of which the food products obtained on the small farms are transferred to their urban relatives. Thus, for a rural household, about half of total food consumption is represented by the value of self-consumption, while in the case of an urban household this percentage represents one-fifth of total food consumption value.

However, many analysts consider these an economic potential loss for Romania's agriculture (Otiman, 2012), representing an inefficient form of land resource allocation (Gavrilescu & Gavrilescu, 2007) by taking out of the agricultural circuit devoted to market production of about 30% of the country's agricultural land area; they also contribute to maintaining land fragmentation, which is a cause of low yields (Steriu & Otiman, 2013). These authors draw the attention on the need to reform the agricultural system in Romania in order to operate the land resources with economic efficiency, which should represent a primordial objective of the agricultural policies, in these authors' opinion.

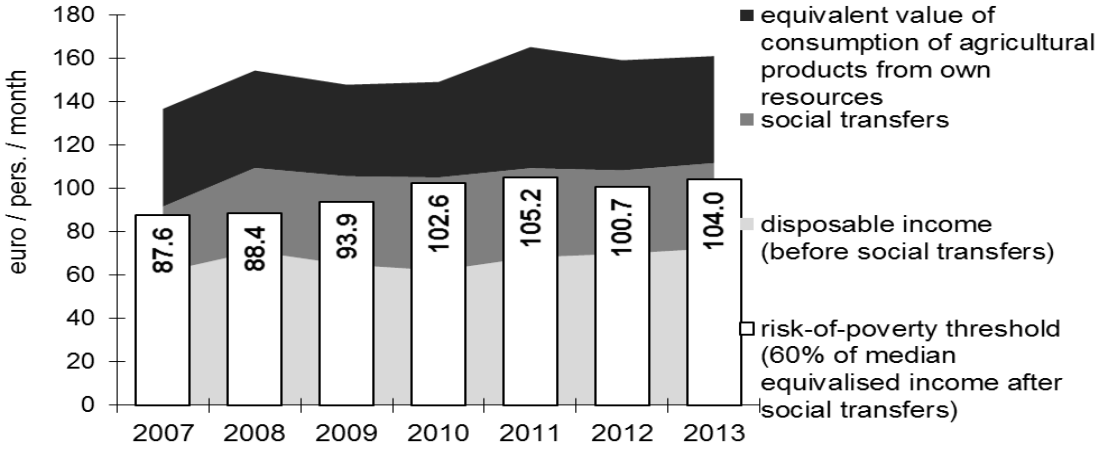
We cannot deny the truthfulness of these conclusions and recommendations, yet there are several arguments counterbalancing the unfavourable opinions regarding the existence of the small peasant family farm (Tudor, 2015).

The first argument is linked to the European and world strategies of *fight against poverty*, in which *self-consumption might have a lever effect* (which is perfectly applicable in rural Romania, as we have previously shown). But supporting this farming type (subsistence or semi-subsistence) comes into conflict with the agriculture restructuring objectives. Pouliquen (2011) concluded on the need to reach equilibrium between these two objectives and on the possible co-existence between the commercially oriented farming and that with social protection connotations. The recent economic and financial crisis reinserted, in the academics discourse, the importance that small-scale agriculture has in countering the effects of welfare decline, especially in the fight against poverty. Thus, in its report of 2014, the Food and Agriculture Organization (FAO) emphasized that small and medium-sized farms are essential for the sustainable management of global natural resources, for environmental protection, and to ensure food security. The FAO experts say that "*... nothing is closer to the paradigm of sustainable food production than family farming. ... Family farm is not part of the problem of hunger, but a vital component in solving this problem*" (FAO 2014, p. vi)

In the case of small agricultural holdings, the modernization process evolves slowly, as these do not have a commercial purpose, but rather a social one (meeting the consumption needs of the family members). The high consumption level limits the commercial actions and consequently, the possibilities to invest in farm modernization.

In the conditions in which the potential of remunerated job supply decreased almost by half compared to 1990 (NIS data), the rural household and the small peasant farm around it became the main means to cover the primary consumption needs for almost half of the country's population (45% of Romania's population currently lives in the rural area). Due to the lack of non-agricultural opportunities on the rural labour market and the prevalence of subsistence and semi-subsistence farms, the welfare of rural households significantly depends on the self-consumption of their own agricultural products (Figure 1).

Figure 1. The contribution of self-consumption to the welfare of rural households in Romania.



Source: own calculations based on NIS data – TEMPO on-line database.

The statistical data reveals that, *generally speaking, without self-consumption, the Romanian rural population would be at risk of poverty.* At the level of Romanian rural households, the social transfers allow to one rural resident person to overtake the poverty threshold (in the peak of the economic crisis -2010 - and in the next years, disposable income per adult equivalent exceeded by only 2% and 7% threshold of relative poverty rate). The same data shows that the value of consumption from own resources significantly contribute to improving the welfare of rural household members; during the economic crisis, the equivalent own consumption represents one-third of the total income of a person in rural (Figure 1).

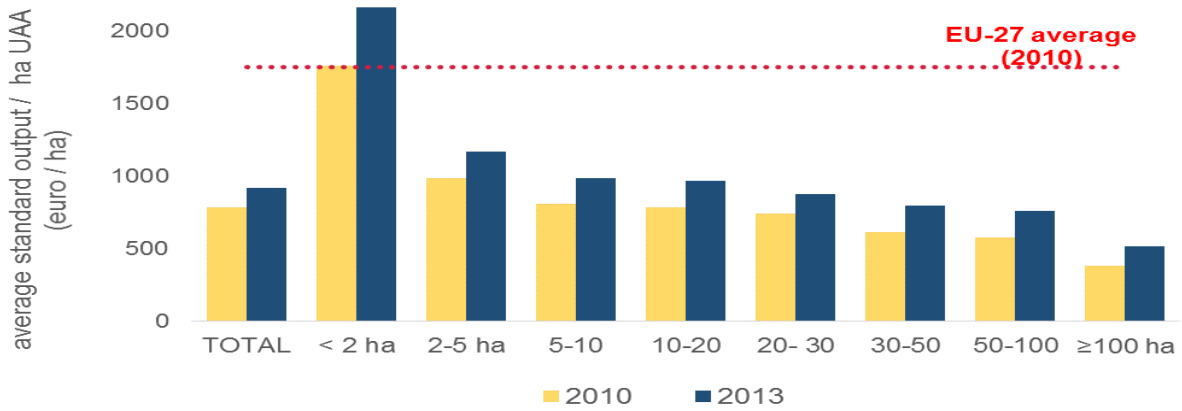
The second argument is linked to the fact that the small rural household farms are ***the main carriers of job supply in the countryside***. Hence, their contribution to the rural population's social sustainability cannot be denied in the conditions of job scarcity in the rural area, but also in the urban areas. Thus, about 90% of the regular labour force that perform farming activities in Romania is working on the farms with utilized agricultural areas smaller than 5 ha and only 1% of these are working on the farms larger than 100 ha. Furthermore, the farms provide occupational opportunities not only for the farm head's family members but also for other unrelated persons, thus contributing to the labour market in agriculture by more than 20% (according to Eurostat data, the number of persons that represents regular non family labour force at the level of small farms – under 5 ha – accounts for about 20% from the total number of these persons in the Romanian agriculture in the last five years).

The third argument is linked to their ***economic performance***, which, per unit of utilized agricultural area, seems to be ***higher than that obtained on the large-sized farms*** on the basis of their production diversification. The statistical data of the last agricultural census 2010 and the Structural survey from 2013 reveals that the small-sized farms in Romania have the highest economic performance in relation to the unit of utilized agricultural area, the value of agricultural Standard Output (SO^2) per one UAA hectare being three times as high for the farms under 5 ha

[2] The *standard output* (abbreviated as SO) of an agricultural product (crop or livestock), is the average monetary value of the agricultural output at farm-gate price, in euro per hectare or per head of livestock. There is a regional SO coefficient for each product, as an average value over a reference period (5 years). The sum of all SO per hectare of crop and per head of livestock on a farm is a measure of its overall economic size, expressed in euro.

compared to the large-sized farms over 100 ha (Figure 2). Furthermore, the farms smaller than 2 ha are the only farms in Romania that reach the EU-27 average of SO/ha UAA value in the year 2010 (in the peak of the economic crisis -2010), maintaining a growing trend of economic performance, till 2013. This efficiency difference in the utilization of land resources, in favour of small farms, can be largely explained by the production structure adopted by the different categories of farms to which we shall next refer.

Figure 2. Disparities in farm performance in Romania according to their utilised agricultural area

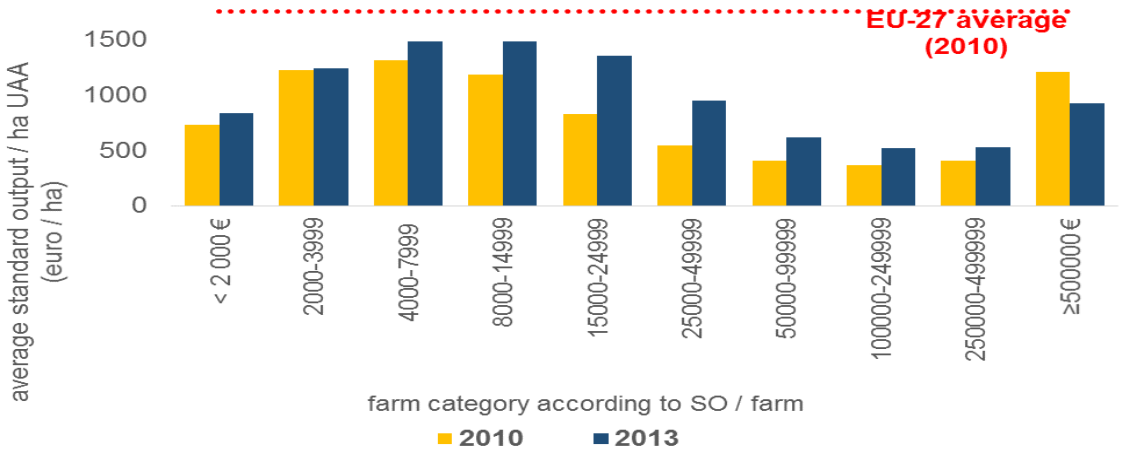


Sursa: own calculations based on EUROSTAT data.

Generally speaking, the very small farms from Romania (those with utilized agricultural area under 2 ha) are not specialized in their agricultural production. They integrated livestock and crop production in the structure of their production and use part of the vegetable products to feed their livestock. On account of this integration, the value of their agricultural production per unit of utilized agricultural area is higher, above the EU average. At the other extreme, large farms in terms of utilized agricultural area, have specialized production structures in field crops (cereals and oilseeds) but their yields per hectare are lower than the average of European countries. Therefore, standard output value per unit of operated area, obtained from these farms is low (lower than those of small farms in Romania).

The analysis of the same indicator according to farm economic size strengthens the conclusion on the higher economic performance obtained on the small-sized farms in Romania. Thus, at the level of farms whose standard value of annual economic output is lower than 2000 euro (generally considered subsistence and semi-subsistence farms and representing 70% of the number of farms in Romania and 18% of UAA), the SO/ha value is getting closer to the national average. The Romanian farms whose value of annual standard output ranges from 2000 to 8000 euro (considered semi-subsistence farms and accounting for 26% of the number of holdings and 21% of UAA) obtain the highest performance levels per unit of utilized area compared to the farms from the other size categories (Figure 3). The same data reveal that only 17% of the country's agricultural area is operated under the large-sized farms (with agricultural productions whose standard economic value exceeds 500000 euro annually). For the large farms, the economic efficiency of land use decreased in 2013 compared to 2010; it is, in fact, the only category of farms that recorded such a trend between 2010 and 2013. Therefore, we believe that the large farms have achieved the maximum in the economy of scale paradigm and their economic performance is likely to decrease in the coming period.

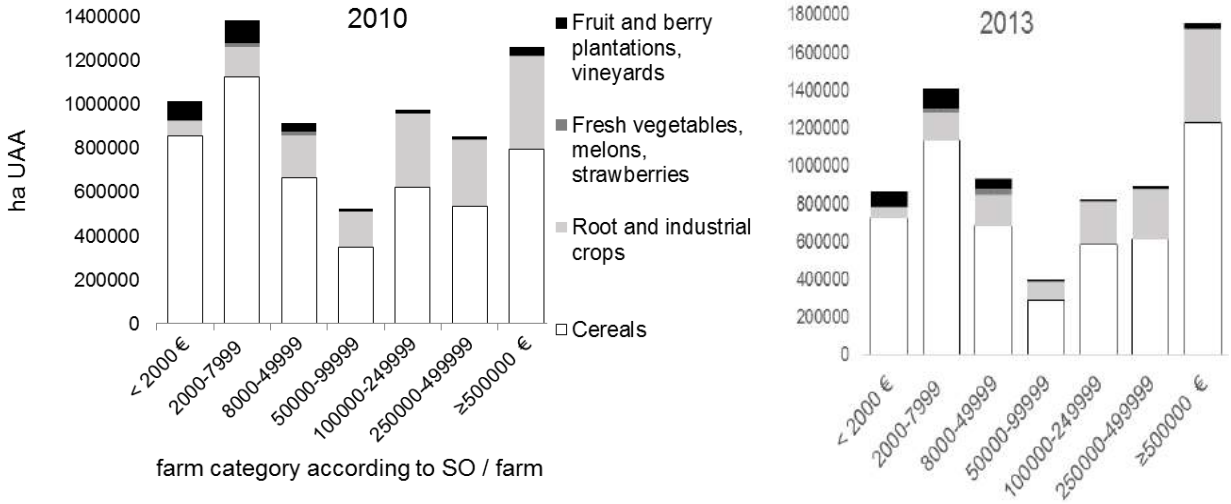
Figure 3. Disparities in farm performance in Romania according to their economic dimension



Sursa: own calculations based on EUROSTAT data.

The fourth argument is linked to the ***much more diversified production structure*** on the small farms compared to the commercially-oriented farms, which better responds to the final consumption needs of the country's population and implicitly ***to the domestic food security requirements***. Thus, while the small-sized farms have quite diversified production structures, integrating the crop and livestock productions, as the farm land size increases, there is a tendency of production specialization and orientation towards crop production (mainly grains and industrial crops – oil crops – suitable for exports and which can be organized on large-sized field areas with minimum technical and technological effort) (Tudor, 2014).

Figure 4. The structure of crop production on Romanian farms after their economic size



Sursa: own calculations based on EUROSTAT data.

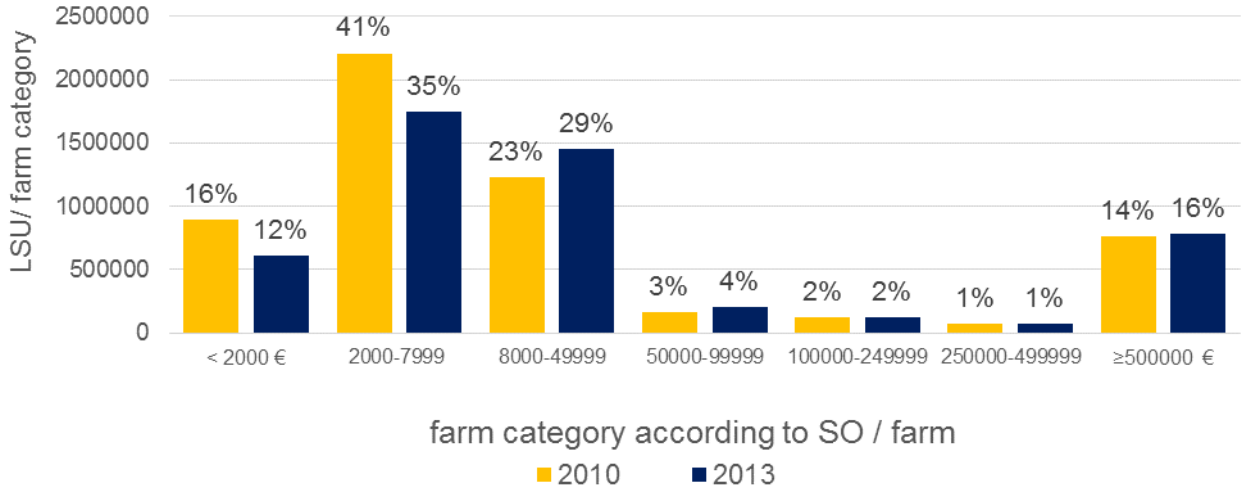
The statistical data reveal that most livestock herds (expressed in LSU[3]) (Figure 5) and the domestic production of meat and meat products are obtained on the farms that are considered subsistence and semi-subsistence farms; it is also on these farms that the largest part of the production of fruit and vegetable at national level is obtained. Thus, in the year 2010, about two-thirds of the areas under vegetables or under orchards and vineyards were operated by farms with economic sizes lower than 8000 euro/year. The large-sized farms, which have in view the maximization of economic effects with minimum effort, are getting their production structures more

[3] The *Livestock unit* (abbreviated as LSU) represents a conventional reference unit that facilitates the aggregation of livestock herds from different species and ages, by using certain conversion coefficients established on the basis of nutritive or feed requirements for each category of animal in part.

and more oriented towards those agrarian economy segments that satisfy their objectives. Their almost exclusive orientation towards the large field crops (cereals and industrial crops) results in scarcity of other vegetable products (fruit and vegetables in particular) on the domestic market (Figure 4).

The same conclusion can be extended to the livestock production. Following the prevalence of cereal crops in the Romanian agriculture, with increasing tendencies, the agri-food balance of trade, except for grains (maize, wheat) and industrial crops (soybean) was and continues to be negative. Significant deficits can be noticed in meat, dairy, fruit and vegetables (Steriu & Otiman 2013: 98; Luca, 2014: 93), products that are mainly produced on the small farms (Figure 5). Without the small-scale farming contribution to livestock production and fruit and vegetables production, the deficit of Romania's agri-food trade balance is under risk of growing larger, due to the productive orientation of large-sized farms.

Figure 5. The livestock production of Romanian farms according to their economic size



Sursa: own calculations based on EUROSTAT data.

As a result, the small farming role in the domestic food security for the population in Romania cannot be denied. Moreover, the recognition and support of these farms is absolutely necessary, taking into consideration their social and economic importance.

CONCLUSIONS

In (post-communist) Romania, a series of great economic and social changes were produced, which were difficult to manage for a large part of the Romanian society. Small-scale agriculture (that is practiced according to traditional pre-communist patterns) represented an adaptive response to the transition shocks. In the last quarter of the century (after 1989), in Romania, the rural space and the small rural household represented high stability systems, suppliers of economic and social security.

Given the arguments set out above and the persistence of small farms in rural areas, we can appreciate that small-scale farming is an economic and social system with high resilience, who resisted to the external changes and, through its features and functions, it acted as a safety solution against rural population's economic and social vulnerabilities.

Yet, in order to face the permanent changes and challenges of the globalized world, of the digital era, etc., the small-scale agriculture system needs to be invested with new abilities to increase its adaptation opportunities and its capacity to find new equilibrium levels. This statement is also supported by the conclusions of studies on resilience, according to which resilience is not a fixed characteristic, but under continuous dynamics, having to modify its parameters according to the evolution of human systems (Simmie & Martin, 2010).

As a result, small-scale agriculture has to get support in order to surmount its vulnerabilities and the simple condition of ”socio-economic buffer” and to become a factor of progress. It is only in these conditions that we can speak about the increase of the capacity to resist, to cope with the permanent external changes on an adaptive basis, resilience strengthening decisively contributing to the diminution of recurrent crises impact.

Taking into consideration the great socio-economic changes produced in the transition period, the main vulnerabilities of the rural population that adversely affect their adaptive capacities are the following: redundant qualifications on the labour market; demographic ageing; obsolete technologies, technical means and managerial practices in agriculture.

The potential ways to increase resilience are generally subsumed to the intervention need through public policies targeting the following:

- Increase of the knowledge and professional abilities stock and their diversification, so as to allow the rural population’s ascending occupational mobility in a modern knowledge-based society and to break up the opacity to technical and technological innovation;
- Support to increase technical performance while maintaining agricultural production structure diversity, which proved to best meet the domestic food consumption needs;
- Decrease of dependence on agriculture through on-farm activity diversification and increasing the value added of agricultural products through processing.

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THE ROLE OF SHORT FOOD SUPPLY CHAINS IN THE DEVELOPMENT OF SMALL-SCALE LOCAL PRODUCERS CASE STUDY: HARGHITA COUNTY

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Abstract: *Currently, short food supply chains represent a viable alternative to the conventional globalized supply chains, thus gradually becoming a more and more proeminent actor in the global logistics sector. The previously mentioned short food supply chains are in general extremely varied both in terms of nature and practices, benefiting producers as well as consumers from the socio-economic, environmental and health improvement points of view. In most cases, short food supply chains effectively reconnect end consumers, especially the young generations, with local small agri-food producers, thus contributing to the process of educating and/or sometimes reeducating individuals about the importance of adopting a healthy diet. Romania holds, in this respect, a high potential for the development of short food supply chains due to a series of factors such as: the large number of small semi-subsistence agricultural holdings (under 5 hectares); the persistent historical rural-urban link, as evidenced by the methods of obtaining food and groceries; the growing number of local certified producers, and last but not least the great veriety of specialized shops. Moreover, short supply chains stand solid chances of development in the near future as a result of sizeable financial support provided by the 2014-2020 National Rural Development Programme, which includes special promotion and development measures for small farmers and the short food supply sector. The present case study, which is based on field research undertaken across the Harghita county, aims to provide evidence of the existence and viability of short food supply chains in the agri food sector. The study identifies new associative forms between local producers and traditional processors and suppliers (butcher`s, meat processors, bakers etc.), specialized shops (groceries, mobile food carts, milk vending machines, on-line shops etc.), as well as new methods of promoting local traditional cuisine (gastronomic routes, food markets, food festivals).*

Key words: *short food supply chains, local food producers, new associative forms*

INTRODUCTION

On a global scale, approximately 80% of the food produced and marketed in 2011 was at the local level. As for the European Union, this figure was estimated at about 20% (Committee of the Regions, 2011). Local food systems are currently regarded as a key issue, not having sufficiently benefited from a thorough analysis. Thus, one can point out the fact that a more comprehensive socio-economic and legal study is needed, with the aim of improving the local food system`s structural, professional and innovative features (Kneafsey et al., 2013; Tanasă, 2014, p.184).

MATERIAL AND METHODS

By reviewing the research literature focused on the short food supply chain topic, one can easily see that most articles and studies are supported mainly by qualitative data to substantiate claims, due to the fact that statistical data of a quantitative nature is only available for individual case studies. An overview of the existing literature has been conducted in relation to short food supply chains and local food systems. Secondly, data and information on currently active economic operators (processing/selling units) registered at the Harghita Sanitary Veterinary and Food Safety Authority (Harghita SVFSA) was used. Available on-line data sources regarding small-scale farmers actively promoting local SFSCs was also included. Thirdly, the article aims to show three case studies representative of Harghita County.

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RESULTS AND DISCUSSION

În authors Fleury and Moustier`s (1999) opinion, short food supply chains (SFSCs) are a major constituent of suburban agriculture, having originated long before 20th Century specific globalized agricultural systems. Furthermore, SFSCs are considered to be an old form of distribution, having been historically documented since ancient times, even though the presence of intermediaries` between farmers/producers and end consumers can be traced back before the expansion of trade (Aubry & Chiffoleau, 2009, p. 55; Tanasă, 2015a, p. 196).

By reviewing the SFSC literature currently available, one can note that an unanimously accepted official definition of the SFSC/LFS concept is not yet available. Thus, uncertainty and confusion arise, especially regarding the direct sales concept. According to several authors, SFSC/LFS are widely understood as the means of selling agri-food sector products on a limited number of intermediary basis, and/or on a limited geographic area, thus shortening as much as possible the distance between the producer and the end consumer. It should also be noted such reduced number of intermediaries (links) are not synonymous with the notion of direct sale (nil number of links). SFSCs are rather to be undestood as means of selling through only one single trade intermediary (e.g. cooperative shops, specialist shops, supermarkets, etc.). (Marechal, 2008; Aubry & Chiffoleau, 2009, p. 55; Tanasă, 2015a, p. 197)

For instance, the UK's Soil Association`s (2001) proposed definition of the SFSC/LFS notion is: "A system of producing, processing and trading, primarily of sustainable and organic forms of food production, where the physical and economic activity is largely contained and controlled within the locality or region where it was produced, which delivers health, economic, environmental and social benefits to the communities in those areas." (Kneafsey et al., 2013, p. 27)

A noteworthy and often cited economic benefit associated with SFSCs is that regarding producers` increased additional returns. According to Lencucha et al. (1998) (cited in Henneberry et al., 2009, p. 65) an estimated additional return of 40-80% can be obtained by selling through farmers' markets (Lencucha et al., (1998)). According to yet other authors agri-food sector producers can add a sort of "price premium" when selling through SFSCs (Pearson et al., 2011), and are able to receive a greater share of the profits (Sage, 2003). Furthermore, in contrast to spatially extended food systems, farmers/producers operating in LFS have more opportunities of diversifying their businesses. As to opportunities of extra market margin and "price premium", it is very important to stress that producers have managed to obtain such economic benefits due to the consumers` current general positive perception of the overall attributes of produce marketed through LFS/SFSCs. In this respect one can notice that the additional information offered by farmers themselves is a major contributor to the consumers` perceived perception that produce sold by means of SFSC is of a higher quality in comparison to produce sold by vendors involved in non-SFSCs (Broderick et al., 2011).

By analyzing case studies included in several authors` works, one can note that different marketing strategies used by small holdings were feasible especially when negotiation costs were minimized, particularly those referring to the labor requirements to market the product beyond the farm-gate. Labor costs, in most cases, were very much reduced due to the use of family labor, volunteer labor, apprentice labor, casual labor etc. Furthermore, transaction costs were also minimized by increasing the volume of products sold through selling of bulk packs, attendance at well-frequented farmers' markets and last but not least cost-effective brand promotion.

In the last 20 years, the E.U.`s Western developed economies have reconsidered short food supply chains, which are now regarded as innovative solutions for sustaining local agriculture systems, ensuring rural communities development and also healthy food consumption. In contrast, in a series of emerging economies of the European Union (especially Romania) SFSCs were prior to 1989 effectively a "crisis" solution for the urban population whose access to food was severely limited due to state authorities` decision to massively export. At present, for the same emerging economies, SFSCs are a viable solution to ensure the survival of small agricultural holdings` survival (Tanasă, 2015a, p. 214).

Table 1. Overview of types of LFS/SFSCs in the European Union

SFSC classification	SFSC Sub-classification
1. Sales in proximity	Community Supported Agriculture (CSA – associated members are entitled to a percentage share of total output volume in exchange for financial and labor inputs): - on farm sales: - farm shops; - farm based hospitality; - roadside sales; - pick-your-own/ "U-pick" schemes. - off-farm sales – commercial sector: - farmers' markets and other types of markets; - farmed owned retail outlet; - food festivals/ tourism events; - sales directly to consumer co-operatives/ buying groups; - sales to retailers who source from local farmers and who make clear the identity of the farmers; - sales to the "HoCaRe" sector as long as the identity of the farmer is made clear to end consumers; - Off Farm Sales – catering sector: sales to hospitals, school units, penitentiaries, orphanages, asylums of elders etc. The catering sector institution in this case is to be understood as the end consumer.
2. Sales at a distance (may be achieved by farmers acting individually or collectively, but produce has to be traceable back to a named farmer)	- farm direct deliveries (delivery schemes); - on-line sales; - speciality retailers.

Despite its considerable agricultural potential (9.4 million hectares of arable land), Romania faces many problems including low labor productivity, underused land potential, fragmented agricultural holdings, lack of storage and processing units, qualified workforce migration etc. While some view the currently estimated 3 million small agricultural holdings classified as having under 5 hectares as a major challenge to the Romanian agri-food sector, for others they are the very premise of the future development of short food supply chains.

By analyzing the current state of facts in Harghita County, one can note that small agricultural farmers are active on the local agri-food sector market, especially Székely community members, who show strong solidarity and entrepreneurial skills in promoting small-scale farmers and producers, SFSCs included.

Harghita County`s agri-food sector is largely appreciated, as a result of:

- The renowned quality of potatoes farmed in the "Giurgeu" Depression and "Ciucul de Jos" microregion;
- The bakery industry products (Székely traditional potato bread, Székely chimney cake (Kürtőskalács), small-scale bakery industry – 44 bakery shops as of 2015;
- The curative properties of its springwaters – brands like *Borsec, Tuşnad, Stânceni, Perla Harghitei, Biborţeni, Spring Harghita/ Mineral Quantum* are widely appreciated as well as locally/ internationally acknowledged by means of awards;
- Edible wild fruit (cranberries, rasberries, red bilberries, blackberries etc) and also forest mushrooms foraging (edible boletus, golden chanterelle/girolle, orange agaric, honey agaric etc) widely found in both mountainous and hillside areas;
- Small agricultural holdings` raising of livestock (milk, dairy and meat production) mostly in the hillside and mountainous areas of *Topliţa, Tulgheş, Borsec, Bilbor, Sâncrăieni, Valea Strâmbă*;
- Small scale apiculture practices resulting mostly in organic honey for human consumption but also intended for therapeutical products; in this respect it can be noted that beekeeping is an ancient practice in many Harghita areas (numerous beekeepers currently operate as Authorized Individual(s)); at present migratory beekeeping is still widely practiced throughout the year;

Table 2. List of local agri-food sector producers involved in SFSCs in Harghita County (products of non-animal origin)

Nr. crt.	Producer`s/retailer`s name	Place of production/producer or retailer	Range of produce/ Types of SFSCs
1.	Szent Abrahami SRL	Avrămești	Phytotherapeutic products – traditional Székely teas & herbs (on-line shop included)
2.	Piposz Impex SRL	Lunca de Sus	Bakery products - „*Taligakerek*" homebread
3.	Silvimex Srl	Lueta	Bakery products– Székely potato bread
4.	Gall Erszebet II	Gheorgheni	Fruit preserves - jams, jellies, organic syrups etc. (on-line shops & retail outlet)
5.	Portik Sándor II	Miercurea Ciuc	Honeybee & derivatives
6.	Jaky Impex SRL	Tușnad	Bakery products– Székely potato bread
7.	Barabás Rozália II	Sângeorgiu de Pădure	Confectionery products – saltline crackers
8.	Fito-Bau SRL	Atid	Alcoholic beverages – pear brandy & wild fruit based liquors
9.	Szasz Ilyes II	Corund	Honeybee & derivatives
10.	Ioli Mex SRL	Târnovița	Food products of non-animal origin - "Abel" mustard
11.	Fitosic Farm SRL	Cozmeni	Fruit preserves - jams, jellies, organic syrups etc. (on-line shops & retail outlet)
12.	Truffoir SRL	Miercurea Ciuc	Truffle harvesting & processing
13.	Vel Fungo SRL	Siculeni	Forest mushroom harvesting
14.	Asociația Székelygyümölcs - Asociația Pomicultorilor și prelucrătorilor de fructe	Lupeni, Zetea, Odorheiu Secuiesc	Fruit preserves - jams, jellies, organic syrups & juices (on-line shops & retail outlet) Fruit farming and processing – fruit beverages, fruit preserve
15.	Paniprod SRL	Crișeni	Bakery and confectionery products
16.	Pilcoop SRL	Gheorgheni	Bakery and confectionery products
17.	Buzakalasz SRL	Miercurea Ciuc	Bakery and confectionery products
18.	Baby Pan SRL	Dobeni	Bakery and confectionery products
19.	Asociația Davidvara Egyesulet	Șiclod, Cristuru Secuiesc	Phytotherapeutic products - traditional Székely teas
20.	Apele minerale Borsec, Stânceni, Perla Harghitei, Tușnad, Spring Harghita (Mineral Quantum)	Borsec, Stânceni, Tușnad, Sâncrăieni	Springwater bottling – sparkling & non-sparkling

Source: own elaboration based on Harghita "Sanitary Veterinary Food Safety Agency" database (ANSVSA Harghita)

According to statistic data available for 2015 from the Harghita Sanitary Veterinary and Food Safety Agency, out of a total of 1020 officialy registered economic operators, 679 were local processing units delivering food products of animal origin, whilst 341 units were specialized in processing/vending products of non-animal origin. Most of these units active in the food retail sector are using selling methods and practices specific to SFSCs. Out of the 679 local units delivering food products of animal origin 21 are butcher`s, 21 meat suppliers, 5 game collecting units, 49 on-farm milk processing plants, 1 off-farm processing plant, 13 raw milk vending machines, 5 aquafarms, 1 fishery, 3 centres specialized in extracting, collecting and supply of honeybee, wax and other similar products, 214 beehives, 1 honey and honeybee derivatives shop, 1 fowl egg collecting centre; 189 are restaurants/fast-foods/fast-food trailers, 11 pizza shops, 71 canteens, 1 pastry & bakery, 2 pastry shops, 17 food cart vendors; 42 tourist accommodation units.

As for the 341 units specialized in processing/vending products of non-animal origin, according to data from the same agency in Harghita County there are 15 breadmakers, 44 bakeries, 153 confectioners, 5 grain millers, 9 pastry shops, 19 fruit and vegetable processing plant, 10 small-scale fruit & vegetable juice plants, 2 potato processing plants, 5 chocolate manufacturers, 6 small-scale pasta producers, 2 small-scale spice processing plants, 33 alcohol processing plants and suppliers, 1 winery, 2 breweries, 7 ice-cream microfactories, 6 beverage plants, 7 springwater bottling plants, 4 commercial mushroom growers, 8 produce packaging factories (www.ansvsa.ro, 2015; Tanasă, 2015b, p. 213).

Table 3. List of local agri-food sector producers involved in SFSCs in Harghita County (products of animal origin)

Nr. crt.	Producer`s/retailer`s name	Place of production/producer or retailer	Range of produce/ Types of SFSCs
1.	Cooperativa Agricolă Produs Secuiesc/ Székely Termek	Miercurea Ciuc	Bakery and pastry products, honeybee & derivatives, dairy products, meat products
2.	Authentic Meat SRL	Gheorgheni, Miercurea Ciuc, Sfântu Gheorghe, Sighișoara, Reghin, Toplița	Meat products & meat specialities (own retail chain named "*Bunătăţi din Secuime"*/ "*Székelyfalat"*)
3.	Karpaten Milk SRL	Valea Strâmbă, Miercurea Ciuc	Milk and dairy products – retail outlet
4.	Sánta Elemér II	Miercurea Ciuc	Pastry products - chimney cake/ "kürtős kalács" (mobile trailer)
5.	Majett Coz SRL	Vlăhiţa	Pastry products – chimney cake/ "kürtős kalács" (mobile trailer)
6.	Country Bakery Prod SRL - Vidéki Pékség	Dealu, Odorheiu Secuiesc	Bakery and pastry products (baker`s shop & pastry-cook's shop)
7.	Gobe Termek	Odorheiu Secuiesc	Bakery and pastry products, honeybee & derivatives, dairy products, meat products/meat specialities - "Gobe Termek" umbrella brand (own retail chain)
8.	Gordon Prod SRL	Bisericani	Milk and dairy products –"Gordon", "Gordon Prime" brands (own retail outlet)
9.	Lactis SRL	Odorheiu Secuiesc & 10 other cities	Milk and dairy products –Lactis brand (own retail outlet)
10.	Produsele Honor	Izvoare	Game & game specialities (own retail outlet, boarding house)
11.	And Var Mézes SRL	Odorheiu Secuiesc	Pastry & confectionery - turtă dulce tradiţională
12.	Arterimpex SRL	Gheorgheni, Miercurea Ciuc, Toplița, Reghin, Sighișoara, Sfântu Gheorghe	Meat products & meat specialities – "Benedek" brand (own retail outlets, mobile trailer)
13.	Direcția Silvică Harghita	Miercurea Ciuc	Wild game harvesting/selling, forest mushrooms foraging & edible wild fruit foraging
14.	Strudel Food SRL	Miercurea Ciuc	Bakery & confectionery
15.	Bomilact Mădăraș SRL	Mădăraș-Ciuc	Milk & dairy products – "Bomilact" and "Gobe Termek" brands
16.	Cooperativa Agricolă Târnava-Mare	Cristuru Secuiesc	Milk and dairy products – "Târnalact" (500 members)

Source: own elaboration based on Harghita "Sanitary Veterinary Food Safety Agency" database (ANSVSA Harghita)

Most small local agri-food sector producers are officially registered as limited liability companies, sole proprietorships and/or partnerships, self-employed/sole traders, state of facts showing a certain degree of adaptability to market requirements.

As a result of a 2013 initiative of both Harghita County Council and the Chamber of Commerce to sustain local/regional producers and agri-food sector products, the *"Székely Termek" Agricultural Cooperative for Székely Produce* was established, comprising 16 small local food cooperatives and 5 sole proprietorships, based on a previous cooperative named "Hangya/Furnica" Agricultural Coop. The main goal of *"Székely Termek"* is to market and represent the interests of local small farmers and artisans. Thus, a monthly food festival and market (usually on the 3rd Saturday of the month) is organized in the central food market area of "Miercurea Ciuc" aiming to promote local traditional cuisine and produce. A retail outlet was also opened to sell *"Székely Termek"* coop. produce (www.szekelytermek.ro, 2015).

Starting with 2014, a similar food festival is held, called *"Ozosep"*, with the active support of the Hungarian Students` Association In Economics – Bucharest Branch, the "Balassi" Institute

(Hungarian Institute in Bucharest), the Harghita County Chamber of Commerce and that of the *Agricultural Cooperative for Székely Produce ("Székely Termek" Coop.).* Both the food festival and market events are intended to reunite and promote small Székely agricultural holdings` produce from the Harghita and Covasna counties (over 30 farmers). Cultural events and related activities are also a major part of the produce themed festival. Thus, *"Ozosep"* is a good example of a functional SFSC, so that end consumers can choose from a wide range of various produce by means of direct contact with the producers themselves. Food items offered for sale range from local traditional dairy products, meat products (game included), organic syrups and jams, honeybee and honey derivatives, homebaked bread, pastry products (including the well-known "kürtőskalács"), traditional alcoholic beverages (e.g. "palinka", home brewed beers) and others.

"Gobe Termek" is another noteworthy example of good practices in SFSCs, basically a form of an "umbrella brand" reuniting and effectively representing the interests of several local entrepreneurs in the bakery and the pastry industries (*Interserv Molnár, Country Bakery Prod, Camizo Jack Company, Elekes Pékség, Váncsa Multiplast, And-Var Mézes and Harmopan*), the milk and dairy industry (*Lactis, Gordon Prod, Bomilact, Karpaten Milk, Lactopan-Kov, Binal Mob*), meat processing industry (*Budvár Húsfeldolgozó, Arterimpex, Primacom – Petry & Bertikris*), poultry farming (*Import-Export Pal-Mar*), fruit farming and the processing industries (Gall Erzsebet), the apiculture industry (Szász Ilyés) and also the beverages industry – mostly of traditional nature (Gall Erzsebet şi Carpaticum).

The *"Gobe Termek"* is also an example of an entrepreneurial initiative which resulted due to from the solidarity of the local Székely inhabitants (www.gobetermek.ro, 2012). Members of *"Gobe Termek"* have managed to open retail shops at their own expense in "Odorheiul Secuiesc" and also supply under contract the local supermarket chain "Merkur" with local food products.

In this context, *Transylvania Authentica* is also worth mentioning: a *Foundation for Partnerships* from M. Ciuc program, an initiative aiming to preserve and promote local traditional agricultural methods, arts and tourism services, especially those specific to Székely communities. *Transylvania Authentica`s* goals are focused on better mutual relationships between small agricultural holdings and artisans of the Harghita region. *Transylvania Authentica`s* has also been officially registered as a brand by state authorities. Its number of trademarks exceeded 800 in 2013. The use of the *Transylvania Authentica* brand is strictly monitored and regulated by the *Foundation for Partnerships* and its criteria compliance is verified upon a yearly basis. Trademark license agreements must be renewed after a 3 year period (www.transylvania-authentica.ro, 2015).

Respected members under the *Transylvania Authentica* brand are *Székelygyümölcs Agricultural Cooperative* - fruit and juice fruit industry, *Szász Ilyés*, *Bartha Zsolt* and *Lajos Ferenc* - sole proprietorships in the apiculture industry, *And-Var Mezeş Ltd*. – bakery and pastry industry, *Gáll Erzsébet* - sole proprietorship operating in the fruit industry (jams and syroups).

The main benefits of an "umbrella brand" are:

- The opportunity of selling next to other local renowned goods/services;
- An increase in the total volume of produce sold;
- Effective interaction and connection between producers and consumers, thus promoting the development of trust and social capital;
- Labeling is less important because the consumer can better judge the quality of products on the basis of his/her interaction with the producer;
- Monitoring encourages producers to keep up with industry standards and regulations;
- Better market visibility of local agri-food sector products.

A highly efficient method of "reconnecting" end consumers and local small-scale producers is establishing and promoting gastronomic routes. In the last couple of years, tourism in Harghita County has been encouraged and promoted through several dedicated projects: "Springwater Trail" – 2 European Union funded projects; "Salt trail" – 1 project; "Fruit trail" – 1 project (www.repf.ro, 2015; www.judetulharghita.ro, 2015). These gastronomic routes are not only intended to promoting the potential of Harghita County`s natural habitat, but also its local customs and culture (including local Székely gastronomy), accommodations and small agricultural holdings part of SFSCs.

CONCLUSIONS

For local food products to really stand a chance, small-scale local producers must resort to collective models like cooperatives, in order to ensure the establishment and development of local food systems, thus securing a substantial reduction of expenditures of its associated members, a wider array of commercial products, and also counter the seasonality problem. By adhering to cooperative structures, potential members can benefit from the advantage of better marketing of their local merchandise in the agri-food sector.

In the general context of endeavours to make young people aware of the benefits of a healthier life style and nutrition, the necessity of "reinventing" traditional food markets arises, firstly by gradually reducing the number of intermediaries ("middlemen") involved in SFSCs, and secondly by enlarging the overall number of local food systems, which are based on the consumer-producer direct interaction. Thus, it might be noted that the increase in the number of temporary food markets, mainly in larger urban centers, is similar to trends recorded, at a larger scale, in the more developed economies of the E.U.

At Harghita County`s level, the presence of associative forms between local producers and traditional processors and suppliers, specific to short food supply chains (butcher`s, meat processors, bakers etc.), specialized shops (groceries, mobile food carts, milk vending machines, on-line shops etc.), as well as new methods of promoting local traditional cuisine (gastronomic routes, food markets, food festivals) are important economic and agricultural developments. According to data currently available, there is an expansion of SFSCs, both in terms of numbers and geographic spread, a situation which is due to a series of factors like favorable geographic environment, high entrepreneurial spirit and skills, and most importantly, the strong sense of solidarity between Székely community members.

Even on the short term SFSCs stand considerable chances of developing in the next couple of years, especially due to financial incentives provided by the 2014-2020 National Rural Development Programme (final version – May 2015). Specifically, Romania has included several special promotion and development measures for small farmers and the short food supply sector as a whole. Concrete examples are Measure 16 – *Cooperation,* Sub-measure 16.4 - *"Support for horizontal and vertical cooperation among actors in the supply chain for the establishment and development of short supply chains and local markets, and for related promotion activities in a local context"*, and Measure 4 - *Investments in physical assets,* Sub-measure 4.1 – *"Investments in agricultural holdings".* Support granted by this last sub-measure addresses family owned agricultural holdings, mainly small and mid-sized ones, with a focus on creating new SFSCs and/or increasing the number of existing ones, but also on various associative forms. Activities are to be implemented by means of established *Local Action Groups* (private-public partnerships).

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THE COMPETITIVE BEHAVIOUR OF RURAL HOUSEHOLDS IN AGRICULTURE - A CASE STUDY IN ŢARA HAŢEGULUI

CHIŢEA LORENA FLORENTINA[1]

Abstract: *The goal of this paper is represented by the analysis of the competitive behaviour at rural household level in Ţara Haţegului, according to the economic size of the agricultural activities performed. If we extrapolate the mechanism from firm level to agricultural household level, competitiveness operates as a selection mechanism (only certain agricultural household farms survive on the market, which obtain quality products and have more efficient production processes); this also acts as a stimulation mechanism (in order to continue to exist on the market, the rural household farms must improve their technology and production organization). Competitiveness increase in agriculture first means a major change with regard to the agricultural behaviour, both at rural household level and at the level of (local and governmental) authorities. But the greatest obstacle to the change of farmers' behaviour presupposes a fundamental transformation of their values and lifestyle, which is quite difficult.*

Key words: *competitiveness, agricultural household, economic size*

INTRODUCTION

The paper is an approach to agricultural activity competitiveness at rural household level. Competitiveness, as a complex concept, can be investigated both at the level of firm, of agricultural household farm respectively, and at territorial, regional and national level.

At agricultural household farm level, competitiveness [5]:

- operates as a selection mechanism, only certain agricultural household farms survive on the market, which obtain quality products and have more efficient production processes.
- acts as a stimulation mechanism; in order to continue to exist on the market, the rural households must improve their technology and production organization.

When competitiveness is approached at household farm level, one must have in view that the rural agricultural households do not operate on the same economic principles as a firm; this because, compared to a firm whose final destination of production is its commercialization, at household level a part of production goes to self-consumption of family members. In the case of households, a series of factors also intervene that influence competitiveness at this level, which cannot be easily modified. Among these, we can mention:

- the agricultural behaviour of the household head, which is rather influenced by mentality and the willingness to try new things (from the change of crop structure, new technologies, new pest control methods to getting involved into associative production forms);
- the mentality in relation to "land"- not as a production factor, but as a "sacred heritage", which constrains land consolidation and may even lead to stronger land fragmentation.

MATERIALS AND METHODS

With no clear definition of economic competitiveness, the rural household economic competitiveness in agriculture can be measured starting from the European methodology for the economic measurement of farming activities, according to which the investigated households can be economically investigated.

The economic size of agricultural activities on the rural households is directly proportional with the competitiveness level reached by a given household, so that the higher economic size the higher the agricultural competitiveness.

Building up a typology of rural households according to the economic size of the agricultural activities performed on the household lies at the basis of the formation of a clear picture of the agricultural behaviour of rural households according to their competitiveness in agriculture.

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The investigated rural households were grouped by the number of Economic Size Units (ESU) obtained on the household. ESU represents the unit by which the economic size of an agricultural holding is expressed, determined on basis of the standard gross margin of the holding (Commission Decision no. 85/377/EEC). The value of one Economic Size Unit is 1,200 Euro.

The calculation method of the number of Economic Size Units for the investigated rural households is based on Annex I from the Applicant's Guide for Measure 121 "Modernization of Agricultural Holdings", on Establishing the Farm Category - Crop Structure and ESU Calculation.

On the basis of this method, the rural households were grouped into 4 categories, as follows:

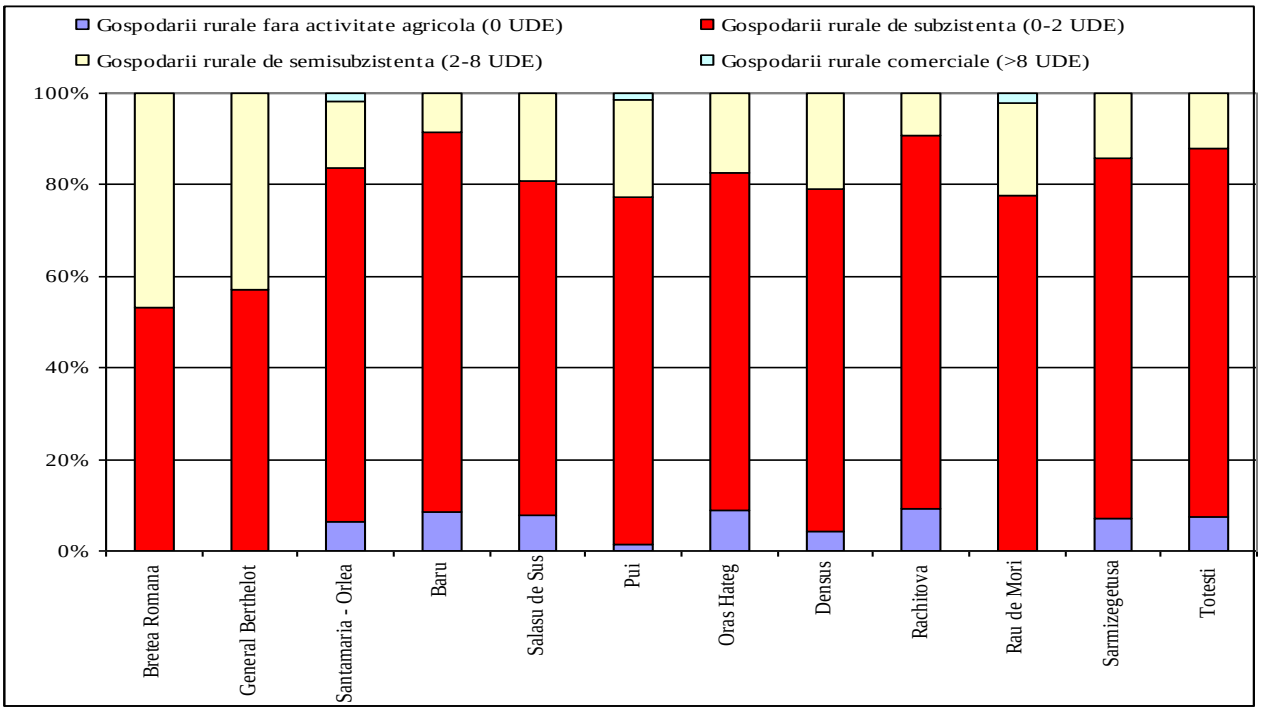
- Commercial rural household farms (over 8 ESU);
- Semi-subsistence rural household farms (2-8 ESU);
- Subsistence rural household farms (0-2 ESU);
- Non-agricultural households (0 ESU).

RESULTS AND DISCUSSIONS

The rural household structure in Ţara Haţegului, by the economic size of the agricultural activity, is the following: 5.00% of rural households have no agricultural activity (0-UDE); 76.50% are subsistence rural household farms (0-2 ESU); 17.75% are semi-subsistence rural household farms (2-8 ESU) and only 0.75% are commercial rural household farms (over 8 ESU) [2].

This structure once again confirms that the agriculture practiced in Ţara Haţegului is of subsistence type, which reveals a low agricultural competitiveness. This fact can be also noticed in the farming practice at county, regional or national level.

Graph 1. Structure of rural households by ESU, at commune level



Source: processing of data collected by the field survey conducted on a representative sample of households in the communes of the rural area from Ţara Haţegului, in the period June -September 2009

The communes where commercial rural household farms were also identified are Râu de Mori 2.22%, Sântămăria-Orlea 1.64% and Pui 1.33%.

The semi-subsistence household farms are those representing the economic development potential of the communes through agriculture. From the point of view of the agriculture development potential, we can identify 4 categories of communes, namely:

- communes with a high agriculture development potential (Bretea Română and General Berthelot);
- communes with a medium agriculture development potential (Pui, Densuş, Râu de Mori, Sălaşu de Sus, Town Haţeg);
- communes with a low agriculture development potential (Sântămăria-Orlea, Sarmizegetusa, Toteşti);
- communes with a very low agriculture development potential (Răchitova, Baru).

The rural households with no agricultural activities represent 5.00% of the households in the investigated area, yet this percentage is different from one commune to another, ranging from 0% in the communes Bretea Română, General Berthelot and Râu de Mori to 9.09% in the commune Răchitova.

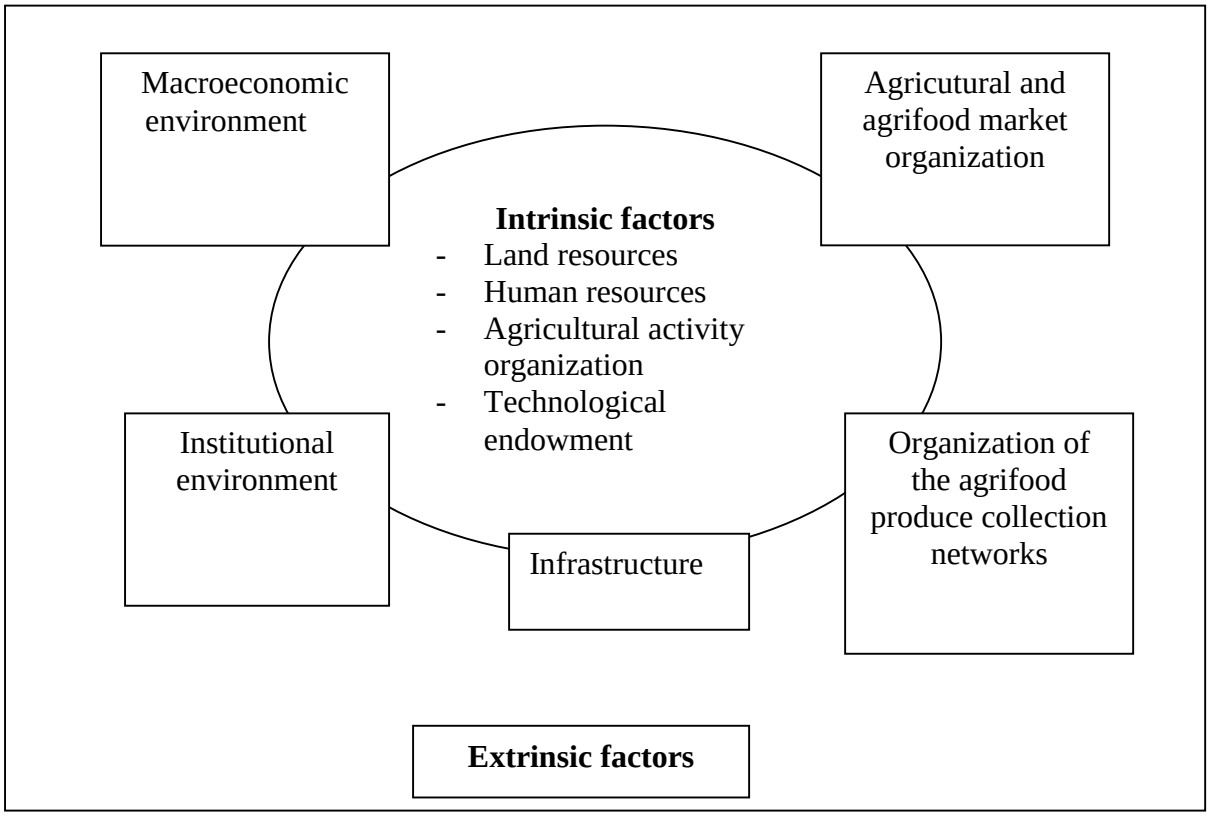
The average ESU per household farm in Ţara Haţegului is 1.36 – which reveals a subsistence, non-competitive and non-performant agriculture, ranging from 1.07 in the town Haţeg to 2.38 in the commune Bretea Română.

The determinants of the economic agricultural competitiveness – Ţara Haţegului

The determining factors of agricultural competitivenes at rural household level can be grouped into:

- household intrinsic factors (land resources, human resources, farm management – agricultural activity organization, technological resources etc.);
- household extrinsic factors (macroeconomic environment, institutional environment, infrastructure, agricultural and agrifood markets organization, organization of the agrifood produce collection networks).

Chart: The competition environment in agriculture, at rural household level



For the analysis of the competitiveness of the agriculture practiced in the rural communes from Ţara Haţegului, the intrisic factors of the household will be investigated from the perspective of the economic size of the farming activity.

Land resources

Land represents the primordial production factor in agriculture, being also one of the competitive advantages of the Romanian agriculture, given the large size of the land resource and its high fertility.

However, the soil and climate conditions specific to the area Ţara Haţegului are included in the category "mountain area", component of the mountain area "Apuseni Mountains", which does not have proper conditions for the farming practice on very large areas. In the area Ţara Haţegului, agriculture is practiced on different geographical units (depression, mountain area, terrace, river plain), which limit the crop structure from the soil and climate point of view.

The rural households in Ţara Haţegului, from the point of view of the ***land area size***[2], have 4.6 ha on the average, out of which 76.41% is land with agricultural destination and 23.59% is land with forestry destination.

The average land size of the rural households is 3.40 ha on the subsistence household farms, 9.69 ha on the semi-subsistence household and 12.73 ha on the commercial household farms. The land structure by farm type is the following: 56.80% of the land areas are owned by the subsistence household farms, 38.14% by the semi-subsistence household farms, 2.15% by the commercial household farms and 2.91% by the households with no agricultural activity.

The average agricultural area of rural households is 2.65 ha on the subsistence households, 7.12 ha on the semi-subsistence households and 9.73 ha on the commercial household farms.

From the point of view of the agricultural land structure, by land category of use, the situation by types of household farms is the following :

- subsistence household farms: 46.78% arable land; 1.28% orchards; 51.95% pastures and hayfields;
- semi-subsistence household farms: 45.24% arable land; 2.66% orchards; 0.56% vineyards; 51.54% pastures and hayfields;
- commercial household farms: 74.32% arable land; 5.14% orchards; 20.55% pastures and hayfields.

The average arable land area is 1.25 ha on the subsistence household farms, 3.22 ha on the semi-subsistence household farms, 7.23 ha on the commercial household farms.

The number of parcels per one hectare of arable land is inversely proportional to the economic size of household farms, so that such that the more performant the household the smaller the number of parcels per hectare: the commercial household farms have 1.20 parcels/hectare; the semi-subsistence household farms 1.73 parcels/hectare; the subsistence household farms 2.64 parcels/hectare.

The average area of pastures and hayfields is 1.93 ha on the subsistence households, 4.28 ha on the semi-subsistence households and 2.00 ha on the commercial household farms. The relatively small average area on the commercial household farms releals the low importance of the pastures and hayfields.

The number of the parcels per hectare is not influenced by the household economic size; there are 1.55 parcels per hectare on the subsistence households, 1.15 parcels per hectare on the semi-subsistence households and 2.17 parcels per hectare on the commercial household farms.

The average orchard area is directly proportional with the economic size of farms, namely: 0.36 ha on the subsistence households, 0.53 ha on the semi-subsistence households and 1.50 ha on the commercial household farms. Land fragmentation, in the case of orchards, is inversely proportional with the economic size of farms: 2.9 parcels/ha on the subsistence households, 1.66 parcels/ha on the semi-subsistence households and 0.67 parcels/ha on the commercial household farms.

These two indicators – the average orchard area and the number of parcels – show that as the economic size of household increases, the orchard farming modality will improve.

[2] The data regarding the land resources, collected through the questionnaire (working instrument), include the land into the ownership of investigated households, that is the land with agricultural destination and the land under forests (into private property).

The average distance between parcels is inversely proportional with the economic farm size, namely 2.158 meters on the subsistence households, 2.204 meters on the semi-subsistence households and 1.667 meters in the commercial household farms.

From the analysis of the average areas by categories of use of agricultural land, by number of parcels and by the average distance between parcels, respectively, we can clearly see the need for land consolidation, on order to increase the farming activity efficiency and agricultural competitiveness implicitly at rural household level. Yet the main obstacles to land consolidation stem from people's mentality (who want only to farm their own land, inherited from their parents and are not willing to exchange their land), without taking into account the beneficial effects from the economic point of view (diminution of land use costs in the case when the land areas would be grouped into a single place).

The demographic resource

The human resource is a dynamic factor, which puts into operation the whole agricultural apparatus of the rural household.

The main socio-demographic factors with impact upon the economic size of rural households in Ţara Haţegului area are the following:

- the household head's gender: the households led by men are found in 70.92% of subsistence household farms, in 84.51% of the semi-subsistence households and 100% of the commercial household farms. At the same time, the average ESU of the households led by men (1.48 ESU) is greater than that of households led by women (1.00 ESU).
- the household head's age: the highest ESU is found in the age category 41-55 years old (1.64 ESU), by comparison with the other age categories (under 40 years old 1.00 ESU and over 55 years old 1.33ESU). This situation is not favourable for agriculture development on medium and long term, taking into account that, generally, the households are led by elderly people (the average age of the household's head is 61years).
- the household head's education: the ESU of households with household heads who graduated primary or secondary school is lower than of those where the household heads graduated high school or higher educatiobn. The households with heads who are agricultural high-school graduates have the highest ESU.
- the time spent on the household farm: the ESU of households with the household head spending more than 50% of the working time on the household (1.43 ESU) is higher than of those spending less than 50% of the working time on the household (1.39 ESU).
- the number of the household farm members: the ESU of the households with 1-3 persons is 1.08, of those with 3-6 persons is 1.56, and of those with 6-12 persons is of 2.29.
- the affiliation to the village /commune: the household heads born in the investigated village/comune have a more sustained agricultural activity (1.44 ESU), than the heads coming from other areas of the country (1.21ESU).

Farm management– organization of the agricultural activity in Ţara Haţegului

The management activity of the agricultural household farm represents the household farm head's main activity, it is his task to organize the whole agricultural activity. The analysis of the agricultural activity competitiveness presupposes the economic measurement of the activity in the crop production and livestock sectors. Thus, the number of the Economic Size Units of a farm consists of the number of ESU in the crop production sector and the number of ESU in the livestock sector. ***The crops*** contribute to total ESU by 49.50% on the subsistence households, by 47.61% on the semi-subsistence households and 41.97% on the commercial household farms, which reveals that while the

economic size of the household increases, the importance of the crop production activity tends to decrease.

The main crops– wheat, maize, potatoes, vegetables – account for 93.62% of the cultivated area in the case of subsistence households, 64.71% in the case of semi-subsistence households and 82.30% in the case of the commercial household farms.

The crop production ESU by the main crops reveals that while the economic size of the household farm increases, the interest in the wheat crop also increases and the interest in the other crops (maize, potatoes, vegetables) has the tendency to decrease.

Crop rotation is practiced by 87.70% of the subsistence households, 90.50% of the semi-subsistence households and 100% of the commercial household farms, which reveals that the application of this elementary rule in agriculture is directly influenced by the competitiveness level of the household farm.

Livestock raising contributes to total ESU by 50.50% on the subsistence households, by 52.39% on the semi-subsistence households and by 58.03% on the commercial household farms, which reveals that while the economic size of the farm increases, the importance of livestock raising also increases.

From the analysis of the conventional average number by livestock categories, from the analysis of each livestock category contribution to the ESU-livestock respectively, the following trend can be noticed: as the economic size of the farm is higher, the importance of raising bovines, sheep, bee families is also higher; this trend is not found in the case of pigs, poultry or horses.

Table. Share of ESU- crop, livestock production in total ESU, by types of rural household farms, by communes and total sample

-%-

Commune	ESU total							
	Subsistence household farms (0-2 ESU)		**Semi-subsistence household farms (2-8 ESU)**		**Commercial household farms (>8 ESU)**		**Total**	
	Share ESU-crop	**Share ESU-livestock**	**Share ESU-crop**	**Share ESU-livestock**	**Share ESU-crop**	**Share ESU-livestock**	**Share ESU-crop**	**Share ESU-livestock**
Bretea Română	60.35	39.65	42.92	57.08			52.21	47.79
General Bethelot	69.05	30.95	68.44	31.56			68.79	31.21
Sântămărie Orlea	51.31	48.69	58.65	41.35	53.63	46.37	52.51	47.49
Baru	45.89	54.11	30.35	69.65			44.43	55.57
Sălaşu de Sus	62.12	37.88	49.04	50.96			59.40	40.60
Pui	41.48	58.52	38.79	61.21	6.21	93.79	40.42	59.58
Town Haţeg	68.32	31.68	39.03	60.97			62.74	37.26
Densuş	44.64	55.36	63.11	36.89			48.56	51.34
Răchitova	53.71	46.29	51.11	48.89			53.45	46.55
Râu de Mori	51.24	48.76	58.48	41.52	73.87	26.13	53.19	46.81
Sarmizegetusa	52.31	47.69	41.15	58.85			50.60	49.40
Toteşti	53.58	46.42	47.48	52.52			52.78	47.22
Total	50.67	49.33	48.17	51.83	44.57	55.43	50.15	49.85

Source: processing of data collected by the field survey conducted on a representative sample of households in the communes of the rural area from Ţara Haţegului, in the period June -September 2009

In the agricultural system of Ţara Haţegului, there is a relative balance of the crop and livestock production sectors, but as competitiveness increases, the interest in the livestock sector also grows:

- ✓ 0-2 ESU – crop production share 50.67%, livestock production share 49.3% (the most relevant crop share is 69.05% in the commune General Berthelot and the most relevant livestock share is found in the commune Pui, i.e. 58.5%);

- ✓ 2-8 ESU – the share of the crop sector decreases in favour of the increase of the livestock sector share (compared to the previous category): 48.17% and 51.83% respectively; the most significant share for the crop sector is 68.4% in the commune General Berthelot, 68.4%, for the livestock sector 69.6% in the commune Baru;
- ✓ Over 8 ESU – the share of the livestock sector prevails, with 55.43%, and the share of the crop production sector is 44.57%; a significant share of the livestock sector, i.e. 93.7% is found in the commune Pui.

The sale of agricultural products takes place on the household farms that have a higher degree of competitiveness.

As subsistence farming prevails, the rural households ensure the food for the family from their own crop and livestock production, and afterwards they take into consideration the possibility to sell the remaining production, yet most often the obtained production is not sufficient even for the self-consumption on the household.

The share of the household farms that sell their crop production is the following:

- ✓ in the case of wheat: 4.21% on the subsistence households, 6.7% on the semi-subsistence households and 33.33% on the commercial household farms;
- ✓ in the case of maize: 1.54% on the subsistence households, 6.25% on the semi-subsistence households and 33.33% on the commercial household farms;
- ✓ in the case of potatoes: 8.76% on the subsistence households, 28.79% on the semi-subsistence households and 66.67% on the commercial household farms;
- ✓ in the case of vegetables: 3.45% on the subsistence households, 9.52% on the semi-subsistence households and 0% on the commercial household farms.

In the case of livestock, the sales are mainly under the form of animal products: milk, cheese, eggs, honey, and less under the form of live animals. Bovines and sheep are the main sources of sold animal products, after the consumption needs of the household members have been satisfied.

CONCLUSIONS

The agriculture practiced in Ţara Haţegului Retezat area is a subsistence, non-performant, non-competitive agriculture, which does not efficiently use the resources it has.

As we could notice from the analysis of the main intrinsic factors with impact upon the competitiveness of the agricultural rural household farms, the main performance factor is "Man", that is the household head that has the task to manage the whole activity. In order to increase the competitiveness on the agricultural household, the increase of the household farm head's performance should be considered. Performance increase in this case can take place by two complementary modalities:

- the renewal of the farm head's generation – which is a must in the agricultural sector, having a direct impact upon its competitiveness, as well as the improvement of the quality of life in the rural area;
- the increase of the farm head's vocational training in order to efficiently manage the farming activity. Thus, competitiveness will increase if the household heads are better trained, and their motivation will increase with the increase of competitiveness.

Unfortunately, there is a series of external factors that bring about negative reactions in a circle, i.e. the low performance leads to the non-efficient involvement in the development of agricultural activities of the household farm heads and members, which can even result in a major lack of interest, and the lack of motivation leads to low performance and so on.

The external factors are represented by the general environment – economic, technical, political, social conditions, etc. – and by the market conditions – integrating the factors that influence the demand for products and services, the land price, the labour price and so on.

The soil and weather conditions, specific to Ţara Haţegului area, are not favourable to the farming practice on very large areas; agriculture is practiced on different geographical units (depression, mountain area, terrace, river plain) which result in a limited crop structure.

Both on the agricultural household farms in Ţara Haţegului, and at national level, there is a duality between the big number of the subsistence and semi-subsistence households and the small number of commercial farms. This is mainly due to the excessive fragmentation of farm ownership, the demographic ageing of the persons involved in the agricultural activity, the lack of storage units for the obtained agricultural production and the lack of processors, while maintaining a non-competitive production structure (weak production diversification), a high level of physical wear and obsolescence of the physical capital, etc.

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THE RELATION BETWEEN CLIMATE AND AGRICULTURE IN DANUBE VALLEY

SLAVE CAMELIA
VIZIREANU IOANA[1]

Abstract: *The work includes analysis of natural and geographical elements of the Danube floodplain, the correlation between these elements and their interpretation. In this regard, the work was conceived as a unitary character of the area at the confluence of the Olt River with Vedea River - Plain Boianului. The area has high availability for agriculture, good yields being recorded today this is due to the conditions of receiving the geographic. The purpose of this paper is to present data on agricultural development of the area.*

Keywords*: agriculture, cereal plains, dunes, Danube Valley,*

INTRODUCTION

In the evolution of geographical knowledge of the Romanian the sector of the Danube Valley can identify several stages closely linked to economic historical phases experienced by the region crossed by the river. The first stage is that of Antiquity, characterized by 'economic development of the Geto-Dacian and economic expansion Greek shores of the Black Sea, followed by the expansion of economic and political life of the Roman Empire on a wide expanse north of the Danube Valley, have gave rise to historians and geographers from this time to know and describe the appearance and mouth of the river in those days, the practice residents, the appearance of towns and villages. "

During this period, the Danube is known under different names such as: ”Histros”, ”Hister”, ”Ister” (after the exit of the gorge Carpathian) west of the gorge one of the most used names represent the Celtic origin 'Danubis. The inferior sector using the name of ”Donaris" Daco-Roman designation of origin. It is assumed that this would be derived from the current name of the river Danube.

From the eighteenth century in cartographic and geographic notes appearing Romanian contributions. It can be mentioned made here the Romanian Cantacuzino country map.

An important role was played G. Vâlsan author makes an analysis of the terraces of the Danube valley, highlights the problem of the river courses and keeping the terraces, the anticline question axis Varna- Rusciuc possibility of continuing high Burnas Plain.

For researching microforms relief plains and meadows, is eloquent the work climatic influences in 1917 by G.Vâlsan in which how are made depression by subsidence in loess and dunes, by wind in sand.(Ielenicz, 2005)

The River Danube has a length of 2860 km and a basin 805300 km^2 (8% in Europe) aimed generally west-east, but has larger deployment in the middle and lower sector.

For this study was selected an area between the junction of Olt and Vedei in southern Romania, the Boian Plain.(fig 1)

MATERIALS AND METHODS

Characterization of alluvial and fluvial relief minor river bed

Meadow is the latest part of the Danube Valley, formed by the action of complex lateral erosion and accumulation of the river under the influence of raising the general trend and oscillations Holocene riverbed usual levels and flows.(Posea, 1974)

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The lowest level of relief - the meadow is dominated generally by top terraces. It develops more on the left side of the river thus contributing to the overall asymmetry of the valley. On the right Danube is better developed floodplain downstream of Turnu - Magurele up to the Lake Suhaia. Along the studied sector, the strip of meadow is maintained without interruption left Danube of variable width (from 1 to 14 km). The meadow in Turnu Magurele has a width of about 4 km, the same thing happening in the locality Fantanele. A width of only 3 km is recorded in Zimnicea town and a little higher value contained 5-7 km in Năvodari and Viişoara villages. The absolute altitude of Danube flood plain is between 20-22 m in Turnu Magurele and average slope is 0.05%. (Ujavari, 1972) Meadow consists of a combination of sand banks, abandoned branches, depressions permanently or temporarily occupied by water.

In the village Zimnicele, strip meadow near the river is very low and flat, having a width of 400-500 m. To the north is a series of longitudinal sand banks height (compared with low meadow) 3-4 m. Floodplain before arranging in the years 1960-1961, it was completely under water and sand banks were emersed.

In the Fantanele – Zimnicea is very smooth, agricultural cultivated and crossed by canals for irrigation. Danube valley is the anthropic unit within Teleorman county. This is due to embankment work, drainage. It was gone from directing complex natural development phase according to the economic component.

Grasslands occupy small areas and are mostly degraded due to excessive use. The dikes for protection are unfinished concrete slabs that cover large areas are unprotected, especially at the mouth of the river Argeş, there is the phenomenon of water excess in these areas. In the area they have been strengthened dykes which are subject to permanent erosion caused by the river Arges. In these situations there is a danger that the dams are destroyed and localities remain without protection in the event of flooding.

Fig 1. Map of the study area

The floodplains and terraces were and still are subject to changes due to destructive action and constructive contribution to the river and major tributaries. There are also important and slope processes, compaction processes that are recorded on the bridge of the terraces.

Danube direction changes recorded structural and tectonic conditions related to the foundation and the general conditions of the transaction process development paleogeographical valley.

Climate

The Danube Valley climate is temperate continental corresponding processes specific atmospheric circulation of the south-eastern Europe and solar radiation regime in the mid-latitudes.

In general, the climate in this area is characterized by long, dry and hot, with long blue and cold winters, owing to the frequency continental air masses from the east and northeast, low precipitation, with heavy rains during summer.

The average duration of sunshine exceeds 2200 hours, radiative and thermal balance is the highest in the valley of the Danube.

The region is dry continental air masses intersection with tropical origin in south and south-west of the continent and the oceanic air masses

Through its work, modifying human society has an impact on climate. Most times, interventions were made on the environment have not considered all the consequences that would arise from such activities.

Deforestation is one of the earliest human intervention exerted on the environment has negative effects (high winds, soil degradation).

The areas in the Danube Plain, by damming and drainage works have been transformed into agricultural land development processes that lead to changes in weather (some parts can become dry).

Due to its geographical position, the Danube valley benefits from low precipitation. Such lands have been and are irrigated. A climatic effect caused by irrigation occurs during periods of warmer when high air humidity and heat consumption mitigates latency maximum daily temperatures.

Table 1 Absolute extreme air temperatures and date

Station	**Absolute min temperatur**	**Date**	**Absolute max temperature**	**Date**
Zimnicea	-23,7ºC	8 february 2005	42,6ºC	24 june 2007
Turnu Măgurele	-20,6ºC	December 1997	42,7ºC	july 2000

Source:Staţia Meteorologică Zimnicea şi Turnu –Măgurele

Except climatic factors, which have a decisive role in causing floods. Floods are favored by a number of characteristics of the riverbed such as banks asymmetry coefficient of tortuosity and meanders and degree of development of the minor bed.

Overall, the bank remains non-flooded sand bank, is affected only very large floods, such as those in 1897, 1907, 1942 and 1962. (Ujavari, 1972)

Surfaces and flood damage varies depending on whether the flood, flood levels of amplitude and position along the Danube floodplains.

As a result of work carried out mostly embankment of the Danube floodplain was removed from the flood. Through the dam creates premises for expanding irrigated crops and in the floodplain, unfit for agriculture, natural woody vegetation has been replaced by plantations stand. A number of lakes were drained and were arranged as fish bossiness.

RESULTS AND DISCUSSION

Agriculture

In the Teleorman District is a subsidence agriculture practiced and semi -subsidence, because the land has high kneading. In the area there are small farms with areas ranging between 1 - 1.5 ha.

The land of Teleorman District has a total area of 578,978 ha and 499,175 ha of agricultural area in 2008.

In Teleorman District are 454 980 hectares of arable land measure in 2008, which was worth 91.15% of the total agricultural situation in 2009 the arable land increased by 377 hectares, totaling 454,603 hectares, which means a share all 91% of the total land area estimated for 2009, according to information provided by Department of Agriculture and Rural Development in Teleorman District.

Pastures represented 7.17% of agricultural land in 2008, 0.17% meadows, vineyards and vine nurseries 1.49% and orchards and nurseries 0.03%.

Uncultivated areas in Teleorman District representing 0.88% of the total land and 1.02% of agricultural land in 2008, and in 2009 the measured surface 3997 ha, with a difference of 1.086 ha the previous year, representing 0.8% of the projected 2009.

The cultivated area in 2008 (367.091 ha, down from the previous year), approximately 97% was full private ownership and major crops, according to statistics were:

· Cereal grains (wheat and rye, barley, oats, corn) 71.2%
· Legumes (peas, beans) 0.3%
· Oilseed crops (sunflower, soybean, etc.) 22%
· Potato 0.4%
· 6.6% of fodder plants,
· Other vegetables 1.8%

Data provided by other county institutions for 2009 included among the major crops and tobacco, 0.1% of the total cultivated area and mustard and coriander but which together accounted for 0.5%. However, among cultures were performed in Teleorman and energy plants, where corn crop It was well represented (25.4%), with rape (8.2%).

All those cultures have been characterized by significant fluctuations in 2009, including culture peas, which recorded an increase of over 25%, rape increased by 15%, and corn, with a decrease more than 10%.

Cultures with the best value for Teleorman District identified through the advisory process conducted locally, was grains, especially corn. Growing large areas of these energy plants in Teleorman County, which determines the appearance of production units bio fuel.

Beekeeping is also an important agricultural area in Teleorman District, which has developed a particular interest, the agricultural production of honey extracted recording outstanding performance after meat production and milk.

CONCLUSIONS

Analysis of current situation of agriculture in the area allowed the identification of initiatives association, and involvement of public authorities in fostering and encouraging various forms of associativity, including through the development of cross-border cooperation projects internally with Giurgiu, who had resulting in the establishment of associations and cooperatives in Teleorman.

Although the lands are characterized by a high degree of fragmentation, is indicative of further subsistence agriculture, the county has identified a trend in the association. In this sense, local authorities can play an important role in advising and informing small landowners the benefits achieved large-scale agriculture through associative.

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SHELTER-BELTS – THE SOLUTION FOR PROTECTING CROPS AND INCREASING PRODUCTIONS IN THE LANDS AFFCTED BY THE DESERTIFICATION PHENOMENON IN OLTENIA

ANCUŢA MARIN[1]

Summary: *Because of the climate changes and the massive clearings, some of the most critical problems that Romania and especially the S-W part of Oltenia are confrunted with are: the desertification and the earth flows. The purpose of the shelter –belts in preventing the effects of the wind and in protecting the agrarian crops and the agrarian production implicitly, can be evaluated by keeping in mind a series of specific determination: soil, climate, wind rate, the quantity of driven sand, wind erosion, soil erosion, agrarian production, density of crop. In this paper it is proven that the best results were obtained when the protection of the agrarian fields was made with the help of the shelter-belts arrays, made so that two shelter-belts encased and directed perpendicular to the dominant wind direction in order to confine an agrarian crop in rotation and, with their accumulated effect, to reduce the wind rate at soil level up to almost zero.*

Key words: *shelter-belts, desertification, protection, climate changes, wind rate, clearing*

INTRODUCTION

The shelter-belts can be defined as silvan vegetation formations, with different lenghts and relatively narrow widths, encased at a certain distance from one another, with an environment protection and climate improvement, economical and aesthetical-sanitary function of the fields.

The purpose of the shelter-belts is found in the advantages brought to agriculture, in protecting establishments and communication and transport ways and last but not least in the advantages brought to the environment. In agriculture creating shelter-belts led to the reduction of soil erosion and to the increasing of the agrarain production, because they reduce the plant evaporation and exudation, so the agrarian production in the field grows up to 20%. The shelter-belts encased on sandy solis have the task of limiting deflation, ensuring an even wattering, protecting the crops against mechanical harms made by sandstorms and protecting the hydrotechnical equipments against sanding. The shelter-belts have the purpose of protecting the communication and transport ways against snowdrift, of protecting dikes and banks against currents, floods and ice, of protecting localities and different economical and social location from certain areas. Regarding the environment advantage, the shelter-belts have a purpose of storing carbon, of reducing air temperature, of increasing aerial humidity, of biological drainage, of reducing direct and reflected light.

The climate changes that happened in the last 50 years, the changes that happened in the structure and the formation ways of the agrarian exploitment, the crop technologies that were used, made serious agro-ecological alterations.

In our country, the first silvan plantations for sand protection occured in Băileşti starting with 1852, on the Ştirbei Prince property. For 30-40 years, in the sands from the south of Oltenia 25.000 hectares of acacia were seeded. The silvan plantations for fixing desert soils in the SW of Oltenia were made after 1895 (Gheorghiu E., 1903; Crăciunescu G., 1904; Ionescu Şişeşti and Staicu I., 1958).

In our country, the soil and agrarian crops protection method by using shelter-belts was initiated since 1861 and developed in the years with big calamities, excessive droughts, sandstorms, (1890, 1935, 1946), materialised by 1961 in planting over 6.000 ha of shelter-belts, and in 1970-1975 of another 1.700 ha in the South Oltenia sands (Popescu, 1993).

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The purpose of this paper is to underline the long term implications of the desertification phenomenon that the S-W of Oltenia is dealing with, brings back to present time possible solutions to stop it.

MATERIAL AND METHODS

In order to blunt the harmful effects of the wind, man took a series of tipical measures to reduce the speed of the air currents in horizontal movement and to abate their kinetic energy that were grouped in literature in three categories: *mechanical* (snow fences, interlaced wire net, fences made out of sunflower and corn strains), *biological* (shelter-belts, herbal plants bands, hedges, fruit tree planations, vine plantations), c*hemical* (glue and şi mygram).

The function of the shelter-belts in preventing the wind effects and in protecting agrarian crops and implicitly agrarain production, can be evaluated taking under consideration a series of specific determinations. A peculiar importance for an agrarian area consists in knowing the climate conditions. Given the fact that the type of climate of an area can favour or fade certain specific phenomena that influence the agrarian and silvan production, for that area, a study had been conducted in order to assess the type of climate for the studied area. In order to define the type of climate the average annual rainfall, the temperature values, the evapo-exudation potential value, were taken under condideration depending on the latitude. With the help from this elements were calculated 3 climate indexes for every month of the vegetation period, from april until september. According to theese calculations, the SW area of the country is defined by a *semi-arid* toards *arid* climate *excessively dry* and *defective.*

The measurements regarding the wind rate were made in the Sadova-Corabia area and were made for the shelter-belts chosen foremost to display the tipical traits of the majority of shelter-belts. They were carried out on a lineal direction, at half distance of the longitudinal axis of the shelter-belts, and in crop in rotation field delimited by the two shelter-belts, there where agrarian crops. In the analysed area there were set up in 3 consecutive years, (2011-2013) wheat, melons and tobacco crops, in both protected and unprotected lots.

In all cases, the soil is sandy, of the protosoil tipical anthropical type, and the climate conditions and crop technologies were identical.

The most efficient measures, throughtout time, were proven to be the biological ones, and among them the first place is occupied by the acacia shelter-belts arranged as a net or an array.

The function of the shelter-belts in preventing the wind effects and in protecting agrarian crops and implicitly agrarain production, can be evaluated taking under consideration a series of specific determinations

The placing of the shelter-belts is assessed by the silvic research, based on foundation studies. Theese shelter-belts can be placed on both state-owned areas and private property areas, depending on necessity and on the results of the overwrought studies.

RESULTS AND DISCUSSIONS

The desertification is defined as being ”a risk pheomenon of ecological nature, strongly depending on the other natural risks and on anthropic ones” (Bogdan Niculescu, 1999). It has multiple cuases, from which the most known are high temperatures and the rise of the rainfall shortage in some areas. The prolonging of the drought sets most of the time the strating point in the occurrence of the desertification phenomena. În Romania, the drought phenomenon that has strong accents in some periods has been signaled and described a long time ago. The statistics show that the drought phenomenon, without having a very strict cyclic character, generally happens every 10-15 years, the alternation of extremely drought years with abundant years under the aspect of rainfalls (1-3 ani) being more and more obvious.

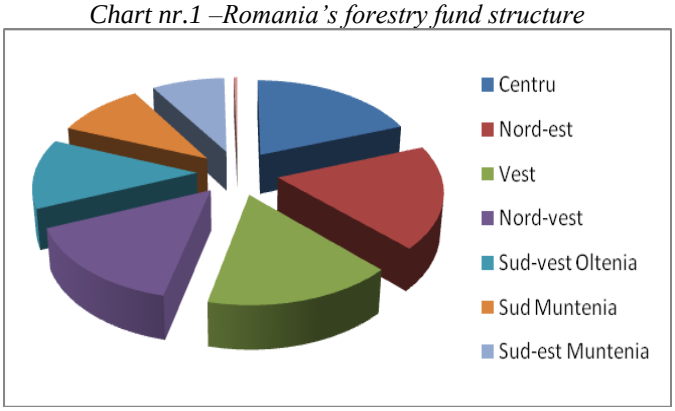
Accordind to the data posted by The National Statistics Institute, from a total of 6.540 thousands ha forestry fund, 12,4% is in the SW of Oltenia, the area where we made the research (Table nr.1 şi Chart nr.1).

Tabelul nr.1

ROMANIA'S FORESTRY FUND		
Geographic area	**Thousands ha**	**%**
Center	1.262,22	19,3
North-East	1.196,82	18,3
West	1.046,40	16,0
Noth-West	987,54	15,1
South-West Oltenia	810,96	12,4
South Muntenia	660,54	10,1
South-East Muntenia	549,36	8,4
Bucuresti-Ilfov	26,16	0,4
TOTAL	**6.540,00**	**100**

Source: data processing TNSI

Chart nr.1 –Romania's forestry fund structure



În Romania the area located between Calafat–Poiana Mare–Sadova–Bechet– Dăbuleni and the Danube river, a surface of 104.600 ha became arid, the sandy soils having an inclination toards desertification.

Table nr. 2

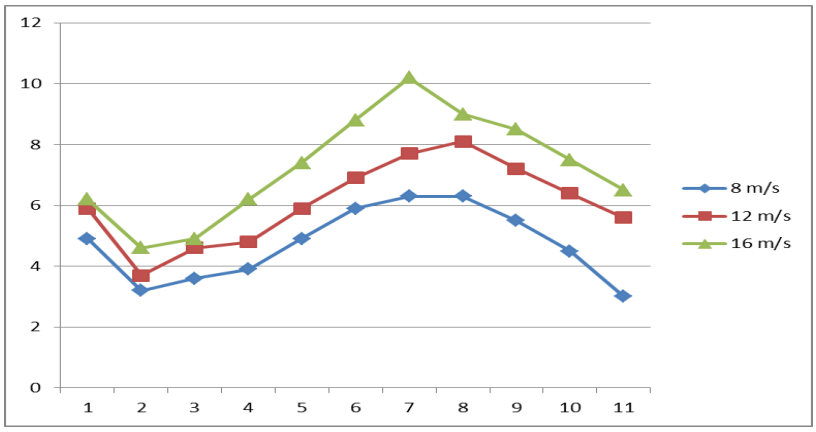
THE CASE OF DOLJ COUNTY AFTER 2011		
INDICATORS	**HA**	**%**
Dolj County surface	556.200	100,00
Forest surface	60.626	10,90
Desertified surface	104.600	18,81
Afforestation works	5.000	0,90

In our country, in order to attenuate and to refute the desertification phenomenon, utill now, the only measure taken is the one related to afforestation, but it is done on very small ares. For exemple in Dolj County 5.000 ha (4%) of the 104.600 ha affected by the desertification fenomenon were afforested (Table nr.2). This fact, assesses the identification and analisys of all the factors that led to the desertification phenomenon and applies immediately and with strictness of the measures reagarding the ceaseing forest cutting, afforestation of the deforested areas, planting shelter-belts.

Reducing the wind rate at ground level by the shelter-belts placed across the agrarian fields aginst the direction of the dominant wind, generated by the acacia shelter-belts, representative for the area and the effects on reducing the wind rate between two shelter-belts, compared to the wind rate in open field, has been studied in three versions of wind rates: 8m/sec, 12m/sec and 16

m/sec, mentioning that they were read at a 2 minutes interval, in natural measuring conditions, at a distance of 1 m and 2 m from the soil, and the dominant direction of the wind was from west-east, perpendicular to the direction of the shelter-belts. The measurements have been made on a lineal direction, at the half distance of the longitudinal axis of the shelter-belts. Knowing the fact that the positive or negative terrain defines considerable influences upon the wind rate, it was taken under consideration the area to be on the lineal direction on which the measurements have been made, so that the general statement of the measurements in all of the versions to be able to be compared and analysed as accurately as possible. The wind rate reduction to the open field rate, which is of 8 m/sec, is obvious for all of the three hights: at ground level, at 1 m and at 2m. The wind rate reduction ranges with the hight, the smallest rate being registered at ground level.

Chart nr. 2- Wind rate reduction between two acacia shelter-belts, at ground level



The strongest effects of wind rates reductions happen when the accacia trees reach maturity after 25-30 years and when their hight reaches approximately 18-20 m as well as the other characteristics of the shelter-belts that favour and involves different variation curves of wind rates in agrarian crop in rotation, but they are obviously superior to those with smaller hights. For sandy soils the sole existence of the shelter-belts doesn't block completely, up to annihilation, the aeolian erosion phenomenon.

This is also conditioned by the wind rate for the studied area, which is very aggressive and with high degree of turbulences and by the type of climate that favours this aggressiveness of the wind through pronounced aridity during the spring and autumn seedings or of underdeveloped crops. The knoledge of the variation curves characteristics is particularly important for the agriculture exercised in sands and sandy soils.

The study regarding the infuences exercised by the acacia shelter-belts upon the agrarian productions has been made on a three calendar years period, in two standard facility agrarian crop in rotation Sadova – Corabia of dimension (300 x 280 m) and facing (north – south). The two agrarian crop in rotations where chosen, close to one-another: the one protected by the acacia shelter-belts (on west and east) on south following the unprotected one, identically faced, but without the shelter-belts on west and east. Also, in order to compare, in identical conditions was founded within the years of study, the same type of agrarian crop (tobacco, wheat, melons) in both cases, the sandy soil being the type of protosoil tipical anthropic, establishment illustrative resulted from the leveling-moulding works. The climate, aerial and soil conditions for each agrarian crop in every year of study were similar, the differences made upon the crops happened exclusively because of protecting the cultures with acacia shelter-belts instead of unprotecting them. It must be shown that the technological conditions applied on crops, for the founding and the green period have been identical.

The state of the agrarian crops has been intended, applying the specific crop technologies, and for this comparison there have been havested across the two crop in rotation agrarian production. Their harvesting was made on a 100m^2 surface, in three repetitions, and the productions where expressed in quintals per hectar (q/ha) for tobacco and wheat and tons per hectar (t/ha) for

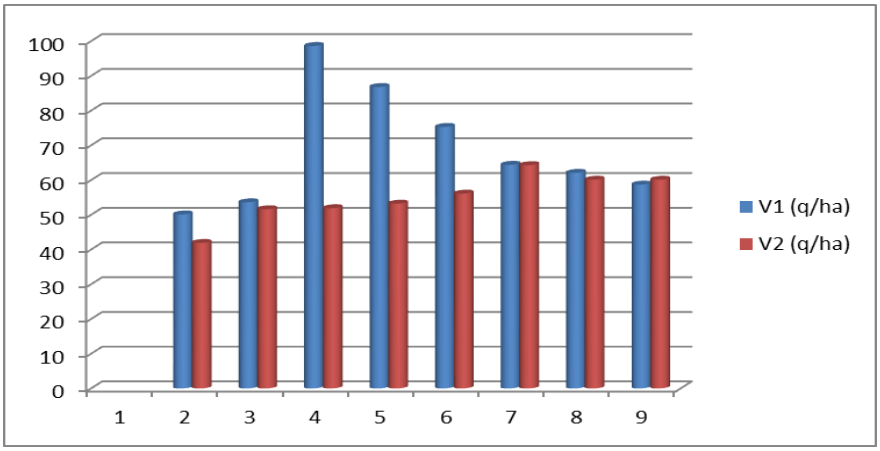
the melons. It was taken under consideration that the two crops in roration in which the crops have been encased, are the object of a study regarding the infuence of the acacia shelter-belts upon the agrarian productions and that is why the the conditions and technological measurements regarding their founding, maintenance and development have been applied identically regarding the time and the period.

The tobacco crop was made in two versions: version 1 – a crop in rotation protected by acacia sheler-belts and version 2 – a crop in rotation that is not protected by shelter-belts. In both of the chosen versions the tobacco was sprayed upon planting in order for the plants to develop roots in the soil where they have been unpoted and they were given 2 maintenance sprayings with norms of 400 mc/ha each. The productions that were obtained from the tobacco crop in the two studied versions were transfered in Table nr.3 and in Chart nr.3. No matter the way in which the size of the obtained production of tobacco crop is analysed, it shows that the smallest productions were obtained in the proximity of the shelter-belts, in the west front and also in the east front, and we believe it's because of the influence of the acacia roots, but especially because of the shading, and the largest tobacco production has been obtained at 50 m from the shelter-belt.

Table nr.3

NR. CRT.	DISTANCE FROM THE SHELTER-BELT (m)	TOBACCO AVERAGE PRODUCTIONS		
		V1 – protected crop in rotation (q/ha)	V2 – unprotected crop in rotation (q/ha)	Difference (V1-V2)
1	6	50,1	41,9	8,20
2	20	53,6	51,6	2,00
3	50	98,6	51,9	46,70
4	100	86,8	53,2	33,60
5	150	75,3	56,1	19,20
6	200	64,4	64,3	0,10
7	250	62,1	60,1	2,00
8	280	58,7	60,1	-1,40
TOTAL		**549,6**	**439,2**	**110,40**
AVERAGE		**68,7**	**54,9**	**13,80**

Chart nr.3– Average tobacco production in a protected crop in rotation (V1) and unprotected (V2)



Overall, the difference is not big, being of only 110,40 q/ha. We can explain this result with the fact that the wind effect is less obvious upon the tobacco crop, because it's planted in the field pretty late, when the wind doesn't have violent outbursts. Tobacco is seeded in especially installed and protected agianst the wind hotbeds and then they are shifted in the field.

The wheat crop has been also analysed in two versions: V1- a crop in rotation protected by sheler-belts and V2 – a crop in rotation that is unprotected by shelter-belts. The crop has been

supervised since the founding date, the 20th of October untill harvest day, the 10th of July. According to the technological card the founding date of the culture has been kept the optimal period of founding the crop and 4 maintenance sprayings with 400 mc/ha each have been made, both experimental crops in rotation have been sprayed. The obtained productions for the wheat crop in the two versions have been transfered in Tabel nr.4 and in Chart nr.4. Just like tobacco, the smalles productions were in the proximity of the shelter-belt. The biggest wheat production has been at 50 m from the shelter-belt in V1 and at 150 m for V2. It's obvious that in V1 version the productions are bigger than in V2 version, this leading to considerable differences of production. In the unprotected crop in rotation version the production is of 30% from the total production obtained in the protected crop in rotation.

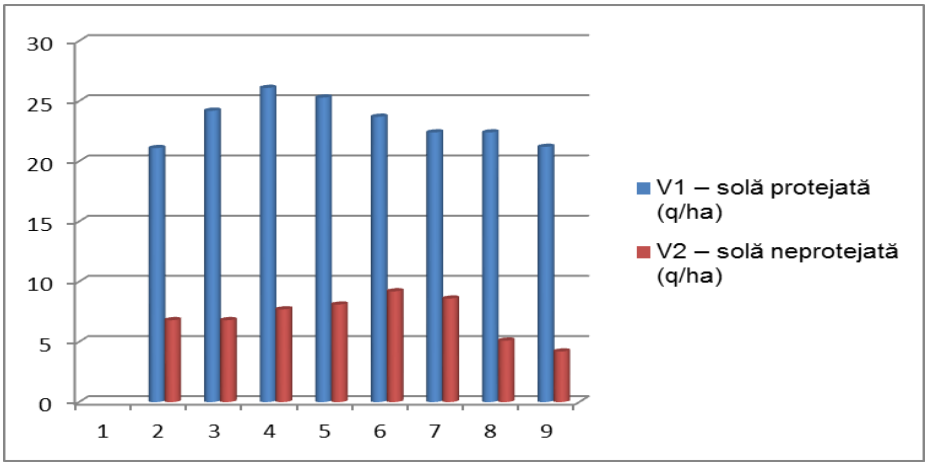
Increasing production in the protected persion had an exponential trajectory, followed by a slower decrease. The small productions obtained at the ends of the chart interval are explained by the fact that in the west side of the crop in rotation there were uprooting phenomena, and in the east side the covering of the plants with the wind driven sand.

Just like in the cases above, for the melon crops we have in mind two versions: V1 – a crop in rotation protected by sheler-belts and V2 – a crop in rotation unprotected by sheler-belts. According to the technological card, on both crops in rotation the soil preparing works began on the 11th of March and were administered the same treatments and the same number of sprayings (3) with norms of 400 mc/ha each.

Table nr. 4

NR CRT	DISTANCE FROM THE SHELTER-BELT (m)	WHEAT AVERAGE PRODUCTIONS		
		V1 – protected crop in rotation (q/ha)	V2 – unprotected crop in rotation (q/ha)	Difference (V1-V2)
1	6	21,1	6,8	14,3
2	20	24,2	6,8	17,4
3	50	26,1	7,7	18,4
4	100	25,3	8,1	17,2
5	150	23,7	9,2	14,5
6	200	22,4	8,6	13,8
7	250	22,4	5,1	17,3
8	280	21,2	4,2	17,0
TOTAL		**186,4**	**56,5**	**129,9**
AVERAGE		**23,3**	**7,06**	**16,24**

Chart nr.4 – Average wheat production in a protected crop in rotation (V1) and unprotected (V2)



In both Table nr.5 and Chart nr.5 it can be seen that the smallest productions happened in the proximity of the shelter-belt. The biggest production of melons was at 50 m from the shelter-belt for V1 version and at 100 m for V2 version. The accession curve, respective the decresion one with exponential aspect can be attributed solely on the wind effect by the aeolian erosion phenomena, during the spring-summer period, existing more moments with violent sandstorms.

To all that, it adds the drying processes of the soil and the water loss from the soil at the depth where the roots are developing, especially in the first stages of development of the plants when the foliar system is undeveloped and doesn't allow protection from the evaporation. In theese conditions, there where partial uprooting phenomena and wind driven sand.

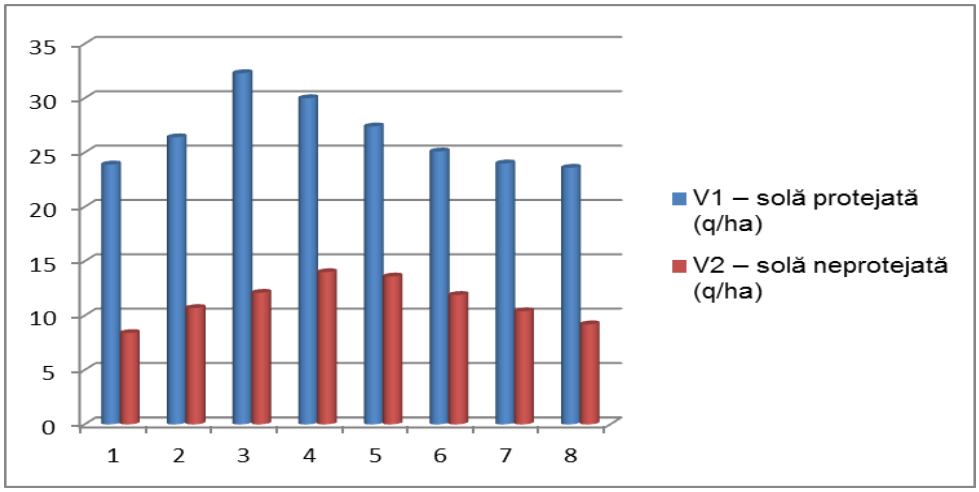
Just like in the cases of the tobacco and wheat crops, the biggest production was registered at 50 m from the shelter-belt. The central part of the crop in rotation had to suffer less, which is obvious given the obtained melon quantity. The obtained melon quantity from the unprotected version represents only 42% from the production obtained in the protected version.

The research made on the sands and the sandy lands from the SW of Oltenia, strongly affected by the deflation and the desertification phenomena evidentiate the purpose of the forests and of the shelter-belts for speed reduction as well as wind intensity, and also their role in protecting the agrarian crops and in increasing productions.

Table nr.5

NR CRT	DISTANCE FROM THE SHELTER-BELT (m)	MELON PRODUCTIONS		
		V1 – protected crop in rotation (q/ha)	V2 – unprotected crop in rotation (q/ha)	Difference (V1-V2)
1	6	23,9	8,4	15,5
2	20	26,4	10,7	15,7
3	50	32,3	12,1	20,2
4	100	30,0	14,0	16,0
5	150	27,4	13,6	13,8
6	200	25,1	11,9	13,2
7	250	24,0	10,4	13,6
8	280	23,6	9,2	14,4
TOTAL		**212,7**	**90,3**	**122,4**
AVERAGE		**26,6**	**11,2**	**15,4**

Chart nr.5 – Average melon production in a protected crop in rotation (V1) and unprotected (V2)



In the present paper it is shown that the best results in this regard, have been made when the protection of the agrarian fields has been made with the help of the shelter-belt nets, made so that two shelter-belts encased and oriented perpendicular to the dominant wind direction in order to bound a crop in rotation and, by their accumulated effect, to reduce the wind rate on soil level up to almost zero.

CONCLUSIONS

The effects of the wind rates reduction on ground level, exercised by the acacia shelter-belts, are more than obvious and very meaningful, but at rates bigger than 8m/sec. and especially more than 12m/sec., ar not enough, they should be completed with afforestation actions of the areas that were cleared.

The wind, the main responsable with aeolian erosion, causes the driven of the sands and of the sandy soils along the year. As it was shown, the acacia shelter-belts reduces the rate and intensity of the wind on ground level. By that, the aeolian erosion and the aeolian transport of the resulted particles decreases considerably.

On both protected areas, but mostly on the unprotected by the acacia shelter-belts areas displacements of the broken ground soil happens. The size and weight of the displaced particles varying from fine to bigger dimensions. With them, there are also displaced from the ground the nutrients: nitrogen, photasium, phosphorus.

The climate type, the clearing, the soil types assert the founding of the shelter-belts directed perpendicularly to the wind direction, respectively N-S. The type of the climate existing in the S-W of the country, the fact that in March-April the wind blows strongly, it favours the aeolian erosion phenomena and drought implicitly. This fact leads us to the only logical conclusion, which is the necessity in founding the shelter-belts.

The acacia shelter-belts, by the wind rate reduction effect on ground level, it reduces the risk of triggering and decreases the intensity of the aeolian erosion processes by prolonging the initial time of dissipation and by the quantity of the aeolian capacity and of the aeolian transport quantum during a calendar year with up to two and a half times.

Given the conducted analysis and the conclusions we can make some recommendations, such as: improving the forest law, by implementing the provisions of the Forest Code, which matches to the present needs by prohibiting clearing and forcing those who are exploiting wood to plant seedling in the cleared areas; the development of the administration models and forest management in drought affected areas and with aridity risk; the ecological reconstruction by afforestation of the weather-beaten areas due to the desertification phenomena, aeolian deflation, landslides; making a national system of shelter-belts for the field and agricultural land, antierosional, of whose efficiency has been verified in time by reducing the loss of water from the soil on the lands between them and the general increases from the agricultural production. The measure has to contain both installing new shelter-belts and also repairing the old ones.

In conclusion, in order to protect them, people and the companies have to understand the vital importance that forests have on our life and the life of our planet, on the whole ecosystem.

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AGRO-ENVIRONMENTAL DIAGNOSIS ON THE CROP FAMILY FARM –CASE STUDY-

TOMA CAMELIA[1]

Abstract: *The utilization of a diagnosis method of the farm influence on the environment is quite opportune in the present context: (i) The environment is a strong component of agricultural policies and a diagnosis is needed to guide the implementation actions (agro-environmental measures, CAP subsidies, high value environmental certification, recognition of high natural value agricultural systems, conversion to organic farming, etc.); (ii) The impact of production techniques upon the environment becomes increasingly necessary to be evaluated along the quality product chains. The purpose of the method is to establish the current environment condition at a given moment, to put into evidence the ecological systems, to identify the risky practices and to suggest improvement modalities to farmers. At the same time, the diagnosis has the capacity to evaluate: (i) "the value added" of the environment, through a better nitrogen and organic fertilizers management; (ii) own natural resources (soil, weather, biodiversity, etc.); (iii) pressure upon water and energy, etc.; (iv) negative and positive effects upon the local eco-systems. The method has a double approach: a global one – analysis of the farm system and its practices (30 indicators, on a scale of 1 to 100 scores) and a thematic one – impact of the farming activity upon the different environment compartments (23 indicators, from 1 to 20 scores). The "DIALECT" method used for the agro-environmental diagnosis on a crop production farm yielded interesting results, specific to the Romanian agriculture, and certain indicators were comparable to the environmental indicators of similar groups of European agricultural holdings.*

Key words: *The DIALECT method, farm, agro-environmental diagnostic, questionnaires, indicators*

INTRODUCTION

The global warming phenomenon, which can adversely impact the sustainable development of human society in general, and of agriculture in particular, threatening the population's food security and health, became a new science, which aroused the interest of both researchers and governments. These reached the conclusion that only by the joint efforts of the economic and political powers of each state in part, we can initiate a collective action in order to reduce these effects.

The climate change in Romania is considered into a European context; taking into consideration the regional conditions, temperature increase will be stronger in summer time, while in the north-eastern part of Europe, the strongest temperature increase is expected during the winter.

Global warming currently implies two main problems for mankind, namely:

-on one hand, the ***need for a drastic diminution of greenhouse gas emissions*** in order to stabilize the concentration of these gases in the atmosphere – thus hindering the anthropic influence upon the climate system and making it possible for the natural ecosystems to get adapted in a natural way - and,

-on the other hand, the ***need to get adapted to the climate change*** effects, while having in view that these effects are already visible and unavoidable due to the climate system inertia, regardless of the result of actions targeting the diminution of emissions.

Agriculture is one of the most exposed sectors to these changes as it is dependent on the weather conditions.

These changes modify the circuit of water in nature and influence the amount of rainfall, in the sense that it will be more rain in certain parts, while in other parts there will be drought, hurricanes, storms or tornadoes.

Weather variations across the years represent one of the main causes of the fluctuating average yields of crops and one of the inherent risks of agriculture.

Hence, what are the foreseeable effects of the weather changes upon the agricultural systems? (fig.1)

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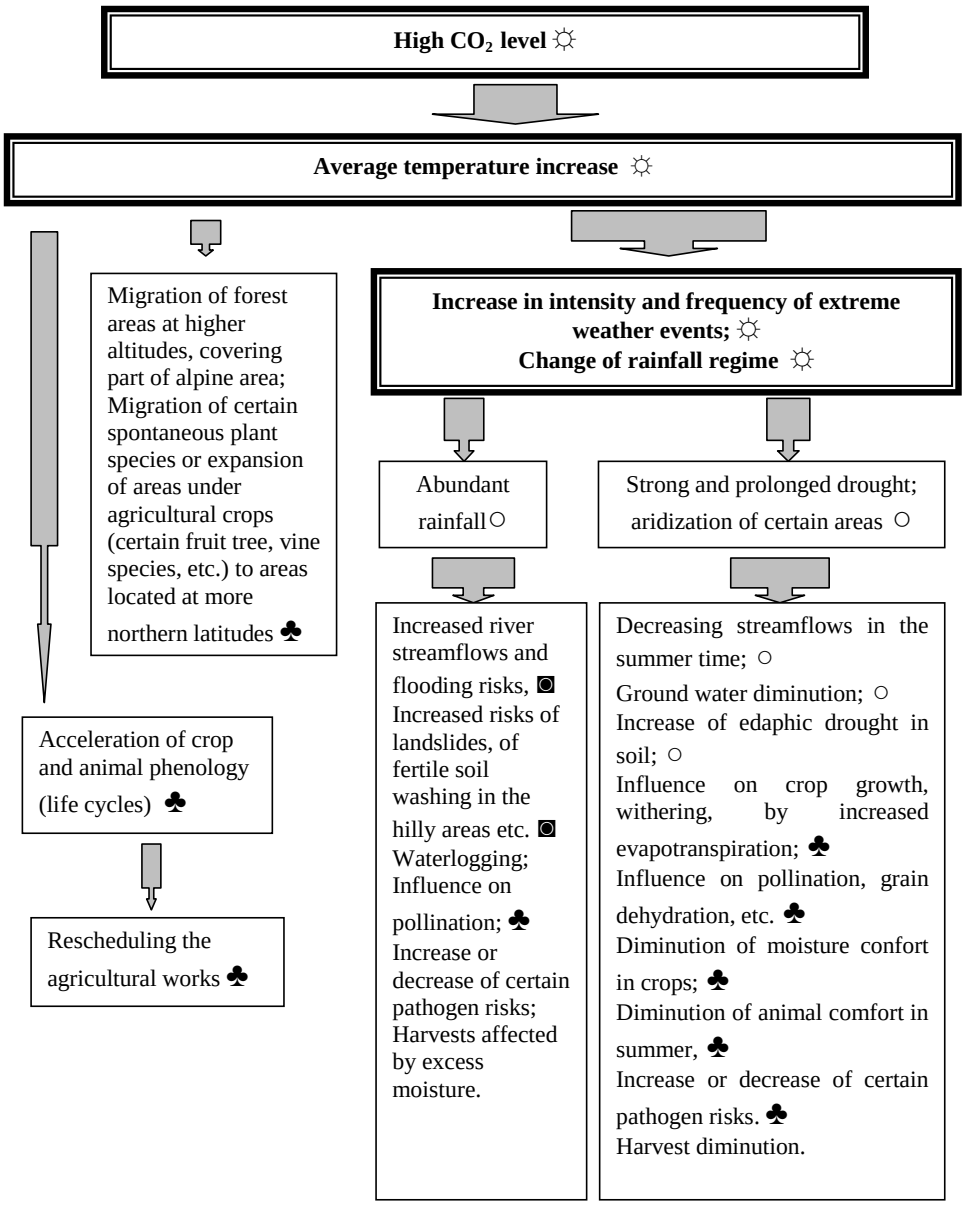

Figure 1. Foreseeable effects of weather changes upon the agricultural systems

Source: Author's processing of data from "Infographie-Quels sont les effets attendus du changement climatique", www.agriculture.gouv.fr, last accessing 05.11.2015 [10]

Note: ☼ = Weather parameter; ♣ = Agro-environmental indicator; ○ = induced effect; ◙ = effect induced by extreme events

The European Environment Agency (EEA, 1999) developed the Method DPSIR (Driving Force – Pressures - State – Impact - Response), which represents an analytical framework to describe and understand the linkages between the economic and environmental activities, under the form of a set of 35 indicators integrating the environmental aspects in the agricultural, forestry and water management policies in the rural area.

The Institute for Soil Science and Agro-chemistry Research proposed a research project TOGI [9] whose main objective is the adaptation and application of the DPSIR Community methodology at local and regional level.

The evaluation criteria of agro-environmental indicators refer to the relevance for policy evaluation, response capacity, analytical base, data accessibility and measurability, interpretation facility and cost effectiveness.

The following conclusions can be drawn from the project results:

"The development of agro-environmental indicators is facing difficulties in reality:

- The environmental problems are often too complex to be represented by individual parameters (such as landscape diversity),
- Romania's territory is quite diverse in terms of farm structures (crop, livestock types, etc.), soil characteristics, topographic and climate conditions, farm size and agricultural productivity,
- The relations between agriculture and environment are complex, so that a simplified description is not necessarily useful; the impact of many agricultural processes depends on a wide range of specific local characteristics,
- The lack or insufficiency of data sets prevents/constrains the implementation of the most appropriate concepts/methodologies of indicators, for instance the irrigable area must be used with approximation for water use assessment,
- The required data for state/impact indicators are often unavailable. Furthermore, several indicators from these fields should be based on a mathematical model or approximated data,
- The causal links are not sufficiently understood so as to be represented through indicators.

In spite of these problems, the agro-environmental indicators remain key instruments for environmental reporting in agriculture (and in other fields as well). The limited resources for data collection make it necessary to select a limited set of indicators that can be maintained on long term as part of an agro-environmental information system."[9]

Environment analysis at farm level through a diagnosis of interactions between the farming activity and the environment, in other words, a diagnosis of the negative and positive effects of the farm activity upon the environment is quite opportune and complementary in the context of the difficulty to calculate certain agro-environmental indicators at local, regional or national level.

By getting the farmers directly involved in making agro-environmental diagnoses on their own farms, these get more aware of the need to reduce the greenhouse gas emissions and the need to adapt to the climate change effects.

At the same time, at present, the environment is an important component that the agricultural policies take into consideration for conservation and financial support, as well as for the implementation of actions, such as: establishment of criteria for the selection and implementation of agro-environmental measures on the farms, providing CAP subsidies, establishment of high environmental value, recognition of high natural value agricultural systems or of those with environmental constraints, conversion to organic farming, etc.

MATERIALS AND METHODS

The team of specialists [1], [3], [6], [7], [8] chose a classical method to evaluate the environmental impact: the interaction matrix for the assessment of the effect of farmer's practices upon the agro-eco-system components.

Evaluation modules were developed for impact characterization, and their aggregation has produced two types of indicators: *agro-ecological indicators*, which express the influences of a certain practice upon the overall environment components, while the *environmental impact indicators* express the influences of the overall practices upon a given environmental component.

In the following years, the indicator-based methods for the assessment of agriculture impact upon the environment were developed for a wide range of end-users, but mainly for farmers, for the territorial communities and for the decision-makers at communal, regional, national and European level.

Thus, in the year 2004, the IDEA method was applied and improved (Indicators of farm sustainability), which is structured into objectives grouped within three sustainability scales: agro-ecological, socio-territorial and economic [2].

These objectives refer to the agronomic principles of agriculture, i.e. they should lead to a *good economic efficiency at the smallest possible ecological cost,* they also refer to the *human ethics and development* and take into consideration the *entrepreneurial function of the farm*.

Each of the three scales is subdivided into three or four components, regrouping *41 composed indicators,* each consisting of two-three sub-indicators, summing up more than *100 simple indicators*.

The IDEA system of indicators was taken over and tested by the researchers of the Institute of Agricultural Economics of the Romanian Academy and it represented the main diagnosis tool for certain Romanian agricultural holdings. [4], [5]

The DIALECT method completes the weaknesses of the previous method by including the agro-environmental evaluation at farm level.

This method was developed by the research center "SOLAGRO" from Toulouse, France, in the period 1995-2015 and it is successfully applied on more than 2000 farms from France, from other different countries of the European Union and even from other regions of the world with temperate climate.[13] In the 20 years since the creation of the first version, improved versions were developed, in line with the research works in the field of agro-environment and climate change, while making a performant interface available, totally or partially transposed into the languages of the EU member states and adapted to the new online informatic technologies, so as to be used by any interested person in this field.

This analysis tool establishes the current situation of the environment and reveals the agro-ecological systems, identifies the risky practices and can suggest improvement modalities to farmers. The diagnosis has the capacity to measure the environment "value added", expressed by a better nitrogen and manure management, by the conversion modality to organic farming, the effect of a change in crop rotation, the modality in which certain operations better optimize the use of own natural resources (soil, weather, biodiversity, etc.) and limit the pressure upon resources (water, energy, etc.), while other have a negative impact upon the local ecosystems.

The environment evaluation method at farm level is based on a double approach:

A global approach, which makes an analysis of farm operation, including two themes:

- *farm diversity;*
- *rational utilization of inputs.*

A thematic approach, measuring the impact of farm activity upon different environment components: water, soil, air, biodiversity, resource use, etc.

A specific part of the diagnosis was dedicated to the farm *energy analysis*. Energy is a necessary condition throughout the production process.

The diagnosis is based on the analysis of 8 criteria and 20 indicators. Each indicator is defined by a calculation modality using quantitative or qualitative variables.

For certain indicators, it is necessary to define an evaluation scale that includes a *minimum value* and a *maximum value* and the evaluation modality within this scale (linear or non-linear).

The instruments used by the DIALECT method are the following:

- *a survey questionnaire*, which makes it possible to collect information, mainly quantitative information (crop rotation, livestock herds, evolution of crops and livestock herds, products, etc.), as well as many qualitative information for the description of the environment on the territory of a given farm;
- *a web platform* for data inputting, which makes it possible to automatically calculate the indicators and express the results in pdf format;
- *a utilization manual* of the Dialect site [13].
- *a database* is available on the Internet for all the diagnoses made by different experts, researchers or students from different universities in this field.

This enables the following: comparing the obtained results with those obtained from other similar farms or groups of farms from different countries of the European Union and ensures the development of agro-environmental benchmarks for a given type of farm and/or agricultural area.

RESULTS AND DISCUSSIONS

The diagnosed crop production farm is located in the county Ialomita. The agricultural land is found on the Danube bank, along the Borcea branch. Being located on the eastern migration route of birds, the territory is visited in the transit period, being a feeding and resting area for rare and very rare water and terrestrial bird species". [11]

There is also an area of 5-6 hectares on the territory of this farm totaling 98 hectares, where the red-necked geese (Branta Ruficollis) feed and spend the winter.

The farmer applies the Agro-environmental Measure, package 7, which he is currently using. Respecting these rules (and many others, according to the agro-environmental requirements), the crop structure in the year 2014 was the following: 34 ha with wheat, 37 ha with rapeseed and 27 ha with maize, the largest part of arable areas being operating under land lease system.

In the year 2014, the average yields per hectare were 6 tons/ha for wheat, 3 tons/ha rapeseed and 10 tons/ha for maize. According to the obligations assumed in package 7, the farmer left almost 3 tons of maize in different feeding locations for the red-necked geese.

The farm has the entire range of agricultural machinery; it applies conventional technology, with the application of fertilizers and pesticides outside the resting and wintering periods of these migratory aquatic birds.

The herbicide application is minimal, mechanical works for weed control and the "false seeding" method being used.

The direct and indirect energy consumption, expressed in "liters oil equivalent" summed up 392 leqp /ha, accounting for 31% agricultural diesel oil, 50% of the applied fertilizers, 3% of the phyto-sanitary products and 17% of the different materials used (plastic packages, baling wire/string, etc.). The produced energies (3041 leqp/ha) resulted from the obtained harvests.

The ratio of output energy to input energy is medium, i.e. 7.75, while the energy efficiency coefficient specific to the system must range from minimum 5 to maximum 15, so as to be considered a sustainable, green and non-polluting system.

The CORPEN balance revealed a good application rate of chemical fertilizers (114 kg N/ha), compared to the necessary fertilizers for obtaining the respective harvests (118 kg N/ha) and 623 kg N/year were volatized, i.e. 6 kg de N /UAA ha. (fig. 2)

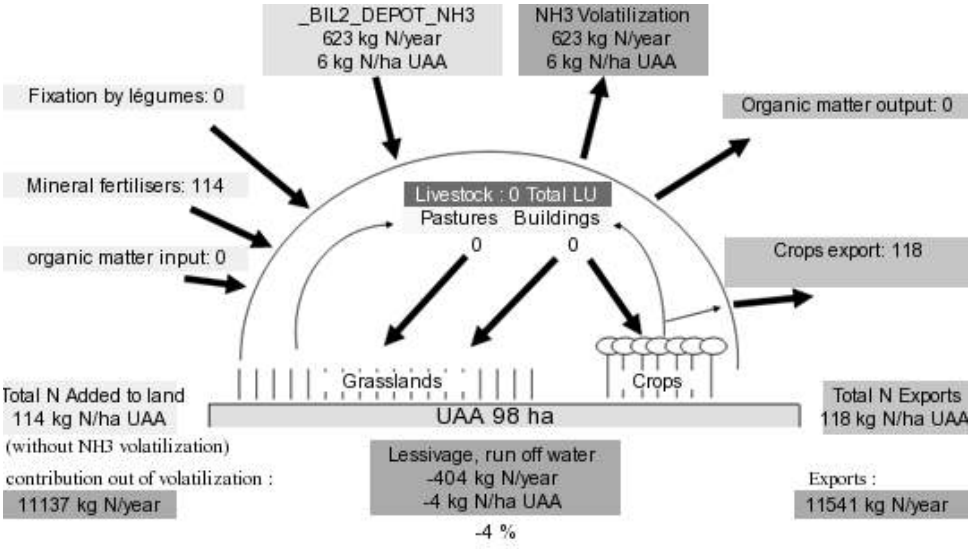

Figure 2. Nitrogen annual flow in the farm(kg N / ha)

Source: Dialect appraisal, www.dialect.solagro.org, Toulouse, France, data introduced on-line by the author

At farm level, the DIALECT program estimated that ***greenhouse gases*** resulting from the farm activities totaling 179 tons/year, i.e. 1.83 tons/ha, consisting of 112 tons/year CO_2 and 68 tons/year N_2O, under the form of direct or indirect emissions. (tab. 1)

Table 1. Main sources of GHG emissions from the farm (tones CO_2 equivalent)

Direct and indirect GHG	tons CO_2/year	kg CO_2/UAA ha	%
Direct GHG emissions from the farming activities, out of which:	97	990	54
-Burning fuels and oils	*29.1*	*297*	*16*
-Direct N_2O emissions from soil	*65*	*663*	*36*
-Indirect N_2O emissions from soil	*2.9*	*30*	*2*
Indirect GHG emissions from the activities of third parties, out of which:	82.5	841	41
-purchased seeds	*0.1*	*1*	*0*
-manufacturing of chemical fertilizers	*61.7*	*630*	*30*
-manufacturing of pesticides	*3.2*	*33*	*2*
-manufacturing of plastic packages	*1.2*	*12*	*1*
-manufacturing of agricultural machinery and implements	*11.8*	*120*	*6*
-construction materials-buildings	*4.5*	*46*	*2*
TOTAL GHG emissions	**179.4**	**1831**	**100**

The sequestrated carbon stock totalled 7 tons/year, accounting for only 4% of total GHG emissions from the farm territory.

According to the DIALECT method, the diagnosis based on the global farm approach cumulated a score of 53 points out of 100 possible points (out of which 22 points are dedicated to the livestock production). From the total score, diversification/specialization in crop production cumulated 31/70 points while input management 22/30 points. The existence of natural infrastructures (green compensation areas and the average parcel size (5.8 ha) obtained a good score (17/18 points),(tab. 2).

Table 2. Overall situation of the farm with respect to the environment. General approach of the farm

Name of indicators	Indicator values	Points farm	Ceiling
TOTAL MIXITY + INPUTS		**53**	**100**
1. Farm mixity		**31**	**70**
1.a. Diversity of crops and land coverage		***10***	***30***
-diversity of crops	*3*	*4*	*13*
-share of legumes	*0%*	*0*	*7*
-land coverage during winter	*72%*	*6*	*10*
1.b. Diversity of livestock, autonomy and ferti. transfers		***4***	***22***
-diversity of livestock production	*0*	*0*	*3*
-sufficiency in forage	*0%*	*0*	*14*
-sufficiency in concentrates	*0%*	*0*	*0*
-bought < 50 km	*0*	*0*	*1*
-transfers through organic matter	*100%*	*4*	*4*
1.c. Natural Infrastructures		***18***	***18***
-agro-environmental facilities	*10%*	*11*	*11*
-average size of plots (10 ha)	*5.8*	*6*	*7*
2.Input management		**22**	**30**
2.a. Nitrogen		***5.8***	***7.5***
-controllable nitrate pressure (mineral + organic)	*120*	*1.3*	*2.5*
-Input/output balance for the farm	*-4*	*4.5*	*4.5*
-few fractionation	*98*	*0.0*	*0.5*

2.b.Phosphates		***2.9***	***3.0***
-controllable phosphate pressure (mineral + organic)	*30*	*1.4*	*1.5*
-Input/output balance for the farm	*-25*	*1.5*	*1.5*
2.c.Water		***6.0***	***6.0***
-volume consumed	*0 m^3*		
-membership of management system		*Without object*	*Without object*
2.d.Pesticides		***2.8***	***7.5***
-pesticide pressure (PP)	*3.9*	*2.8*	*7.5*
2.e.Energy		***4.5***	***6,0***
-total consumption per ha UAA	*392*	*2.3*	*3.0*
-energy efficiency specific to the system	*7.75*	*2.3*	*3.0*

The global situation and the mixity of the farm is considered as “medium”, and ”high” for the management of inputs.(fig. 3)

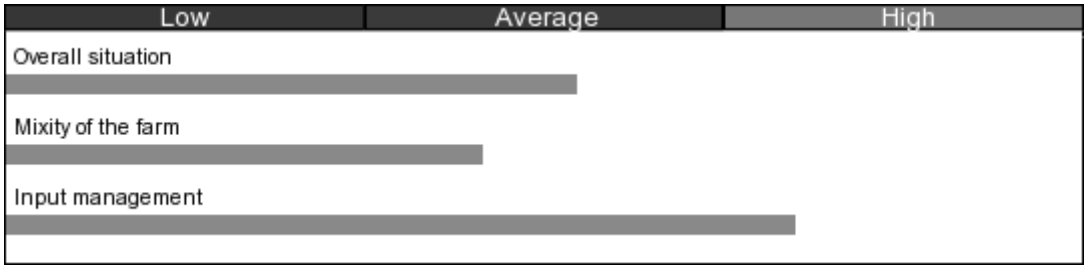

Figure 3. Agri-environmental diagnosis of the farm by the Global Approach

The thematic environment approaches, resulting from the Dialect Balance, qualified the farm as having a “high” impact upon water quality, with 16.6 points out of 20 possible points.

The thematic approach to the ”soil”, ”biodiversity” and consumption of resources” environment component revealed a ”medium” impact with 9.8, 11 and 10.7 out of 20 points.(fig.4)

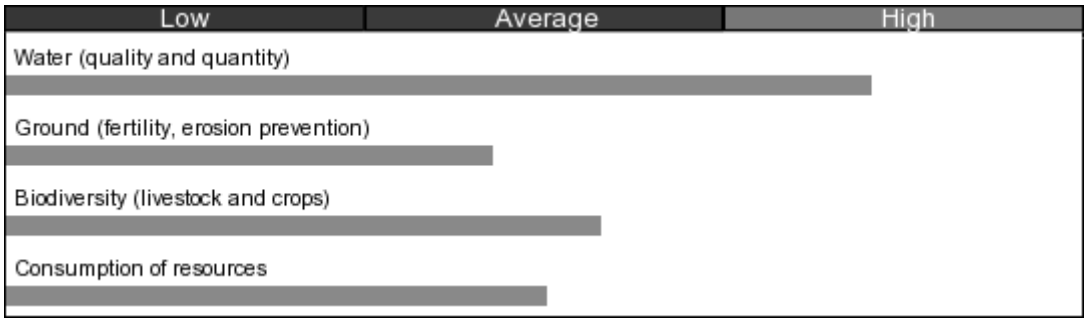

Figure 4. Agro-environmental diagnosis of the farm by the thematic approach

CONCLUSIONS

Agriculture is one of the most affected sectors by global warming, as it is dependent on the weather and climate conditions; at the same time, it is also a polluting agent with chemical fertilizers, pesticides, effluents from the livestock sector and a consumer of direct and indirect energy. In order to measure the impact of human activities upon the environment, as well as to evaluate the climate change effects upon the environment and the population, different sets of indicators were established. The agro-environmental indicators partially respond to the regional and national analysis needs, as the impact of many agricultural processes depends on a whole range of specific local characteristics (heterogeneous relief units, altitude, climate, agricultural production methods, from the most simple to the most sophisticated technologies, etc. The farm agro-

environmental diagnosis method, created by the French experts and made available on a free of charge basis, for online utilization, represents a very easy to apply tool, even by farmers themselves. By their direct involvement in making agro-environmental diagnoses on their own farms, farmers become more aware of the need to drastically reduce the greenhouse gas emissions and of the need to get adapted to the climate change effects.

With the 53 accumulated points, the farm from the Ialomita county, diagnosed through the Dialect Method, is found among the 30% of the farms from the EU sample. The diagnosis results go back to the farmer, and the role of consultancy and researcher expert is only at the beginning.

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THE AGRICULTURE – AN INDICATOR FOR THE RURAL DEVELOPMENT IN MARAMURES COUNTY

ALECU IOAN NICULAE, GIAMBAŞU TALIDA

Summary: *Romania's rural development and, implicitly, of Maramures county is a sector of significant importance, which has become a priority also for the European Union, particularly since 91% of the European territory is represented by rural areas. In Maramures County, the rural environment is faced with a set of important issues that require urgent settlement in order to fulfil the desire for sustainable development. The purpose of this work is to identify, by analyzing the current data provided by the National Statistics Institute, the main weaknesses in this sector and the potential rehabilitation opportunities. The results of the survey can be successfully corroborated with other surveys of other rural development indicators, so that a clear and accurate image of the current status can be outlined, upon which actual strategies of relaunching certain sectors can be conceived, in order to raise the quality of rural life and to achieve the objectives of sustainable rural development, by connecting the actions to the needs*.

Key words: rural development, zootechnics, agriculture, Maramures.

INTRODUCTION

The purpose of the rural development policy of the European Union is to settle the issues encountered in the rural areas and to raise the potential thereof. According to the National Strategic Plan for Rural Development for 2014-2020, the rural areas in Romania cover 87.1% of the country's territory, comprising 44.9% of the population on January 1, 2009 (9,663,516 individuals) and 46.11% on January 1, 2014 (9,198,308 individuals) (www.pndr.ro). Restructuring the agriculture and the revitalization of the rural economy may represent significant development levers. According to the National Strategic Plan for Rural Development for 2014-2020, the contribution brought by agriculture to the gross domestic product was always high.

For instance, in 2006, the gross value added (GVA) of agriculture represented 1.2% of the GDP and 13.6% of the total GVA. Due to the failure to use the agricultural resources entirely, the contribution of this sector remains low.

Restructuring agriculture shall have a particular impact upon the rural economy in Maramures County, considering that agriculture continues to be the most important activity in the rural area and therefore represents an essential income source for the households. In order to be able to develop the rural environment in this administrative-territorial unit it is required to start with the assessment of this region:

1. *The population from the rural environment in Maramures County is faced with a powerful demographic decrease,* which represents a strong challenge for the economic development of this region. Since 1990, the number of the individuals living in rural areas has continuously dropped, whereas the urban population has registered a slight evolution.

2. *The rate of the natural growth in the rural environment is negative,* whereas in the urban environment it maintains positive values. However, the average lifetime of an individual living in the rural environment is slightly superior to the average lifetime registered in the urban environment (72.78 years).

3. *The average number of employees in the sector of agriculture and forestry is continuously dropping,* as in 2007 only 0.34% of the total number of employees in Maramures County were acting in the sector of agriculture and hunting and 1.15% in the field of forestry and forest exploitation, while in 2014, - 0.27% in the field of agriculture and hunting and 1.21% in forestry and forest exploitation.

4. *The average net salary* in the agricultural sector is, since 1990, permanently inferior to the average net salary in Maramures County. In forestry and forest exploitation, the incomes are higher,

although, except for a few years, also in this sector the average net salary is lower than the average net salary registered in all activity fields from the county.

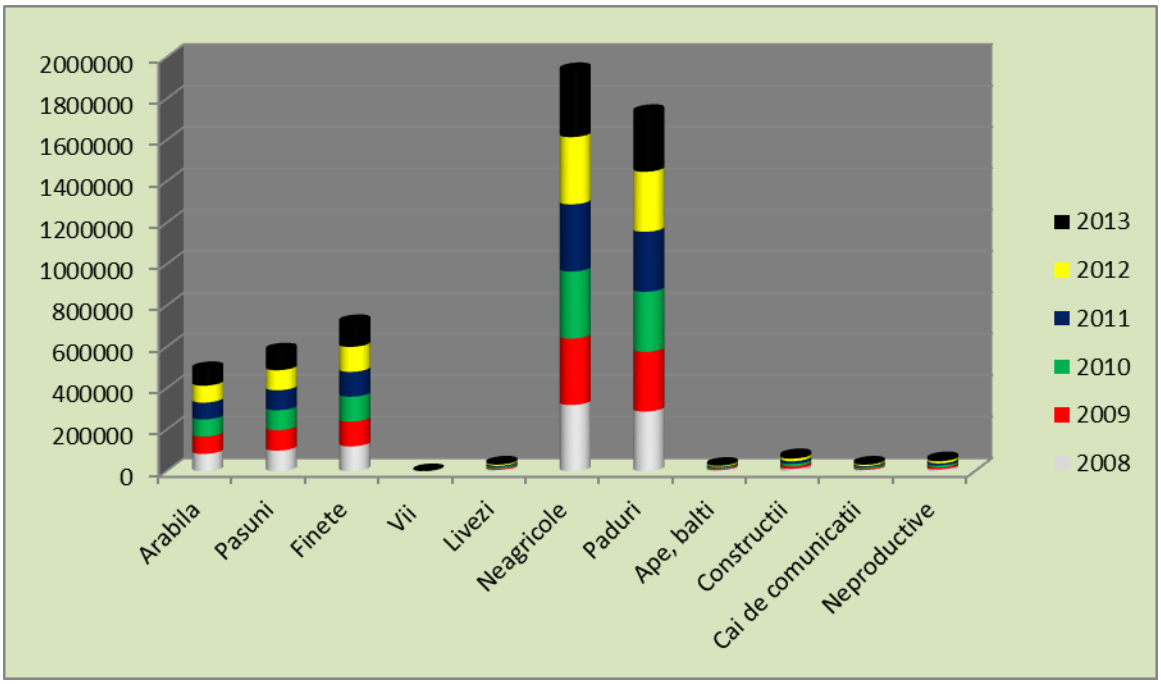
5. *Only 2.5% of the total number of companies acting in Maramures County were a part of the agriculture, hunting and forestry sector* (269 units) in 2007, most of them being rated as Small and Medium Enterprises. The percentage of the companies acting in the agricultural sector from the total number of enterprises acting throughout the county was, however, on a slight rise during the last few years, as in 2012 it was of 3.06% (288 units), which represents an increase of 1.1% in 5 years.

MATERIAL AND METHODS

The analyzed material comprises the entire area of Maramures County, specifically both the rural and urban areas, whereas this approach of the survey is required for identifying the needs and determining the relaunching strategies in regard of various sectors of agriculture. The results regarding the status of the land fund were subject to analysis and discussions according to the use manner, the cultivated area to be exploited, the average production of the main agricultural cultures, the number of animals and their production, the production parameters of the agricultural branch per sector, the labor force records, the land categories and forest species, as well as the production of the various forest species existing in Maramures County. The survey is part of a more comprehensive work, where the results obtained in this document shall be used in order to outline the overview of sustainable development in Maramures County. The data used in the survey were obtained by inquiring the temporal series (2008-2013), made available by the National Statistics Institute (www.insse.ro).

RESULTS AND DISCUSSIONS

The analysis of the areas forming the land fund according to the use manner shows that the areas designed for agriculture are slightly decreasing since 2004, and so is the arable land (picture 1).



Picture 1. The analysis of the land fund according to the use manner (NSI)

The highest percentage is held by the non-agricultural areas and forests, which is contrary to the touristic potential of the region and to the use manner of the lands at County level. The

second rank is occupied by hayfields, grasslands and arable areas, whereas this shows the preoccupation of the population engaged in agriculture for the extensive land exploiting systems, which, if corroborated with the region's touristic potential, create the basics for sustainable rural development and improved life quality in such areas.

The development of the infrastructure required for building communication channels is another important issue that shows the preoccupation of the authorities for the sustainable development of the region subject to analysis.

Based upon the analysis of the data available at the time of inquiry in regard of the timeframe 2008-2013 as produced by the National Statistics Institute for Maramures County related to the land fund and its use manner, the following conclusions can be drawn:

- ✓ The total agricultural area is decreasing, 4796 ha being lost during the analyzed period;
- ✓ The arable land has lost in 5 years 2589 ha;
- ✓ Grasslands have registered a significant area decrease during the period 2008-2010 (3239 ha), then a very slight increase, without reaching, however, the level from 2008. Basically, in 5 years, 2846 ha were lost;
- ✓ Hayfields have registered an area increase, gaining 1002 ha during the analyzed period;
- ✓ The area cultivated with grapevine has remained constant during the entire period;
- ✓ The area designed for orchards and tree farms has lost 336 ha;
- ✓ The forests and other areas planted with trees have gained in 5 years 1283 ha, as well as the areas with waters or ponds, which have an additional 257 ha (compared to 2008);
- ✓ The communication channels and railways have gained another 305 ha, and the areas covered by buildings, 1296 ha;
- ✓ Non-productive or degraded lands have also gained some space, their area increasing by 1628 ha during the analyzed period.

With regard to the cultivated area, the highest percentage of the cultures in terms of area is held by cereals for grains (corn beans keeping their top position in the percentage of allotted areas), then potatoes and vegetables. Nevertheless, the areas dedicated to such cultures were on the rise until 2009, then they registered a significant drop. For instance, the areas cultivated for exploiting purposes has lost between 2009 and 2011, 6872 ha; the area allotted for cereals for grains has lost between 2004 and 2013 16747 ha, whereof the area dedicated to corn beans, 5881 ha (2004-2011). Table 1 contains the average productions (kg/ha) of the main cultures in Maramures County during the period 2008-2013.

Table 1

Average productions* (kg/ha) of the main cultures in Maramures County, during the period 2008-2013 (NSI)

Main cultures	Years					
	Year 2008	**Year 2009**	**Year 2010**	**Year 2011**	**Year 2012**	**Year 2013**
	UM: Kg/ ha					
Cereals for grains	2718	2653	2936	3248	2461	3322
Corn beans	3099	3174	3627	3653	2705	3661
Potatoes – total	10586	12760	10856	13753	8549	11346

*average production = the quantity of gross products (per culture) obtained on the cultivated area unit

The productions of the main cultures in Maramures County, during the analyzed period, have registered increases, particularly in the case of individually exploited agricultural areas. The highest productions from the analyzed timeframe were registered in 2013 regarding cereals for grains, including corn and in 2011 regarding potatoes. As concerning the ownership type, the individually exploited agricultural areas hold an overwhelming percentage of the total exploited

areas from the private sector (100%): 99.55% cereals for grains; 99.48% corn beans and 99.84% potatoes.

Table 2 presents the status of the animal farms of economic interest, during the period 2008-2013, at the level of Maramures County. The fact that the number of animals is decreasing does not represent an isolated phenomenon in this county, but exists in the entire country. As a particularity, we might state that this descending trend is due, in the analyzed period, to the climatic conditions with very dry years (2009, 2010, 2011), as well as to the world financial crisis, which has directly or indirectly impacted also the zootechnics sector in our country.

Table 2

Number of animals in Maramures County, during the period 2008-2013 (NSI)

Animal categories	Years					
	Year 2008	Year 2009	Year 2010	Year 2011	Year 2012	Year 2013
	UM: Number					
Cattle	89162	87137	82227	81976	81856	80090
Cows, buffalos and heifers	64263	64210	62214	62105	61165	58337
Pigs	120641	118199	98616	96923	98736	95843
Sheep	186466	179102	155662	155383	162131	168866
Goats	13957	15037	16372	17328	19154	20116
Horses	16211	14586	11488	11240	11394	9870
Poultry	891747	975181	1010061	930114	967235	940917
Bee families	13987	13703	24396	23437	23174	23876

The number of cattle, bubaline, pigs and horses have registered losses during the entire analyzed period, the number of sheep has dropped since 2008 until 2010, and then has increased, the number of goats was the only one that has registered increases during the entire period, the number of poultry has dropped until 2011 and then increased, while the bee families have significantly grown in 2010, then the growth was insignificant from one year to the other (a few hundreds of families).

The analysis of the main animal productions in Maramures County during the period 2000-2003 and 2007-2011 (table 3), shows a growth of the production of cow and buffalo milk during the first period and a drop during the second period, except in 2011, when it starts to rise again; a decrease of wool production (is no longer industrially processed); a decrease of the weight of the animals when sacrificed during the first period and a decrease of the poultry egg production.

During the period 2007-2011, the total meat production (live weight in tons) has registered a maximum value in 2009 (27961 t), suddenly dropping during the next period (to 22702 t).

The cattle meat production has decreased from 9015 tons in 2007, to 5061 tons in 2011, having a minimum production in 2010 (4972 tons); the pig meat production has dropped in 2007-2008, then registered a production maximum in 2009 (15702 t), and then in 2010, it suddenly decreased to 10826 tons, while in 2011 it starts to slightly rise again (12010 tons).

Table 3

Animal productions during the period 2007-2011 in Maramures County (NSI)

Categories of animal agricultural products	2007		2008		2009		2010		2011	
	total	private sector	total	private sector	total	private sector	total	private sector	total	private sector
Meat - total (live T. W.)	26346	26236	22714	22697	27961	27948	21260	21254	22702	22688
Cattle meat (live T. W.)	9015	8990	7481	7471	6618	6608	4972	4970	5071	5061
Pig meat (live T. W.)	12164	12079	10319	10312	15702	15699	10826	10822	12010	12006
Sheep and goat	2161	2161	2254	2254	1833	1833	2154	2154	2037	2037

meat (live T. W.)										
Poultry meat (live T. W.)	2996	2996	2657	2657	3799	3799	3304	3304	3580	3580
Milk (+calves consumption) (thousand hl)	2185	2185	1819	1819	1711	1711	1641	1640	1856	1856
Wool production (tons)	370	370	378	378	373	373	332	332	298	298
Egg production (million pcs.)	101	101	102	102	102	102	93	93	141	141
Extracted honey production (tons)	146	146	553	553	262	262	498	498	437	437

The sheep and goat meat production during the period 2007-2011 is maintained at a relatively constant level (between 2254 tons in 2008 and 2037 tons in 2011, except in 2009, when the production level was at a minimum (1883 tons).

The honey production registered a significant increase in 2008 compared to 2007 (378.77% increase), while in 2009 it drops to 262 tons, only to raise again in 2010 and 2011 to 498 tons, namely 437 tons.

Table 4

Indices of the agricultural branch production per sector (NSI)

Agricultural branches – new series						
	Year 2008	**Year 2009**	**Year 2010**	**Year 2011**	**Year 2012**	**Year 2013**
	Percentage (%)					
Total	106.2	99.3	89.7	114.5	83.7	104.7
Vegetal	114.9	96.6	88.9	115.8	68.8	116.4
Animal	90.5	104.7	90.9	112.4	104.9	94.4

The indices of the agricultural branch production (volume indices) are calculated based upon the value of the production obtained in the previous year, expressed in the prices valid during the previous year (table 4). In table 22 and picture 10 we are able to see that the indices of the vegetal agricultural production expressed in percentages have dropped during the period 2008-2010, while in 2011 they reach a peak of 115.8%, and then in 2012 they drop again to 68.8% and then rise in 2013 to 116.4%, exceeding the value registered in 2011.

The indices of the animal production register an increase during the period 2008-2009, while in 2010 they decrease (the economic crisis and the drought, plus the drop of the vegetal production) and rise again in 2011 (following the indices of the vegetal production) and then drop in 2012-2013.

According to the NSI data, as centralized in table 5, the status of the labor force occupied in agriculture during the period 2008-2014, shows a decrease of the yearly labor – employees units (UAM) from 221 UAM in 2008 to 165 UAM in 2014.

The maximum employee UAM was registered in 2009 (227 UAM). Since 2012 and until now, a drastic drop of this category was registered.

Table 5

The status of the labor force in the agricultural sector in Maramures County during the period 2008-2014 (NSI)

The list of variables labor force	Years						
	Year 2008	**Year 2009**	**Year 2010**	**Year 2011**	**Year 2012**	**Year 2013**	**Year 2014**
	UM: 1000 yearly labor units (UAM)						
Total	2152	2152	1639	1532	1573	1564	1444
Non-employees	1931	1925	1429	1326	1349	1386	1279
Employees	221	227	210	206	224	178	165

UAM of the non-employees in the agricultural sector are higher by an order of magnitude than the employees (thousands). Fortunately, this category has registered a decrease during the analyzed period, from 1931 UAM non-employees in 2008, to 1279 in 2014.

As regarding the forest area in Maramures County during the period 2008-2013, it has dropped since 2008 until 2011, and has then registered a slight increase in 2012 and 2013. Basically, since 2008 and until 2013, the forest area has dropped by 0.9 ha (table 5).

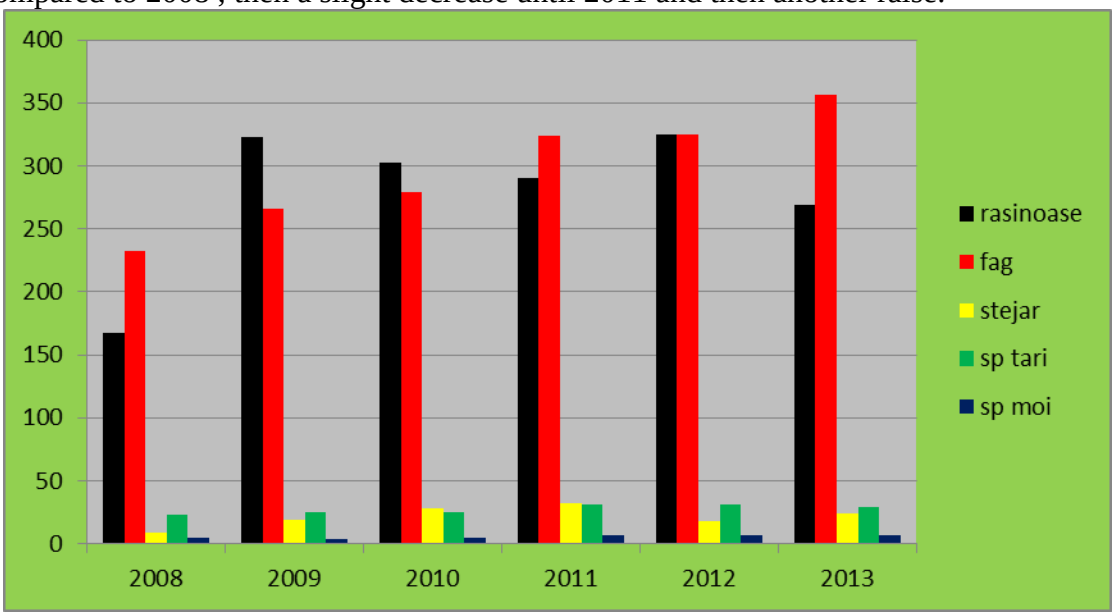
Table 5

Land categories and forest species in Maramures County during the period 2008-2013

Land categories and forest species	Years					
	Year 2008	**Year 2009**	**Year 2010**	**Year 2011**	**Year 2012**	**Year 2013**
	UM: Thousand hectares					
Total	260	259.8	258.9	258.6	259	259.1
Forest area	253.6	253.8	251.9	251.9	252.4	252.5
Resinous	110.7	111.2	109.3	108.7	108.6	107.5
Deciduous	142.9	142.6	142.6	143.2	143.8	145
Other lands	6.4	6	7	6.7	6.6	6.6

With regard to the productivity of the forests in Maramures County (picture 2) during the period subject to analysis, the largest productions were registered at the beech forests, which show a productivity increase every year (from 232.1 m^3 in 2008 to 356.8 m^3 in 2013).

The resinous woods (softwood) also register a production increase that is almost double in 2009 compared to 2008 , then a slight decrease until 2011 and then another raise.



Picture 2. Production of various forest categories in Maramures County during the period 2008-2013 (NSI)

The oak forests register a significant production increase during the period 2008-2011, from 8.7 m^3 in 2008, to 31.7 m^3 in 2011, then the production drastically drops to 18.2 m^3 in 2012, slowly coming back in 2013 to 23.7 m^3. Various species of hardwood register a production increase during the period 2008-2012, while in 2013, the production slightly drops and the softwood registers constant production increases in the timeframe 2009-2013.

CONCLUSIONS

Based upon the analysis of the data available at the time of inquiry in regard of the timeframe 2008-2013 as produced by the National Statistics Institute for Maramures County related to the land fund and its use manner, the following conclusions can be drawn: the total agricultural area is decreasing and during the period subject to analysis 4796 ha were lost.

Since 2004 and until 2011, the main percentage of the cultures in terms of areas is held by the cereals for grains (corn beans keeping their top position in the percentage of allotted areas), then potatoes and vegetables. Nevertheless, the areas dedicated to such cultures were on the rise until 2009, then they registered a significant drop.

The analysis of the main animal productions in Maramures County during the period subject to analysis shows an increase of the cow and buffalo milk production and a decrease of the weight of animals when sacrificed during the first period, as well as a decrease of the poultry egg production.

The indices of the vegetal agricultural production expressed in percentages have dropped during the period 2008-2010, while in 2011 they have reached a peak of 115.8%, and then dropped again in 2012 to 68.8% only to rise in 2013 to 116.4%, exceeding the value registered in 2011. The indices of the animal production follow the trend of the vegetal production, whereas the dependence relationship between the two is well-known.

The number of the individuals non-employed in the agricultural sector is higher by an order of magnitude than the employed (thousands). Fortunately, this category has registered a decrease during the analyzed period, from 1931 UAM non-employees in 2008, to 1279 in 2014.

As regarding the forest area in Maramures County during the period 2008-2013, it has dropped by 0.9 ha. From the forest categories, the softwood has registered a decrease of the allotted areas, while the hardwood showed a relatively constant increase from one year to the other, without registering significant maximum values.

The sustainable rural development of Maramures County is possible by relaunching the agriculture, along with other significant branches at area level (for instance, tourism).

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AGRICULTURE AND SOILS OF MOLDOVA: ASSESSMENT, FINDINGS, SOLUTIONS

TAMARA LEAH

Abstract. *The paper includes evaluation of agriculture, including soil resources of Moldova. Agricultural land area is continuously being extended and changing trends in production and consumption putting increasing pressure on land resources, which has a limited character. Small areas of agricultural land, the large number of landowners and their inappropriate placement involving deficiencies in the organization and sustainable management of agricultural land. Climate change intensifies soil degradation, desertification of agricultural land and lead to the vulnerability of ecosystems and habitats to adaption. Protection of farmland and environmental, economic, social, environmental and cultural functions are not achieved by determining the legal status of the soil as natural-historical body, basis of ecosystems with multiple functions, partially renewable natural resource. The current policy, legal-regulatory and institutional framework should be focused on the image of soils, constant supervision of changes in the composition of land resources, required to analyze and predict the ecological status of the land, to assess these changes, drawing up concepts, programs and implementation measures prevention of negative processes and determine the trends of these processes for the protection and rational use of land resources, their conservation and improvement.*

Key words: *agriculture, degradation, measures of protection, soils.*

INTRODUCTION

UNO has declared 2015 the International Year of Soils in an effort to raise awareness and promote more sustainable use of this critical resource. Healthy soils are the foundation for food products, fuel, fiber material and medical products, but also are essential for our ecosystems having an important role in the carbon cycle, storing and filtering water, and improving resistance to floods and droughts [2].

Activities in the agricultural sector of Moldova in the last 50 years have had a negative impact on the environment, particularly on the soils, manifested by degradation and desertification of land due to poor management, soil compaction (using agricultural heavy machinery) and pollution through overuse pesticides (pest control) and fertilizers (used for soil fertilization). Soil erosion in Moldova ranks first in terms of land degradation due to excessive fragmentation, inappropriate agricultural practices, grazing, rational exploitation of land, inadequate application of a technological system in particular on the small and medium farm land.

Sustainable use of soil involve some long-term measures that would ensure achievement of positive economic results, while preserving and improving soil quality. Application of modern agriculture principles (crop rotation, use of local organic fertilizers, promoting the works of qualitative improvement of the soil) are prerequisites to ensure sustainable development of agriculture of the Republic of Moldova.

The assessment of the financial situation of the agricultural sector as a result of average annual financial allocation from the state budget, from international financial resources and expected future benefits and investment shows that the sector is adequately funded to solve current problems. But the planned actions in national and sectoral development strategies and action plans, on the medium and long term fulfilled and partially implemented.

In connection with this it is necessary to reveal and analyze barriers to implementation of adaptation actions identified and recommended in the agricultural sector. The focus should be on achieving a multiannual research on adaptation to climate change; organizing an information campaign nationally through such regional workshops, etc.

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MATERIAL AND METHODS

The methodological issues resulting from the essential complementary approaches: integrated and componential (analytical or specialized) of the agricultural sector. The first approach perceives the real situation in agriculture, the second approach involves a specialized analysis on the state of soil resources. In this mode is presented evolutionary explanation of land resources, and issue of integrated agricultural sector. Analytical module (componential) are in dialectical unity with integrated research module; they complement each other and merging parallel develops a unifying highlighting individuality of the goal.

As materials were used bibliographical sources of reference, information obtained from the Internet, statistics, documents of agricultural policy farming with reference to national programs, development strategies, action plans intended to diminish soil degradation and increase their fertility, elaborated on this subject and in the process achieved.

RESULTS AND DISCUSSION

The current state of agriculture. Republic of Moldova is an agrarian-industrial state, which came in a strong economic decline after 1990, which has not recovered than in 2000 (Table 1). The maximum weight in the economy holds agricultural sector. It contributes over 13% to GDP (Figure 1).

Table 1. Moldova's economy (1991 - 2014)

Years	**Increasing / decreasing, %**	***Years***	**Increasing / decreasing, %**	***Years***	**Increasing / decreasing, %**
1991	-7.5	*1999*	-3.4	*2007*	+3.0
1992	-29.0	*2000*	+2.1	*2008*	+7.8
1993	-1.2	*2001*	+6.1	*2009*	+6.5
1994	-30.9	*2002*	+7.8	*2010*	+6.9
1995	-1.4	*2003*	+6.6	*2011*	+6.4
1996	-5.9	*2004*	+7.4	*2012*	+0.7
1997	+1.6	*2005*	+7.5	*2013*	+8.9
1998	-6.5	*2006*	+4.8	*2014*	+8.5

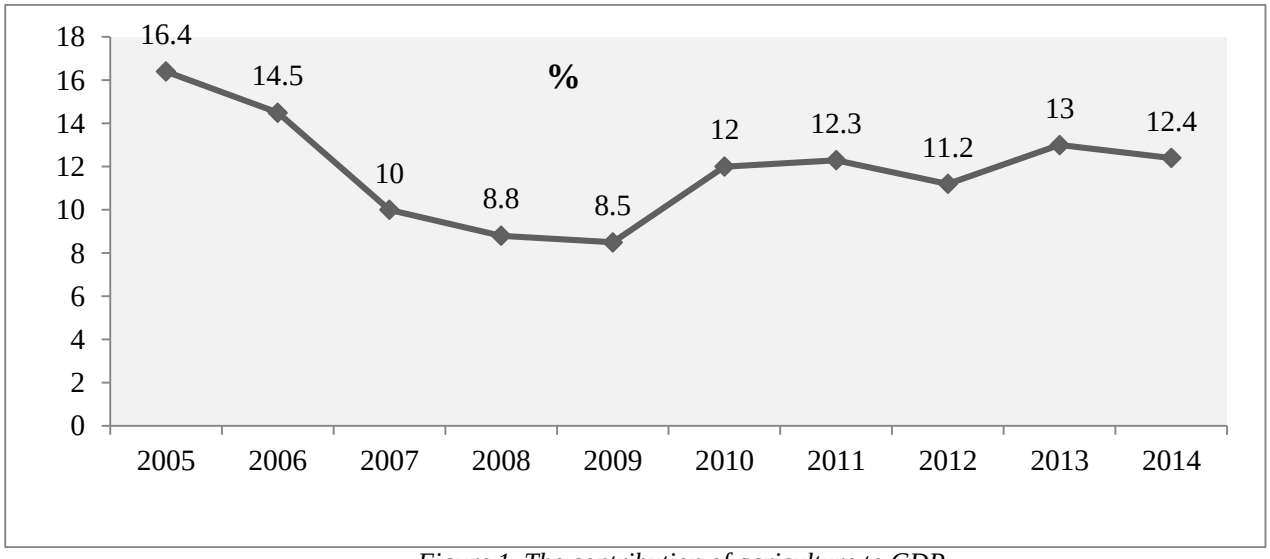

Figure 1. The contribution of agriculture to GDP

It should be noted that compared with neighboring countries, the contribution of agriculture to GDP in the Republic of Moldova is one net significant. Thus, in 2013, in Romania [6] the contribution of agriculture to the GDP amounted to 5.6% and in Ukraine - 9% [9].

A study by the World Bank show that agriculture in Moldova is inefficient [1]. For example, in 2013 it registered a low productivity, investment in the field were small and costs exaggerated. Agricultural productivity is 2-3 times lower than in Europe and its situation is comparable to that in Europe '70s [10].

Moldova's agricultural sector is dominated by crop production, livestock sector having a smaller role in production. In the years 2001-2014, the crop production represents 60-70% of total agricultural production, the land endowment favoring crop production, which like other countries in Eastern Europe. The share of arable land in the utilized agricultural area in Moldova is among the highest in Eastern Europe (70%).

The structure of agricultural production can be considered as a relatively stable, which in general, in Moldova is 55-70% for the vegetable and 30-45% animal. In 2014 this ratio was 66.3% for plant production and respectively 33.7% for the animal (Figure 2 and 3).

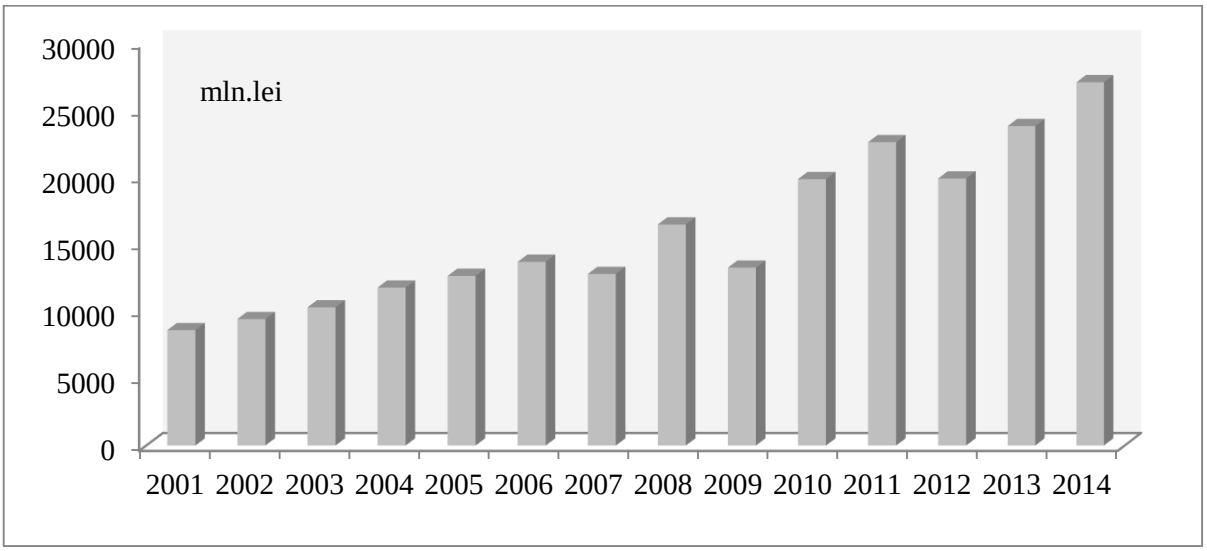

Figure 2. Agricultural production (total)

In general, the Moldovan agriculture focuses on low-value crops, production sectors of nuts and honey are niches that were discovered and who is to pay attention. In the last decade, these two products have access to EU markets and are successfully exported to EU and other markets.

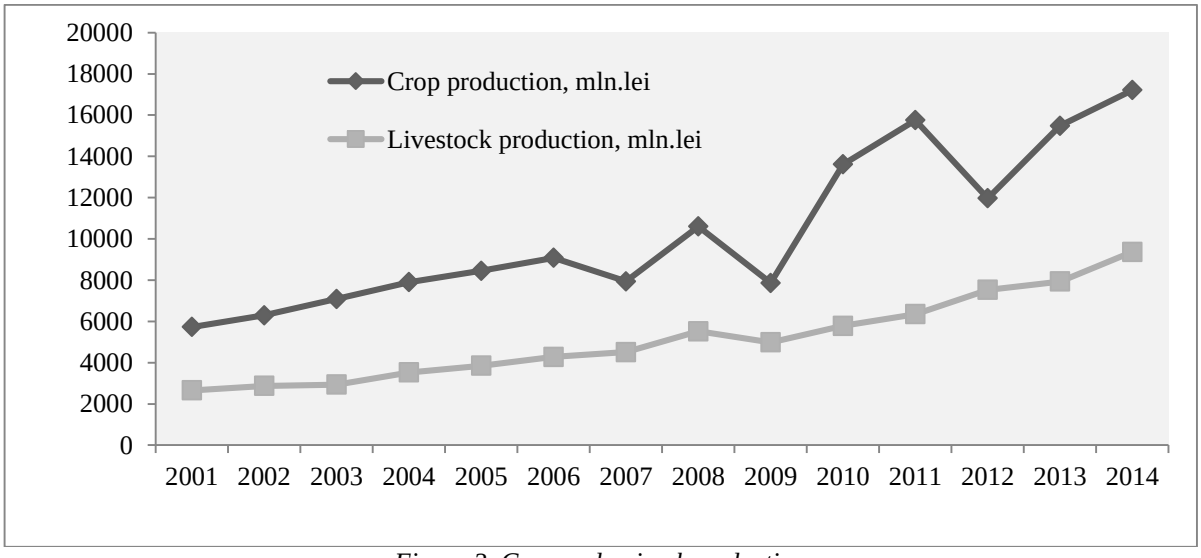

Figure 3. Crop and animal production

Low profitability in agriculture is determined by the dominance of low-value crops in agricultural production to the detriment of high-value crops. Over 80% of the cultivated area in Moldova is covered by low value crops (such as cereals, oilseeds, sugar beet and fodder crops),

while fruits and vegetables occupy less than 20%. Only cereals (these include wheat, corn and barley), occupying more than half the areas sown in Moldova.

In the last decade the development of livestock sector has been problematic due in respect of the impediments and market competitiveness. The livestock sector is faced with the challenge of internal resources (limited supply of feed) and harsh pressures caused by cheaper imports of animals. Providing local forage is limited because of the lack of good quality pasture, which is in turn caused by adverse weather conditions and limited irrigation capacity. On the other hand, relatively high domestic production costs, low productivity and uncompetitive animal breeds considerably reduce the ability of Moldovan animal products to compete with products from meat / dairy cheaper (subsidized) provided by the EU and CIS markets. As a result, Moldova is a net importer of most animal products.

The current status of soil resources. The soils in Moldova is presented by fertile black soils (chernozems) and productive farmlands. Almost every second hectare of land have average quality, of which 689 thousand ha (27% of agricultural land) is of good quality. However, the creditworthiness of the soil decreased by 7 notes in 30 years as a result of climate change and intensive agricultural use. According to the situation of 01.01.2015 the national land fund is 3384.6 thousand hectares (Table 2). Agricultural land area is 2499.1 thousand ha or 73.8% of total area, including arable land - 1817.4 thousand ha, perennial plantations - 291.7 thousand ha, meadows and pastures - 348.6 thousand ha. In Moldova, as in other countries, take place the reduction of arable land per capita. According to recent data this area is 0.407 ha. The soils affected by various degradation processes occupy over 2 million ha [3].

Table 2. Land Fund according to utilization, on January 01

Land Fund	2011		2012		2013		2014		2015	
	th. ha	%	th. ha	%	th. ha	%	th. ha	%	th. ha	%
Land – total, *of which:*	3384.6	100	3384.6	100	3384.6	100	3384.6	100	3384.6	100
Agricultural lands, *of these*:	2498.3	73,8	2498.0	73.8	2497.8	73.8	2500.1	73.9	2499.7	73.8
arable land	1812.7	53,6	1810.5	53.5	1814.1	53.6	1816.1	53.7	1817.4	53.7
perennial plantings, *of which:*	298.8	8,8	298.7	8.8	295.3	8.7	295.3	8.7	291.7	8.6
orchards	133.3	3,9	134.5	4.0	135.1	4.0	135.8	4.0	134.5	4.0
vineyards	149.6	4,4	147.3	4.3	142.6	4.2	141.2	4.2	137.5	4.1
pastures	350.4	10,4	350.3	10.3	348.9	10.3	348.0	10.3	346.4	10.2
hayfields	2.2	0,1	2.0	0.1	2.1	0.1	2.1	0.1	2.2	0.1
fallow land	34.2	0,9	36.5	1.1	37.4	1.1	38.6	1.1	42.0	1.2
Forests and other forest land	463.1	13,7	462.7	13.7	464.2	13.7	465.2	13.7	464.5	13.7
Rivers, lakes, pools and ponds	99,6	2,9	99,5	2,9	99,2	2,9	96,9	2,9	96,8	2,9
Other land	323,6	9,6	324,4	9,6	323,4	9,6	322,4	9,5	323,6	9,6
Land equipped for irrigation	228,3	6,7	228,3	6,7	228,3	6,7	228,3	6,7	228,3	6,7

According to the General Agricultural Census (GAC) in 2011 [5] the using average agricultural area (AAA) is 2.29 ha, is similar to that seen about 49% of all farms in EU Member States. However, according to the results of GAC, index AAA / capita is 0.54 ha, so that Moldova is placed above the media / capita in the European Union (0.34 ha of AAA / capita). The results of GAC illustrate the excessive fragmentation of agricultural land, which also results in a reduction in agricultural productivity, disruption of crop rotation, soil degradation and other negative effects (Figure 4).

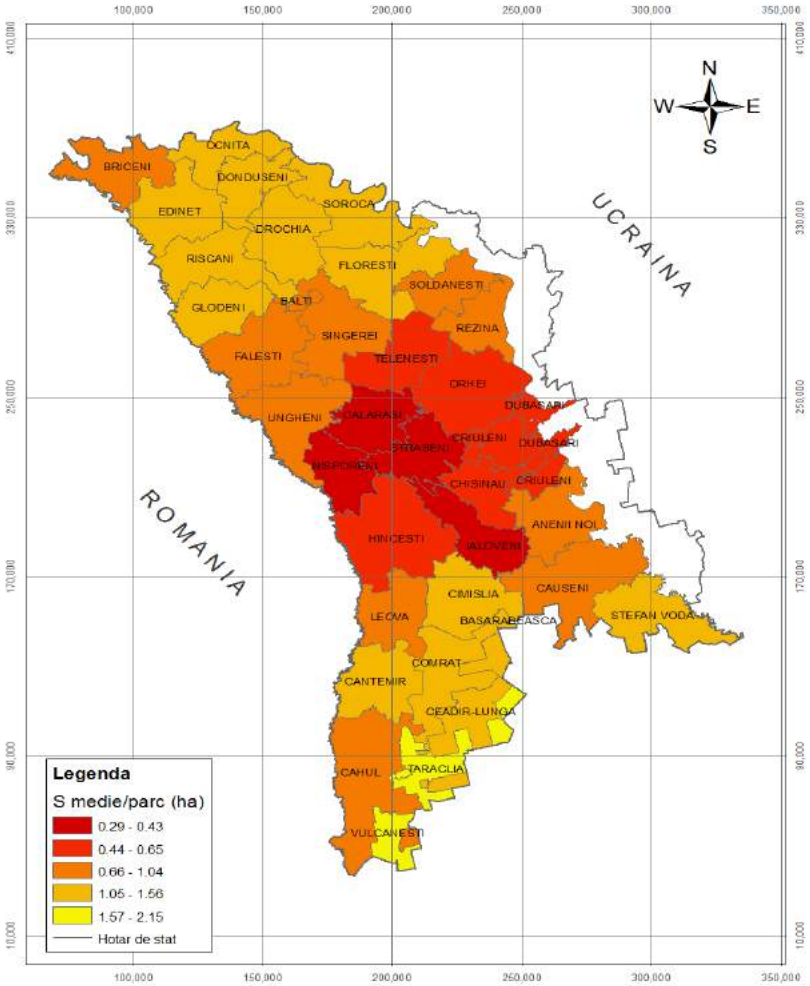

Figure 4. The average area of an agricultural parcel of the districts

At the same time, the average area of a parcel of land in the country is 0.85 ha, the Central Zone is the most fragmented, this the minimum area of plots representing 0.29 ha (Strășeni district).

Moldovan soils, characterized in the past by a high natural fertility, in the last 20-25 years, due to increased degradation processes and forms, degraded and risk losing their fertility. The worst forms of degradation, leading to reduction of production capacity or damage the soil cover are: water erosion, affected area - 40% of the agricultural land; humification, soil nutrient depletion, extensive secondary compacting on the entire arable land; salinization - on 220 thousand ha; active landslides on 25 thousand ha of land [7].

In the agricultural exploitations are not observed the regional crop rotation in farms, protecting the soils. The share of leguminous crops, amelioration, biological nitrogen fixing, decreased by 5-6 times.

The volume of organic fertilizers incorporated in soil decreased 20 times, the minerals - 15 times. The balance of humus and nutrients in soils is negative. The average weighted creditworthiness note of agricultural soils is 63 notes, while 178 thousand ha are highly degraded or damaged with creditworthiness less than 20 notes. The damage to the economy of the processes of soil degradation is about 3 billion MDL annually [11].

To improve the situation on the quality state of the soil cover, the Moldovan Government by decision no.636 of 26.05.2003 and no.841 of 26.07.2004 approved the " Complex Program of exploitation of new lands and increasing soil fertility" for years 2003-2010 [8]. The work covered by this program due to lack of finance, have been met by volume below 5 percent. Given the current state of quality status of the soil cover has decided to extend land reclamation works in the "Program of soil conservation and fertility improvement" for the period of 2012-2027 [4].

Program goal is to provide measures to halt the degradation and increasing soil fertility by upgrading and extending the land improvement system implementation of modern technologies and environmentally friendly agricultural practices.

Program objectives: to create Automated Information System of the soil quality state based on the pedological and agrochemical research; stopping active forms of damage the soil cover; improvement soil fertility for growing crop productivity.

The basic principle of the strategy to combat land degradation, conservation and increase their fertility consists of applying complex of measures - economic effective, environmentally safe, simple in execution, with low power consumption. The work is carried out in three main directions:

- combating soil erosion, stabilization of landslides and ravines, through simple hydro-ameliorative works, reforestation and revegetation, hydrological organization of farmland; founding grassed channels and outlets, dams;
- stopping the degradation of soil cover by extending land reclamation works (organizational, forestry, plant cultivation, agro-technical, draining-drying, amendment and ameliorative fertilization);
- increasing soil fertility by applying environmentally friendly agricultural practices; implementation of harmless fertilizer, irrigation expansion and application of modern technologies.

The program is the basic document for planning and promotion by central and local government bodies unique state policy on the protection, rational use and increasing soil fertility.

In developing the program were used scientific results of research and practical, education and design institutions, materials contained in the Complex Program of new lands and increasing soil fertility approved by Government Decision no.636 of 23.05.2003 and no.841 of 26.07.2004 [7].

The Program of soil conservation and increasing the soil fertility is developed by the Ministry of Agriculture and Food Industry, Land Relations and Cadastre Agency, Ministry of Environment and Agency "Moldsilva".

The program is developed for the period 2012-2027 and sets out the objectives, actions, expected results and the performance indicators, the volume of works, volume and sources of funding. Program implementation will ensure minimizing or stopping the main forms of soil degradation of the Moldova and will create prerequisites for increasing agricultural production by 1.3-1.5 times. The activities provided by the program will have beneficial impact on the ecological situation in Moldova.

Creating the layer Geoinformation "Soils of Moldova" is provided in order to execute the provisions of the Government Decision no.1298 of 28.10.2003 on the creation of National Geographic Information System. There is not any one source of information that could be express truthfully, on-line information about the creditworthiness note of agricultural land, their pretability, monitoring of erosion processes, etc. The principle of creating the databases is transforming soil maps, including their attribute information, available to the relevant authorities in digital format. Preliminary assessment of these works are estimated in accordance with the level of administrative-territorial unit (ATU) in the amount of 6.6 thousand MDL, representing at the national level approximate 6.0 million MDL.

Pedological mapping of agricultural land is provided in compliance with the enforcement of Law no.1247 of 22.12.1992 on *State Regulation of land ownership regime, State Land Cadastre and Land Monitoring* and Government Decision no.24 of 11.01.1995 approving the *Regulation on the content of the documentation general cadastre* with a periodicity 10 - 15 years. Evaluation of these works according to time rules approved by the Land Relations and Cadastre Agency is estimated from 1 ha conventional amounting 35 lei, representing at national level about 66.5 million MDL or 6.65 million MDL annually.

Development of cartograms to recovery measures and improving the degraded lands is needed to monitor in time and space the measures of stopping the soil degradation (conservation), both designed and those capitalized actions.

Cartograms will be prepared on paper support and in digital version for each ATU (scale 1: 10000) and at the administrative district level (scale 1:50000). Preliminary assessment of these

works according to specifications is estimated at administrative unit in the amount of 5.8 thousand MDL, representing at national level about 5.25 million MDL.

What keeps to re-parcelling drafting of agricultural land is provided by the Land Code and the Government Decision no.416 of 17.04.2007 on implementing the Program of Land Consolidation. Evaluation of these works is estimated to 1 conventional quota of farmland (three parcels), including their registration in the Land Register, amounting to about 500 MDL, representing annual 4000 quota and 2.0 million MDL.

Projects of organization and planning erosion control works of agricultural lands based on the landscape succeed from the re-parcelling of land having the imperative aim the rational and efficient use of farmland in perspective. This process is regulated by Government Decision no.1075 of 01.10.2007 on the approval of the Land Consolidation Regulation. Preliminary assessment of these works according to specifications is estimated at 1 ha of agricultural land amounting to about 165 MDL, representing annual about 1.0 million MDL [4].

CONCLUSIONS

To improve the situation in the agricultural sector of the country, including the current status of soil resources the imperative mission lies with both science and policy makers, in fact, the whole society to conserve soils, preventing its degradation, mission precedes any political, economic or otherwise, as soil is the foundation of perpetuating our existence.

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ANALYSIS OF THE SITUATION AND THE IMPORTANCE OF FORESTRY IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT IN SERBIA[1]

NADA MIJAJLOVIĆ[2]

Summary: *This paper presents the analysis of situation of forests in Serbia. The data to be presented are related to the parameters of the situation of forests in Serbia in the last five years, according to official statistics. The aim was to draw attention to the status of forests in Serbia and the importance and prospects of further development of this important segment of the economy in the context of sustainable agricultural and general development of the state of Serbia. The forests are very important at the global level (primarily as the "lungs" of the planet) in this context should be carried out foreseen measures of care and protection of the forest area. The paper presents the legal documents and Forestry Development Strategy in Serbia. A section is dedicated to analysing the condition of forests in the Serbian Danube as an important region that is part of the Danube basin, which connects several states of the European Union.*

Keywords: *forestry, sustainable development, biodiversity,*

INTRODUCTION

Forests are of great importance at the global level and have multiple roles. The importance of the noise is with respect to already-known syntheses of oxygen, in addition is also important that the volume of wood is used in the industry; forest affect the water cycle, the microclimate conditions, prevent soil erosion, habitat for many plant and animal species; Forests are a significant factor in the global carbon cycle as a reservoir of bound carbon. Previously, forest covered a much larger area but intensive logging has led to a significant reduction in these areas. To major deforestation has been the development of agriculture and increase of arable land in the nineteenth century. By the mid-twentieth century reclaimed two-thirds of the forests in Serbia. In addition to deforestation, there has been a degradation of forests in several ways: the development of certain diseases, the destruction by insect pests, the effect of natural disasters and fire.

The total territory of Serbia, according to national inventory (2009), forests was represented on 29.1% and that means Serbia is middle wooded ground (7.1% in Vojvodina, in central Serbia 37.6%). According to international definitions, woodland is also scrub and bush and in Serbia they occupy 4.9% of the area. According to the calculations, forest land in Serbia stretches to 34.0% or 36.3% compare to the productive land area. Years of monitoring forest cover in Serbia and statistics related to these issues in relation to the referenced 1979th shows that the forest area has increased by 5.2%, which certainly is relevance in a positive impact on the environment. This increase is a result of the implementation of forest cover planned forestation, but some other factors must be taken into account as a reduction in the number of residents in the rural area and the cessation of extensive agricultural production. The question is targeting also cadastral and recording categories and land uses that are not always in line with reality. The forest coverage in Serbia is close to the global one (30%) and significantly lower than the EU, which is 46% (2000).

In comparison to some European countries, Serbia is similar to Romania (28.0%), Spain (28.8%), Norway (28.9%), France and Greece (27.9%). The forest coverage in Serbia in relation to population is 0.3 hectares per capita. Compared with other countries, it is much smaller (1.01 ha Austria, Bosnia and Herzegovina 1.38 ha, 1.31 ha, Bulgaria, Croatia 1.25 ha, 0.75 ha, Czech

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Republic, Finland 5.91 ha, Germany 0, 92 ha, 6.93 ha, Norway, Rumunija1, 02 ha, ha, 1.02 Slovenia, Switzerland and Russia 11.11 ha). Quality of forests is determined on the basis of their structure and origin.

MATERIALS AND METHODS

In this paper is analysed the available literature data related to the condition of forests in Serbian Danube. Also analysed the official statistics, and in terms of methodology were applied standard statistical operations.

RESULTS AND DISCUSSIONS

Legislation in the field of environmental protection in Serbia has been adapted internationally, especially taking into account the protected area as a special nature reserve Upper Danube and the National Park Frushka Gora and the Iron Gate on the Danube area. These are unique natural ecosystems and are rare and valuable in terms of biodiversity that they have.

In the context of sustainable development and conservation of the environment and biodiversity, a growing need for protected areas in the national and international instruments ratified by our State exists . Protected areas are considered in the light of climate change, one of the main tools to mitigate these effects. Preserved, especially forests, ecosystems have greater flexibility and adaptability in relation to climate change. Protected areas can mitigate climate change by preventing the accumulation of carbon being lost in the process of photosynthesis absorb de novo and associate carbon from the atmosphere. Integral ecosystems contribute to the mitigation of extreme events such as storms, floods and droughts. Sustainable use of protected ecosystem has its economic importance in terms of tourism and fisheries, as in the Danube region can be emphasized. (The assessment of vulnerability to climate change, Serbia, Belgrade, 2012th)

Total number of established national inventory of woody species in Serbia is 49 species. Of this number, there are 40 species of deciduous and the other, evergreen, are represented by 9. The total volume record the highest percentage of beech forest 40.5%, 13.0%, followed by bitter and sessile oak 5.9%, 5.8% of farnetto, hornbeam 4.2%, 3.1% locust, oak 2.5% and 1.6% of ash. Spruce Coniferous has the largest capacity share of 5.2% and 4.5% of white pine and fir 2.3%. While the poplar is grown on 1.7% in volume of the total forests in Serbia, other types of trees have 1 or less than 1% share. Of the total forest area (2,252,400 ha) in Serbia state-owned is 1.194 million ha, or 53%, and other 1,058,400 ha or 47% is privately owned. (National Forest Inventory of the Republic of Serbia, 2009).

Climate change is a global problem with serious consequences at the local level. In the center of the Serbian Danube following climate change occurs:

- Absent of the usual seasonal changes, with frequent droughts and floods, which caused significant damage.
- The increases of temperature and drought have particularly negative consequences for the agricultural area of the Lower Danube and Vojvodina.
- Reduced winter snow cover and reduce indirect impact on the reduction of water resources (drinking water, as well as those designed for industry and agriculture)
- Forests are vulnerable in many ways by climate change: fires are more common and more dangerous, more frequent are disease outbreaks, epidemics and pests.

Global warming has an impact on forest ecosystems so that there is more to the withdrawal of forest and cooler locations. The impact of climate change is evident in Serbia and one of the areas most exposed to the impact of these changes is considered to be the Danube-Carpathian Basin. The impacts that climate change may have on the forest are as follows:

- Pushing the limits of some forest types in relation to the geographic breadth of the house, and elevation;

- Change the size distribution of different forest types and their relationship;
- The Decline and withdrawal of certain forest communities
- Changes in the composition of plant communities
- Changes in the ratio of individual species to the light
- All of the above will have the effect of cumulative effect, which will adversely affect the conservation of biological diversity and the possibility of a rational management of these natural resources. (Medarević et al., 2007).

The Upper Danube is special nature reserve is of great importance and is one of the first categories of protected resources. By classification of IUCN it is placed in category IV as Habitat and Species Management Area. The reserve represents an area (19 648 ha), placed on the left valley plain of the Danube from border with Hungary to Bogojeva, covering the city of Sombor and the Municipality of Apatin.

Special Nature Reserve of the Upper Danube is a large marsh complex. These marshes are composed of a number of plant communities such as forests, meadows, ponds and wetlands along the Danube River and its meanders. This wetland was drained and thus is very narrow, representing the rest of the great marsh ecosystem. The impact of human activities in this area is reflected in the establishment of forest plantations. These planted forests at the same time are used as hunting grounds. It has been realized as an imperative that these complex forest must be managed comprehensively and integrally, as this is a valuable natural resource and rarity.

This is a special nature reserve and one of the last refuges for plants and animals associated with floodplains. In terms of fauna presented in the reserve, there are, 51 species of mammals, 248 species of birds, 50 species of fish, 11 species of amphibians, 9 species of reptiles, many invertebrates. In terms of flora it is considered that there are more than 1000 species of plants. The reserve is home to dense almost impassable marshy forests composed of native poplars. The reserve is represented and some endangered species *Eranthis hyemalis, Hottonia palustris* and *Hippuris vulgaris.* It is quite obvious that reserve must be investigated not only in terms of biodiversity and natural values but in terms of tourism. There is a great potential in the authentic cultural heritage of this area, which makes it very authentic as destination. Developing hunting tourism and fishing represents certainly a big potential in this area. http://www.gornjepoduna vlje.info

The Middle Danube in Serbia is area that has changed much with urban and agricultural activities. Near of the New Sad is the National Park Fruska Gora that is an Important Bird Area (IBA) and Important Plants Area (IPA). This mountain (5 39 m highest point) is rich with oak, hornbeam, beech, linden and other trees species. Flora of the protected area has over 1,500 plant species. The plant communities of the National Park are inhabited by over 50 endangered plant species. It should be noted that it was found more than 30 species of orchids, of which 18 species of international importance. In addition to dendroflora a fragmented steppe species might be found. Among fauna presented a protected species of insects, amphibians and reptiles, which are on the Red List of Threatened Species, might be found. Avian species are represented with 211 ones of which 130 are nesting. Fruska Gora is one of the most important areas for rare birds nesting in the Pannonian Plain and Serbia. Only in Fruska Gora eagle nest one of the endangered species. Of the many species of mammals protected species of bats, ground squirrel and mole rat should be set aside.

The central part of the Lower Danube, is National Park Iron Gate. That is a national park that meets the geomorphological, hydrological and natural science requirements for national park status (Official Gazette 36/09) . Iron Gate National Park is the territory placed in southeast of the Europe and the north-eastern of Serbia, on the border with Romania. (*www. djerdap np. org / start. html)*

Area of the national park Iron Gate under trees is 64% and they are mostly rich and diverse forest ecosystems. From over 1. 100 plant species should allocate relict and endemic. Hazel *(Corylus Colum)* is one of the relict species, which here forms thick and old phytocenoses with other relics. Eternal green trees and shrubs in the Iron Gate are represented by holly *(Ilex aqufolium),* olive *(Daphne laureola)* and yew *(Taxus baccata).* Together with relict species in these communities one

can meet modern species of trees and shrubs. Approximately there are fifty plant communities in this area of which 35 are relict. Vegetation characteristic of this national park is that different types of woods alternate at a short distance. Large differences were observed in the forests of silicates in relation to the forest on a limestone base. In addition to the previously mentioned species Corylus columna relict communities are made up of the following types: Lilac (Syringa vulgaris), walnut (Juglans regia), silver linden (Tilia cordata), maple (Acer monspesulanum), downy oak (Quercus pubescens), hackberry (Celtis australis) , (Corinus coggigrya). Most important with particular emphasis on forests are Moesian beech (Fagus moesiaca), oak (Quercus petraea) and hornbeam (Carpinus betulus). It can be based on these forest communities to conclude that in this national park, there is very interesting mosaic of forest types and communities of interest in the scientific and tourist sense.

The Iron Gate is the largest national park in Serbia and as such is protected by a special legal document. Local plan for use of the National Park represents the goals and objectives of nature conservation and development, and measures to improve conditions and sustainable use of the area. According to this document zone with three levels of protection were determined. In addition, the National Park was established as Iron Gate IBA (Important Bird Areas), IPA (Important Plant Areas) and PBA (Prime Butterfly Areas) and is a part of the EMERALD area network (Emerald Network of Areas of Special Conservation Interest - ASCII) - significant with point application of Convention on European wildly Flora and fauna and natural Habitats (Bern Convention) conservation in Serbia. The area of this park is placed on the Preliminary List of the World Cultural and Natural Heritage (UNESCO), is a candidate for the Biosphere (MAB), and is in the list of the Carpathian region (Framework Convention on the Protection and Sustainable Development of the Carpathians). (Spatial Plan of Special Purpose for national park "Iron Gate", 2011.) All regulations must be given to the importance and implementation of activities to protect this national park has to be implemented.

CONCLUSIONS

Forest ecosystems in the Serbian Danube region who are considered in this work are part of the continent within the European Danube region and must be preserved as it is ratified in international and national regulations determined. Modern approach to the problem of forest ecosystems must be comprehensive and current climate change must be taken into account. Interactive relationship of climate change and the carbon cycle in nature is essentially linked to the condition and sustainable use of forests in the global and local level. In the Serbian region are significant forest preserved in its natural form and it is a resource that should be preserved and enhanced. The world trend of raising the city's forest plantations can be achieved in metropoliten areas related to the large industrialized cities such as Belgrade and Novi Sad.

The forests are especially in the lower Danube natural resource with high biodiversity. Serbian Danube area considered in this study is interesting a natural phenomenon that must be protected and preserved with the principles of sustainable development.

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ACCESSING EUROPEAN FUNDS TO DEVELOP RURAL ENTREPRENEURSHIP IN WESTERN MOLDOVA

ALINA-MIRELA MARCU[1]

Abstract: *The purpose of this scientific approach consists in analyzing the entrepreneurial initiatives from rural areas of Western Moldova, after Romania joined the European Union in the context in which the rural entrepreneurship has become in recent decades, the main source of income for an important segment of the rural population, especially for people made redundant or are unable to find a job. In pursuit of this work they were used statistical method and mapping method for expressing information acquired and for determining the spatial characteristics of projects beneficiaries with European funded. At regional level, the analysis indicates that private beneficiaries of the Fund for Agriculture and Rural Development were interested to carry out agricultural activities and crop and livestock farming, based on specific traditions Romanian village. To these are added investments for the acquisition of machinery and equipment for field crops, construction of sheds and purchase of animals. By accessing these European funds were supported mainly the small and medium enterprises, considered to be able to develop new products or to capitalize the natural resources through innovation and adaptation. Thus, the investments made were focused on increasing the competitiveness of the economy, the need to protect water resources and improve the quality of life of rural inhabitants of Western Moldova*.

Key words: *entrepreneurial initiatives, rural areas, beneficiaries, projects, resources*.

INTRODUCTION

Entrepreneurship refers to an individual's ability to put ideas into practice. As regards entrepreneurs, these represent those people who are trying to get value by creating or developing economic activities, and entrepreneurship activity represents a human activity of enterprise to some measures which intended to produce value by creating economic activity [7]. Regarding rural entrepreneurship, it is the domain who knows new valences in the context of the reorganization of the labor market affected by the global crisis [1]. He is limited by certain constraints [6] respectively of the lack of material and human resources. In addition, an important issue is the limited access to financial services, especially loans offered by financial institutions which are located mainly in urban centers [3].

However, the development of non-agricultural enterprises sector in rural areas is a priority for Romania, because thereby it may diminish the rural underemployment, and it may ensure higher living standards for the rural population [4]. One solution would be to increase the number of jobs outside agriculture sector, to reduce poverty and to offer a chance discouraged workers return to the labor market, but especially to increase the income per capita in rural areas [2].

But, by adopting the National Program for Rural Development 2007-2013, as a strategic document for implementing European programs for rural areas, Romania has assumed a new model of intervention based on a medium-term strategy, and a set of measures to access the European funds in order to support and develop Romanian village [5]. This program was certainly one of the main instruments of generation a designed social change, backed by a clear interventionist vision [8].

MATERIAL AND METHODS

In order to achieve this scientific approach were used as main sources of information, the statistical dates from publications of Paying Agency for Rural Development and Fisheries on eligible beneficiaries of EU funded projects, and the research methods were used:

▪ *Statistical method* to record in systematically and unitary mode the statistical dates and for to apply the *principle of comparability of data* both in temporal and territorial plan.

▪ *Method of structural cartodiagrams in sized circles*. Choosing this method it is explains through the fact that the cartographic representation is a means of transmitting statistical and geographical

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information, but also a means of communication, easily understood and interpreted by most people regardless of language and culture.

RESULTS AND DISCUSSIONS

The European funding is a component of a mechanism for collaboration between European states, which has a helping character, in order to support certain exceptional situations, in which, the beneficiary State does not have the human and material resources for effective resolution on their own. Thus, after the accession period, the irredeemable financial support granted by the European Union to Romania through the European Agricultural Fund for Rural Development (EAFRD) supposed the transformation of semi-subsistence farms in holdings, oriented by market and introduction of performance technologies adapted to local conditions, improving the incomes of agricultural holdings managed by young farmers, supporting the modernization process on environmental protection, hygiene and animal welfare, and safety at work.

At the national level, the statistics data from Table no. 1 indicates that, in the programming period 2007-2013 were contracted 63.498 projects, with a total eligible value of 4.202,01 mil. Euro while in Moldova were implemented 11.428 projects with a public value of 867.84 million Euro. Concerning the EAFRD program beneficiaries in Moldova, they were interested in carrying out agricultural activities for plant cultivation and livestock, activities based on specific traditions of Romanian village, because of the high share of projects implemented in the Axis I and III of the Developmental National Rural Programme 2007-2013.

Table no. 1: Number of projects EAFRD and their public value in Romania and Moldova

Axis	Measure	Number of projects				The value of grant (Euro)			
		Romania		Moldova		Romania		Moldova	
		Nr.	%	Nr.	%	Mil. Euro	%	Mil.Euro	%
I	1.1.2.	8.981	14.14	1.307	11.43	190.38	4.53	28.98	3.33
	1.2.1.	1.977	3.11	363	3.17	711.08	16.92	151.37	17.44
	1.2.3.	719	1.13	89	0.77	693.99	16.51	104.93	12.09
	1.4.1.	47.214	47.35	8.881	77.71	354.40	8.42	66.56	7.66
	Total I	**58.891**	**92.74**	**10.640**	**93.10**	**1.949,85**	**46.40**	**351.84**	**40.52**
II	2.2.1.	16	0.02	6	0.05	2.39	0.05	0.55	0.06
	Total II	**16**	**0.02**	**6**	**0.05**	**2.39**	**0.05**	**0.55**	**0.06**
III	3.1.2.	2.375	3.74	389	3.40	308.70	7.34	54.77	6.31
	3.1.3.	1.449	2.28	197	1.72	242.76	5.77	28.99	3.34
	3.2.2.	665	1.04	166	1.45	1.651.21	39.29	423.14	48.75
	Total III	**4.409**	**6.94**	**752**	**6.58**	**2.202,67**	**52.41**	**506.90**	**58.40**
IV	431.1.	101	0.15	15	0.13	4.38	0.10	0.70	0.08
	431.2.	81	0,12	15	0.13	42.72	1.01	7.85	0.90
	Total IV	**182**	**0,28**	**30**	**0.26**	**47,1**	**1.12**	**8.55**	**0.98**
	TOTAL	**63.498**	**100**	**11.428**	**100**	**4.202,01**	**100**	**867.84**	**100**

Source: Paying Agency for Rural Development and Fisheries. Own calculations.

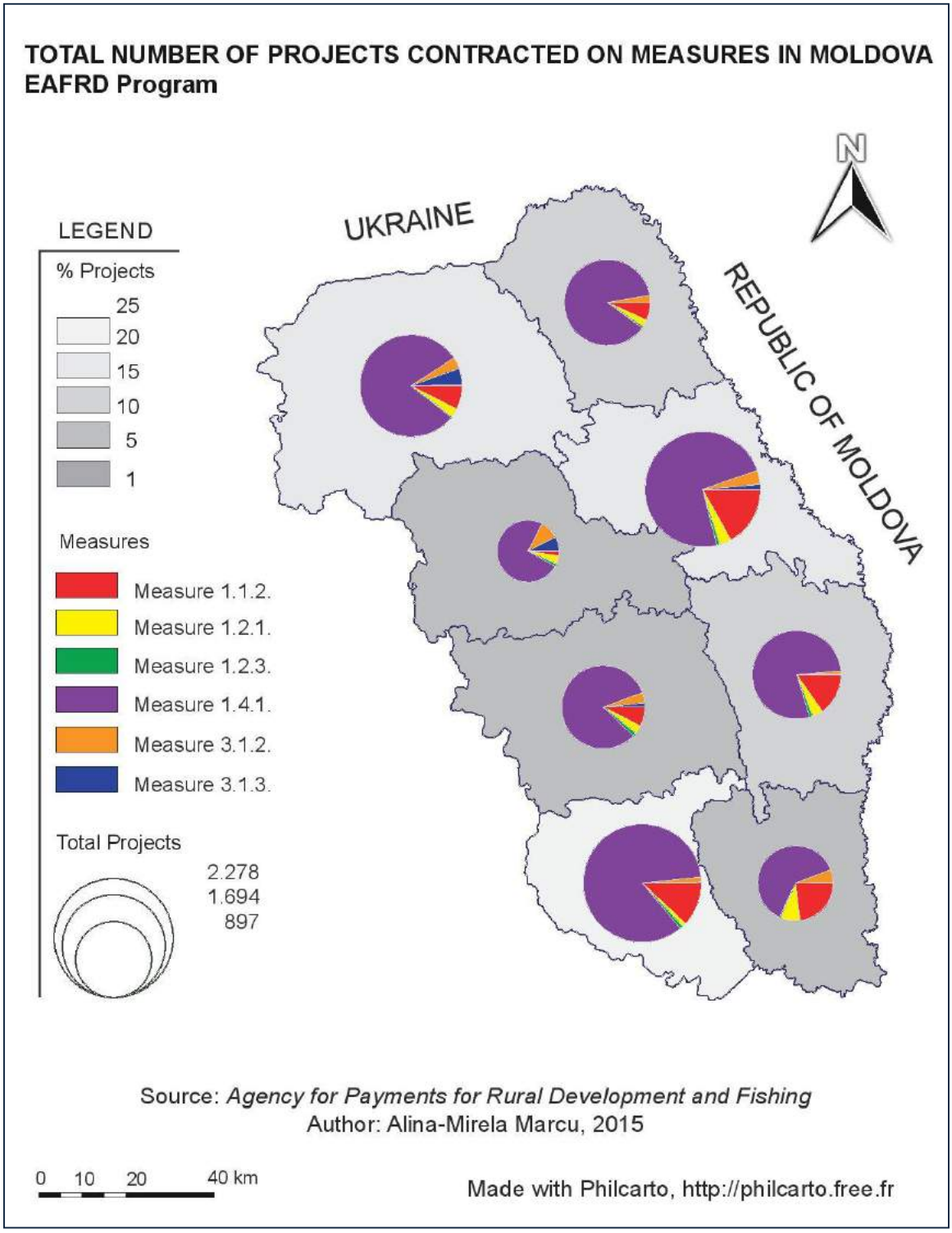
According to this document, Axis I has been divided into three main measures which refers to improving knowledge and enhancing the human potential; restructuring and developing physical capital and promote innovation; and at the transition period for Romania. At their row, these main measures have been divided into secondary measures being analyzed only those that presented of particular interest to eligible beneficiaries in Moldova.

In this sense, they were considered the following measures: *1.1.2. Setting up of young farmers* (1.307 projects), *1.2.1. Modernisation of agricultural holdings* (363 projects), *1.2.3. Adding value to agricultural and forestry products* (89 projects), and *1.4.1. Support for semi-subsistence*

agriculture farms (8.881 projects), measures which totaled 10.640 projects and a financial value of 351.84 million Euro.

Regarding Axis III, this in turn was divided into two main measures about the diversification of the rural economy respectively the improving the quality of life in rural areas but, as in the previous case, were analyzed the measures most requested by beneficiaries respectively *3.1.2. Support for the creation and development of micro-enterprises* (389 projects) and *3.1.3. Encouraging tourism activities* (197 projects), whose financial absorption was about 83.76 mil. Euro.

Fig. No. 1 Total number of projects contracted on measures in Moldova through EAFRD Program



At the regional level, from Figure no. 1, we observe as the in south-western part of Moldova were carried most of semi-subsistence agriculture farms due of grassland surfaces and natural hayfields from high area, which favoured developing a large herd of animals, the livestock production being a tradition in Vrancea county. Currently, this sector presents a particular interest in local and national economy, because by developing its sub-branches, can be realised a series of products for the consumption of population and food industry, thus contributing, on the one hand, at achieving significant incomes, and on the other hand, at a uniform and complete use of the potential of the local labor force. Besides these, the high frequency of densities by sheep from subcarpathian depressions and interhill is explained for the most part by human intervention in order to develop here the species who find the most favorable conditions for nutriment.

Also, hilly landscape, at least one third of the slopes, in the north eastern part of Moldova has created optimal conditions for development of agricultural works in contrast to the counties in the western part of the region. Thus, the Botosani County is among the first of importance in our country's agriculture, since all villages from county have an agricultural predominantly character. Thus, by diversification of plant and animal production, cultivation of cereals took first place from the total area of Moldova.

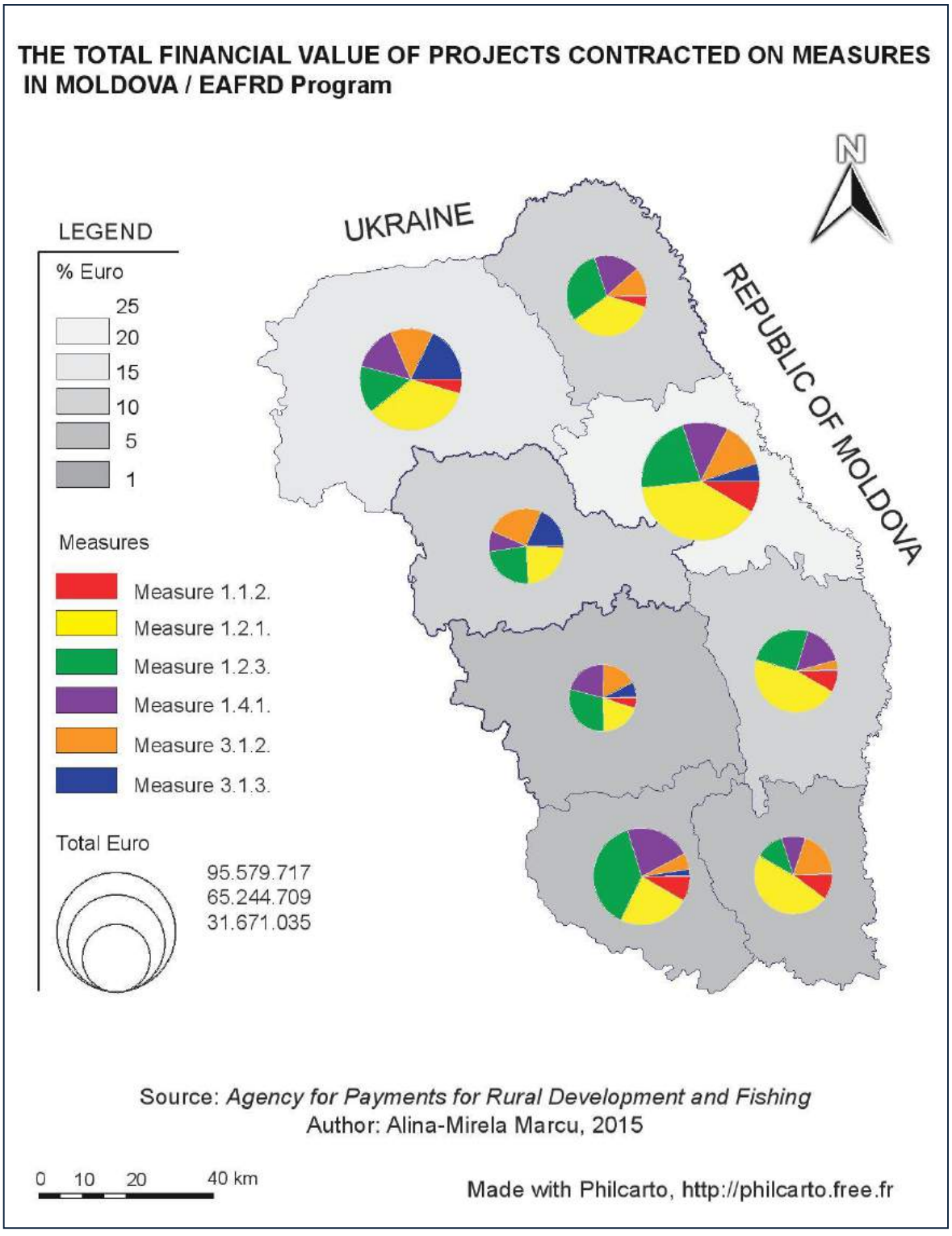
Among the counties with the highest number of investments were Vrancea and Iasi due of settlements from cereal areas which presents an agglomerate structure in contrast to the scattered settlements from mountain area, more accurate from Bukovinian Sub Carpathians, Bicaz Basin and Trotus Upper Basin where the character of agricultural economy is predominantly pastoral. In terms of total financial value of projects contracted by measures, this was accessed by authorized individuals and the family associations in the sight to modernization of agricultural holdings and increasing the competitiveness of agricultural producers from this region on market from Romania, and on the market in the European Union.

Besides these, the Galati and Vrancea counties attract our attention by the large number of implemented projects for the creation and development of micro-enterprises. This situation is explained by the presence of physico-geographical elements, which supported the economic activities practiced by farmers from this rural space. Thus, the presence of drinkable water maintained from the earliest times the life sources of human communities and constituted a primordial condition for population and for the existence of settlements, the houses being placed sometimes, even on lands unfavorable, if they ensured required water for alimentation, livestock, fisheries, irrigation, etc.

We note, also, the large number of investments made in tourism domain Suceava County being par excellence one of the most important tourist counties of the country, due to the great expanses of mountainous space and piedmont area which offering a complete range of tourism activities. But, at all this, is added the most valuable monuments of architecture respectively, the 5 churches of monasteries Voronet, Arbore, Humor, Moldovita and Sucevita monuments of universal importance included in UNESCO heritage, being the only painted churches. A similar situation is found in Neamt County in particular along the axis of circulation Piatra-Neamt - Targu Neamt, due to the presence of the following tourist sights: Neamt Monastery, Monastery Varatec, Agapia Monastery famous for paintings of high artistic value belonging to the Romanian painter Nicolae Grigorescu, the Humuleşti village - the place where he grew the great storyteller Ion Creanga, Neamt Fortress built during of reign Prince Peter Musat, Baltatesti Resort, etc.

In addition, the orientation of eligible applicants towards the production of milk in the Dornelor Country is due primarily to the high density of cattle from localities Panici, Dorna Arini, Saru Dornei and Dorna Candrenilor, compared with the central part of the Eastern Carpathians where there is a higher density of sheep, in especially in the settlements from surrounding the mountains Ceahlau, Stanisoarei, Bistritei and Rarau. Also, the position of contact between the two geographic units Carpathian Mountains and Moldova Plateau as well as the natural conditions and some elements of historical order favored the development of a mixed agricultural economy, specialized in animal breeding, cereals and viticulture.

Fig. no. 2. The total financial value of projects contracted on measures in Moldova through EAFRD



As regards, accessing of the grant European support, from Figure no. 2 we can see a relatively uniform distribution of the total financial value of the projects contacted by measures. The our attention is directed especially toward the percentage absorption of Measure *1.2.1 Modernization of agricultural holdings*, at regional level, by this measure, being supported the investment oriented to the endowment with tools and performance equipment in relation to the existing agricultural structure at respectively moment, but and investments regarding the adaptation of agricultural buildings for respect the Community standards and the increasing of agricultural holdings.

According to statistical data, the financial value accessed through this measure in Moldova was about 151.37 million Euro, on the second place being Measure *1.2.3. Adding value to agricultural and forestry products* with a grant value of 104.93 million Euro. This thing is explained by the fact that the investments have been made in areas of high population density respectively in the contact areas of great natural units, Carpathian depressions, the valleys of important rivers, the intersection of circulation axes, Iasi County being an example in this case.

CONSLUSIONS

In conclusion, we can say that most projects with European funded on rural entrepreneurship development in Moldova were implemented in counties: Suceava, Iasi and Vrancea. In terms of relief units, one can note a higher spatial distribution of investments in the mountain area of the region, due to the large number of investments made in tourism domain, Suceava County being par excellence one of the most important tourist counties of the country. In addition, the position of contact between the two geographic units Carpathians and the Moldavian Plateau, as well as natural conditions and some elements of historical order favored the development of a mixed agricultural economy, specialized in animal breeding, cereals and viticulture. Is the case of Iasi and Vrancea counties where were implemented the projects on modernization of agricultural holdings and the increasing competitiveness of agricultural producers.

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INCREASING THE COMPETITIVENESS OF A VEGETAL AGRICULTURAL HOLDING BY ACCESING SUB-MEASURE 4.1

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Summary: *In this study, is analyzed by elaborating a project using sub-measure 4.1"investment in agricultural holdings" have as their end support for investment to increase competitiveness of agricultural machinery and equipment performance in relation to the current agricultural structure. The actual investment involves purchase you take farming for family business, striving in this way to increase labor productivity, product quality, the use of modern technologies and improvement of working conditions. The varieties grown on 80ha land. are: cereals, leguminous plants, plants producing oilseeds, root vegetables and tubers.In the analysis we estimated two situations: the situation in which grants access EAFRD through Measure 4 sub-measure 4.1 with a public aid for 90 % of the value of the investment and the situation in which one uses a agricultural credit.*

Keywords: *investment, EAFRD, sub-measure, equipment*

INTRODUCTION

Small entrepreneurs who want to carry on an economic activity with your family may choose to set up a family enterprise.

Mechanized work related types of vegetable cultivated crops (wheat, maize, sunflower and potatoes fall) are usually performed double/twin room with the help of third parties, these leading to a considerable expense for the enterprise, therefore you can opt for the purchase of farming with the help of grants.

Funds awarded through the EAFRD represents a real opportunity for financing rural area from Romania. EAFRD financing is granted by 50-90% of an eligible project value.

MATERIAL AND METHOD

The development of work are taken into account results achieved in the project " Purchase of agricultural machines in vegetable farm-area 80 ha ".

Drafting the feasibility study shall be conducted with the APPLICANT GUIDE-INVESTMENT in AGRICULTURAL HOLDINGS, SUB-MEASURE 4.1**,** which is a technical information material for potential beneficiaries of the European Agricultural Fund for rural development (EAFRD) and is an informational support for the drawing up of the project according to the specific requirements of the PNDR.

RESULTS AND DISCUSSION

The project is in an area with a potential environment for vegetable crops performed in non-irrigated farm system, the surface of the vegetable being 80 ha Not having machinery and farm equipment maintenance required.

Agricultural products covered by the project are: wheat, corn, sunflower, and potatoes.

Family business aims to produce for their own consumption members of society, but a large part of production accomplished will go toward marketing, profit from operating activity recorded the plant will be used for the development of family enterprise and hence to improve the living standards of its members.

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Calculation of the economic size of the holding

According to the coefficients of standard for vegetable production sector was made an estimate of the economic size of **82619.7 SO**. the farm, thus having an average economic size falling between 12000 and 250,000 SO, as required by sub-measure 4.1:

Table No.1 Economic size of agricultural enterprise

Culture	Area cultivated ha-	Standard production coefficient	The economic dimension SO
Non-irrigated wheat	40	529.67	21186.8
Non-irrigated corn	15	640.66	9609.9
Non-irrigated sunflower	10	501.37	5013.7
Autumn potatoes	15	3120.62	46809.3
TOTAL	**80**		**82619.7**

Technical-economic Scenarios through which the objectives of the investment project may be:

Situation no 1: A first scenario for achieving the goal of investments lies in the adoption of a solution that involves accessing grants EAFRD through Measure 4-measure 4.1, with a public contribution of 90% of the value of the investment, i.e. 119303 EURO and a credit agricultural 13.256 EURO.

Table No.2 Project Value (situation no 1)

Financial plan (Euro)	Eligible expenditure	Ineligible expenses	Total
Grant public aid	119.303		119.303
Private funding of which	13.256	32.786	46.042
self-financing		32.786	32.786
loans	13.256		13.256
TOTAL PROJECT	132.559	32.786	**165.345**
Percentage public contribution	90%		

Thus, taking into account the forecast of receipts and payments for the period from the commissioning of the investment, the holding will have an increasing surplus in the first year of 10768 reaching 14531 lei on 5 year forecasting.

Situation no 2: The second scenario presents a situation in which to achieve the objective of investment shall be a credit 132359 agricultural euro-amount required the purchase of agricultural equipment, failing to take into account the possibility of accessing non-refundable support from EAFRD through Measure 4-measure 4.1.

Table No.3 Project Value (situation no 2)

Financial plan (Euro)	Euro	Lei
Credit value	132.359	587.237
Total payments to bank borrowing	167.955	749.702
- repayment rates	132.359	587.237
- interest and commissions	36.618	162.465

Taking into account the earnings forecast and payments for the period from the commissioning of the investment, the holding will have a deficit in the first year-to -114.475 lei to 76.891 lei in 5 year forecasting.

Preparation of scenarios assumptions from the same physical structure of sales and the value of the holding.

In the first case the analysis shows hypothesized that public aid is very important, so the farmer managing to cover their expenses for agricultural activities.

In situation no 2, the coverage of the investment through an agricultural credit, may not be economically viable, he recording a deficit at the end of each year of the forecast. In conclusion, it is proposed to adopt the situation no 1, which can bring, at the end of each year of the forecast to a positive surplus.

The project is focused on the type of action eligible under sub-measure 4.1 data sheet: investments for the establishment, expansion or modernization of farms and plants, including storage capacity, packaging, sorting, packing plant to increase production of value added products.

Accessing grants will be made from the analysis of Familiar Undertaking classification criteria for eligibility according to submeasure 4.1.

Table No.4 Eligibility criteria

Eligibility criteria	**Detail of fulfilling the eligibility criteria for the family**
The investment must be made in the context of a farm with an economic size of min . 8,000 SO	Economic size of **82619.7 SO**
The investment must fall within at least one of the eligible actions provided for in sub-measure	Investments in the establishment, expansion or modernization of farms and plants, in order to increase the added value of products.
The applicant must demonstrate securing co-financing of the investment	Credit contracted worth 13.256 euro
The applicant must fall within the category of eligible recipients	Family enterprise

Table No.5 Selection criteria

Selection criteria	**Detail of fulfilling the eligibility criteria for the family**
The principle of holding size	> 50,000-100,000 ≤ SO-13 p
Principle of priority sector	cereals and potatoes-11 p
The principle agricultural potential of the area	The project is implemented in - an area with potential for agriculture (according to the scoring of bonitare (DOCENT))-9 p
Principle of skill levels in the agricultural sector	Higher education 10 p

The project is developed so as to obtain a score of 43 points thus falling into the category of eligible beneficiaries, thus benefiting from the EAFRD funds.

Through investment in the farm aims to raising the quality and quantity of agricultural works executed which will ultimately lead to higher financial and economic results, with an indication of the fact that at present all the work related to the types of agricultural mechanized plant cultivated crops (wheat, corn, sunflower and potatoes in autumn) are executed with the help of third parties, which leads to a considerable expense for the enterprise.

Average annual payments for materials and supplies necessary for the operation of the farm are worth approx. 310.868 lei, representing the cost of raw materials, fuel costs needed for mechanized operations.

The necessity and appropriateness of investment derived from family-owned enterprise aim, namely to produce for their own consumption of society members, but at the same time a large part of production accomplished will go toward marketing, profit from operating activity recorded the plant will be used for the development of family enterprise and hence to improve the living standards of its members. Thus proposes investment in the farm crop area of 80 hectares through acquisition of machinery/equipment and new farm equipment, characterized by increased productivity and higher efficiency.

Will acquire the necessary machinery/equipment for technological flow : tractor, plough reversible waged, disc harrows, cultivator, etc. Purchases are grounded on the basis of existing production capacity and financing.

Acquisition of machinery and farming aims to increase labour productivity, improving the quality of agricultural products, the use of modern technologies and improvement of working conditions. Throughout the period of implementation of the project does not generate waste, assuming only the acquisition of farm equipment in order to increase profitability in operation with reduced pollution to a minimum.

Agricultural Equipment proposed to be acquired have the operating parameters of the win, pollutant emissions resulted fall within the provisions of the technical standards and environmental protection, ensuring functioning at optimal parameters and checking technique of their periodicals. The gas supply will be made in compliance with all norms of environmental protection. Thus, protecting our environment is ensured through the integrated prevention and control of pollution, i.e. reducing emissions into the air and the ground.

Table No.6 Acquisitions proposed by project

Name/Type machine/equipment	**Number pieces**	**Value without VAT -Lei-**	**VAT -Lei-**	**Total with VAT -Lei-**
Tractor	1	221391	53134	274525
Reversible plug worn	1	41039	9849	50889
Disc harrows	1	27508	6602	34109
Cultivator with fertilization	1	45254	10861	56,040
Seeding of platforms	1	79417	19060	98477
Precision planter for herbs prasitoare	1	38213	9171	47384
Potato planting machine booklet the	1	113580	27259	140839
Trailer	1	20835	5000	25835
TOTAL		**587237**	**140937**	**728174**

The total value of procurement proposed by the project is 728174 Euro (VAT included).

Table No.7 Financing Sources network skilful

Specification	**Eligible expenditure (euro)**	**Ineligible expenses (euro)**	**Total (euro)**
A non-refundable public aid	119.303	0	**119.303**
Sources of financing in order to complete the financing requirement of which:	13.256	32.786	**46.042**
-self-financing	0	32.786	**32.786**
-loans	13.256	0	**13.256**
TOTAL PROJECT	**132.559**	**32.786**	**165.345**

As shown in data table 7, public aid for 119.303 EUR representing a 90% and the contractual loans 13.256 euro represents a 10% of the eligible project **.**

Self-financing of 32.786 lei represents the value of the project ineligible (VAT.etc.).

CONCLUSIONS

To access the non-reimbursable funds farmers must comply with the conditions of access and comply with the criteria for the selection of the Measures, referred to in the applicant's guidelines.

Through the realization of the investment and the purchase of agricultural machinery will ensure technological works for grain growing in optimal conditions will get increased production and efficiency will increase the added value of agricultural products which leads to an increase in revenue.

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EVALUATION OF THE YOUTH MOTIVATION TO CHOOSE RURAL AREAS FOR LIVING AND WORKING

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Abstract*: The main purpose of this scientific article was to disseminate the results of applied research of authors conducted within postdoctoral training sessions. The main objectives of the paper were: presenting current general economic and social context from Romanian rural areas and the specific problems of rural communities in the context of their integrated sustainable development; assessing the motivations of young university graduates (cycle I, II and III Bologna) to choose a rural area as a destination to live and work. To achieve these objectives has been achieved at national level case study based on an applied research materialized as the original investigation using a questionnaire with nine questions. In the applied / qualitative research were collected and processed 190 questionnaires completed by students, master and doctoral students from 11 higher education institutions in Romania, and the responses from the questionnaires were interpreted in conjunction with economic indicators and social features integrated economic development rural communities. For conceiving this article were made a series of original analysis, respectively they were issued some opinions and personal recommendations based on the experience of the authors as researcher and on the realities captured in the field. In the context of the integrated approach to the development of Romanian rural communities, purpose and outcome of the economical and social process it is need to find and maintain a balance between all parts of the countryside, so as to ensure both a quantitative trend upward (economic growth) and qualitative (sustainable development).*

Keywords: *rural areas, Romania, sustainable development, young people, specialists.*

INTRODUCTION

In the landscape of current research of rural economy, this theme is something new, starting from the current need to convince young people, graduate and postgraduate, of returning to rural areas (especially in the areas of residence) to live and work. This would be a solution for rejuvenation Romanian rural areas, to revitalize them and to ensure their sustainable development.

The main purpose of this research, carried out in a postdoctoral training, was to study in detail the motivations of young professionals (higher education graduate - college, master, doctorate) to return or Romanian rural areas and trying to achieve a "picture" of Romanian rural areas and their sustainable development prospects in terms of returning young professionals to live and work in this area. The main objectives of the research were: acquisition of knowledge and new concepts; developing a case study on the motivation of young professionals to choose the Romanian rural communities as a place to live and work; SWOT analysis of the development of rural areas in Romania resulting from their studies and research carried out; interpretation based on questionnaire responses obtained in connection with integrated sustainable economic development of rural communities; issuing conclusions and recommendations based on synthetic data obtained.

MATERIAL AND METHODS

In preparing this article were conducted fundamental research aimed at acquiring knowledge and new concepts and applied research, based on a case study conducted using a tool specific research - questionnaires, formulating hypotheses original conclusions to be drawn synthetic development of personal recommendations (Chirițescu, 2015; Duță, 2008).

Applied research, type quantitative research, was conducted using a questionnaire with nine questions in 11 prestigious universities in Romania on a sample unrepresentative consists of 190 people, representatives of students (particularly the final year), master and doctoral students.

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The main methods of data processing were the statistical and mathematical methods respectively computer assisted processing using quantitative analysis software SPSS and Excel.

RESULTS AND DISCUSSIONS

During the period February to May 2015 was conducted an applied research based on questionnaire regarding *"Evaluation of the motivation of young future professionals to choose the countryside to live and work"* (Chirițescu, 2015). Original questionnaire with 9 questions of various types - closed, open, with free answers, etc., was completed both directly and online by 190 respondents (students, master and PhD students) in the country. The main purpose of applied research was to obtain information regarding: the desire rural respondents to choose as a destination to live and work after graduation (the 4th question); conditions which should provide rural areas of Romania in order to induce respondents to choose these stable communities as locations of living (question 5 of the questionnaire); the strengths and weaknesses of Romanian rural communities in the poll respondents (questions 6 and 7 of the questionnaire); Romanian rural locations (districts, counties, etc.) where respondents would like to live and work (question 8 of the questionnaire); rural areas of activity in which respondents would like to work (question 9 of the questionnaire).

Consistent with the purpose of research, we aimed to test the following *hypotheses*:

(1) - the major trend of young professionals is to return or not in rural areas after graduation to live and work;
(2) - know young students, master and doctoral Romanian rural realities (strengths, weaknesses, opportunities);
(3) - young specialists decision to return or not in rural areas after graduation to live and work, it is fair and well founded;
(4) - which should provide rural Romanian to motivate young professionals to return here (possibly in their localities) to live and work;
(5) - which are the main areas where young professionals would like to work who would choose to return to the countryside after graduation;
(6) - there is Romanian rural regions / counties / communes / villages that young professionals would like to choose them as places to work and live.

Rural communities, in a sense purely geographical, is "rather territories, than villages and towns with low population density and economic activity diverse and dispersed, relatively independent of direct influences metropolitan areas" as defined initially OECD (Organization for Economic Cooperation and Development). Subsequently, OECD experts found that "rural economy integrated into the national and international economy, it is no longer synonymous with agriculture, it has diversified" (Gavrilescu, Giurcă, coordinators, 2000).

In this remarkably complex and heterogeneous setting, young professionals (graduates) can produce real change radically in terms of how community development, their specialization (where applicable, depending on the type of villages), ways administrative management, changing the structure of the rural economy, namely its diversification etc.

The new philosophy of the rural areas is based on the concept of local sustainable and integrated development (economic, social, ecological, cultural, etc.) which requires both a solid non-agricultural rural economic component and an agricultural component (or forest, if applicable) important. The issue of sustainable rural development policies encapsulated the economic and social development of local communities (rural) in a harmonious ensemble (Chiriţescu, 2013).

Sustainable rural development is part of the concept and at the same time, part of a strategy of economic and social sustainable development. This new principles, concepts and features of sustainable rural development are relatively difficult to understand rural community members (Berea, Stoica, Brăgaru, 2010). In this context, the role of youth with higher education who would come to work and live in rural areas would be to: deciphering the "mysteries" of new models of sustainable rural development; presentation of potential solutions to ensure economic growth at the local level, both in agriculture and non-agricultural, development and implementation of viable investment

projects; promote the concept of community development with active involvement of all local public and private actors; implementation of development measures, social cohesion and inclusion etc. (Dona, Florian, 2010; Chirițescu, 2015).

Community development in rural areas can be a process to create the conditions for economic and social progress for the whole community with its active participation and with total confidence possible in initiative of communities (according to the UN definition, 1955).

According to Professor Dumitru Sandu, 2010, community development refers to voluntary changes "to" "by" and "for" the community. Therefore, community development processes are changes in a community based on participation of community members, including the solutions implemented such baggage ancestral knowledge of its members, their spirit of initiative and self-help, their capacity for social innovation.

Based on the results obtained by administering questionnaires were able to highlight a number of motivations of young specialists in terms of choice the place to live and work. Below we present the answers to the questionnaire of the 190 respondents included in our study. Analysis and processing of information was done by developing models of answers that are still represented in tabular summary of the answers given by the interviewed subjects / respondents to 9 questions from the questionnaire.

Question 1 "Is you ..." has three possible answers: a) student; b) master; c) PhD student and model answers is presented in Table 1.

Table 1. Results of the question 1 from the questionnaire

Possible answer	**Number of respondents**	**%**
a) student	147	77.37
b) master	23	12.10
c) PhD student	20	10.53
Total	190	100.00

From Table 1 and common experience in relation to potential respondents during investigations, it can be seen that the most receptive were students who responded to the questionnaire in particular in the virtual mode (online).

Question 2 "Field of study: ..." had more predetermined responses and a free response. Based on the responses we identified several areas were prevalent, as can be seen from Table 2.

Table 2. Results of the question 2 from the questionnaire

Answer	**Number of respondents**	**%**
a) economic	96	50.53
b) agricultural	20	10.53
c) technological / industrial	17	8.95
d) juridic	3	1.56
e) touristic	31	16.32
f) other	23	12.11
TOTAL	190	100.00

Question 3 "Do you have residence in the bulletin / identity card in ..." had two answers "urban" or "rural" and the results are presented in Table 3.

Table 3. Results of the question 3 from the questionnaire

Possible answer	**Number of respondents**	**%**
Urban	109	57.37
Rural	81	42.63
Total	190	100.00

As can be seen in Tables 1, 2 and 3 can be mouldable as a dominant profile of respondents student category, the field of economic study, residence areas. The initial objective was to choose as many young people residing in rural bulletin, but unfortunately in recent years there has been a sharp decline in the number of young rural acceding to university courses; the main reason is lack of financial resources.

Question 4 "After graduation we want to work in the environment: ...." had two answers all "urban" or "rural" and the results are presented in Table 4.

Table 4. Results of the question 4 from the questionnaire

Possible answer	**Number of respondents**	**%**
Urban	132	69.47
Rural	62	30.53
Total	190	100.00

As it was easy to predict most of urban respondents chose as the location to work and live after graduation. This question have been asked and answered briefly justify chosen and the main reasons identified were:

Table 5. Justification responses to the 4th question from the questionnaire

Answer / motivation	**Number of respondents**	**%**
a. Urban	***132***	***69.47***
- Well-paid jobs	56	42.42
- More chances to find a job in the studied area	12	9.09
- Personal development opportunities	57	43.18
- There are social services	25	18.94
- Well-developed infrastructure	36	27.27
- Already employed in urban areas	15	11.36
- Is domicile locality	27	20.45
b. Rural	***62***	***30.53***
- More chances to find a job in the studied area	14	22.58
- Tangible and intangible cultural heritage locally	11	17.74
- Health benefits	15	24.19
- Already employed in rural areas	12	19.35
- Is domicile locality	14	22.58

Note: the sum of responses is greater than the total number of respondents (190) because some respondents selected several areas.

Question 5 "What conditions should be met in rural areas of Romania to determine your location to choose as stable living?" had multiple choice of answers; the respondents were asked to choose the significant responses to them. The tabulation of results is presented in Table 6.

Table 6. Results of the question 5 from the questionnaire

Answer	**Number of respondents**	**%**
a) developed urban infrastructure (water, sewage, gas etc.)	124	65.26
b) doorways modernized (roads)	170	89.47
c) more developed communication infrastructure	120	63.16
d) provided social services (schools, kindergartens, hospitals etc.)	128	67.37
e) modern system of local government	74	38.95
f) better paid jobs	159	83.69
g) infrastructure for leisure well developed	96	50.53
h) general standard of living of the inhabitants	81	42.63
i) the existence of friends, relatives, co-workers etc. in the area	74	38.95
j) other reasons	20	10.53

On questions 6 "What are the strengths of the last villages where you've been (home, where I live grandparents or parents, occasional visits)?" And 7 "What are the weaknesses of the last villages where you've been (home, where living grandparents or parents, occasional visits)?" the answers were free, wanting to capture the respondents' awareness of the realities of Romanian rural communities. The results of the two central questions processed (systematized and slightly reworded) are presented in Table 7.

Table 7. Results of the question 6 and 7 from the questionnaire

Answer	**Number of respondents**	**%**
a. Strengths	***190***	***100.00***
- Fresh air, cleanliness and low emission	96	50.53
- Running water	79	41.58
- Relatively good transport infrastructure	68	35.79
- Satisfactory communication infrastructure	68	35.79
- Green and wonderful landscapes	65	34.21
- Natural and anthropic tourism potential	64	33.68
- Sewage	59	31.05
- Quietly	55	28.95
- Healthy food (organic, biological)	49	25.79
- Proximity to town	48	25.26
- Stable and harmonious social relations (acquaintances, friends, family, community members)	44	23.16
- The safety of citizens	38	20.00
- Investment opportunities, including family farms	34	17.89
- Ensuring basic social services	28	14.74
- Well-managed communities	26	13.68
- Adequate educational infrastructure	20	10.53
- Well-developed agriculture	16	8.42
- Did not answer	18	9.47
b. Weaknesses	***190***	***100.00***
- Underdeveloped urban infrastructure	76	40.00
- Poorly developed transport infrastructure	74	38.95
- Jobs few and poorly paid	64	33.68
- Lack of opportunities for recreation and entertainment	48	25.26
- Improper educational infrastructure	43	22.63
- Below average standard of living, poverty	42	22.10
- The aging rural population	36	18.95
- Underdeveloped communications infrastructure	35	18.42
- Migration of rural population	33	17.37
- Lack health infrastructure	31	16.31
- Deficient public administration	31	16.31
- Relatively large distance from the city	25	13.16
- Passivity of inhabitants	23	12.10
- Depopulation of communes and villages	17	8.95
- Degradation of heritage	10	5.26
- Did not answer	22	11.58

Given that 62 respondents (30.53%) opted for the countryside to work and life after graduation, on average 50 respondents (26.31%) identified one or more strengths of rural communities Romanian (the last villages where they were - the home where I live grandparents or parents, occasional visits) and 39 respondents (20.53%) identified one or more of the same weaknesses rural communities. As can be seen from Table 7, in terms of strengths were mentioned more intangible elements (clean, quiet, no pollution, green landscapes, etc.), while the weaknesses mentioned more tangible and measurable elements (infrastructure, employment, etc.).

Question 8 "There are in Romania any location in the countryside where you would like to live and work?" had two answers "Yes" or "No" and the first version was requested more details on

the region, county, town / village identified the respondent, wishing to highlight any preferences for certain regions or counties. Centralization of responses is shown in Table 8. It is interesting to note that although only 62 respondents chose the countryside as a destination to live and work after graduation, a number of respondents identified 83 rural areas attractive the same objective.

Table 8. Results of the question 8 from the questionnaire

Possible answer	Number of respondents	%
Yes	83	43.68
No	102	53.68
Did not answer	5	2.64
Total	190	100.00

În ceea ce privește *locațiile* "*... din mediul rural unde v-ar place să trăiţi şi să munciţi?*", au fost enumerate:

- Regiunea Sud - Muntenia, județele Argeș, Călărași, Dâmbovița și Ialomița;
- Regiunea Sud - Est, județele Tulcea, Constanța, Buzău și Vrancea;
- Regiunea Sud - Vest - Oltenia, județele Gorj și Vâlcea;
- Regiunea Centru, județele Sibiu, Brașov și Alba;
- Regiunea Nord - Est, județul Suceava;
- Regiunea Nord - Vest, județul Maramureș;
- Regiunea București - Ilfov, județul Ilfov.

Regarding locations "... in rural areas where you would like to live and work?" they were listed: South – Muntenia Region, counties: Argeș, Călărași, Dâmboviâa and Ialomița; South – Eastern Region, counties: Tulcea, Constanța, Buzău and Vrancea; South – West Oltenia Region, counties: Gorj and Vâlcea; Central Region, counties: Sibiu, Brașov and Alba; North – East Region, Suceava county; North – West Region, Maramureș county; Bucharest – Ilfov Region, Ilfov county.

Question 9 "What are the activities in rural areas who would like to work?" had several answers possible (areas considered relevant in the context of this research) and a free response (other, requesting specification the preferred domain). Replies (see Table 9) were seconded field of tourism / tourism and public administration.

Table 9. Results of the question 9 from the questionnaire

Answer	Number of respondents	%
a) Agriculture, including animal husbandry	26	13.68
b) Public administration	37	19.47
c) Services, including social	21	11.05
d) Industry	24	12.63
e) Tourism / agrotourism	59	31.05
f) Trade	23	12.10
g) Others	20	10.53
Did not answer	12	6.31

Note: the sum of responses is greater than the total number of respondents (190) because some respondents selected several areas.

CONCLUSIONS AND RECOMMENDATIONS

In the landscape of current research of rural economy, this theme is something new, unique, starting from the current need to convince young people graduate and postgraduate of returning to rural areas (especially in the areas of residence) to live and work. This would be a solution for rejuvenation Romanian rural areas and to ensure their sustainable development prospects. Personal

teaching experience of over 15 years in the Romanian university strengthened its credibility in the success of this research and the subsequent realization of research results.

Rural issue has been and continues to be one of the most important and complex issues of economic, social, political, cultural, moral, environmental, etc. of our country. Significant structural changes and the essential changes that have occurred in recent decades in Romania, affected towards rural Romanian state, namely the village of peasant agriculture and Romanian (Otiman, 2006). Although the potential solutions for rural development through multi-activity by processing agricultural products farm and business diversification is not doctrine entirely new, being included from the beginning in the text of the Common Agricultural Policy of the European Union, they have become but realities widely Romanian rural areas (Storey, 2009).

In the area of agricultural policies and tools for implementing them, Romania is still in a constant search for and attempt to respond to challenges set mainly short term and the conditionalities imposed by international financial institutions or international organizations to our country has adhered.

The concept of "integrated rural development", promoted herein, refers to addressing rural communities in a comprehensive manner, taking into account the links and how to influence key areas in the life of a community, namely: economic development, education, housing, health care, environmental issues, etc. (Kuhnen, 2011; Chirițescu, 2013)

Romanian rural area represents an area with a great variety of physical aspects (relief, soil and subsoil, infrastructure), economic (population, standard of living, resources, production, efficiency and effectiveness), social (inclusion, health, education level, poverty) and environmental (degree of pollution, water quality, air). Unfortunately, the rural population is aging, low skills, structures 'obsolete' and people seem uninterested in their own future; Under these conditions, the solution for real development to reduce disparities in rural - urban and Romania - Europe is the youth returning "home" from studies abroad or in big cities. This category of demographic resources, had become labor in rural areas could change the Romanian village, rebuilt it from the ground and turning it into a civilized place to work and live.

Based on the assumptions set out above, taking into account the development potential of Romanian rural area and given both own research results and European trend on sustainable rural development, we can issue the following recommendations:

- in Romania, it is necessary to conduct a comprehensive program of investment in agriculture, rural development and land reclamation, financed both from own funds and with funds raised (European). It is also required special programs for small farms, subsistence and semi-subsistence, covering early retirement and system life annuity, helping young people to establish in rural areas and start up businesses, establish the system of direct payments, taking into account EU recommendations, etc. Only then we can talk in the future about modern agriculture and the real sustainable development of rural Romanian areas;
- to achieve its goals and fulfill its objectives, sustainable rural development must focus primarily on the development of rural communities (in this case, the communes and villages), having regard to all components of physical, economic, social , ecological, cultural, educational, etc. thereof;
- sustainable rural development, the main theme of this research can not be achieved without innovation, modern technology, computerization and modernization, ICT development, networking knowledge and technology transfer etc. In developing this absolutely necessary elements for implementing a real process of sustainable rural Romanian devoltare must involve all stakeholders or "forced", be they local or central public authorities, education and research institutions, ministries etc .;
- new vision of integrated economic development of Romanian rural communities should be followed by construction of a coherent and based on rural realities (of land) for sustainable rural development. Solving the major problems of Romanian rural area is possible in terms of implementing horizontal policies of development that integrate land policy, fiscal policy and lending in agriculture policy, socio - professional development policy of basic services, environmental policies, policy educational and public health, etc. All this must be

accompanied by constant upgrading of the local government sector in all fields and social infrastructure - urban and economic.

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AN INITIATIVE TO LINK BETWEEN RESEARCH AND SUPPORT FOR YOUNG FARMERS WHO ACCESS THE SUB-MEASURE 6.1 - RDP 2014-2020

ANA URSU[1]

Summary: The paper highlights the involvement of field research in achieving a *model farm calves for fattening and associated with basic fodder popularizing information and for practical use, which is necessary for young farmers first install the head / manager of a holding in a production animal competitive. This study is based on a business plan prepared according to the Applicant's Guide for sub-measure 6.1 of the RDP 2014-2020, and meetings with young farmers. Development of a forage-based livestock farms related constitutes an advantage for farmers resulting from the combination of two types of activities in that young farmer could sell his crop production on the farm, thus reducing cost production of animal products by 60%. In the same time, the young farmer can judiciously organize his activities in both farms livestock and crops plant having a rigorous and permanent control, so that it can intervene if there are any financial losses during the production process. The results reveal that young farmers could benefit from improved access to information, but there is no real benefit assessment because of the small number of relevant surveys.*

Keywords: *research, model, farm, sub, young farmer.*

INTRODUCTION

There are many arguments in favor of allocating grants for young farmers. According to statistics, in Romania, agriculture is still characterized by an insufficient number of young farmers, aspect determined by economic and social factors as well as the aging population of farmers, which in medium and long term can affect the performance of agricultural sector. "Sub-measure 6.1 helps to promote entry into the agricultural sector of farmers suitably qualified and, in particular of generation's renewal. Scientific research supports the approach taken by the sub-measure 6.1: Support for young farmers by conducting studies of practical utility and creating new tools for transmitting information. The necessity of drawing up models of farms, in order to be adopted or to develop new ideas arises. For a scientist it is easier to follow the progress of existing things and transmit information in a manner accessible to young farmers. Research institutes have access to information. The interaction between research and farmers is not new in approach, but support the development of collaborative relationships is essential for knowledge transfer. Scientists can learn from farmers, making them aware of how their research is interpreted or how it can be applied and adapted to the needs of young farmers.

MATERIAL AND METHOD

To access the sub-measure 6.1 by a young farmer, it is necessary to develop a business plan, as recommended in the Guidelines for Applicants specific sub-measure. The proposed model aims to build a farm calves for fattening fodder base related, to achieve a competitive animal production, respecting the 5 principles for providing support, namely: priority sector, merging farms, qualifications in agriculture, the agricultural potential of the area, local breeds, etc. The method used was to use the hypothesis that the farm can become competitive if carried out with the main business of fattening cattle breeding and fodder production activities. The model was built under the funding scheme, for support in two installments.

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RESULTS AND DISCUSSION

To achieve the model took into account the five principles for support.

The principle of agricultural potential

The farm was designed Dumbrava Rosie, Neamt County, in an area with high potential for both increasing fattening cattle and for fodder plant cultivation. The advantage of combining the two activities lies in the fact that young farmers share their crop production in farms cattle fattening saving value added tax and trade margins (which were added in the production of fodder for animal feed) with a reduction in cost of production of animal products.

To identify the market for a preliminary analysis of bovine meat market in the counties neighboring the county Neamt, Botosani and Bacau respectively. For a true market meat must take into account bovine, obtained yields and their influencing factors. Fluctuating trend of the beef market is determined by a number of factors: specific pathological factors, used technological factors, economic factors (low economic base for farmers because of the low size holdings), organizational factors (poor organization of farmers for recovery production achieved; lack of strong meat producer sector - meat merchandise unplanned production, the lack of an organized supply of animals to slaughterhouses, poor forage production sector productivity, high cost of meat processing).

Table 1: Dynamics of livestock and meat production in 2007-2013

No.	Specification	UM	2007	2010	2012	2013
1	Total cattle Staff	Thousands head.	2819	1985	2164	2197
2	Total production of beef (live)	Thousands tons	333	205	198.5	232.6
3	The average weight at slaughter	kg / head	280	264	332	327

Source: MARD

The period under review reflects a negative trend of herds since 2007, reaching to a lowest in 2010, and then from 2012 recording increases of livestock and production of beef meat (in live). The current offer of beef meat is assured from the private sector. Demand for meat depends on the quantities needed for food and other necessities, like those quantities for export, industrialization, etc. For meat product, the size of the offering dependents on two factors: the bovine number and the average weight at slaughter. In the settlement of meat market and product orientation for this product an important role is to create a balance between supply and demand. Adjusting supply can be realized through:

- organizing farmers to harness production obtained;
- a system of negotiated prices agreed with the producers;
- increasing productivity in fodder production;
- Permanent informing of farmers through stock exchange quotations on the amount of meat offered and purchased on the market, price and quality indicators.

Meat consumption has tradition originates in Romania and non-commercial activities at farm level have a high level of fragmentation, a large part of production remaining on the farm for its own consumption.

Table no. 2: Meat production per capita live and average annual consumption

No.	Specification	UM	2007	2010	2011	2012	2013
1	Meat live	kg	72	64.5	67.4	66.3	65
2	Average consumption of meat, prod. Meat and edible offal (fresh equivalent)	kg	68.8	63.5	59.4	58.7	-

Source: MARD

In 2012, the average annual consumption of meat (fresh equivalent) was 58.7 kg compared to the European average of 90 kg (beef represents only 10% of total meat consumption in the EU while consumption is 40%). The market is underdeveloped, mainly because of low purchasing power, but also because of reduction of meat supplies.

For an overview of the meat market in Romania, will present the summary balance agro live animals and animal products.

Table 3: International trade in live animals and animal products

Euro Millions

No.	Specification	2007	2010	2011	2012	2013	2014
1	**Export** Live animals and animal products	252	437	584	731	747	49.1
2	**Import** Live animals and animal products	870	984	965	1035	1118	90.2
3	**Trade Balance** Live animals **and** animal products	-618	-550	-381	-304	-371	-41.1

Source: MARD

The live animals and animal products is a trend of the deficit in 2011, agro-food deficit is negative animals and animal products with -41.1 million Euro (exports exceeded imports) in 2014.

A feature of the market in beef and cattle Romania is that only 82.7% of meat production approx. 11460 tones is valued by the free market, of which 35.4% of industrialized state or private establishments and 64.6% of the production is delivered directly to the market. Family consumption represents 17.3% of total meat production.

In Romania, Collection and use of beef production on 30 March 2014, is as follows:

Table 4: Total Cattle Meat

Heads

No.	Specification	Products Total	From which Private Sector	Family consumption	Selling on the open market	From which Direct	From which state or private industrial units
	Total	**123 637**	**123 388**	**22388**	**101000**	**72,970**	**28030**
1	Botosani	10448	10448	180	10268	0	10268
2	German	7613	7600	2400	5200	4530	670
3	Prahova	6958	6958	1009	5949	5689	260
4	Bacau	6856	6856	236	6620	5664	956
	% Of total Neamt	**6.2**	**6.2**	**10.7**	**5.1**	**6.2**	**2.4**

Source: MARD

Table 5: Cattle live weight

tons

No.	Specification	Products Total	Average weight	Total Private Sector D.C	Average weight	Family consumption	Selling on the open market	From which industrialized state or private Units
	Total	**39,259**	**318**	**39,122**	**317**	**6773**	**32,349**	**11460**
1	Botosani	3958	379	3958	379	56	3902	3902
2	German	3005	395	3000	395	900	2100	208
3	Prahova	1548	222	1548	222	250	1298	90
4	Bacau	2365	345	2365	345	81	2284	435
	% Of total Neamt	**7.7**	**124.2**	**7.7**	**124.6**	**13.3**	**6.5**	**1.8**

Source: MARD

Table 6: Average purchase price of bovine meat (in the living G)

Euro / UM

No.	Specification	UM	2007	2010	2011	2012
1	Meat cattle (in the living G)	Kg-living	2.98	4.85	5.51	5.54

Source: MARD

In the case of cattle farms that are selling meat the average purchase price trend growth is very slow; this approach affects the entire acting ensemble of competitors in the market.

In this context, in terms of investment opportunity, there are the some relevant issues concerning the sector, market, labor, pedo-climatic conditions and the local economy.

At sector level: currently, the activity of meat production (livestock) shows a downward trend at national level, which is leaded by a reduction of market demand insufficient supplied by domestic producers and increased demands on the food quality; reduction of the purchasing power of consumers.

At the retail market level: orientation of the preferences of domestic consumers from pork and poultry meat consumption to beef consumption; meat demand increasing, as the growth of consumption level perspective at the same level from other EU countries.

At the soil and climate conditions: climatic conditions from Dumbrava Rosie area are favorable for raising activities of fattening cattle. The climate is continentally- tempered with hot summers (Monthly average temperature in summer is 20 – 30^{o}C), harsh winters (monthly average temperature in winter is -10 – 40^{o}C) annual thermal amplitude (difference between the highest and lowest temperature recorded in a year) the largest, annual rainfall are about 250-500 mm, north winds; the investment will be located in an area with high potential for cattle growth.

At the local economy and geographical location: farm location in an area with strong touristic character gives the opportunities to market capitalization.

The price will be mostly determined by supply and demand. Therefore the farm will try to charge at the market price and will try to reduce the negative effect of its decline due to competition for the meat product. Selling price of farm products, which were taken into account in forecasting revenues is 12 lei / kg live calf to a weight of 450 kg / capita farm gate price.

The principle of consolidation of holdings

The idea of holding another association with the need to ensure forage base appears own young cattle fattening recommended surface for the 65 heads is 51.8 ha - Table. 7 Given the priority sector is represented by the calculated increase in cattle surface to achieve maximum economic size is 45 SO 50000 hectares. According to the Applicant's Guide for sub-measure 6.1, the size of agricultural holdings should be between 12,000 and 50,000 SO (SO - total output value in euro).

Table. 7: The estimate for providing the necessary feed

Name	Cultivated area (ha)	Prod. Average (kg / ha)	Total production (t / ha) (2 x 3)	Required farm feed (t)	Required surface (ha) (5: 3)	Difference (t) (5-4)
1	**2**	**3**	**4**	**5**	**6**	**7**
Wheat	4	4200	16.8	29.3	7.0	-12.5
Barley	4	4800	19.2	22.8	4.7	-3.6
Grain maize	4	4800	19.2	26	5.4	-6.8
Corn silage	9	36000	324	325	9.0	-1
Vetch g.m.	5	30000	150	195.0	6.5	-45
Vetch hay	4	8040	32.2	45.5	5.7	-13.3
Alfalfa hay	9	8040	72.4	65	5.4	+7.4
Lucerne g.m.	6	36000	216	195.0	8.1	21
Total	45	x	x	x	51.8	

Source: Own calculations

The principle of priority sector

The farm size shown in Table 7, 52.3% is the animal sector, and the remaining 47.7% is the vegetable sector. Within the animal sector, 100% is meat production, and in the vegetable sector, 33.3% from the economic dimension is given alfalfa, vetch 20%, 20% corn silage, maize 8.9%, 8.9% barley and wheat 8.9%.

Table 8: Economic size of farms Standard Output (SO)

Structure crop / livestock production	Farm size (SO) in 0
Vegetable Sector	**23693.20**
Wheat 4 ha	2118.7
Barley 4 ha	1824.2
Grain maize 4 ha	2562.6
Corn silage 9 ha	4217.2
Vetch g.m. 5 ha	1936.3
Vetch hay 4 ha	1549.0
Alfalfa hay 6 ha	3794.1
Lucerne g.m. 9 ha	5691.2
Animal Sector	**25932.40**
- 65 cattle fattening	25932.40
TOTAL	**49625.60**

Source: Own calculations

The principle of indigenous breeds

Brown breed is the subject of work in the farm and part of indigenous breeds list. All animals with certificate of origin issued by the National Livestock Production "Prof. GK Constantinescu "in the List of accredited associations to carry out the establishment and maintenance service of the book in accordance with HG nr.1188 / 2014 OM No.19 / 2006, OM No.22 / 2006 and OM No.13 / 2006 as amended and supplemented.

Setting goals farm: increasing the production of goods, in the third year from a spore of 800 g/day to 1000 g/day to achieve the delivery weight of 450 kg/capita.

- Introduction fattening weight: 100 kg
- Weight gain / day: 800 gr.
- Increase total weight 350 kg / head
- Timing of fattening cycle of 438 days (350 kg / head / 0.8 kg gain) - 1 year and 2 months ½ days

Rearing and fattening period is 12 months; average weight calves are purchased from 100 kg delivery is made to a year at an average weight of 450 kg. By weight of 250 kg, is discretion feeding, and then feed management will make weight structures according rations (Table 8).

Table no. 9: 65 ration for cattle fattening

Name	U.M.	Quantity / head / year	Total Required
Wheat	t	0.45	29.3
Barley	t	0.35	22.8
Grain maize	t	0.4	26
Corn silage	t	5	325
Vetch m.v.	t	3	195.0
Vetch hay	t	0.7	45.5
Alfalfa hay	t	1	65
Lucerne m.v.	t	3	195.0

Source: Own calculations

Table. 10: The estimate for providing the necessary feed

Specification	UM	WINTER	SUMMER
FIBRE	t	98.8	x
Succulents	t	325	x
Coarse	t	58.5	x
Concentrate	t	32.5	26
Green earth	t	x	390
Straw	t	x	26

Source: Own calculations

= Coarse corn stalks, wheat straw and barley;
Concentrate = mixture of corn, barley and wheat

Table no. 11: Cultural Plan

Culture	Area. Cultivated (Ha)	Prod. average (t / ha)	Year 1	Year 2	Year 3
			Sing. The total (t)	Sing. The total (t)	Sing. The total (t)
Wheat	4	4.2	16.8	16.8	16.8
Barley	4	4.8	19.2	19.2	19.2
Grain maize	4	4.8	19.2	19.2	19.2
Corn silage	9	36	324.0	324.0	324
Vetch g.m.	5	30	150.0	150.0	150
Vetch hay	4	8.04	32.2	32.2	32.16
Alfalfa hay	9	8.04	324.0	324.0	324
Lucerne g.m.	6	36	48.2	48.2	48.24
Total	45				

Source: Own calculations

Depending on the necessary fodder crop plan was developed using cropping and crop rotation compliance. Farm for breeding and fattening young bulls have autonomy forage harvesters having 45 hectares of arable land, of which 15 ha area under forage (alfalfa).

For the purposes of complying with environmental requirements, the firm will build a platform of manure and slurry basin, in line with the mandatory observance of good agricultural practices on manure management.

Table no. 12: Production of livestock farms Plan

No.	SPECIFICATION	Year 0		Year 1		Year 2		Year 3	
		Head	Prod.	Head	Prod.	Head	Prod.	Head	Prod.
1	Cattle total, of which: young cattle	65	29250	65	29250	65	30063	65	31,688

Source: Own calculations

Table. 13: Summary of revenues, expenditures, financial results at farm level

Indicators	Year 0	Year 1	Year 2	Year 3
Income				
Vegetable sector (subsidies)	34,718	34,718	34,718	34,718
+ The livestock sector subsidies	383 500	383 500	394 030	408 070
TOTAL REVENUE	**418 218**	**418 218**	**428 748**	**442 788**
Expenditure				
Vegetable sector	61,092	61,092	61,092	61,092
The livestock sector	240 333	240 333	240 333	240 333
TOTAL EXPENSES	**301 425**	**301 425**	**301 425**	**301 425**
Gross	**116 793**	**116 793**	**127 323**	**141 363**

Source: Own calculations

Farm feed production is an advantage for the farmer with a reduction of production cost on the meat by 60%. On average, the gross result obtained is 2163 euro / month in the first year, 2358 euro / month in the second year and 2618 euro / month in the third year. If the farm has 4 employees, the result varies from 541 crude euro / person in 1, 589 euro / person respectively in the second year and 657 euro / person in third (1 euro = 4.5 lei). If the farmer is unhappy with the results, he can intervene at any time if it finds financial losses during the production cycle.

Principle qualification in agriculture: According to this principle, the applicant must be aged at least 18 years old, have competencies and skills (secondary education / higher education / knowledge by attending training programs (initiation, specialization)) in the veterinary field agriculture / veterinary

The role of research in interaction with young farmers: They have organized various actions, such as: developing type projects, online distribution projects, organizing workshops where they presented these model projects, etc. In this context, there is a real benefit assessment because of the small number of relevant surveys.

CONCLUSIONS

The farm, built on the basis of five principles constitute a landmark for young farmers who would like to access sub 6.1 and work in agriculture, respectively in raising young cattle for meat. The model is efficient and focused more on improving the market orientation of farmers and increasing skills in the business sector.

The initiative to create a link between research and young farmers has led to the improvement of knowledge exchange (farmers learned from the experience of others, researchers have learned from farmers, etc.) and identify problems to be solved by research, and so on It should be possible to fund research so that research can be carried out at the farm or you could easily access such budgets needed for carrying out practical experiments to verify previous results, etc.

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THE RURAL DEVELOPMENT PROGRAM IN ROMANIA AND THE PLACE OF LEADER PROGRAM WITHIN ITS

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Summary: *The new National Rural Development Program 2014 - 2020 puts a far greater emphasis on the Leader measure through greater allocations regarding to funds towards this segment, and better partitioning through sub-measures that make up this measure. The level of rural development in Romania is very low, and the lack of measures to support the rural Romanian environmental progress fail to appear, although the Romanian village had benefited in the past from such support based on European funds. Most likely, it is the last chance for Romania to align to the rural environment to other rural areas closer to the developed countries belonging to the European Union.*

Keywords*: rural development, Leader measure, the situation of Romanian rural areas*

INTRODUCTION

The Romanian rural space is facing a number of problems of socio-economic nature, departing from the exodus of young people from rural areas to urban centers, so that the number of young people who should inherit practice of traditional crafts such as agriculture appear to be predestined to doom, and once with these their customs.Another outstanding issue is the lack of jobs, one of the reasons that mentains the exodus of young people to urban centers. At the same time the number of households receiving the minimum of comfort such as water, gas and sewerage is extremely low even today.

The role of The National Rural Development Program is ceaseless in terms of importance and the contribution it brings to rural development in Romania. This program is the equivalent of a Master Plan of road infrastructure, which means that concerns a range of measures that must be achieved in a medium or long term.

Of all the European programs Romania had reached, this managed to absorb most money from the European Union in the past programming period, namely 2007-2013.

The new Rural Development Program 2014-2020 focuses on identifying needs and treating them in a more efficient manner through a series of measures developed in this way. Rural development in PNDR's vision aims no less than 26 needs refering to the knowledge of Romanian farmers, to counseling and advice, rejuvenation of generations of farmers, clusters and agricultural producers, integrated food chains, measures to protect the environment, growth and diversifying the number of jobs, reducing poverty and the risk of social exclusion and local development through the Leader approach. Measures to combat mental shortcomings are in number 15 including:

M01 - Shares for knowledge transfer and information actions;
M02 - Advisory services, farm management services and farm replacement services;
M04 - Investments in physical assets;
M06 - Development of farms and businesses;
M07 - Basic services and village renewal in rural areas;
M08 - Investments in the development of woodlands and improving the viability of forests;
M09 - Establishment of groups and producer organizations in agriculture and forestry;
M10 - Agro-environment and climate;
M11 - Organic farming;
M13 - Payments to areas facing natural constraints or other specific constraints;
M14 - Animal welfare;
M15 - Forest-environmental services, climate services and forest conservation;
M16 - Cooperation;

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M17 - Risk management;
M19 - Support for local development LEADER.

All these measures are aimed in developing and supporting existing farms, especially those operating in rural areas. It is worth mentioning that in terms of the extent M14- "Animal welfare", dedicated to the charge of raising pigs and hens or meat birds, given that RDP 2007-2013 was extended until 2015 due to the delay in approving the RDP 2014-2020, those active in the field of pig and poultry for two years did not receive welfare support granted by measure. It seems that this will be reactivated from the next year.

MATERIALS AND METHODS

The researches were based on information that refer to the rural development program and place of Leader within it, through data obtained from the PNDR, the Ministry of Agriculture and Rural Development and APIA, data that can show the evolution and activity impact of Leader in Romania.

RESULTS AND DISCUSSIONS

We can say that the distributions in the amounts allocated to the National Program for Rural Development, for each measure are very important because we can see the direction that the Ministry of Agriculture and Rural Development wants to follow for the development of rural areas and the manner in which attempts to eliminate the main problems encountered in this sector.

Table no. 1.

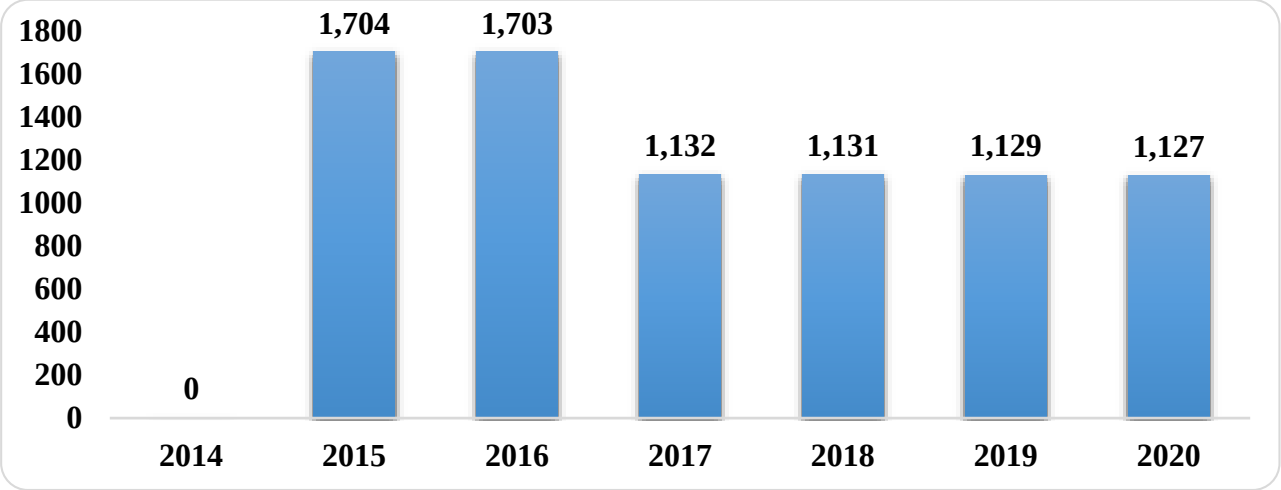
The amounts allocated to each measure related to the National Rural Development Program 2014 – 2020

Nr. Crt.	Measure	Total contribution from the European Union
1	M01 - Shares for knowledge transfer and information actions;	60.386.100
2	M02 - Advisory services, farm management services and farm replacement services;	60.386.100
3	M04 - Investments in physical assets;	2.057.028.093
4	M06 - Development of farms and businesses;	978.690.545
5	M 07 - Basic services and village renewal in rural areas;	1.100.595.249
6	M08 - Investments in the development of woodlands and improving the viability of forests;	105.695.159
7	M09 - Establishment of groups and producer organizations in agriculture and forestry	18.000.000
8	M10 - Agro-environment and climate;	909.964.916
9	M 11 - Organic farming;	200.686.161
10	M13 - Payments to areas facing natural constraints or other specific constraints;	1.150.796.418
11	M14 - Animal welfare;	437.013.969
12	M15 - Forest-environmental services, climate services and forest conservation;	100.000.000
13	M16 – Cooperation;	28.021.100
14	M17 - Risk management;	170.000.000
15	M19 - Support for local development LEADER.	572.364.672

Source: Processed data from PNDR 2014 - 2020

The most significant amounts of money have been allocated to measures relating to investments in physical assets by more than 2 billion euros (plus 750 million euros, the contributions reserved for operations falling within the scope of Article 59 para. (6) of the EU Regulation no. 1305/2013), followed by measure 13 - Payments to areas facing natural constraints or other specific constraints with a value of 1.15 billion euros and M07 - basic and renewal services villages in rural areas by 1.1 billion euros.

Graphic no. 1



Annual contributions related to EAFRD (bln. Euro)

* Source: Processed data from PNDR 2014 - 2020;

On the opposite side there are measures M09 - establishment of groups and producer organizations in agriculture and forestry, namely M16 – cooperation, with allocations below 30 million euros over the six years of the program so that these allocations totaling 8 billion euros for the National Rural Development Program, plus the contribution from the state budget, amounting to 1.5 billion euros, so that Romania has available, in 2014-2020 the total amount of 9.5 billion euro money supporting rural destinations and business developed in rural areas.

In chart no. 1 we can see that the amounts allocated for the programming period 2014-2020 are distributed in a decreasing way since 2015 when the fund amounts to over 1.7 billion euros, followed in 2020, it at just 1.1 billion euros, but we can say, from the previous schedule from 2007 to 2013, we learned that this period will most likely extend for another two years because as we know and PNDR 2007-2013 was available to farmers by 2015, whereas the chances of a full absorption in this period are extremely small.

The role of Measure 19 - support for local development of LEADER is very importand for the National Rural Development in socio-economic development of rural areas, to reduce disparities between urban and rural areas and promote social inclusion.

By 2011, the number of LAGs (81) accounted for around 63% of the eligible teritory and 58% of the eligible LEADER population, so that in the new programming period intends to complement entirely to these two issues and expects the number of LAGs fixes may reach over 200 and covering almost 90% of the eligible area.

Environmental issues and climate change, one of the major problems of humanity are encouraged by this measure, which supports efficient water use, diversification of agriculture and the establishment of agricultural activities in regard to the identification and use of renewable energies play a role particularly in rural development.

The existing problems in these areas can be solved by finding innovative solutions supporting public utility projects with economic, social, cultural and natural impact.

The four sub-measures constituting the LEADER measures are designed to complement each other so that the first sub 19.1 - Support preparatory, offering support for the establishment of Local Action Groups, the second one sub-measure provides support for the implementation of operations under local development strategies, and the last two sub-measures relates to the support provided for the preparation and implementation of cooperation activities of the Local Action Groups, namely the costs of running and animating their activities.

The four sub-measures forming the Leader measure, we can say that there is also completing mutual relationship aimed at rural development. We can say that by its sub-measure

19.3 - Preparation and implementation of cooperation activities of the Local Action Group is an opportunity for LAGs in Romania to access to the experiences of the LAGs from other countries that have this system well established and to interact with the European comunity of Leader.

Under this preparatory stage, it involves six parts that these actors have go through, following the simplified diagram below, and this is the most important stage as it represents the startup stage in the establishment of a Local Action Group.

Fig. 1.

The process of granting preparatory support

Source: Leader measure sheet, V3 draft

At first glance we can say that the process is relatively easy, after developing a scheme so that in the first stage, the Paying Agency launches call for the selection of cases, followed by those interested in subbmiting specific documentation. In the third stage the Payments Agency carries out the examinations of submitted dossiers of preliminary font, then these are selected by AM. The last two phases will sign the contract between the beneficiary and the Paying Agency and check the implementation projects by it.

The selection of projects under the Local Action Groups is transparent based on a flow of these steps, stating in an efficient step taken by these in order to select projects that will receive funding for the investments covered so that once the Group of Local Action launches call for project selection, using the most efficient ways of informing potential beneficiaries can submit their secretariat draft.

LAG out checks for compliance project and compliance with eligibility criteria. Selecting files is based on the LAG strategy, based on its criteria. Besides the LAG selected projects end up being verified by the Paying Agency which will send back a notification regarding the approval or disapproval of the project.

The final recipient of the payment applies to LAG, and they submit Paying Agency after checking in advance.

CONCLUSIONS AND RECOMMENDATIONS

Although Romania has benefited in the past from European funds under this LEADER measure, the results achieved are low in practical terms, even though much of these funds have been absorbed. With the establishment of new LAGs covering the whole eligible area of the country, this can make a contribution that will be felt in terms of the harmonious development of rural areas.

Given that the rural town halls receive insufficient funds to conduct complex works, but a necessity unquestionable lives of people, the amounts allocated to this measure through the LAG represents a milestone in this aspect.

It is absolutely necessary that the promotion campaign among all rural actors to be more aware of this opportunity which aims, whether we are talking about town halls that can attract such investments to upgrade the infrastructure of the village they represent, whether merely a farmer who

wants to streamline activities at the farm, so that through Local Action Groups shortens practical approval process of any type of project aimed at an investment covered by a specific measure in the National Program Rural Development.

It is noticeble that the LEADER measure, inexperienced with managing European funds and said the word so that by 2012 the absorption of European funds dedicated to this measure were rather weak, whereas the level of this year the number of LAGs founded only reaches 83, with coverage of only 63% of the eligible population. However after 2012, with the massive promotion made this measure things began to take shape and the number of LAGs reached the level of 2015 to 163, an increase of 50% compared to 2012.

The new programming period 2014-2020, with a significant allocation for LEADER measure, proposes the establishment of more than 200 LAGs with over 90% coverage of the eligible area under this measure.

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LOCAL ACTION GROUPS (LAGS) AND THEIR IMPACT ON THE PROCESS OF RURAL DEVELOPMENT IN ROMANIA

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Summary: *The development of rural areas in Romania is quite low compared with what rural environment means in countries that have benefited from the Rural Development Program since 1991, when the measure started, it was dedicated to member states of the European Union. The problems of required rural infrastructure to ensure a minimum for decent living conditions still exist, and the only thing that could contribute to the development of rural areas is the involvement of local actors through the Local Action Groups.*
In 2015, we will draw a line and see how it contributed to the rural development program of National Rural Development Program 2007-2013. It is noticeable that Romanian farms begin to grow slowly and try to align with European standards found in developed countries in the European Union. However, the process should be continued, which is why PNDR 2014-2020 continues the development direction of the Romanian village placing more emphasis on the LEADER measure, which implies a more active involvement of local actors in supporting and developing the Romanian village.

Keywords: *Local Action Groups, LEADER , Rural Development*

INTRODUCTION

The LEADER axis through Local Action Groups has been an important tool for proper rural development in Romania, with the possibility of accessing irredeemable funds in the programming period 2007 - 2013. In the previous National Rural Development Program, the impact of this measure has led to training of 163 local action groups, covering an area of 142,000 km². Also the training process of these LAGs is affected by the number of inhabitants subjects of the Local Development Strategy, which must be between 10,000 and 100,000. This strategy may be included and towns whose inhabitants population must be maximm 20,000 inhabitants.

Essentially, LAGs represent an active public-private partnership that brings together the various actors in the rural areas aimed at developing their whole. Also, the share of private sector actors need to be over 51%. The Leader measure subdivision consists of 4 other sub-measures, the first one is represented by sub-measure 19.1 - "Preparatory Support " offering support for developing / preparation of local development strategy (LDS). The sub-measure 19.2 (Support to the implementation of actions under the local development strategy) offers support regarding the implementation of what has been developed under the LDS, which will support local development and potential. It also seeks to improve competitiveness of natural environment, quality of life and diversification of the economy and combating poverty and social exclusion.

Interterritorial cooperation will be possible through the sub-measure 19.3 - "Preparation and implementation of cooperative activity of LAGs" aimed to improve local perspectives and strategies and better access to the information, the ability to interact with other regions or countries. The last sub-measure that complements the Leader measure is 19.4 - "Support for operating expenses and animation", providing support for managing these LAGs that require professional management with financial allocations properly designed.

MATERIALS AND METHODS

The researches were based on information that refer to Local Action Groups by the data

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obtained from the Ministry of Agriculture and Rural Development, data that may indicate the evolution and the impact of LAGs in.Romania.

RESULTS AND DISCUSSION

If at the end of 2011, the number of Local Action Groups rises to 81 and covers a number of 1007 villages, with a total area of over 82,000 square kilometers and 3.5 million inhabitants, at the end of 2013 it amounted a number of 94 LAGs, covering a number of 1144 villages, with an area of over 95,000 square kilometers and with over 4 million inhabitants.

Table no. 1.

LAGs situation in North-West development region for 2013

Nr. crt.	County	No. LAGs	LAGs covering villages	Total area km²	No. Inhabitants
1.	Bihor	2	28	1.977	132.578
2.	Bistrița-Năsăud	2	21	1.106	96.497
3.	Cluj	4	51	4.123	153.319
4.	Maramureș	2	27	1.986	105.332
5.	Satu-Mare	3	43	2.489	143.242
6.	Sălaj	2	22	1.364	58.967
Total		15	192	13.044	689.935

Source: Ministry of Agriculture and Rural Development;

According to Table. 1. we can see that the largest county, both in terms of area and number of inhabitants in the North-West region, that the Local Action Groups are covering, is Cluj. It has most LAGs (4 in total), which manages to cover 51 villages. Another important county for the same aspects is Satu-Mare, which is the second after Cluj in area and number of inhabitants, but has three LAGs able to cover 43 villages. The number of inhabitants and the total area that covers these LAGs amounts to around 700,000 inhabitants, 13.044 km².

Table no. 2.

The situation of LAGs in the central development region in 2013

Nr. crt.	County	No. LAGs	LAGs covering villages	Total area km²	No. Inhabitants
1.	Alba	3	45	3.132	117.249
2.	Brașov	2	22	1.686	72.681
3.	Covasna	2	25	2.197	78.912
4.	Harghita	4	54	5.606	184.320
5.	Mureș	4	48	2.517	153.203
6.	Sibiu	3	42	3.478	131.147
Total		18	236	18.615	737.512

Source: Ministry of Agriculture and Rural Development;

In the central region, the leading counties are Harghita and Mures with 4 LAGs, of which the first mentioned county covers 54 villages, the county of Mures manages to cover 48 villages. The total number of villages benefiting from the support of the LAG stands at 236, and in terms of area and total population for the region stands at 18 615 km², respectively 737 000 inhabitants.

Table no. 3.

The situation of LAGs in South-Muntenia development region in 2013

Nr.crt.	County	No. LAGs	LAGs covering villages	Total area km²	No. Inhabitants
1.	Argeș	3	39	3.495	136.547
2.	Călărași	1	12	937	37.699
3.	Dâmbovița	6	23	1.288	99.632
4.	Giurgiu	1	2	280	11.833
5.	Ialomița	3	51	4.165	202.656
6.	Prahova	3	21	950	129.789
7.	Teleorman	1	17	1.032	42.468

Total	18	165	12.146	660.624

Source: Ministry of Agriculture and Rural Development;

Ialomita county has only three LAGs, compared with the county Dambovița (which has 6 LAGs), but manages to cover an area almost four times bigger and has over two times more inhabitants compared to the other one. The total number of people benefiting from these LAGs in the South region is over 660,000 and covers an area of over 12 thousand km².

Table no. 4.

The situation of LAGs in the Western development region in 2013

Nr. crt.	County	No. LAGs	LAGs covering villages	Total area km²	No. Inhabitants
1.	Arad	4	57	5.377	202.958
2.	Caraș-Severin	1	13	2.011	39.980
3.	Hunedoara	2	38	3.832	79.393
4.	Timiș	3	42	3.972	134.179
Total		10	150	15.192	456.510

Source: Ministry of Agriculture and Rural Development;

The western development region has 10 LAGs, but Arad receives four LAGs, which manage to cover the 57 villages, which are made up of more than 200,000 inhabitants and an area of 5,300 km². In this region the 10 LAGs covering over 150 villages with over 450,000 inhabitants and 15,000 km² surface.

Table no. 5.

Situation of LAGs in the North-East development region in 2013

Nr. crt.	County	No. LAGs	LAGs covering villages	Total area km²	No. Inhabitants
1.	Bacău	2	20	2.371	117.539
2.	Botoșani	2	24	1.415	110.213
3.	Iași	1	11	737	45.861
4.	Neamț	2	21	2.544	112.182
5.	Suceava	2	24	3.764	71.393
6.	Vaslui	3	49	3.200	164.755
Total		12	149	14.031	621.943

Source: Ministry of Agriculture and Rural Development;

Vaslui County holds the most LAGs in the North-East development region, covering 49 villages, with an area of 3,200 km² and a total of over 160 thousand inhabitants. Regarding the surface it is exceeded by Suceava, where the two LAGs covering over 3,700 km², but the number of villages covered is smaller, only 24, and the number of residents who are already covered LAGs are at half the number Vaslui County residents.

Table no. 6.

Situation of LAGs in the South-East development region in 2013

Nr. crt.	County	No. LAGs	LAGs covering villages	Total area km²	No. Inhabitants
1.	Brăila	1	11	848	35.169
2.	Buzău	3	35	2.955	131.184
3.	Constanța	3	27	2.923	99.590
4.	Galați	1	16	991	68.712
5.	Tulcea	2	12	2.452	45.229
6.	Vrancea	3	37	3.033	152.984
Total		13	138	13.202	532.868

Source: Ministry of Agriculture and Rural Development;

In Table. 6, which refers to the situation of LAGs in the South East development region, we cand see that most counties with LAGs are Buzau, Vrancea and Constanta, all boasting three Local Action Groups. Vrancea county covers most villages (37), distributed over an area of 3,000 km² and

more than 150 thousand inhabitants. This region accounted a total of 13 LAGs covering 138 villages, with an area of 13,202 km² and a population of 532 868 number.

Table no. 7.

Situation of LAGs in the South-West Oltenia development region in 2013

Nr. crt.	County	No. LAGs	LAGs covering villages	Total area km²	No. Inhabintants
1.	Dolj	4	57	4.212	230.608
2.	Gorj	1	9	872	36.991
3.	Mehedinți	1	21	1.572	49.142
4.	Olt	1	16	902	48.323
5.	Vâlcea	1	11	1.545	32.623
Total		8	114	9.104	397.687

Source: Ministry of Agriculture and Rural Development;

The region with the fewest LAGs is the South-West, totaling a number of 8 LAGs, covering 114 villages, with an area of 9104 km² and a total of 397 687 inhabitants.

CONCLUSIONS AND RECOMMENDATIONS

Establishing the Local Action Groups had registered an upward trend since 2011, increasing from 81 to 94 LAGs in 2013 and 2015 recorded a total of 163 LAGs, covering an area of 142,000 km². However, by the end of 2016 it is estimated that the LAGs will reach 200, covering over 90% of the area declared eligible for this support.

At the end of 2013 the best performing region in terms of the number of LAGs, villages, inhabitants and covered area was the central region with a total of 18 local action groups, 236 villages covered an area of over 18,000 km² and more than 730 thousand inhabitants. On the opposite is South-West Oltenia with just 8 LAGs covering 114 villages, with an area less than 9,000 square kilometers and 400,000 inhabitants.

Moreover, the new National Program for Development, through the LEADER measure should help regions with a smaller number of such local action groups, which have a low number of villages and inhabitants who have benefited from the support provided by these LAGs. Most likely through a more active involvement of the Ministry of Agriculture and Rural Development, reflected in a promotion and a clear explanation of the benefits that these Local Action Groups can bring to rural environment, could lead to an entire absorption of these Leader funds allocated to these measures, which will be reflected in the development of these regions of the country while trying an alignment of Romanian rural areas in the Western European countries that have benefited from these measures far ahead of us and applied them more effectively.

It is very important the number of LAGs covering Romania's area and population, but the most important aspect is that these Local Action Groups, should develop a strategy in line with the realities and needs identified in the region and especially to be implemented a more accurate manner.

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THE IMPACT OF THE NATIONAL PROGRAM OF BEEKEEPING ON THE EVOLUTION OF THE BEEKEEPING SECTOR

GIMBĂȘANU GABRIELA[1]

Summary: *It is clear that the National Beekeeping Programme was a true support for Romanian beekeepers, contributing to the development of this branch of agriculture with important sums of money that they could access reflected both in the number of bee colonies and the the quantity of honey valued. Continuing this program is essential for beekeepers because this is a costly occupation that requires a lot of knowledge in beekeeping, and is knownthat the bees are very sensitive.*

Keywords: *National Beekeeping Programme, bee colonies, honey*

INTRODUCTION

Beekeeping, like sheep breeding is a traditional occupation in Romania, which is practiced in ancient times. In the last period, with the opening of new markets and opportunities for their honey, but also thanks to the support of the state budget and the European Union, this activity began to be increasingly practiced by Romanians of all ages.

Romania occupies a leading position in terms of annual production of honey, so in a classification made by the European Commission, our country is in 4th place in Europe, after countries like Germany, France and Hungary. Annually our country exports 60% honey from conventional beekeeping and over 80% of honey from organic beekeeping. Much of these amounts of honey gose to Germany, Spain and in the Nordic countries.

With a total production of honey exceeding 20.000 tons, Romanian consumes on average annually under half a kilo of honey, while the average Europan amounts to a kilogram and a half, and the amount of honey consumed by a northern rises above 3 kilograms per year.

So far, Romania has benefited from three national programs of beekeeping that have supported the work of those that operate in the sector and encouraged this activity and among others. National Beekeeping Programme (NAP) 2011-2013 has enjoyed great success, so that the allocated funds were absorbed 100%, where the total support amounted to over 29 million lei. The money allocated by the NAP 2011-2013 aimed among others the purchase of medicines, nutritional supplements, stimulators, purchase of queen bees, of beehives and purchase physicochemical analyzes to prove the quality of honey.

Among the most important types of honey are obtained in Romania are: acacia honey, lime honey, rape honey, sunflower honey, honey; honey and honeydew honey lavender again. Of all these honeys, honeydew that is most difficult to obtain and therefore most expensive honey in the Romanian market. Honeydew honey is the purest, because it is collected from bee at high altitudes in the trunk of conifers located above the brow. Honeydew honey is recommended for consumption in winter because it strengthens immunity, treats anemia, colds, respiratory illnesses and stomach.

Statistical overview, the transaction number of bee colonies is administered by the Ministry of Agriculture and Rural Development, National Institute of Statistics, the Agency for Payments and Intervention in Agriculture, and the National Agency for Amelioration and Reproduction in Animal Husbandry.

[1] Student at Faculty of Management, Economic Engineering in Agriculture and Rural Development;

MATERIALS AND METHODS

The researches were based on information that refer to the number of hives and natural honey production during 2007-2014, this information or obtained by the National Institute of Statistics and economic data on import and export of honey on Romania, this informație can indicate the way of who the beekeeping sector can be developed in Romania.

RESULTS AND DISCUSSION

The amount of financial support allocated from the state budget through the Ministry of Agriculture and Rural Development, allocated to the National Beekeeping Programme for the period 2014 - 2016 is 44,545,756.82 lei.

This stream from support provided by the Ministry of Agriculture and Rural Development, particularly through national programs Bee led the last 7 years, the number of bee colonies to grow rapidly, so that in 2007 their number was 982,368, while in in 2014 it was 1,350,998, representing an increase of 37.52% compared to 2007.

The only region that registered an upward trend is represented by Bucharest-Ilfov region with a fall of 37%, so that an explanation for this decrease is that beekeepers preferred to carry on flocks of bees in places less polluted and less stressful for them and the disappearance of the areas were the bees could procure food.

Table no.1.

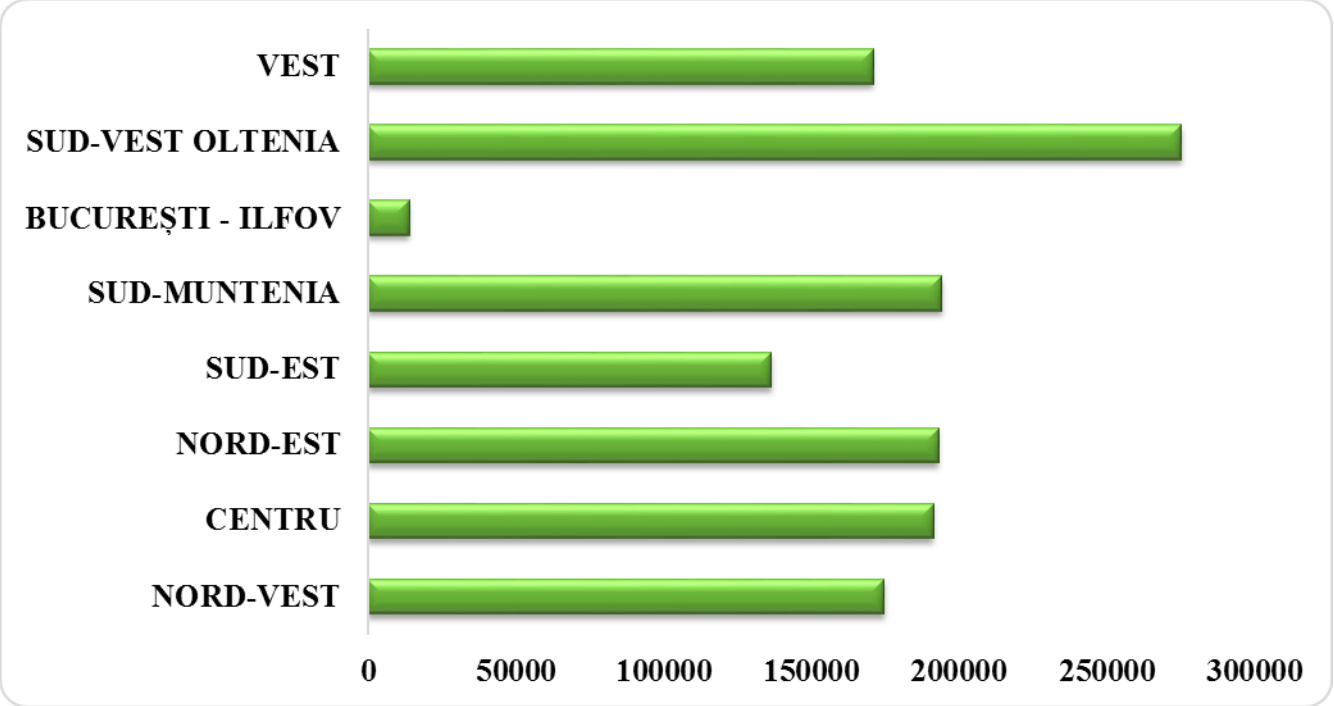
The evolution of the bees colonies in the period 2007-2014

Bees colonies	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
	U.M Number of bees colonies							
Northwestern Region	128.863	126.541	129.207	170.269	162.294	162.351	170.933	174.834
Central Region	145.051	145.446	154.062	184.046	185.463	188.778	195.713	191.442
North East Region	138.702	138.247	143.653	178.685	170.837	170.731	195.333	193.306
South East Region	127.034	128.494	136.211	152.529	150.510	141.234	138.325	136.689
South Muntenia Region	145.949	150.878	164.742	193.084	184.822	185.561	192.110	194.209
Bucharest – Ilfov Region	22.444	21.870	16.072	19.207	17.752	18.882	18.248	13.959
South West Oltenia Region	141.516	145.373	173.917	197.052	209.892	218.345	270.707	275.499
West Region	132.809	141.510	139.322	180.045	168.040	168.157	172.849	171.060
TOTAL	**982.368**	**998.359**	**1.057.186**	**1.274.917**	**1.249.610**	**1.254.039**	**1.354.218**	**1.350.998**

Source: National Statistics Institute;

If in 2007 the region with the largest flocks of bees was a South-Muntenia, in 2014 this changed, first place is occupied by the South-West Oltenia. In both regions ware registered significant increases, only the South-West Oltenia presented a much higher growth than the South-Muntenia, from 2007 that first region showed an increase of over 33% and the other region over 94%.

Graphic no. 1.



Status of bee colonies in 2014

In the year 2014 the largest flocks is in the South-West Oltenia region with 275 499, and the opposite is screened Bucharest - Ilfov region with only 13 959 bee families.

Increasing the number of bee families is not reflected as they should and natural honey production during 2007-2014. Relating to the year 2007, increased production of honey is only 7%, compared to the reported increase in the number of bee families (37%), taking the same reference.

Table no. 2.

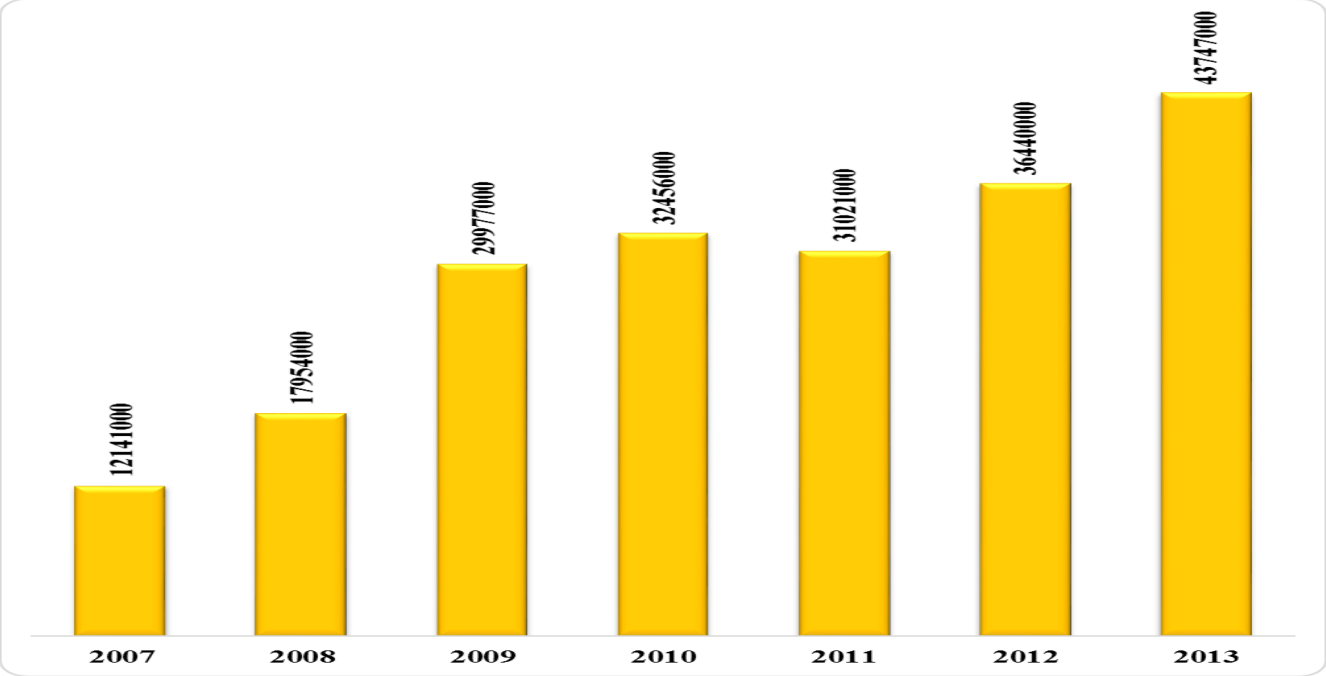
Production of natural honey during the period of 2007-2014

Development regions	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
	U.M: Tons							
Northwestern Region	1.780	2.525	2.421	2.771	3.159	2.910	3.117	2.291
Central Region	2.627	2.982	3.207	2.891	3.466	3.354	3.958	2.533
North East Region	2.435	3.360	2.544	3.894	3.692	3.368	3.433	2.711
South East Region	2.334	2.464	2.553	2.650	2.728	2.922	3.130	2.246
South Muntenia Region	2.216	2.742	2.693	3.592	3.318	3.395	4.152	2.688
Bucharest – Ilfov Region	337	392	304	225	215	219	379	171
South West Oltenia Region	2.582	2.819	3.464	3.409	4.037	3.797	4.491	2.718
West Region	2.456	2.753	2.751	2.790	3.512	3.097	4.018	2.682
Total	16.767	20.037	19.937	22.222	24.127	23.062	26.678	18.040

Source: National Statistics Institute;

The region has experienced the most rapid decline was represented this time Bucharest-Ilfov region with a fall of over 90% reported in 2007. We can say that the region which found the highest production of honey was the Southern West Oltenia, which holds the largest number of hives. Reporting us at 2013, we can say that all regions recorded decreases of over 20% in honey production, and in some cases exceeded 50% (Bucharest-Ilfov region).

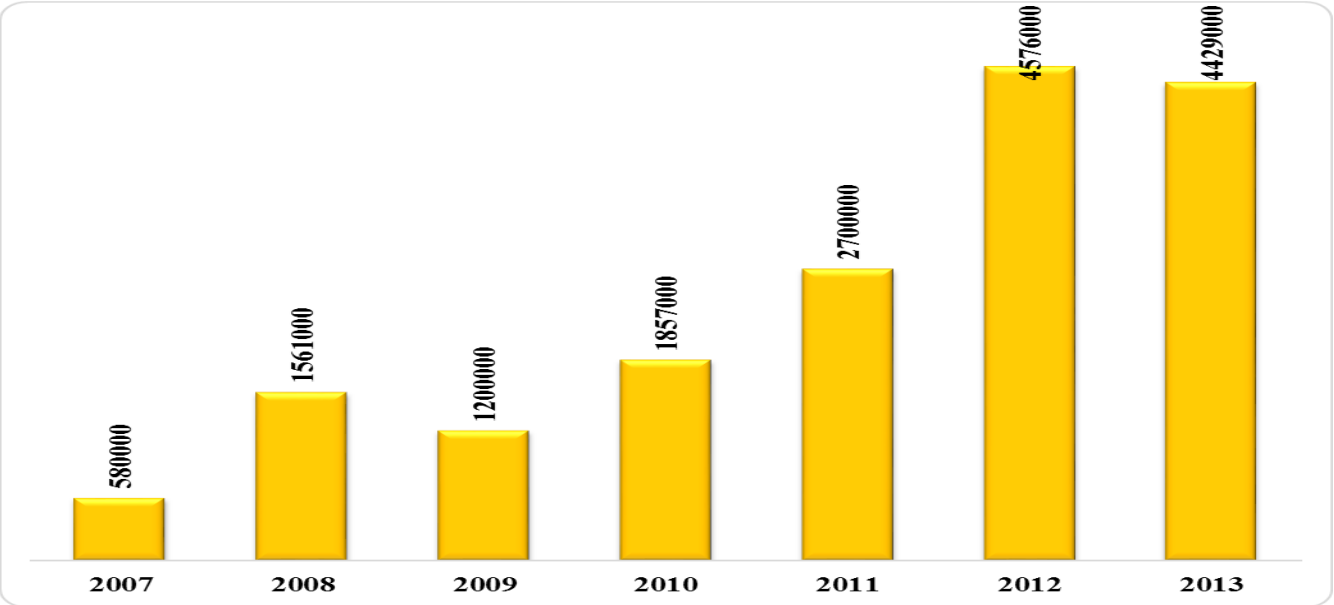
Graphic no. 2.



The evolution of export value of honey in 2007-2013 (EUR)

Exports of honey in terms of value registered a general upward trend, with a single fall recorded in 2011 (31.021.000 euros) compared to 2010 (EUR 32.56.000). The value of exports in 2013 was over 3 times higher than in 2007, registering a difference between the two periods of over 31 million. The growing demand for honey is provided by countries like Germany, Spain, especially Scandinavian countries who are big consumers of these products.

Graphic no. 3.



The evolution of import value of honey in 2007-2013 (EUR)

Compared to 2013, the value of imports is almost 10 times less than the value of exports. Even so, the evolution of imports recorded an upward trend, so if we compare 2013 to 2007, these values have increased over 7 times, from 580.000 euros (2007) to EUR 4.429 million (2014).

CONCLUSIONS AND RECOMMENDATIONS

It is noted clearly upward movement of the number of bee families, with the National Beekeeping programs available to support beekeepers by Ministry of Agriculture and Rural Development.

Note that it may see a decrease in the number of bee colonies during the National Beekeeping program begins and throughout there is an upward trend until the first year of future NAPs. Most likely the new National Beekeeping Programme 2014-2016 will record the same trend.

Once Romania joins the European Union and opening to new markets, exports of honey has increased, reaching in 2013 to over 43 million, largely due to importers represented by Germany, Spain, and especially large consumers of these products, namely the Scandinavian countries.

National Programmes Bee played a significant role in the evolution beekeeping exploitations, so that beekeepers were disbursed significant amounts of procurement, namely: for medicines and funds hives to control or funds hives antivarooa (100% of the purchase price of which VAT excluded) 72.79 Euro / pcs queen, 174.69 lei / pcs swarm combs, 349.37 lei / piece for beehives, 147.47 lei / pc purchase of hives to reform hives spent after their pastoral movement, but as the physico-chemical and certifying the quality of honey (which is the amount of VAT excluded).

We can say that in 2014 the number of beekeepers who have benefited from this support from the PNA was 5.391, organized into 143 associative, which were purchased 38 526 pieces of jelly, 23,297 pieces beehives, 19.71 pieces swarm package, 86,035 pieces hives, and 7 sets of physical and chemical analysis.

These decreases in quantities of honey unjustifiably long, reporting us that the number of hives has remained approximately constant, due justification beekeepers to develop a new national program beekeeping and the number of bee families would not be able to fall because they are conditioned by old programs to preserve a certain period of time.

In other words, the positive evolution of Romanian beekeeping is dependent to a very important support provided by the state through the Ministry of Agriculture and Rural Development.

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THE SOCIAL INCLUSION FAVORING DEVELOPMENT – FEATURE AND ALSO CONCEPT OF THE DEVELOPMENT STRATEGIES – ROMANIA CASE

ILIE (ȘERB) ELENA MIHAELA[1]
ȚINCU (BENA) CARMEN[2]

Abstract: *There are three features as well as concepts of the development reforms which can be identified in the European Strategy 2020, namely: the intelligent development, the sustainable development and the inclusion aiding development. The hypothesis which supports the new development policy of the EU is based on the idea that a lasting and favourable for inclusion growth is crucial in order to diminish the long term poverty. This is why the development policies aim to stimulate the human capacity so that this could head to prosperity, wealth and the creation of new work places. Romania, once considered as the most important wheat producer in Europe, has the obligation and the opportunity to apply there principals, mainly in this field, agriculture. Starting from this aspect obviously some questions can arise: "To what extent has Romania put into practice this objective of the European Union?" or "which is the satisfaction level of the population working in the agricultural field?" As a result of our inquiry we have reached a purely statistical conclusion that will be further debated and discussed. Therefore, this is the theme of our research and this idea has led us to a complex area one with a complicated historical evolution and a troubled social-economic reality.*

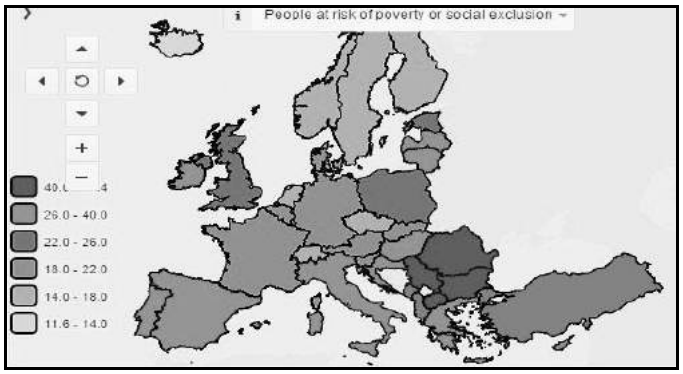
Key words: *agriculture, the sustainable development, the inclusion aiding development, the population employed in agriculture, average duration and quality of life.*

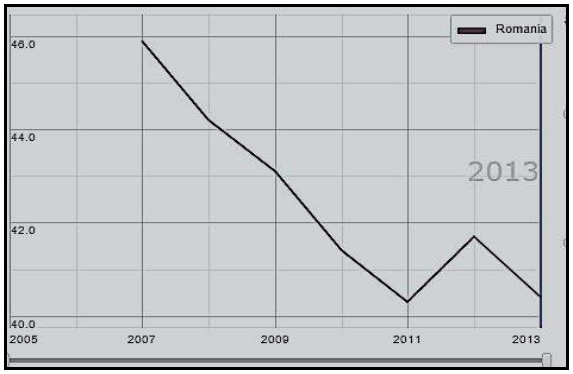
INTRODUCTION

To discuss about the politics of development of our country we have to bring into discussion the European Strategy 2020[3], which is focused on three main objectives that are mutually reinforcing, namely: *intelligent development* in terms of economy based on knowledge and innovation; *sustainable development*, by promoting a competitive economy with low carbon emissions and an efficient use of resources, *the development favourable to population inclusion* on the labor field and the fight against poverty and social exclusion.

The process of social inclusion represents the assembly of measurements and multidimensional actions from the fields of social protection, employment, housing, education, health informing-communication, mobility, security, justice and culture, to combat social exclusion and ensuring participation of people in all economic, cultural and political aspects of society.[4]

According to the chart below about the *Situation of inclusion of European population*[5] we can say that Romania falls into a high risk (40, 4%) of poverty and social exclusion.





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[2] Ph. D Student, "Valahia" University of Targoviste; E-mail address: carmen_bena@yahoo.com
[3]Strategia Europeană 2020 disponibilă online la adresa: http://ec.europa.eu/europe2020/index_ro.htm
[4] According to Art. 6 lit. c) of the Law on Social Assistance nr. 292/2011
[5] http://ec.europa.eu/eurostat/web/europe-2020-indicators

In this article we intend to answer the following questions: „*To what extent has Romania applied this objective of the European Union?"* and „*What is the degree of satisfaction of the population employed in agriculture?"*

The hypothesis we start from are the following:

- Romania has started the politic of social inclusion to fulfil the objective of social nature of the European Union 2020.
- Young people (potential farmers) are not convinced of our country's policy regarding inclusion in agriculture.

Through the applied research methods we will demonstrate the perception which people have about the policy of inclusion in employment.

MATERIAL AND METHODS

The development favourable to inclusion of population in agriculture

Agriculture in Romania, plays an important role in the rural economy, especially through the employment in villages. Although it is the most vulnerable sector of the Romanian economy, 30% of the country's population still works in agriculture using the old technology.

To highlight all the problems our country is facing in the agricultural sector we have processed some statistics[6] relating to the politics of inclusion of agricultural population.

Thus, we have analysed the evolution of some indicators such as: the total employed population of Romania on the fields of activity, the average life expectancy, the unemployed and the unemployment rate, and we caught the following aspects:

1. Romania's population, compared to Moldova during 1990-2013, from July 1

million persons

Country	1990	2000	2005	2010	2012	2013
The Republic Of Moldova	4,4	3,6	4,2	4,1	4,1	4,1
Romania	23,2	22,4	21,3	20,2	20,1	20,0

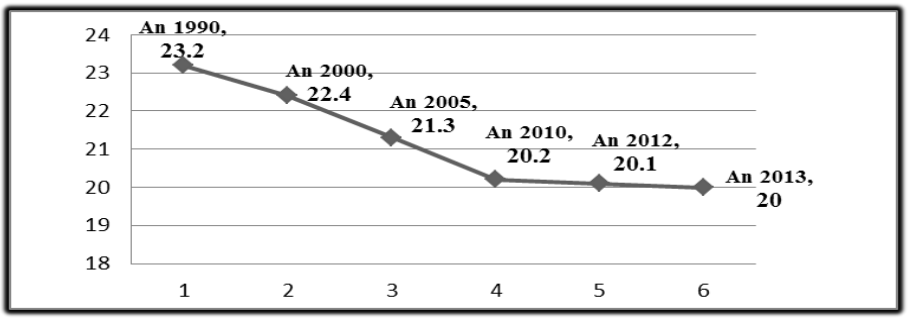

Fig.1 – The population of Romania (1990-2013)

2. The total employed population of Romania on the fields of activity, between 2010-2013

thousand persons

Country	The employed population	Structure as a percentage of total employed population, the main activities			
	SUM	Agriculture, forestry and fishing	Industry	Construction	Trade
		1	2	3	4
Romania	8605,1	29,7	20,8	7,4	14,7

[6] Processing statistical data from the statistic Annuary of Romania, edition 2014

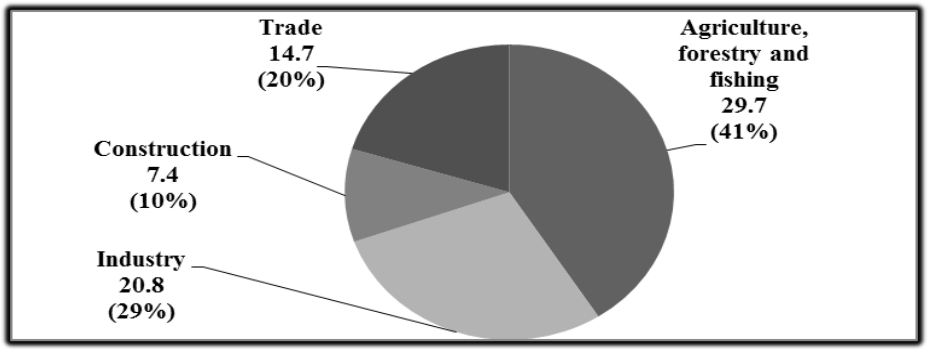

Fig.2 – The employed population at the end of 2012

3. The average life expectancy

years

Country	Men	Ladies
Romania	71	78

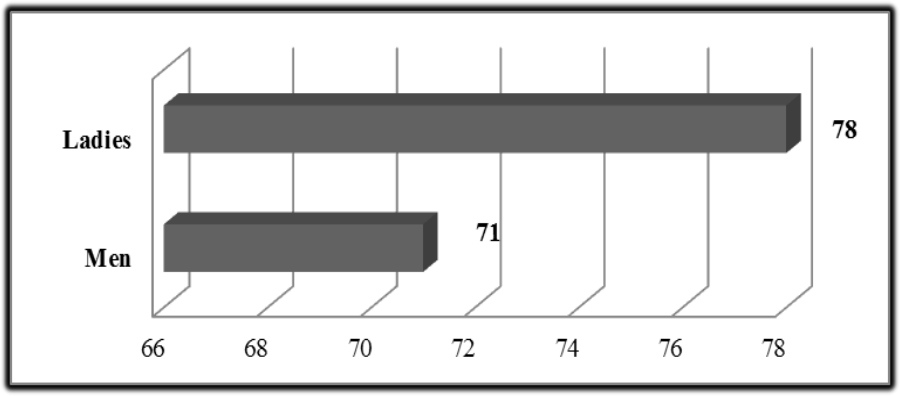

Fig.3 – Average life according to sex

4. The unemployed and the unemployment rate

Indicators	Romania				
	2008	2009	2010	2011	2012
	1	2	3	4	5
Unemployed - thousand persons	549	624	652	660	627
Unemployment rate - %	5,6	6,5	7,0	7,2	6,8

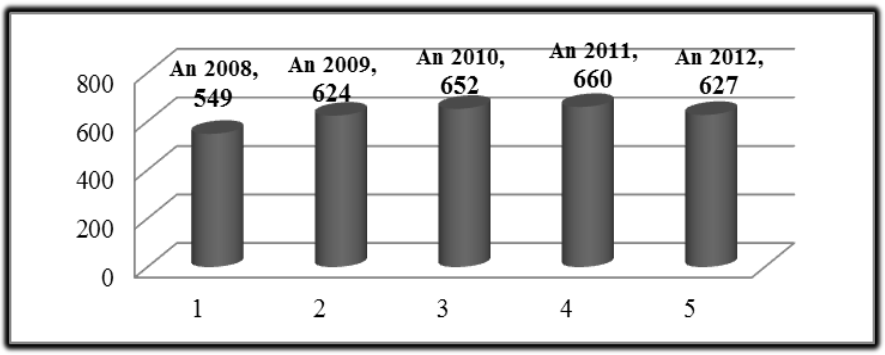

Fig. 4 – The unemployment

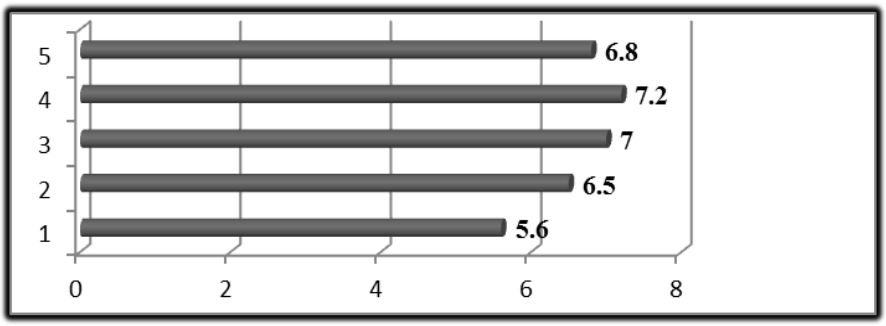

Fig.5 – The unemployment rate

Analysing all the indicators above, both under the form of a table and graphics, we notice that:

- the population of Romania is decreasing from year to year, from 23,2% in 1990 to 20,0% in 2013;
- the share of employed population in agriculture in 2010-2013 is higher (29,7%) than the population employed in industry (20,8%), commerce (14,7%) and construction (7,4%);
- referring to the number of unemployed, it has registered a fluctuating evolution from 549 thousand people in 2008 to 627 thousand people in 2012;
- also, the rate of unemployment is part of the same trend, increasing from 5,6% in 2008 to 6,8 % in 2012.

A number of factors have influenced the evolution of these indicators after 1990, among which we name: the poor living standards, perpetuating the system of employment in the fields of activity with no future, dismantling the large state companies, excessive taxation, the lack of interest towards foreign investments, the lack of correlation of the curricula with fields of activity where young people could work etc.

In this context, the European Union analysing the situation of the 28 EU state members provided them a package of financing from the European Agricultural Fund for Rural Development (FEADR) in order to modernize the agricultural exploitations, the support given to young farmers, sustainable management of land and improving infrastructure broadband.

Through the Program of Rural Development of Romania (PDR), adopted on 26 May 2015 by the European Commission were outlined the main priorities of our country for the period 2014-2020 with a total financing from European Union of 8,128 billion euros, representing a percentage of 8,18% of the total FEADR. Also, Romania will benefit of the amount of over 10, 6 billion euros for direct payments from the European Fund for Guarantee in Agriculture.[7]

The areas that this Program (PDR) will especially focus are: promoting competitiveness and restructuring the agricultural sector in Romania; environment protection and climatic changes; stimulating economic development; creating new jobs and a better quality of life in the villages in Romania.

Within the program of rural development young farmers will further benefit of financial aid grant up to 70.000 euros for the installation in the farm/opening a business in agriculture, professional training and consulting services[8].

Regarding the County of Dâmbovița, the ***agricultural production*** is represented in a balanced way on the two components: growing vegetables and livestock. The production of vegetables is oriented towards grain cereals culture, potatoes, vegetables and fruit. Thus, in Dâmbovița's County, the productions of fruit, vegetables and potatoes place the region in the category of major producers of the country. In 2011 Dâmbovița's county gave 7, 3% from the production of fruit (107, 6 thousand tons, No. 2 in the country); 7, 3% from the production of vegetables (305, 0 thousand tons, no 2 in the country); 4, 8% of potato production (194, 3 thousand tons, no 5 in the country). In

[7]http://www.economica.net/romania-va-primi-10-6-miliarde-de-euro-subventii-directe-pe-suprafata-pana-in-2020-cat-ajunge-subventia_70328.html
[8]Idem [6]

livestock production, Dâmbovița occupies the 3rd place in the hierarchy of Counties, in the production of eggs (256 million pieces with 4, 0%), the 7th place in total production of meat (48412 tons of weight in live with 3, 6%) and 20th place in the production of cow and buffalo milk (985 thousand with 2, 2 %).

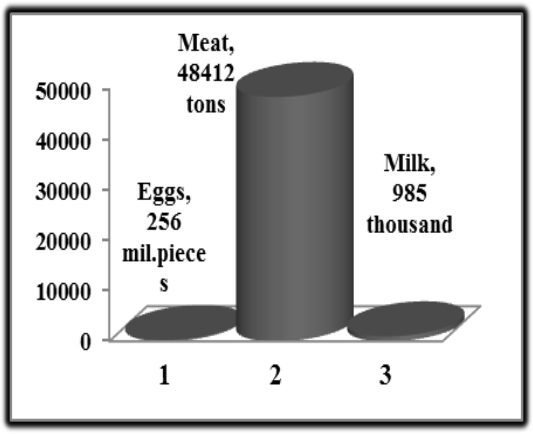

Fig.6 – The production of meat, eggs and milk

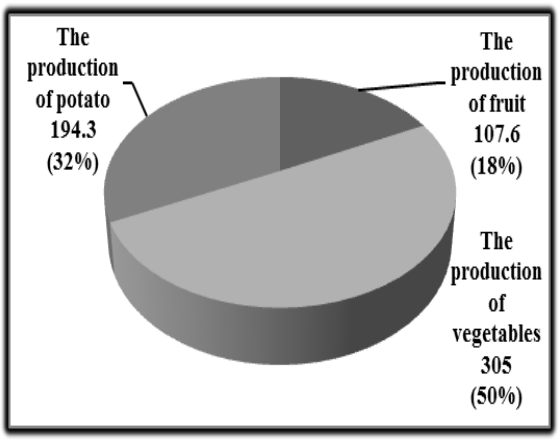

Fig. 7 – The production of fruit, vegetables and potato

RESULTS AND DISCUSSIONS

To achieve the second objective of our research we interviewed a few people with agricultural areas in very low households (having the possibility to cultivate at least one hectare) and graduates of high school who in the future can occupy a job in agriculture.

The sample included a total of 50 people in two areas of the country: one country's border and the capital area.

Thus, in Bucharest were interviewed 20 people of which: 10 were highly educated people and 10 were with secondary education, 10 of them having the status of unemployed.

In Dâmbovța's county were interviewed 30 people, 15 with higher education and 15 with secondary education, of which 28 people were unemployed (13 with higher education and 15 with secondary education).

The answers of those interviewed were represented both graphically and in a table.

The question	Answer	
	RURAL	URBAN
Living in rural or urban?	10	40

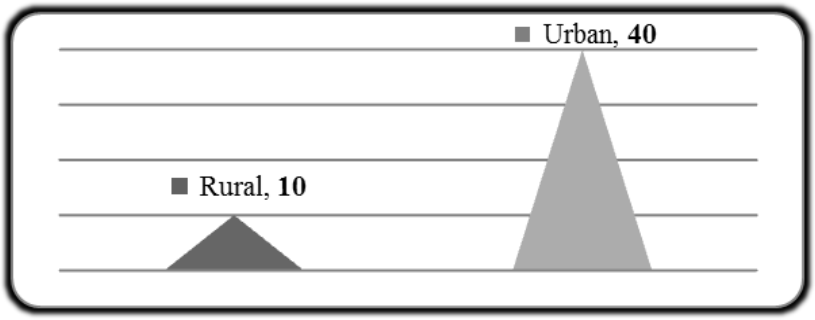

Fig. 8 – People living in urban and rural

The question	Answer				
	SUM	YES		NO	
Are you familiar with the policy of state support for young farmers Romanian?	50	11	22%	39	78%

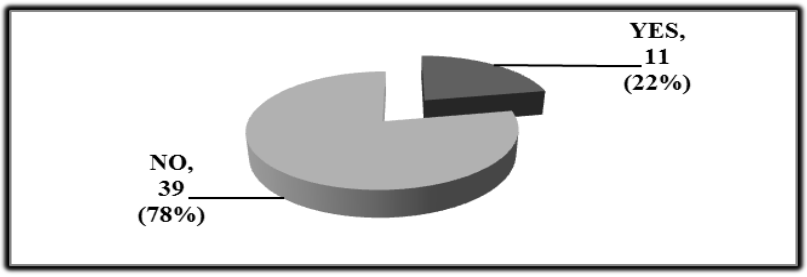

Fig.9 – People familiar with the agrarian policy

The question	Answer				
	SUM	YES		NO	
You have a steady job?	50	12	24%	38	76%

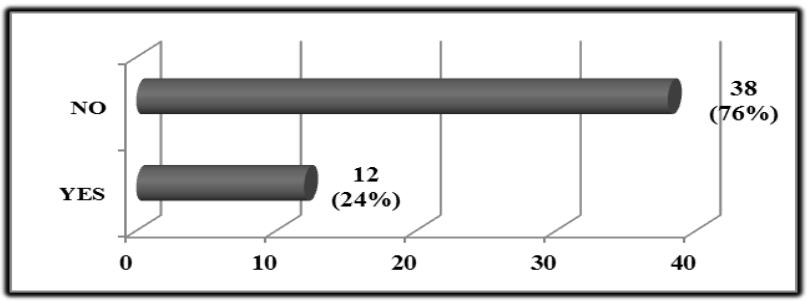

Fig.10 – Number of persons engaged

The question	Answer				
	SUM	YES		NO	
You agree to receive a support grant of 75,000 euros from the Romanian state to open a farm?	50	18	36%	32	64%

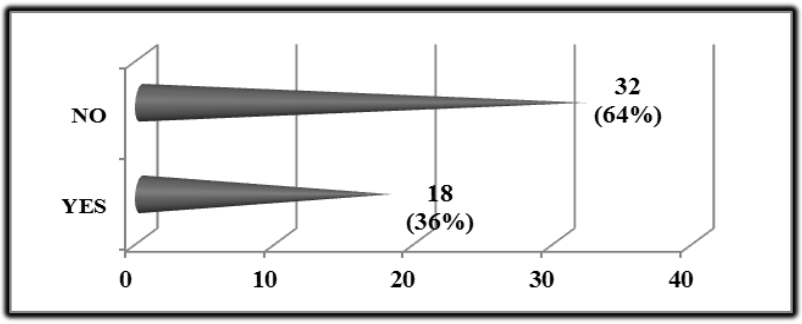

Fig.11 – Agreement for grant support from the state

The question	Answer						
	SUM	a)	b)	c)	d)	e)	f)
If your answer is negative, choose the reasons behind this choice: a) low wages in agriculture; b) lack of stable employment; c) the fierce competition of large farms; d) climate change and the environment; e) bureaucracy; f) other.	50 (100%)	10 (20%)	20 (40%)	10 (20%)	5 (10%)	3 (6%)	2 (4%)

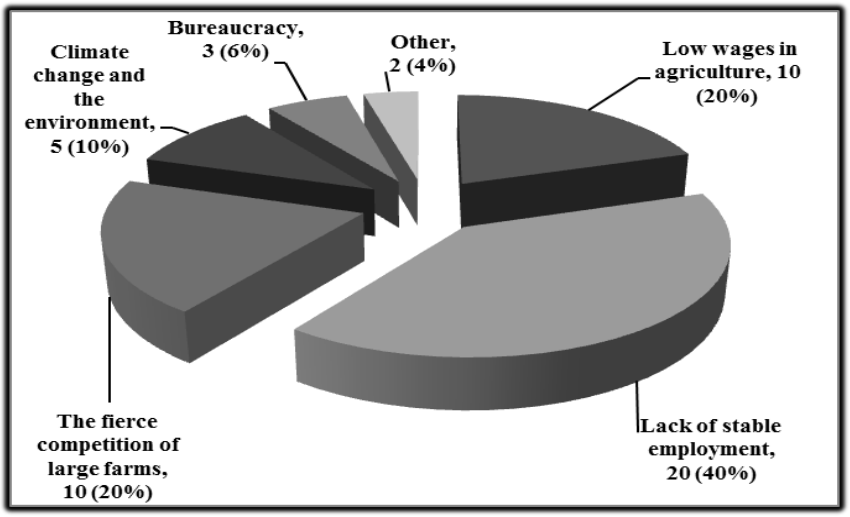

Fig.12 – Reasons for not leaving your current job

Our research based on the method of questionnaire highlighted the following aspects:

- the majority of the interviewed people live in urban areas;
- 78% are familiarized with the policy of support given by the Romanian state to young farmers;
- 24% have a job;
- 64% do not wish to benefit by the grant of 75.000 euros to open a farm;
- the reasons why these persons would not leave their current job are: instability of the job, (40%), low salary in agricultural area (20%), low wages in agriculture (20%), fierce competition of large farms (20%), climatic changes and environment (10%), bureaucracy (6%), another (4%).

CONCLUSIONS

Due to the changes in the economic-social sphere registered over the years in the Romanian society, the countryside has come to a difficult road to find their identity.

The moment of land restitution represented for small farmers a hope in increasing the quality of life in the villages. But without financial support and having outdated technology, the activity in agriculture remained, largely, not professionalized. However, the lure of urban areas, easier work and safe monthly income determined young people from villages to migrate to cities.

In this context, the rural population knows a demographic decline, being in a continuous declining and ageing.

However, almost 30 % of the population of Romania still conducts its activity in the agricultural sector.

After the research made we noticed that the majority of the interviewed people do not want to benefit from the policy of inclusion in the agricultural area proposed by the Program of Rural development of Romania, as they perceive a high risk.

Low attractiveness of the agricultural sector, as well as the decrease of the number of graduates of the schools with an agricultural profile are factors that contributed to the decrease of the level of preparation of managers of agricultural exploitations and to the removal of young farmers from the agricultural sector.

We believe that, for the development and modernization of the rural area we have to adopt the economic, social and environmental aspects of the sustainable development. Thus, among the awareness of rural population and the investments in the agricultural sector it is needed the investment in human capital through proper education, improvement of activity and the diversification of activities in the rural area.

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NON-AGRICULTURAL ACTIVITIES IN THE ECONOMIC DEVELOPMENT OF THE ROMANIAN RURAL AREA

ELENA SIMA[1]

Abstract: *The Romanian rural economy is mainly an agricultural economy, as the share of agricultural economy is 60% compared to 14% in European Union. Most farmers practise part-time agriculture, insufficiently spending the working time on agricultural activities. In total Romanian rural area, the non-agricultural economy (SMEs in industry, services, rural tourism) has a low share, while the rural tourism, except for certain mountain zones and the Danube Delta is poorly developed. In such conditions, the paper contains an inventory of the most important methods for increasing the available time used in non-agricultural activities, as alternatives for part-time agriculture, which may become an important income source for family farms. The work relies on data processed according to the European Commission Statistics (Eurostat) and the national statistics, in order to reveal the labour force employment in agriculture. The investments in the non-agricultural and food economy, while contributing to gross value added increase through the processing of agricultural and non-agricultural raw materials from local resources, has another great advantage, by creating new jobs and by using and maintaining the local (rural) labour, revitalization of rural localities, mainly those in the less-favoured and remote rural areas.*

Key words: *sustainable rural development; non-agricultural activities; investments.*

INTRODUCTION

At present, in Romania, the economic functions of the rural zones depend almost entirely by the existence of the agricultural activities. In the last decade, the economic development of the secondary and tertiary sector drew the active rural population to urban areas. Although the active population in rural areas recorded a slightly downward trend, due to the declining and aging rural population, still there is available labour force involved to a large extent in subsistence and semi-subsistence agriculture. [8] This situation explains the need for creating new, alternative jobs in the rural area, especially for the orientation of the small farmers or of the family members to non-agricultural sectors.

The employment of available labour force is a development imperative not only on the part-time farms, to which it could provide additional incomes, but also for the national economy as a whole. This is a complex process which presupposes, besides the diminution in number of the population employed in agriculture, by attracting it to other sectors, the pluriactivity development, the employment of the members of part-time farms in other non-agricultural activities. [4]

The stimulation of investments in the rural area, for the development of small and medium-sized enterprises (SMEs) in the non-agricultural economy and the processing of primary agricultural products, must become a permanent concern of the local authorities, by setting up, under the economic decentralization and decisional subsidiarity process, in the rural localities (or rural zones), with labour force surplus, of village industrial microzones, with county or regional financial support, by equipping these with the utilities necessary for industrial activities (electric, thermal power, gas, water, sewerage, access and interior roads, telecommunications etc.), according to the model of those created in the rural areas of the EU countries a long time ago. [3]

MATERIAL AND METHODS

The whole volume of information present in this article was obtained through scientific research specific methods, while respecting all its stages from the methodological point of view: identification of the investigated problem, research framework delimitation, information collection, data processing, analysis and interpretation and drawing up the conclusions.

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An important place for the purpose of the paper is held by office research, which consisted of the identification of other studies and articles that have approached the same subject, as well as of the processing of certain statistical data. As a result, the information sources used can be classified into governmental sources (statistical, ministerial and from research institutes) and non-governmental sources (independent publications).

RESULTS AND DISCUSSIONS

The economic growth, as well as the increase of the living standard, determine an increase of the entrepreneurial sector role, as more people can access funds in order to start their own business, in an economic environment able to facilitate the putting into value of opportunities. Besides these, there are also other factors that influence the entrepreneurial activity rate, such as the demographic, cultural and institutional characteristics existing at national level.

The Strategy Europe 2020 proposes three general key directions for economic growth, attainable through concrete actions at the level of the European Union and at national level:

- promoting knowledge, innovation, education and digital society;
- a more competitive production, with a more efficient use of resources;
- a greater participation to the labour force market through the acquirement of skills and fight against poverty.

The Strategy Europe 2020 is meant to be a solution for getting out of the present crisis, through actions at community level so as to create an economy – of the 21st century – which is intelligent, sustainable and inclusive; this could lead to employment increase on the labour market, to productivity growth and increase of the economic, social and territorial cohesion. [6]

The rural economy is more developed and more dynamic if it has a more diverse structure. The non-agricultural economy consists of extractive and processing industry, food and light industry, wood and forest products harvesting and processing, cottage industry, agro-tourism activities and services.

In the sector of agriculture, forestry and food, competitiveness increase leads to the improvement of performance, the revitalization of the rural areas and the creation of new jobs; this aspect was mentioned in paragraph 1 “The development challenges” of the Partnership Agreement, which is the national document that describes the way in which Romania has in view to use the EU funds in order to reach the goals of the Common Agricultural Policy in the period 2014-2020. [6]

In order to promote labour force employment in the rural area, the European Commission has proposed a series of measures to stimulate the economic activities in the countryside and to encourage the local development initiatives through support to projects targeting the establishment of micro-enterprises and consolidation of local action groups.

Thus, the **diversification of rural activities in the rural area** contributes to the creation of new alternative or additional income sources for the rural population, as the main possibility to increase the occupation of available time in the rural areas.

By diversification we understand any income - generating activity that does not depend on any agricultural work, but it is connected to the farm. This refers, among others, to: agro-processing, wood processing, aquaculture, energy production from renewable sources for the market, contracts for hiring working equipment, tourism, housing and other leisure activities, craftsmanship. [1]

By the diversification of the farm activity, an equilibrium could be reached between the agricultural activity, other forms of rural development and the preservation of natural resources, while the multifunctional role of farmers could acquire other dimensions – that of food or non-food producers, suppliers of services, rural entrepreneurs. [4]

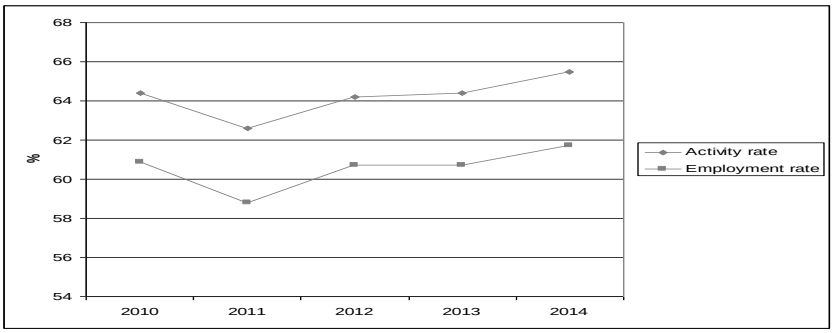
Business environment development in the countryside, contributing to the preservation and development of traditional activities, also leads to the diminution of rural – urban disparities.

In a modern economy, starting from the principle that labour movement is much more expensive than the movement of materials and products, most countries modified their policy with

regard to enterprises location, and they moved the enterprises towards the labour force and not inversely. The displacement of labour implies massive investments and complex social phenomena. On the contrary, the location of small and medium-sized companies in the rural area means economy diversification, labour employment, increase of the economic power of rural localities and their overall development.

In Romania, at present, most rural people are working in agriculture, forestry and fisheries. In the year 2011, both the activity rate (62.6) and the employment rate (58.8) of the population in the rural area had lower values compared to previous years (Figure 1).

Figure. 1. Activity rate * and employment rate * in the rural area, in the period 2010-2014



*Calculated in relation to the working-age population (15-64 years).
Source: Romania's Statistical Yearbook, 2010-2014 data series, NIS.

The creation of new enterprises had been proceeding well up to 2008 but stalled during the recession and has yet to fully recover. However, the number of agricultural enterprises increased across the years in the investigated period (Table 1).

Table 1. Evolution of the number of active economic and social operators of national economy

Operators type	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Enterprises	410383	450666	480910	520228	555128	541836	491956	452171	472342
Agricultural holdings	11794	12510	13347	14221	14407	15112	15240	15152	16080
Non-agricultural Enterprises*	394519	433030	461812	499857	533976	519441	470080	430608	449482
Private entrepreneurs	410642	381468	324700	330438	306879	307777	290960	280377	278078
Total	901414	928255	911662	957524	1002879	942876	876225	826170	850113

* Enterprises from industry, construction, trade and other services
Source: Romania's Statistical Yearbook, 2004-2012 data series, NIS.

Most of the non-agricultural enterprises are involved in trade activities due to the fast recovery of investments and minimum necessary expertise in the organization of such activities; at the same time, the industry and services are not developed in conformity with the market demand. Except for two branches, i.e. food industry and timber industry, there are no other industrial activities in the proper sense of the word in the rural area.

Only about one quarter of the communes of Romania have non-agricultural economic activities on their territory, organized under the form of SMEs in the extractive, processing, cottage industry and agro-tourism activities. In 2011, only 18.1% of the active SMEs with non-agricultural profile were listed in the rural area, which shows a low share of SMEs involved in carrying out these activities (industry, services and rural tourism). Yet, in the period 2005-2011, the number of rural non-agricultural SMEs increased by 16%, but the effects of the crisis from the last years led to a decrease in number of these. [6]

The decrease of the number of workshops providing services and handicraft cooperative units generated severe compression of the social economy from rural areas. In 2010, out of the

2,017 cooperatives, 42.5% were crafts cooperatives where traditional activities were carried out (crafts, handicrafts). [8]

Business development in the rural areas features great differences across regions, as an effect of the insufficient material resource exploitation, of the deficient education, of the low level of utilities, as well as of the massive rural-urban migration or out-migration to foreign countries. Romanian businesses proved to be less resilient during the recession. The most problematic factors for doing business in Romania are corruption, tax rates, government bureaucracy and inefficiency, access to finance, tax regulations, inadequate infrastructure, inflation and an inadequately educated workforce.

The access of SMEs to funding remains a problem. In terms of territoriality, financial services are generally less accessible to rural areas enterprises and to the agricultural sector, due to high credit costs. Although financial mechanisms (guarantee schemes) were in place, some of the beneficiaries who signed financing contracts under the 2007-2013 NRDP did not succeed to access credits for investment. The main reason consisted in the non-existence of an agricultural credit adjusted to the specificity of agriculture. The requirements imposed by the banking institutions for accessing funds (e.g. for guarantees) are similar to the ones applied for any other company or SME, being impossible to fulfill. The insufficient specialization of crediting services was directly reflected in the guarantee system for agriculture, which was not used to its planned capacity, and, implicitly, in the limited level of accessing the program and the high level of project cancellations among selected beneficiaries. [8]

Development of small-scale business is an important source for employment/income earning, and the analysis of rural SMEs shows a low ability to provide jobs for population.

The diversification of the non-agricultural utilization of available resources in the rural area makes it possible to develop an entrepreneurial environment oriented towards:

- *productive non-agricultural activities,* such as:

- light industry (leather-made items, footwear, woolen and fur items, knitware, household appliances, odor control products, etc.);
- industrial processing of wood products (e.g. furniture), starting from the timber stage;
- industrial processing of meat and milk products;
- fine mechanics, assembly of machines, tools and household appliances, production of packages, etc.

- *craftsmanship activities*, handicraft and other non-agricultural traditional activities with local specificity (processing of iron, wool, pottery, embroidering, manufacturing traditional musical instruments, etc.), as well as their marketing (small selling shops of own products obtained from these activities).

- *services for the rural population*, such as:

- tailoring, barbers' shop, shoemaking;
- private kindergartens;
- internet connection and diffusion;
- mechanization, transport (others than the purchase of transport means), phyto-sanitary protection, sanitary-veterinary services and artificial insemination of livestock;
- repair of machines, tools and home appliances.

- *renewable energy production* by the procurement of equipment for producing energy from renewable sources other than the bioconsumable sources;

- *commercial activities* (small shops for the sale of own products obtained from agricultural and non-agricultural activities, as well as of those of local, regional, national or global origin, with agricultural or industrial character);

- *financial-banking and advisory services*;

- *rural tourism activities, ecological tourism etc*.

The development of micro-enterprises as well as of small and medium-sized enterprises plays an essential role in the European economy, where these represent a significant source of incomes and of promoting the entrepreneurial, innovation skills and job creation.

In Romania, for the period 2014-2020, NRDP provides support to the non-agricultural enterprises in the rural area under measure **M6 – "Farm and business development"** and has two sub-measures - 6.2 "Support to the establishment of non-agricultural activities in rural areas" and 6.4 "Investments in the creation and development of non-agricultural activities". [8]

The goal of the support granted under the measure M6 will stimulate the business environment in the rural area, contributing to the increase in the number of non-agricultural activities in the rural areas, as well as to the development of the already existing non-agricultural activities, job creation and increase of the rural population's incomes. At the same time, the support targets the farmers or members of agricultural holdings who wish to diversify their economic activities by the practice of non-agricultural activities in order to increase their incomes and create occupational alternatives.

The sub-measure 6.2 "Support to the establishment of non-agricultural activities in rural areas" has in view: *the diversification of the rural economy* through the increase of the number of micro-enterprises and small enterprises in the non-agricultural sector, development of *services* and creation of jobs in the rural area and encouraging the maintenance and development of *traditional activities*.

Under **the sub-measure 6.4 "Investments in the creation and development of non-agricultural activities"** support is provided for the micro-enterprises and small enterprises in the rural area that create or develop new activities in the countryside.

The modern approaches from the governmental strategies prioritize the actions and measures have in view to remove the constraints to private initiative in the rural areas through:

- Support to the private sector in the identification of investment opportunities;
- Strengthening the existing labour force and supporting to its re-qualification in order to meet the requirements of private investors in the rural areas;
- The adjustment of the education curricula in the rural areas to the specific conditions of the communities or regions, so that the young people can get jobs more easily;
- The increase of the quality of public administration in the rural areas;
- The public infrastructure improvement in the rural areas;
- Supply of technological assistance at the level of communities for the identification and coordination of public investments efforts.

The Governments have always recognized the problems in the rural area and the lower living standard compared to that in the urban area. At the same time, the problems generated by the fewer opportunities to find jobs in the rural area have been included on the governmental agenda, together with the support to job creation and environment protection. Several governmental strategies existed and still exist, trying to coordinate the efforts and resources of different ministries and governmental agencies (agriculture, labour and social protection, administration and environment), so as to generate a critical mass necessary for rural area development.

Yet these strategies have not generated the expected results, not even with regard to the increase of competitiveness of agricultural activities and to rural area development. The causes of failures are, in general, the top to bottom approach of the different strategies, the non-involvement of the authorities and of the rural communities, the systematic non-allocation of the funds that have been initially foreseen and the absence of certain priorities to be maintained for a long time period.

CONCLUSIONS

In a modern economy, starting from the principle that labour movement is much more expensive than the movement of materials and products, most countries modified their policy with regard to enterprises location, and they moved the enterprises towards the labour force and not inversely.

The location of small and medium-sized companies in the rural area means economy diversification, labour employment, increase of the economic power of rural localities and their overall development.

In Romania, the rural economy is by tradition associated to agriculture. This situation explains the need to create alternative jobs in the rural area, mainly by orienting the small farmers or the members of their families towards non-agricultural sector.

The statistical data reveal that agriculture, food industry and forestry are of primordial importance for the rural economy. The presence of non-agricultural activities in the Romanian rural area, related to the primary sector, and mainly to the exploitation of natural resources and their processing, are non significant in economic terms.

The analysis of SMEs in the rural area reveals their low capacity to respond to the need to supply jobs for the rural population. Small-scale business development is recognized as the most important source of jobs and incomes in the European rural area.

In the present socio-economic context, the creation and promotion of entrepreneurial initiatives put into operation a viable mechanism for the rural communities development. In order to obtain good results in the entrepreneurial activity in Romania, the following aspects should be taken into consideration:

- Infrastructure improvement to support business through the creation and development of industrial parks and businesses incubators;
- The continuation of the bureaucracy diminution process in the establishment and operation of the new enterprises;
- A better information of population as regards the governmental programs for private initiative stimulation;
- The promotion of the successful business stories of the Romanian entrepreneurs at larger scale.

The business environment development in the rural area, according to the principle of activity field prioritization, contributes to:

- Diversification of agricultural and non-agricultural activities and job creation in the rural area;
- Increase of rural population's incomes and narrowing the disparities between the rural and the urban areas;
- Fostering the maintenance and development of traditional activities.

In the future, with the continuation of the reform in education, the conditions of entrepreneurial spirit development could be changed. The success of such changes depends on how fast and how much the administrative and managerial capacity of local authorities will be improved.

The investments in the non-agricultural and food economy in the countryside, besides adding value to products through the processing of agricultural and non-agricultural raw products from local resources, has another great advantage, in the sense of creating new jobs, through the utilization and stabilization of the local (rural) labour force, the revitalization of the rural localities, mainly of those localities from the less-favoured and remote areas.

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THE TOURISM SEASONALITY IN ROMANIA

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Abstract: *One of the problems which establishments managers must deal with is the seasonality from tourism. The seasonality causes may be natural (the seasons succession, climatic conditions), the variety and the cultural values attractiveness, the frequency of events (fairs, festivals, etc.) and economic and organisational (structure of the school year and university year, holidays, increasing the length of leisure time and its redistribution, habits, etc.). In this paper we pursued the seasonality calculation at the country level by calculating the coefficient of the seasonality of accommodation and overnight stays, resulting, for the period 2010-2013, for a total tourist structures an obvious seasonality. The magnitude of seasonal variation and their frequency of manifestation has consequences on the development of tourism and its efficiency, as well as other sectors of the economy, branches that tourism develops in interdependence.*

Keywords: *tourism seasonality, accommodation capacity, overnight stays*

INTRODUCTION

In touristic activity, the seasonality is reflected on the one hand, in a significant underspending of the technical-material base and workforce, negatively influencing the cost of tourist services and their quality, the recovery of investments, profitability, and on the other hand the low level of serving the needs of consumers in this way affecting the development of the tourist circulation. Tourism seasonality presents a series of particularities compared to other sectors of the economy, due to the high dependence of tourist circulation toward natural conditions, the tourist services nonstock character and the rigidity of the supply.

This must be regarded as an objective reality which marks profoundly the entire activity of the agents involved in tourism. It is found at all levels of decision-making and interests all the suppliers of tourist services.

Based on these factors which determine the contents of the tourist market, we can say that it is characterized by a number of features, including:

-is a market with specific purpose, tourists aiming at obtaining some special satisfaction, representative for this sector of activity;

-It is a fragmented market, a result of confrontation between highly heterogeneous offer and demand determined by the subjective preferences of tourism consumers;

-it is of a special complexity in time and space, because the tourist offer is seen initially in a subjective manner, as an image constructed from information circulating between the potential and actual tourists, becoming objective only in the moment of actual consumption;

-is a market on which acts more decision-makers, the purchase act of a touristic product may be influenced by a number of participants;

-present a higher risk degree, the bidders uncertainties being more numerous than in the case of material goods market.

-presents a seasonality, being characteristic for the other forms of tourism.

MATERIAL AND METHOD

The accommodation capacity seasonality analysis is carried out mainly with the help of the seasonality coefficient whose formula is (simple arithmetic mean method):

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$Ks = \frac{\bar{CA}_t}{\bar{CA}_T}$, where: $\bar{CA}_t$ = accommodation, overnight stays as monthly or quarterly averages and

$\bar{CA}_T$ = the overall average monthly or quarterly of accommodation capacity or overnight stays

The higher the value of the coefficient of seasonality tends to 1 the seasonality is smaller, while the removal from 1 reveals a high seasonality.

The seasonal variation calculation consists in determining the part of the annual total that is owed to each of the twelve months of the year. The calculation is done for a number of years, for compensation for some accidental monthly variations. In this series of statistics must be removed the trend, and what remains represents the seasonal variation, which is expressed as an index or the seasonality coefficient.

The link between the tourist offer (accommodation) and tourist consumption (the number of overnight stays) was done by calculating the correlation ratio that expresses the intensity of links between the two phenomena analyzed) using the formula:

$$r = \frac{N\sum xy - \left(\sum x\right)\left(\sum y\right)}{\sqrt{N\sum x^2 - \left(\sum x\right)^2} * \sqrt{N\sum y^2 - \left(\sum y\right)^2}}$$

where **x** represents the capacity of accommodation and **y** the overnight stays.
Statistical significance of the correlation report was done with Fisher test.

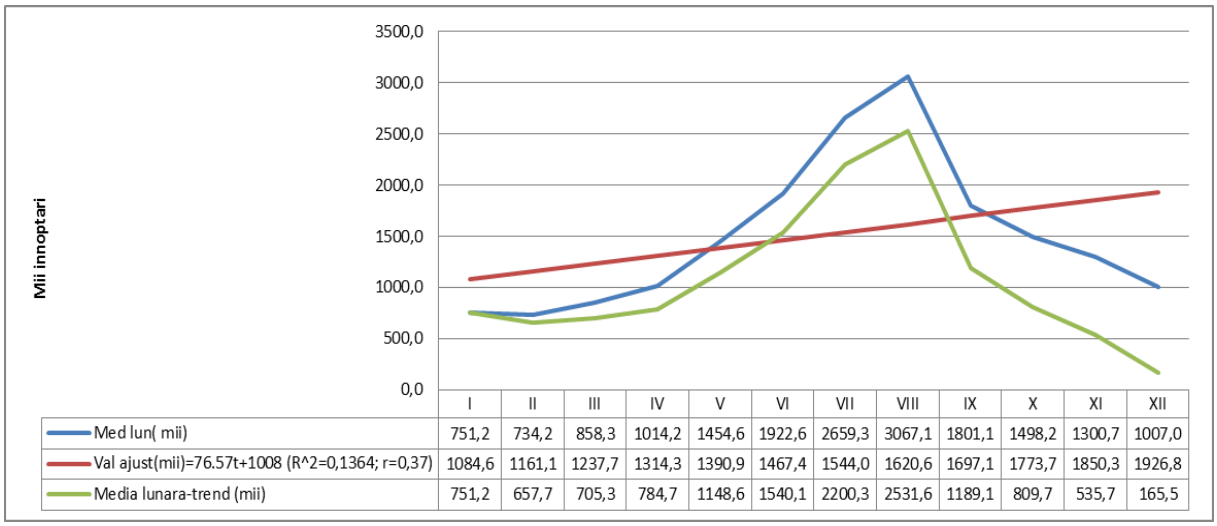
RESULTS AND DISCUSSION

The seasonality coefficient was calculated at country level for the offer of tourist accommodation , through the monthly accommodation capacity , and for the tourist product consumption through monthly overnight stays. The seasonality coefficient is given by the activity share of the month in which it was obtained the highest number of overnight stays in the number of overnight stays on the entire range (calendar year). If the coefficient is 0.833 % indicates a uniformity in the activity of economic units, and if it is greater than a certain 0.833% denotes some seasonality which emphasizes with the increase of the coefficient of seasonality.

At the country-level the seasonality of seasonal tourist accommodation capacity and overnight stays tourist structures on the total for the period 2010-2013 is obvious.

The accommodation capacity coefficient is during July and august of 1.45 de 1.40, when we have the maximum of tourism, but that can be extended from May to September when the figure is higher than 1.

Fig. 1. The overnights monthly trend, on total tourist structures, at the country level, for the period 2010-2013

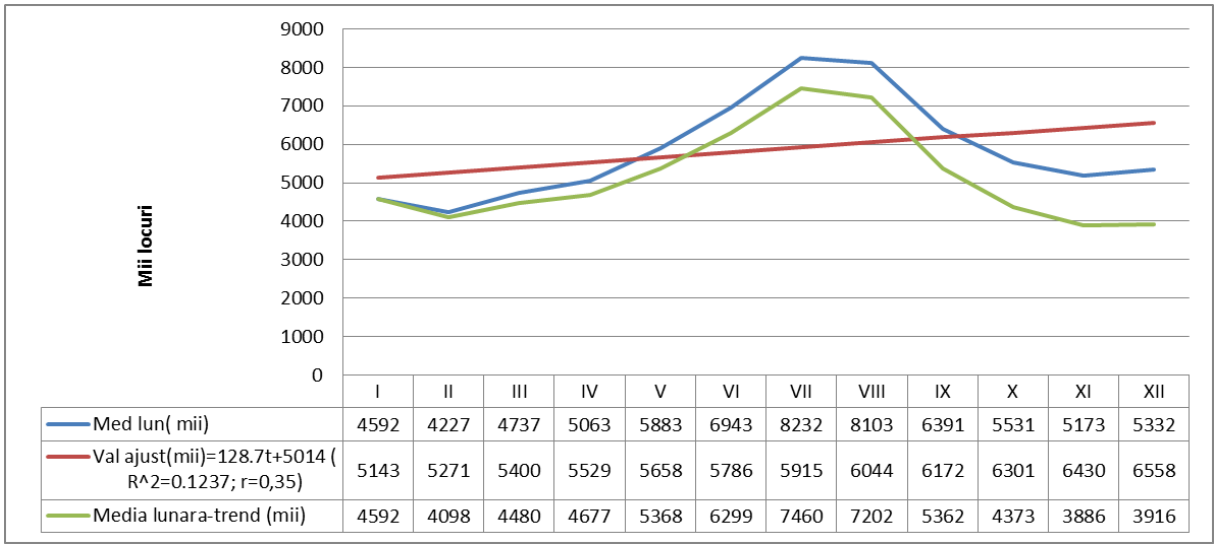


	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Med lun(mii)	751,2	734,2	858,3	1014,2	1454,6	1922,6	2659,3	3067,1	1801,1	1498,2	1300,7	1007,0
Val ajust(mii)=76.57t+1008 (R^2=0,1364; r=0,37)	1084,6	1161,1	1237,7	1314,3	1390,9	1467,4	1544,0	1620,6	1697,1	1773,7	1850,3	1926,8
Media lunara-trend (mii)	751,2	657,7	705,3	784,7	1148,6	1540,1	2200,3	2531,6	1189,1	809,7	535,7	165,5

Processed by: * INS, 2014 Database TOURISM-TEMPO, h ttps://statistici.insse.ro/shop/?page=tempo2&lang=ro&context

Adjustments in the monthly trend in overnight stays were made using a linear regression equations, where resulted the adjusted value(thousand overnights) at the level of country = 76.57t+1008(R^2=0.1364; r=0.37)

Fig. 2. The monthly trend for accommodation capacity, on total tourist structures, at the country level, for the period 2010-2013



	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Med lun(mii)	4592	4227	4737	5063	5883	6943	8232	8103	6391	5531	5173	5332
Val ajust(mii)=128.7t+5014 (R^2=0.1237; r=0,35)	5143	5271	5400	5529	5658	5786	5915	6044	6172	6301	6430	6558
Media lunara-trend (mii)	4592	4098	4480	4677	5368	6299	7460	7202	5362	4373	3886	3916

Processed by: * INS, 2014 Database TOURISM-TEMPO, h ttps://statistici.insse.ro/shop/?page=tempo2&lang=ro&context

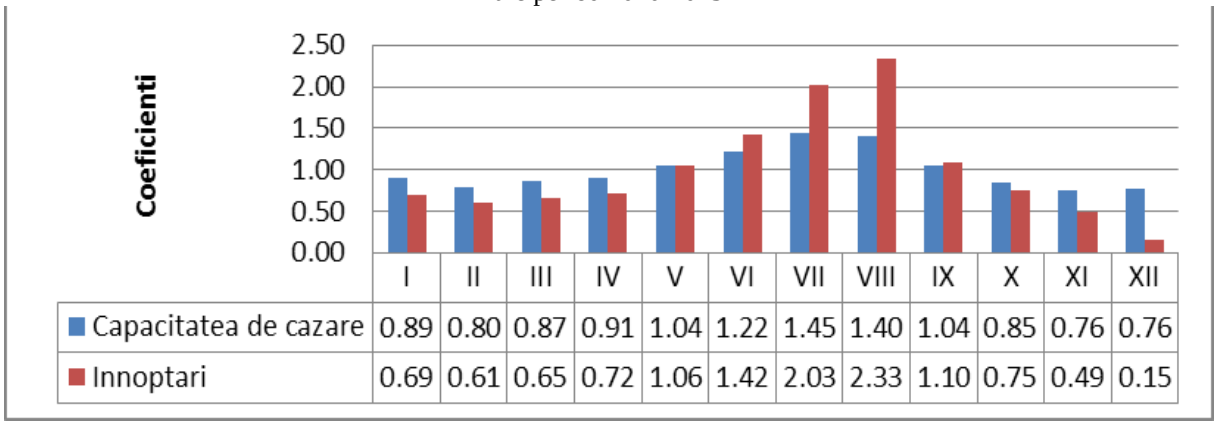
Accommodation capacity trend adjustment was done using a linear regression equations, where resulted the adjusted value (thousands persons) of total accommodation capacity = 128.7 t + 5014 (R ^ 2 = 0.1237; r = 0.35)

Table 1. Differences between seasonality coefficients of supply capacity and total tourist overnight stays at the country level, for the period 2010-2013

Coef of seasonality	Month												
	MU	I	(II)	III	IV	V	VI	VII	VIII	IX	X	XI	(XII)
Accommodation capacity	No	0.89	0.80	0.87	0.91	1.04	1.22	1.45	1.40	1.04	0.85	0.76	0.76
Overnight stays	No	.69	0.61	0.65	0.72	1.06	1.42	2.03	2.33	1.10	0.75	0.49	0.15
Deviations	No	-0.20	-0.19 per	-0.22	-0.19	0.01	0.19	0.58	0.93	0.05	-0.10	-0.26	-0.61
	%	*77.5*	*76.1*	*74.6*	*115.9*	*101.4*	*115.9*	*139.8*	*166.6*	*105.1*	*87.8*	65.3	20.0

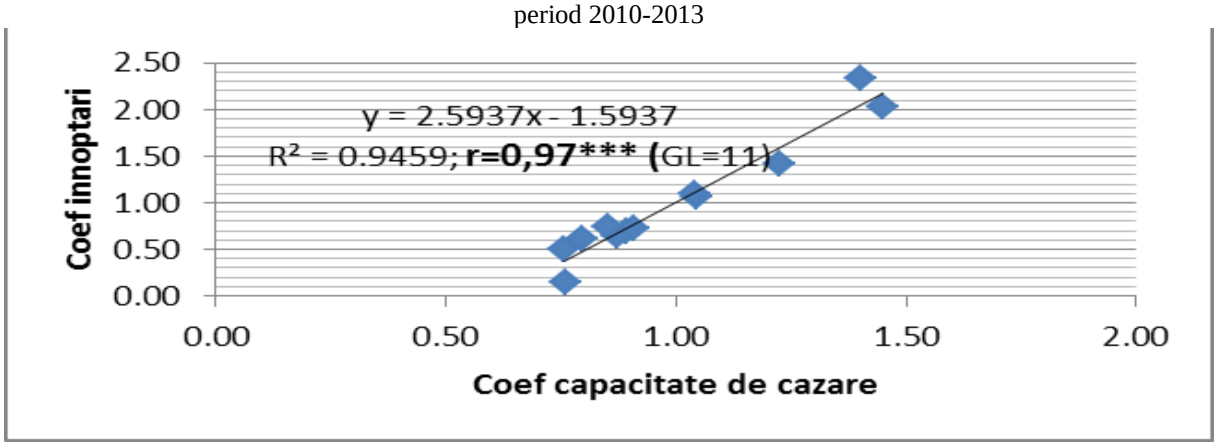
Processed by: * INS, 2014 Database TOURISM-TEMPO, h ttps://statistici.insse.ro/shop/?page=tempo2&lang=ro&context

Fig. 3. The monthly seasonality coefficients of accommodation capacity and overnight stays, at the country level for the period 2010-2013



	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Capacitatea de cazare	0.89	0.80	0.87	0.91	1.04	1.22	1.45	1.40	1.04	0.85	0.76	0.76
Innoptari	0.69	0.61	0.65	0.72	1.06	1.42	2.03	2.33	1.10	0.75	0.49	0.15

Fig. 4. Correlation between the total accommodation capacity and the total overnight stays at the country level, for the period 2010-2013



The correlation between the total accommodation capacity and total overnights at country level for the period 2010-2013, is obvious through r = 0.97*** (GL = 11), which is very significant.

It is interesting that by analysing the number of overnight stays at the country level is found that also between May and September seasonality coefficient is more than 1 , with a maximum in July and august of 2.03 and 2.33.

CONCLUSIONS

1. The study undertaken shows a obvious seasonality for the period 2010-2013. Between the two sets of coefficients of monthly seasonality, there is a very strong correlation, that is, a correlation coefficient of 0,97***, proving a good organization of the activities.
2. Measures to be taken to minimize the effects of seasonality are:

- adjustment of supply to market demands and providing facilities for rates and attractive prices for tourist services in periods of low season.
- Attracting tourists in low season periods by the intensification of activities for enhancing attractiveness of sightseeing.
- Intensification of marketing, launching and improving advertising actions for promotion of tourism in the tourist extra season.
- A very important measure is the diversification of touristic offer by providing combined stays with the use of other elements of attraction in nearby areas or other areas of interest.
- the formulation of the company's marketing policy through extensive and sustained efforts to adapt the touristic offer to the specific needs of the tourists.

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TRAVEL TO BARCELONA, CITY THAT STILL BELONGS TO SPAIN

PETRICĂ ŞTEFAN[1], FLORINA ŞTEFAN[2], ROMEO CĂTĂLIN CREŢU[3]

Abstract - *For more than 20 years, « Turisme de Barcelona » has been compiling indicators about tourist activity in the city based on fieldwork carried out in house and already existing sources. The main results are obtained by conducting surveys of hotel managers and tourists visiting the city. The data generated has been gathered in reports and publications since 1989. The multiplier effect of tourism on the economy of the Barcelona city and the province is very significant: 25% of the impact affects sectors not directly considered as tourism. In terms of demand, the variety of profiles is very wide, which helps reduce seasonality in activity during the week and throughout the year. Tourism in Barcelona is characterised by a wide variety of departure origins and by its international market trends, which has not stopped growing: 80% of tourism demand comes from overseas markets. In doing so, we've concentrated on answering your most important questions on transport, accommodation, activities and attractions.*

Keywords: *grow, heritage, province, travel, tourism,*

INTRODUCTION

This Barcelona tourism and travel information is updated daily and includes money and time saving tips from people living in Barcelona city so check back frequently for valuable updates.

If you have any questions about your trip take a look at our *frequently asked questions section (FAQ)* with hundreds of popular questions already answered it can help you quickly find the answers you need.

In addition to essential Barcelona tourism information, you will also find dozens of time and money saving tips from local people - information hard to find anywhere else. These special tips will make your Barcelona city break that much more special.

Each year thousands of football fans from all over the world flock to Camp Nou - the home of Barcelona FC. With the stadium's capacity of almost 100,000 people, the grounds are a Mecca for football fans around the world. I visited the stadium on a normal Thursday afternoon in February to find out all about the now infamous Barcelona FC Stadium and Museum Tour. This tour is the most popular of all tours in Barcelona. There was no match taking place on the day that I visited, but still crowds of fans were at the stadium, paying their respects to the 'shrine to football' in Barcelona. It's true to say that Camp Nou is more than just a stadium, just as Barcelona FC is said to be 'more than just a club'.

MATERIALS AND METHODS

To help us find the answers as quickly as possible, Barcelona tourist information has been grouped into 2 main categories:

1) If you've **already made your decision** to come to Barcelona then I recommend you go to the top of the page and type in your question into the search bar. This search bar will search every page on our site (of which we have several thousand pages) and present you with the answers to your questions. This is the **single quickest and easiest way for you to find answers to your questions**. Alternatively you can search through our menu on the left hand side. Please be aware however that we have many more thousands of pages that we can't put links to on the left menu and you are more than likely going to miss what you are searching for this way.

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2) If you need **help in making your decision** whether Barcelona is the right destination for you we recommend you visit our photo Barcelona map that has over 500 photos of the top Barcelona tourism attractions linked directly to the map. Using the interactive map will show you first hand the most important landmarks and attractions - it's almost as if you were walking around the locations for yourself. I've also included guide notes to give you information on each of the sites and areas.

	2014	2013	% Var 14/13
Tourists in hotels	7,874,941	7,571,766	4.0%
1. Spain	1,618,007	1,517,378	6.6%
2. France	680,415	636,903	6.8%
3. United Kingdom	676,867	629,969	7.4%
4. United States	654,131	627,412	4.3%
5. Germany	486,416	453,102	7.4%

Source: *Turisme de Barcelona* based on data from Idescat and the INE

As with food in general on Barcelona, prices are quite high (dinner mains start at around €20.00). However, I went to try the restaurant's Menu del Dia - a three course set menu, costing €10.00. What the food lacked in quality, it made up for in quantity and nice touches - free olives at the start of the meal and a plate of cake and biscuits at the end were a welcome surprise at such affordable rates.

RESULTS AND DISCUSSIONS

Lively and colourful Barcelona faces the Mediterranean Sea and features the world's top city beaches, including Sant Sebastià, Barceloneta and Somorrostro beaches. There is plenty to see and experience in this city of great architecture: the historic Gothic Quarter, the amazing modernist design of Gaudi’s creations and the popular Las Ramblas.

Barcelona is famous for its street performances, colourful markets and great Catalan dining. Easy to explore on foot or using the reliable metro, the city is full of things to do and views to see!

Discover the hidden squares and architectural pearls of Ciutat Vella and visit the locals’ favourite meeting spot, La Plaça Catalunya. Wander the sunny beachfront or watch an FC Barcelona game at Camp Nou, the largest stadium in Europe.

The city’s most popular food quarter is Barceloneta with plenty of popular restaurants serving seafood and tapas. If it’s shopping you’re after, visit the Grácia and return to the Ciutat Vella for small shops full genuine souvenirs, designer fashion and fresh produce. Getting to Barcelona is an easy trip from El Prat International, Girona or Reus Airports. Find modern hotels, fancy apartments and cheap hostels on Booking.com, sure to have the perfect accommodation for your holiday!

Sagrada Familia Basilica

La Sagrada Familia

Its multicolored towers piercing the blue sky, La Sagrada Familia is no doubt the most iconic structure in Barcelona. The church, located in L'Eixample, has been a fixture in Barcelona since construction commenced in 1882 and as building continues on today the structure's fame only grows.

Though still a work in progress, the church already is an amazingly intricate structure. Antoni Gaudí spent 43 years on this project and, since his death in 1926, the duty to finish it has been passed on to several architects. Though the responsibility continues to change hands over the years, the architects have all respected Gaudí's vision and have made additions with his design in mind.

While most of the work has been done to the exterior, there is still much to see inside the church. Impressive stained glass windows line the main room and a lift takes visitors up one of the towers to enjoy the view. Smaller rooms hold exhibits detailing the history and future of the structure. La Sagrada Familia is projected to be completed in 2026, the 100th anniversary of Gaudi.

The finished product will have 18 towers: 12 for the apostles, 4 for the evangelists, 1 for the Virgin Mary and 1 for Jesus Christ. The tallest, saved for Jesus Christ, will stand more than 1.5 times higher than the existing tallest tower. Already the tallest building in the area, La Sagrada Familia will surely not be hard to find! Some edits to Gaudí's original plan have been made though, as his models were lost in a fire that destroyed his workshop during the Spanish Civil War.

Explore the beauty of Barcelona on this Best of Barcelona Tour, which offers a comprehensive view of this exquisite Catalan city, including a visit to La Sagrada Familia. Perfect for first-time visitors, the tour will show you the city's most iconic sights and allow you to discover some of Barcelona's best-kept secrets. You'll enjoy skip-the-line access at La Sagrada Familia, so you can avoid the long queues at this popular attraction. You'll also visit the hill of Montjuïc and the Gothic Quarter. On this small-group tour, you'll receive personalized attention from your guide.

Highlights

- Full-day or half-day sightseeing tour of Barcelona
- Skip-the-line access to La Sagrada Familia
- Panoramic view of Barcelona from Montjüic hill
- Drive through the Example, Barcelona's modernist centre
- Walking tour of Barcelona's Gothic Quarter, including the 2,000-year-old Roman temple
- Why our insiders chose this tour.

Look no further if you want a superb highlights tour! Whether you have a full day or just a morning, this small-group experience shows you Barcelona's most distinctive neighbourhoods and allows you to bypass the long lines at La Sagrada Familia.

Start with a drive to Barcelona's famous hill of Montjuïc, the site of the 1992 Olympic Games, which offers excellent views over the city. After a brief stop at the Catalunya National Art Museum, continue down to Plaça Espanya and on past the modernist buildings of the Eixample area.

On your way to the Sagrada Famlia, you'll go through Passeig de Gracia, home to designer stores and two of Barcelona's most renowned Antonio Gaudí buildings – La Pedrera and Casa Batlló.

Skip the line at La Sagrada Familia and avoid the very long queues. Your guide will give you a comprehensive tour of the exterior before taking you straight past the long lines and into the magnificent interior of this famous structure, where you will have some free time to explore on your own.

You'll then head to the oldest part of Barcelona, the Gothic Quarter, where you'll leave the bus and enjoy a stroll through the narrow streets of medieval Barcelona. From there, travel back to the early Middle Ages, visiting the Jewish Quarter, the Royal Palace, the original 2,000-year-old Roman temple and part of the Cathedral.

Continue to the *Born* district, where you'll have free time for a quick lunch before heading to the magnificent Santa Maria del Mar church, one of the most beautiful in Barcelona, where your tour ends at approximately 1pm.

CONCLUSIONS

Barcelona is one of the main urban tourist destinations in the world. Its ability to attract tourism is a driver for a much larger area and this contributes to its development. Barcelona has to carry out the role of capital of Catalonia and the Mediterranean.

For visitors, Barcelona represents a variety of tourist attractions and sites that can be visited from wherever the tourist is staying. Barcelona's area of influence has a rich collection of tourism elements that make it a powerful international leader with excellent infrastructure that also provides services to a wider area. But Barcelona is much more than the city. The province of Barcelona offers a world of possibilities to enjoy leisure activities, culture and nature. Barcelona Coast, Barcelona Countryside and Barcelona Pyrenees are the three tourism brands used in the wider province of Barcelona which has eighteen tourism areas including sea and beaches, inland countryside, art and cultural heritage, and *enotourism*, as well as the rich history of an important industrial past, of traditions, commercial activities, and more. Barcelona is a valuable asset in terms of tourism and for this reason there is a lot of effort being put into mutual collaboration between the city and the wider area it influences, based on a win-win approach that can be beneficial for both parties. From a customer-orientated perspective, which is understood well by tourism business owners in the city, further efforts are being made to develop the competitiveness of Barcelona's tourism.

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COMPARATIVE ANALYSIS OF THE EVOLUTION OF VEGETABLE PRODUCTION BETWEEN THE PERIOD AFTER 1989 REVOLUTION AND THE PERIOD WHEN ROMANIA JOINED EUROPEAN UNION

DUMITRU EDUARD ALEXANDRU[1]

Summary: *Romanian agriculture has been subjected to cyclical periods difficult enough over a short period of time. After the passing of the revolution, Romania has traveled through a difficult process of transformation and the results were not observed or are not seen, the evolution of Romanian agriculture continued with the period before Romania joined EU, during this period of time agriculture received financial suport, that was named SAPARD, but without visible results on the agricultural sector. Most likely this range of 2014-2020, is the last train that can save Romanian agriculture, if it wouldn't be taken seriously we won't get another chance.*

Keywords: *development of agriculture, the European Union, crop production.*

INTRODUCTION

After the 1989 revolution, Romania has entered into a comprehensive restructuring process, especially in agriculture, which has suffered through the destruction of the former forms of organization in agriculture (C.A.P), which culminated with the destruction of the main system of irrigation, things that contributed to high productions that Romania register itself with the pre-revolutionary period.

Once Romania joins the European Union in 2007, along with Bulgaria, besides opening new markets, the main advantage was the European funds (RDP 2007-2013) that both farmers and producer groups, they could access for upgrading and creating new agricultural activity. In light of these considerations it is necessary to identify the main vegetable crop yields compared between post-revolutionary period and the post-accession to the European Union and to identify measures that can help improve this aspect. Previously, Romania has benefited from European funds in the pre-accession, specifically between the years 2002-2007, with programs titled "SAPARD" that has being offered by the EU financial instruments for candidate countries in the pre-asccession in the field of agriculture and rural development.

Also the new National Rural Development Programme, developed for the programming period of 2014-2020, helps Romanian farmers and producer groups, in another form, but with higher amounts that are available, intended to support agricultural development.

MATERIALS AND METHODS

The research it is based on information of the production that has been obtained by Romania during the period of 1990-2014, using the data processing provided by the Romanian National Institute of Statistics,but also the date about the cultivated areas in the same period, making a parallel between the period after 1989, and the period after accession, since the year of 2007, taking into account certain factors.

In this category will be included land indicators to identify how the land is use, the area cultivated with various crops, and here it will be taken into account representative crops, crop production and the average productions per unit area.

RESULTS AND DISCUSSION

Before 1989, Romania was considered the "breadbasket of Europe" managed to register the most higher harvests in terms of quantity and the romanian farmes managed also to compete on an

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equal footing with countries with an entire experience and tradition in agriculture, such as France or Germany.

After the 1989 revolution, Romania has entered into a comprehensive restructuring process, both in general, but especially in the agriculture field, where the land that was abusively taken during the communist period, was restored to the rightful owners. With these formerly retrocessions, the land that was compact in the previous period, was chopped excessively, and it still remained one of the major problems of Romanian agriculture.

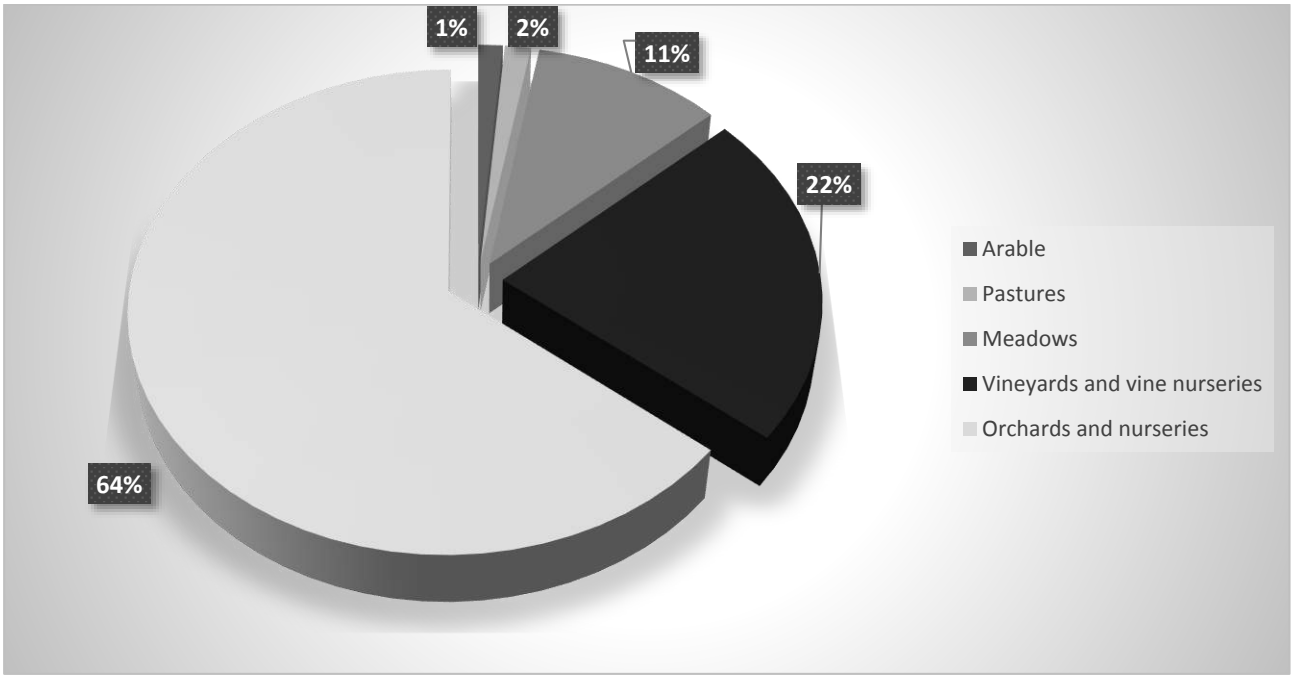
Another fact which contributed to a higer production in terms of quantity and quality was a principal system of irrigation, but after the revolution this irigation system was left unattended and it was stolen by thieves, that is way in this moment the principal irrigation system it hardly exist. In the new National Programme for Rural Development, Ministry of Agriculture and Rural Development will facilitate the development of secondary irrigation systems, using sub-measure 4.3 - Investments for development, modernization or adaptation of agricultural and forestry infrastructure, where the projects can be funded up to 1.5 million euro.

To restore it primary system of irrigation Romania, through the Ministry of Agriculture and Rural Development has submitted a project to the plane Junker (which provides for the establishment of a new European Endowment for strategic investments in partnership with the European Investment Bank), where he plans to obtain funding in the amount of one billion euros, an amount considered sufficient to restore the main irrigation infrastructure for all Romanian agriculture land.

Regarding the level of technology, Romania continued to use old Romanian tractor U650, until now. Although these, once Romania joined the European Union and the first measures where opened, measures that were aimed to support and encourage the Romanian agriculture, the park of agricultural machinery has been changed in well, so Romanian farmers have to buy new high performance machines, that support them to have very good yields per unit area, encouraging the reducing losses when it comes to production or the consumption of fuel of these machines.

In Romania, the farming land was located over the post-December period at around 14.6 million hectares, making a slight decrease compared to the period immediately after our country joined EU. Regarding how Romanian farmers use the land, this aspect remained unchanged, so that more of the agricultural area it consists of arable land 60%, followed by pastures and hayfields, with approximately 22% and 10% . At the opposite pole it lies the vineyards and vineyards nurseries and orchards and orchards nurseries.

Graphic no. 1



Share of agricultural land in Romania in 2013

Most of the arable land in the period between 1990 - 1997 and after Romania joined the European Union was occupied by crops wheat and corn, this crops also registered some fluctuation in terms of cultivated area. The market trends have influenced the cultivation of smaller areas or larger of main crops sach like corn, or wheat, but a substantial change was recorded for rape, in 2014 the rape was cultivated on an area of over 400.000 hectares, compared with the period immediately following by revolution when this crop was cultivated on only 13.000 ha. This distribution played an important role both Romanian supplementing farming incomes, and at the all country level, because the selling price of rapeseed is quite high. In the year of 2013 the price of a kilo of rape was 1.57 lei. At the opposite it was placed the barley crop that in 1990, the cultivated area of barley was over 650,000 hectares, but in 2014 this area was it was reduced by half.

In the period that followed the revolution we find that generally, the evolution of the production that were otained in the vegetable sector is one that was fluctuating, this aspect was directly influenced by the surface on which they cultivate each crop and the absence of irrigation systems that could contribute to achieve bigger and constant production. Also during this period it is found that corn and potatoes were the main source of food for the households in rural areas, and this would explain that the total production of corn and potatoes recorded levels throughout the country, much of this can be found in the private sector, contrary to the other crops like barley crop, where only half are found in privately-owned. In the case of rape, obtained privately-owned yields almost did not exist, at least until 1997.

Tabel no.1

Comparative evolution of total average production for the years 1990-1997 and the years 2007 – 2014

Main crops	**Total average production for the years**		**The dynamics of productions**
	1990 - 1997	**2007 - 2014**	**The period after accession / The period after the revolution**
	Kilo/ha	**Kilo/ha**	**%**
Total wheat	6.483.547	6.935.759	6,97
Barley	1.853.250	782188	-57,79
Oat	438.660	386.317	-11,93
Corn	10.526.237	9.954.697	-5,43
Sunflower	898.329	1.656.679	84,42
Rape	5.220	738.411	14044,64
Total potatoes	3.447.574	4.000.007	16,02

Source: NIS - Query TEMPO-Online

The comparison between the two periods analyzed in the case of barley, oats and corn is one situated on a descendent trend. One explanation would be: Romanian farmer reorientation to other more profitable crops due to higher sale price for sunflower and rapeseed. If the total average of rapeseed production in the period 1990 - 1997 was only 5.220 kilo, in the period immediately following the joining of Romania to the European Union the total producction was situated at about 738 tons.

The obtained productions in wheat, barley, oats, maize and potatoes have remained relatively the same line, with production recorded immediately after the revolution obviously related oscillations, so that the problem of lack of irrigation systems remained until now. In terms of the culture of sunflower and rapeseed, the total production achieved are outstanding, trading culture whose price is much higher for other crops. In 1990 sunflower production was approximately 550.000 tons, while the end of 2014, it was nearly four times higher, exceeding to 2 million tons. So if the rape culture registered an production of only 10,800 tonnes in 1990, in 2014 the same production reached more than 1 million tons, registering an increase of nearly 100 times.

After the period after when Romania became a member of European Union, it can be noted that over 95% of total production registered throughout all the country was obtained in the private sector compared to the period 1990-1997, when much of the productions were obtained in the public sector.

Tabel no.2

The average of agricultural production per ha recorded in the period 1990 - 1997 or 2007 – 2014

Main crops	**Total average production for the years**		**The dynamics of productions**
	1990 - 1997	**2007 - 2014**	**The period after accession / The period after the revolution**
	kilo/ha	**kilo/ha**	**%**
Total wheat	2952.86	3346.57	13.33
Barley	3514.14	3494.29	-0.57
Oat	1707.00	2028.00	18.80
Corn	3555.86	4060.29	14.19
Sunflower	1432.57	1772.71	23.74
Rape	1195.86	2048.14	71.27
Total potatoes	13734.14	16776.29	22.15

Source: NIS - Query TEMPO-Online

In Romania the productions registered are heavily influenced by weather conditions, so that the construction of an mainly functional irrigation system is more than necessary. Regarding wheat, an average made between the average yields per hectares during the period 1990 - 1997 is somewhere around 3000 kg, compared to the period between 2007 and 2014 where the average is over 3.300, registering a production growth of over 13% in the period after accession to the period after the revolution.

The most spectacular increase was recorded at the rape culture, with over more than 71%, compared to the period after accession to the European Union (where average production during this period was 2.048 kg/ha) and after the revolution (where average production during this period was 1.195 kg/ha), followed by the average yield for sunflower (23.74%) and potatoes (22.15%). The only decrease in the production media developed between the average yields between the two periods under examination, is recorded at the barley culture, with a decrease of 0.57%.

CONCLUSIONS AND RECOMMENDATIONS

Romanian agriculture has been subjected to cyclical periods difficult enough over a short period of time. After the passing of the revolution, Romania has traveled through a difficult process of transformation and the results were not observed or are not seen, the evolution of Romanian agriculture continued with the period before Romania joined EU, during this period of time agriculture received financial suport, that was named SAPARD, but without visible results on the agricultural sector.

Since 2007, Romania joined the European Union, along with Bulgaria. Also during this period it was drafted the National Rural Development Program, designed to support investment in agriculture, by grants. Of all the European programs available at the country level, one focused on agriculture has the highest absorption, however recordeing a positive impact on Romanian agriculture.

On the other hand Romanian processors had to adapt to a new legislative regulations imposed by the European Union and were put in front with strong competitors that come form all Europe.

The new RDP 2014-2020 is still largely the same axis with the old program, but also bring several new aspects that are including: the reducing of bureaucracy, by removing the documents necessary to access grants and the opening of new measures to support the rebuilding the secondary irrigation system.

Unfortunately, if they do not invest in the main irrigation system, most likely secondary system will not have the expected goal through these measures. Another major issue is the level of

complexity of the feasibility study, on which the farmer recive the grants, and this study for a farmer with no education, seems impossible to write, and they are obligated to go to a consulting firm that will help the farmer to take the money form the EU. A reduction in the complexity of these feasibility studies could provide equal rights to each farmer who needs support.

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TECHNICAL-ECONOMIC ANALYSIS ON A COMMUNITY AGRICULTURAL COOPERATIVE IN THE VILLAGE OF, IN THE COUNTY VIDRA, ILFOV CASE STUDY

DINICĂ MARIUS[1]

Summary: *In Romania, agricultural cooperatives are important pieces in the development of rural areas with permanent changes in the development of vegetable, vegetable harvesting, storage and marketing of products designed to consumption. Agricultural cooperatives contribute to improving the productivity of small farms and make possible access to product marketing, savings, credit, insurance and technology. Agricultural cooperative organization of production is determined on conditions such as: market demand, financial resources, natural environment, income, market risks. At the same time agriculture is the main source of income in rural areas.*

Keywords: *cooperative agricultural, productivity, farm, market.*

INTRODUCTION

The Vidra vegetable agricultural cooperative , established in January 2013 started out with 12 members, commune Vidra growers in Ilfov County. The action was carried out within "Association, a chance for farmers" project a "Rural development through entrepreneurship and association"program. The project was initiated and financed by the Romanian-American Foundation (RAF) and in partnership with several foundations, one of which had a decisive role for Civil Society Development Foundation (CSDF).

For the start, FDSC conducted a survey among vegetable growers in the village and as a result most of them agreed with the idea of an association. People are still afraid to work together. Very few are those who see things in perspective and realize what means to be stronger, to be "great." Although most of them agree that the association is a solution, mistrust hinders them. When entering a cooperative many of them expect to receive something, not give, and in this form of organization they must pay taxes, fees and entrance cooperative setting. For many, of them benefits that cooperative provides, seem in insignificant.

The cooperative consist of 22 members who mostly represent the labor inside it and sometimes the staff temporarily used to cover the activities of the agricultural year. Focusing agricultural cooperative on vegetable cultivation is caused by the increasing demand for figh quality vegetable products on the market and their dedication to the sales, being sold as tinned tomatoes but at a low percentage.

MATERIAL AND METHOD

The research methodology liess analysing the information within the cooperative on a based concrete through direct interview with questions on the economic aspects of the cooperative. Information has been obtained within the framework of the cooperative (annual financial statements, management accounting, sales levels).

RESULTS AND DISCUSSIONS

The agricultural Cooperative Vegetable production profile is medium, characterized by the cultivation of early vegetables and fresh vegetable seedlings. The high demand for quality fresh vegetable products and vegetables seedlings made this cooperative satisfy consumer's requirements**.**When the cooperative was set up there were five members with a total acreage of

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20,000 square meters and goes after in two years' time it reached 22 members with a total cultivated area of 100,000 square meters.

Table nr.1

Specification	Hectars	Protected space	Unprotected space
Agricultural surface	10	8	2

Vidra is close to the capital with temperate continental climate influences, surrounded by a belt of forests which creates protect an environment against bad wather and favours the process of production. The relief is plain with a reddish brown soil rich in mineral salts, very fertile for crops.

Table nr.2

Tehnical means in use			
Equipment	**2013**	**2014**	**2015**
Atomiser	1	1	1
Tractor	1	1	1
Sowing machine for vegetables	2	2	2
Means of transport for vegetables	1	1	1
Transport trailers	1	1	1
Irrigation pumps	3	3	3
Motocultor	1	1	1

In Table. 2 There has been listed existing equipment at the disposal the cooperative, functioning at normal parameters is specially in basic activities carried out such as: soil tillage and sowing plants.

In order to know the phenomena, detecting causal links it is necessary to analyze - a research method based on breaking up the whole (either object, phenomenon, process) into its component elements, or sides or features, as well as determining the factors and causes which generated it in order to identify the nature, place, their significance and necessity of the whole question. With analysis it is possible to know the objective reality in all its complexity.

The process of knowledge of the objective reality covers the way between appearance and essence. Or to sense what is the main feature, which keeps the internal side of objects, phenomena and processes of key events taking place in their depth, with correlative analysis requires a combination of them - synthesis. The knowledge synthesis method of analysis inextricably linked, is understood as a logic operation to reunite in one all elements, factors and causes the sides and features, previously isolated by the analysis, in order to acquire full object phenomenon or process.

So using analysis and synthesis man investigates things, phenomena and processes in reality, he or she discover the structure, checks them, establishes causal relationships, factors that generates them, discoveres the laws of training and their deployment, and on this basis, makes decisions on work future. Complete knowledge of activities of objects, phenomena, requires a combination of analysis and synthesis in a unit as a means of knowledge.

Economic and financial analysis examines the business or economic phenomena, ie the consumption of resources and results. The essential economic analysis taking into the consideration the relations hips and the functional structures of cause and effect.

Methods, procedures and techniques of financial analysis are an increasingly important role in evaluating the full potential of the company. They become a real management tool to ensure effective functioning of the enterprise.

In general it can make a correlation between income and expenditure, meaning that realization of an income requires an expenditure of income, and vice versa. But there are exceptions. So for example, financial expenses as well as the exceptional do not generate revenue and achieve them at no cost. The analysis of the expenses belowging to incomes aims their

evolution and the factors determining it in order to identify the possibilities of diminishing so as to in crease profitability

Table nr. 3

Nr. Crt.	Indicator	2013	2014	2014/2013	
				Value - lei	%
1.	Total incomes, of which:	337.210	352.095	+ 14.885	+4%
1.1	Exploitations incomes	311.020	339.980	+28.960	+9%
1.2	Other incomes	26.190	12.115	-14.075	-16%
2	Total expenses, of which	271.579	282.796	+11.217	+4%
2.1	Exploitation expenses	271.002	282.003	+11.001	+4%
2.2	Financial expenses	577	793	+216	+27%
3	Financial results, of which	65.631	69.299	+3.668	+5%
3.1	Gross profit	65.631	69.299	+3.668	+5%
3.2	Net profit	55.130	58.211	+3.081	+5%
3.3	Profit rate %	0,84	0,79		

Cooperative economic results show that it had developed a profitable activity, as demonstrated by the indicators presented in Table 3. Both results from 2013 and 2014 have detertmined the accession of other farmers in to our cooperative, which led to increased production and hence profits. Product selling price was higher and because due to contracts with MEGA IMAGE and through the "miss the taste". The production process represented the largest share of operating expenses referring to the effort made by holding for growing.

The total cultivated area is distributed by the cooperative's president on three types of crops: vegetables seedlings, early vegetables fresh vegetables, with low added value and high added value.

a) early vegetables for fresh consumption with high added value: tomatoes, peppers, spinach, cauliflower, eggplant, sweet corn with a great weight due to high volume production that can be recorded on a not very extensive area to get high yields.

b) early vegetables for fresh consumption, low added value: lettuce, cabbage, greens, celery with leaves, radishes, turnips.

Tabel nr. 4

Specification	2013		2014	
	Quantity	Percentage %	Quantity	Percentage %
Tomates	120.000 kg	68,15%	144.000 kg	64,2%
Mild paper	30.000 kg	17%	42.000 kg	18,73%
Spinach	300 kg	0,17%	520 kg	0,23%
Cauliflover	5.000 kg	2,83%	7.000 kg	3,12%
Egg plant	700Kg	0,39%	1.100 kg	0,49%
Sweet corn	3.000 kg	1,7%	3.000 kg	1,33%
Lettuce	9.000 kg	5,11%	15.000 kg	6,68%
Cabbage	1.500 kg	0,85%	2.300 kg	1,02%
Greens	200 Kg	0,11%	310 kg	0,13%
Celery with leaves	6.000 kg	3,4%	9.000 kg	4,01%
Radishes	170 kg	0,09%	-	-
Turnips	190 kg	0,10%	-	-
TOTAL	**176.060 Kg**	**100 %**	**224.230 Kg**	**100 %**

In all kinds of vegetables there were recorded average yields but certain tomato varieties were large oscillations due to unprotected environment where grown and resulted in decreased quantity. It is necessary to make investments in solar and greenhouses for the purposes of the production process.

The staff of the cooperative is formed of its members and a reduced number of partially unskilled people. Calling is also made day laborers carrying out various activities such as sowing vegetables, plant maintenance and harvesting vegetables.

The Vidra vegetable cooperative accesses European funds by the RDP 2007-2013, Measure 141 "Support for semi-subsistence farms" worth 1,500 euros. The funds were used to purchase equipment, this has led to increased economic performance of the cooperative in 2 years' time.

The cooperative bought seeds, fertilizers, pesticides, prices of "wholesale" economy is sometimes 50%. To this is added the possibility to sell together, more and better prices, the beneficiaries sure, on contract. Thus money on your taxes (such as VAT) are recovered. Not to mention the time that no longer is lost by selling your own products, the stress caused by the lack of a real market, selling vegetables, and more.

Table nr. 5

SWOT ANALYSIS OF THE VIDRA VEGETABLE COOPERATIV ACTIVITY IN THE PERIOD 2013-2014	
Strong point	**Weak point**
- The existence of a wide range of vegetable products; - Financial stability regarding the profit level; - The cooperative owns a large area of fields which represents a high agricultural potential; - Contracts with the big hypermarket chains.	- Lack of a sorting line for vegetable and of a deposit for stocking products; - Unskilled labour; - Lack of a modern irigatinon system.
Opportunoties	**Ricks**
- Providing with technical equipment in order to reduce expenses; - Extention of the market on a large scale; - Staff training; - European funds accessing through the programme PNDR 2014-2020.	- Increase of cost with imputs in agriculture; - Increase of the number of local competitors.

In conclusion, we proposed the following:

• capitalize the production of vegetables of the members by firm contracts and by opening stores in major shopping areas in Bucharest;

• to ensure the requirements of the cooperative members with the means of agricultural production and facilitate their professional development;

• to develop science-based farming, according to the principles of agri-environment that protects agricultural land (the main means of production of the local community), and for consumers;

• develop community we belong to The Vidra vegetables agricultural cooperative is just beginning. We are not small,we are very small, but optimistic. Neither the West were the big start, though communism had not existed in their past. In the first year, 2013, we started shyly to sell vegetables online. We had the support of RAF which put up 100,000 dollars for a period of three years. Out of the money in the first six months we paid an Executive Director, who was also a member of the cooperative and directly responsable online sales using their own car.

Online sales were a real test for us. However quality, timeliness and reliability were decisive,. I ccan say that we did not become matter of laughter and the year 2014 was an even worse year from certain points of view. We managed to achieve contracts with a network of supermarkets in Bucharest, which obliged us greatly. In the end, however, the contracts were performed well, both sides were satisfied. Basically, by the end of November we had sold vegetables which were 480 000 lei worth which meant 12 700 euro per person. The basic vegetables we sold through supermarket chain were the following: tomatoes, lettuce, celery, cauliflower, kale, cabbage, red cabbage, eggplant and herbs.

At present, we are negotiating a contract extension phase, but we are already talking of from other positions. At the end of 2014, the number of producer members reached 19. Of these, 16 will sell products through supermarkets. We have already made a first investment: a second-hand 25 000 leiworth refrigerating van to transport 1 000 kg vegetables. Depending on the structure of

crops and the delivery schedule after an economic calculation, it will be decided whether to purchase a second van.

Also, with the financial help of RAF, we will support, in turn, the development of the cooperative members by providing them with various materials needed to upgrade existing greenhouses or we will build new ones. Finally, we are eager to initiate discussions with the National Network for Rural Development specialists in projects in which we can access European funds, Measure 16 - "Cooperation". In the near future we hope to have a deposit of vegetables, especially a greenhouse for seedlings. The fact that we are associated in a cooperative increases our chances of winning the projects we will submit.

CONCLUSIONS AND RECOMMENDATIONS

The high potential of our country is a path to develop our agricultural cooperatives, and the support of the cooperatives by structural funds (RDP) is partyculary important. The commercial success or profitability of each cooperative is largely determined by the downstream segments of chain food products: the secondary sector (processor), the third sector, and not in the least trade and end consumer.

The increase of the cooperative profitability can be positively influenced by culture or niche products, used as food adjuvants, canned foods. There is already a tendency to use industrial-type work techniques, economies of scale, high degree of mechanization.

In this regard, the developed economies are becoming a formidable competitor in the market of agricultural products benefiting from a verticallymore advanced integration. The necessity of forming of farmers groups with a technologically advanced system, agriculture is primarily a booming business that can benefit from criteria for the benefit of the farmers and turning to account some opportunities.

Supporting association is important because it is in its early stages of development and, at the same time, it is necessary to quide the mass agricultural production to processing at the level of the farm in order to increase the agricultural prodact value while exporting because the Romanian market of agricultural products is insignificant.

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THE DEVELOPMENT AND CAPITALIZING POSSIBILITIES OF THE TOURISM AND AGROTOURISM IN TULCEA COUNTY

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Summary :*Tulcea county is a very important touristic aria of our country, because it is the gate to the Danube Delta Biosphere Reservation, the place where the Danube devides in 3 arms and pours into the Black Sea, forming here a real corner of heaven with dreamlike landscapes and full of life, the third place of ecological importance in the world. Across the county there is a municipality, 5 cities, 46 parishes and 133 villages, which means that this is mainly a rural area. The living standard of the rural area inhabitants from here is not a very good one, poverty being the problem the county inhabitants are confronting for years, despite the tourism potential of the area which is not capitalized properly.*

This paper wants to highlight the problems that limit the tourist activity in this area that has a great potential in this regard and aims to also highlight a few posibilities of development and capitalizing of the tourism potential, by making a touristic and agrotouristic quality activity.

Key words*: agrotourism, tourism potential, touristic activity*

INTRODUCTION

Romania is a country with a particular natural tourism potential that is so diversified and well distributed in the territory, that, if we would harness it to the maximum, we would be able to compete on a par with the benchmark countries in tourism.

The Danube Delta Biosphere Reservation is one of the cornerstones of Romania, in terms of tourism, ranking 1st in Europe regarding beauty and scientific importance, it's the place that attracts thousands of tourists every year.

Where it pours into the Black Sea, the Danube splits into 3 smaller arms and forms a Delta, a kingdom of waters, dotted with floating islands and full with the raufo and rush-bed forest, in which thousands of species of beings live, some of them protected by law, due to being endangered.

Representing the third place in the world in terms of ecological importance, this protected place could attract like a magnet the tourists that are keen on spending the free time in nature, in a landscape that doesn't exist anywhere else in Romania.

Due to the abundance of flora and fauna that exists here, these places are real treasures, corners of heaven, for researchers– who come here to study plants and aninal species that are endangered or even unique in the world, hunters or fishermen – avid with hunting and sport fishing, or for the tourists that love sailing.

But, despite the unique natural abundance that exists here, the inhabitants of these regions are confrunted with poverty, their living standard being at the poverty line.

Because most of the inhabitants live here in the village, the rural tourism and agrotourism activity could help them live a better life.

The condition would be to target touristic activities, to offer a tourism product with a higher quality than the one that is offered now and to emphasize the product that they want to trade, in order to also attract tourists from other countries.

MATERIAL AND METHOD

As a method of researching the tourism potential in this area, assessing the capitalizing, the level of this potential and the tourism development posibilities, we used the SWOT analysis of the

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county in terms of tourism, whereby we could determine the existing problems and elaborate a few proposals regarding the tourism and agrotourism development in Tulcea county.

RESULTS AND DISCUTIONS

Given the fact that approximately half of the Tulcea county is occupied by the Danube Delta reservation, meaning wetland and that only 12,9% of the dry surface here represents farming lands [1], we get a first conclusion, that the tourism and agrotourism activity can be a main source of capitalizing and economic progress of the county, right after fishing, who is ranked first at present time as an activity that unfolds in the area and brings profit.

Also, by looking at the statistic data performed by The County Statistics Department– TULCEA, from the administrative organization of the county's territory we notice that the rural areas predominate (in the county's territory there are 133 villages, 46 parishes and 5 cities) and that the living standard of the rural inhabitants is a very low one. [2]

Also from the statistic data provided by The National Institute of Statistics, we notice the tourist's low interest in this area that is extremely important in terms of tourism.

So: in 2004 – was registered a number of tourist arrivals in the accommodation structures in Tulcea county of 73241 persons, and in 2014 – the number of tourists accommodated in the same accommodation structures in the county, dropped to 66242 persons. [3]

The number of accommodation units didn't increase very much either between 2005-2015, by looking and the statistical data provided by NIS, in this period there has been registered an increase of 12 units, from 128 existing in 2005, to 140 registered in 2015. [3]

The most important environment preservation project, called Natura 2000 Project, which targeted a lasting development and the preservation of the protected areas, bound every Member State of the European Union, to become involved actively and legally in assessing and administering the preserved areas.

So appeared "The Development of the Potential for Sustainable Tourism in a Natura 2000 Wetland Area: the Danube Delta case".

The results that were expected in the project were:

1. The transfer of knoledge through training sessions (October 2007 and April 2008) for the local stakeholders from the public and private sectors, that have competences in tourism.
2. Fulfilling a tourism strategy for the Danube Delta (possible to be extended to the whole Tulcea county territory), with the active involvement of all the factors involved.
3. Fulfilling awareness actions for an incorporated vision, accepted by everyone, on tourism development in an Natura 2000 area, through building and debating sessions, workshops, a booklet, an information campaign.
4. Organizing an international event on continuous tourism in the wetlands (Open Days 2008, October 3rd 2008). [4]

The Tulcea County Council, together with the project team WES BRUGGE, the DANUBE DELTA Biosphere Reservation administration and other co-operators, made "THE STRATEGIC PLAN FOR CONTINOUS TOURISM DEVELOPMENT IN THE DANUBE DELTA", in 2009, with the purpose of highlighting the problems that the tourism in the area is confronted with and elaborating some development strategies of this activity, with the help of the SWOT analysis.

From the SWOT analysis conducted by the specialists involved in this project comes out the following:

- The strengths of the tourism activity in Tulcea county are: the natural and anthropic tourism potential that is rich and unique in the country, the flora and the fauna unique in Europe, the traditional activities that still take place and can take place in the area, the authenticity of the place, the diversified offer from in the accommodation units, multiple possibilities to spend the free time and diverse recreation means.
- The weaknesses are: the distance and the quality of the roads that are lacking, the insufficient or obsolete public transportation that the tourists are forced to use, the guides that are

insufficiently trained in ecotourism, the services quality level is pretty low and the lack of trained personnel emphasizes this level, the insufficient advertizing of the area, the insufficient or not properly enhanced thematic tracks, the local communities lack of involvement in tourism activity and tourism advertisement in the area, the pollution that amplifies widely with each year, the small number of tourists – run-down in the last years, big taxes for all the activities that the tourists can unfold in the touristic activity, strict and severe regulations, the lack or insufficience of innovations, the frail cooperation between the public sector and the private sector.

- The opportunities are: a natural and anthropic touristic potential that can be developed more than it is now, an important potential market of tourists that are interested in nature, towards whom the people who organize and sell touristic packs in the area can orient to – meaning tourism agencies and retail, the area's authenticity – the architecture – the landscapes, spending the holiday in the village - agrotourism, the potential development of the local Danube Delta airport, improving the road infrastructure, opening an Ecotourism center in Tulcea through the cross-border Romania-Ukraine PHARE CBC 2004 project, The National Center of Tourism Education, the goals submitted by the Romanian government for implementing an environment management, for the rehabilitation of the Romanian infrastructure coast, the economical and ecological resizing of the Danube Delta, the goals of the local public administration of the Tulcea county to bring in modern transport means, bringing the public utilities infrastructure from the touristic areas up-to-date, supporting the tourism agencies to partake in the domestic and international tourism fairs, coaching the human resources in this field with European Union support, drafting regional tourism development strategies with the support from European experts in the field, organizing international meetings for investors, performing advertising activities in order to show the regional touristic target, involving a large number of ecotourism associations.

– The threats are: de biodiversity decline due to the extinction of some plant and animal species as a result of the aggressive actions of the people that live here or even of the tourists, the low level of accommodation capacity in the protected area, a place where the majority of tourists want to be accommodated during the holiday, the poor offer of activities and services that are specific for this unique place, the more aggressive industrial fishing in the last years that led to the disappearing or the reducing of many species of fish, the tourists that are interested more and more in active and interesting vacations, the keen competition in this activity, the tourism activity that is developing continuously, quality-price level that is unsatisfactory. [4]

After analysing all from above, one can explain to a certain measure why the number of tourists decreases from one year to another despite the extremely valuable touristic potential that the Danube Delta has.

Among the development and capitalizing strategies of the tourism in Danube Delta made in the above mentioned project, we will list hereafter some of the most important:

- involving all the foundations and organizations in the continuous development and in the maximum capitalizing of this touristic potential that the area has, but also the active involvment of the county's inhabitants in developing and promoting touristic activities;
- identifying the primary target groups of potential tourists, the client segments upon which the entire tourism products advertising activity has to focus on and focus on the tourist– his needs and wishes, concentrating on the recreative tourism;
- primary focusing on the foreign market and then on the domestic one;
- focusing on the niche tourism;
- the selection of quality touristic products and services prompted by the market and offering attractive touristic packs to the tourists that are bent on this form of tourism;
- the increase of the level of the inhabitants hospitality, encouraging and giving local cuisine;
- the use of local raw material, natural, authentic;
- training the youth in the art of the local craft;

- the presence of outlets for this objects made by the artisans in the area, souvenir shops for tourists;
- highlighting the essential values that this corner of heaven has by using the authenticity elements in all the steps involving the tourism and agrotourism activity unfolded in the area;
- organizing special places for camping and building constructions with local materials, in order to add in beauty and interest;
- rehabilitating the cultural and heritage objects;
- the accomplishment of collaborations and partnerships between the public and the private sector;
- the creation of an attractive natural and cultural touristic product by preserving the unspoiled and unpolluted areas and the conservation of the precious cultural heritage;
- acquireing the financing for the development of long-lasting tourism;
- attracting investors towards this activity for a faster development of the tourism and agrotourism in the county.
- setting the touristic development priorities for the 8 important areas in which the county is divided. [4]

CONCLUSIONS

In conclusion, due to the existence of an extremely important and unique touristic target in Tulcea county, this has real chances for touristic development and implicitly of development and economic progress.

By developing the tourism activity together with the other activities unfolded in the area, the living standard of the inhabitants, especially of those who live in the rural areas will increase and this thing must be the starting point in setting and implementing strategies for the development and the capitalizing of the tourism activity in the Danube Delta.

For that purpose, there must be followed and implemented the above listed strategies with an even higher seriousness and with a more pronounced interest, from both the empowered foundations in this field and the area's inhabitants that could have the biggest and most important influence in reviving this activity, namely the tourism and agrotourism in Tulcea county.

After developing and capitalizing at maximum capacity of this potential held by the studied area, the living standard of this county's inhabitants could increase widely, giving them a better life.

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STUDY REGARDING THE MODERN MANAGEMENT SYSTEMS, METHODS AND TECHNIQUES

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Summary: *In this article, I point out that the management systems, methods and techniques are the actual ways used to solve the problems arising from the management functions and which trigger the component activities of the organization functions. The classification of the management systems, methods and techniques includes all the activities by which the structural framework appropriate to the profile and tasks from farms is performed and the activities that ensure the normal work processes. The adoption of modern management systems, methods and techniques, allowing the involvement of execution personnel in managerial act without breaking the authority principles and the innovation promoting, can influence the management style, imparting a democratic character, beneficial to the performance of a farm.*

Keywords: *systems, methods, techniques, modern management, farm*.

INTRODUCTION

The farm management revolves around the activities to be accomplished in a given period and includes the actions that transmit to the execution personnel their tasks and responsibilities. Henry Fayol has established five management functions which, by their content, are also valid in present, namely: forecasting, organization, command, coordination and control. He made the distinction between the official authority, obtained as a result of the position occupied by the manager and the personal authority, whose components are: intellect, experience, moral qualities, ability to be a leader, previous merits etc. [10]. On the other hand, Peter Ferdinand Drucker points out that *the management is achieved largely through examples,* claiming that *the effectiveness can be learned and must be learned* [3].

The criterion on which the classification of the management systems is based is to group them on management leadership positions, so they can be differentied as follows:

- *General management systems,* which cover the entire process management or more management positions. *A management system is an ordered set of elements characterized by interconnection and interaction, able to achieve, under the action of various stimuli, an objective with certain performance* [2].
- *Specific management methods and techniques* aimed, mainly, only a function of leadership. In managerial practice, the managerial method is hardly delimited from the managerial technique, the difference being made only by the fact that the latter *has a simplier construction, through which a specific management task is performed, its impact being limited to the level of a manager* [9].

MATERIAL AND METHODS

The material included in this article was developed through a study on the theoretical aspects that underpin the company management.

The methodology of developing this article envisages a comprehensive analysis of studies and theoretical aspects that underpin the modern management.

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RESULTS AND DISSCUTIONS

The organization of the farms is not easy, because the execution personnel must carry out a complete set of tasks specific to the concerned productive-economic activity. The organigram is more or less clear, but due to schematization of objectives and lines of action order, delegation of responsibility, competence, authority and current task workload, the results are variable. Regardless of his / hers field of practice, a good manager has the capacity necessary to sense that he / she can not solve alone all the problems, but he / she can efficiently handle priorities destined to provide flexibility to the challenges and the changes with which any organization is facing.

1. GENERAL MANAGEMENT SYSTEMS

In theory, the most widespread modern management systems used in exercising the management processes at farm level are: *System for Management by Objectives (SMO), System for Management by Exceptions (SME), System for Management by Product (SMP), System for Management by Budget (SMB), System for Participative Management (SPM) and Information System for Management (ISM)*.

The System for Management by Objectives (SMO) is defined through a management system based on setting goals up to the execution personnel, who directly participate in their preparation and - through the close correlation of rewards and penalties - at their preset realization level [4] and consists of performing the following main steps: *determining the basic objectives of the farms, setting the derivate, specific and individual goals, development of action plans, deadline timetables, budgets and management method list, adequate adaptation of subsystems (decision-making, organizational and informational) to requirements for achieving objectives, coordinating and tracking of achievements, evaluation of achievements and rewarding the execution personnel* [9].

In Peter Ferdinand Drucker's vision, the modern management father, as shown in Fig. 1, SMO is viewed as a system which allows to increase the performance by focusing on results and not on the work itself, ensuring reducing and aligning the company goals with the individual objectives of the managers from different levels within the organization.

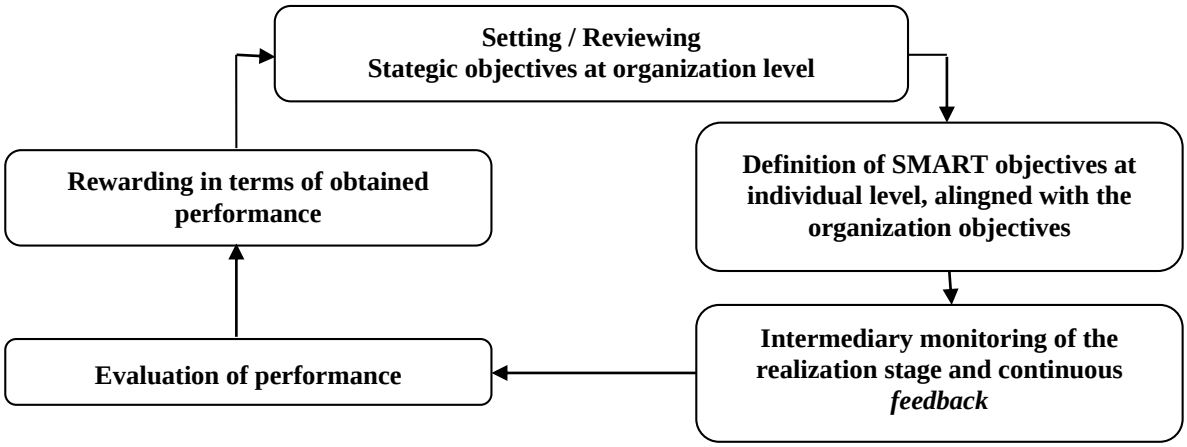

Fig. no. 1 – SMO process steps adapted after P. Drucker, The Practice of Management, Harper & Row, New York, 1954 [5]

Among the positive effects of **SMO**, we can mention:

- increase of the realism of farm objectives and of its components;
- high level of motivation of the execution personnel to achieve objectives;
- development of a creativity climate, extremely important in the transition to a market economy;
- improvement of use of manager working time, due to the decrease of supervisory and control tasks, thanks to self-control promoting;
- consolidation of responsibilities for achieving objectives both for managers and execution

personnel;
- strong correlation between wage level and obtained results;
- promoting of cooperation and collaboration, initiative and innovation;
- contribution to strengthening the discipline and increasing the responsibility in farms;
- development of the dynamics in actions and the skill to be flexible.

Among the disadvantages of **SMO**, we can mention:
- slow change in mentality and behavior of the execution personnel on accountability;
- difficulty in setting individual targets for all kinds of positions.

The System for Management by Exceptions (SME) is the method by which the manager deals only with problems that require his / hers intervention, being absolved of details incumbent on the subordinates. The steps for SME implementation are: *setting the level of results to be achieved, fulfilling activities, analysis of deviations from the established levels and achievement of the levels initially set.*

The benefits of implementing **SME** reside in savings in costs and managers' time, with beneficial effects in increasing the organization profit. The disadvantages consist in failure to transmit significant information on the violations and / or obsolescence of the set tolerances [7].

The System for Management by Product (SMP) is characterized by assigning the main leadership tasks and responsibilities on the implementation and marketing of products or group of concerned products to other manager with responsibilies in decision adoption and operationalization of the actions to maintain and increase competitiveness.

The steps for implementing **SMP** are: *establishment of products or group of concerned products forming the system objective, designation of head for products or groups of products who will ensure the system management, development by the head for products or groups of products of the strategic alternatives in obtaining and marketing of managed products or groups,* and *regular evaluation of production and marketing of the product - subject to the system.*

The positive effects of **SMP** are:
- ensuring the unitary coordination of technical and economic processes for manufacturing the considered products or group of products;
- pronounced orientation on the concerned product or group of products for renewal and / or adaptation to market requirements;
- improvement of quality of concerned products or group of products, improvement of technologies and diminuation of production costs, leading to increased prestige of the farms.

The limitations of **SMP** are not only the difficulty of ensuring sufficient system autonomy, but also the emergence of synchronization mismatches in the system management and conflict situations between the leaders of the products or groups of products.

The System for Management by Budget (SMB) is a management system which consists essentially in substantiating the costs needed for achieving each objective of the organization and systematic tracking of fitness of effective expenditures into the planned cost level [15].

The implementation of **SMB** is based on the following principles: the active participation of execution personnel and managers in budgeting and implementation of the budget system, setting of realistic objectives and economic and financial regulations, implementation of the structure and the budget administration in the management process.

The advantages of **SMB** may be:
- permission to exercise a permanent control of financial resources and thus of all resources;
- facilitation of corrective actions making on constant deviations, on the basis of rigorous evaluation and location thereof;
- allowance of objective evaluation of execution personnel in terms of the degree of the objective fulfillment, the fitness in the set budget and the fitness in the planned costs.

The disadvantages of **SMB** are:
- the lack of conjugation of the budget system with a complex motivational system for the execution personnel to achieve budgetary savings;

- big workload for completing the forms used in the method application;
- low efficiency due to long informational circuits.

The System for Participatory Management (SPM) is dedicated to exercise the management processes by involving a larger number of performers and is based on attracting the personnel in the management process in order to increase the economic efficiency.

SPM can be *advisory* (based on consultation with the execution personnel to solve some decision problems) and *deliberative* (based on the group decision adoption).

The specific objectives of **SMP** are: *enhancement of the collective creative thinking, of the capacity of all employees and their motivation to contribute to all activities (from high level to primary level personnel), improvement of the process of goal setting and decision making, broadening the knowledge of all employees not only in their specialization, but also for areas related to the real work of leadership, raising the quality of work reflectedin individual and collective performance, creating a climate for promoting joint action, cooperation, increasing the integration of individuals in work collective.*

The advantages of **SMP** are focused on:

- raising the levels of general informing and decision substantiation as a result of the involvement of execution personnel in the decision-making processes;
- amplification of execution personnel involvement in setting and achieving of the goals;
- asage of the execution personnel at a higher level of professional and managerial potential.

The disadvantages **SMP** consist of:

- high percentage of time for subordinate consultation and participation in the meetings of participative management;
- diminutation of the efficiency for solving some problems;
- amplification of costs related to the preparation of meetings, reproduction of materials, and transportation of the members of participatory bodies [8].

The Information System for Management (ISM) is a combination of human and computer resources aimed at collecting, storing, organizing, calling, communication, distribution and use of data and information, used by the managers in the management performance in order to achieve an efficient management. For the data and information can efficiently serve the decision-making process and be processed using the ISM, the following quality criteria must be met: *timeliness, clarity, completeness, conciseness, reliability and relevance of information* [18].

The specific objectives of **ISM** are: informing the managers on processes and economic activities from farms, timely access to information, monitoring the performance and highlighting the aspects that hide potential problems or crises.

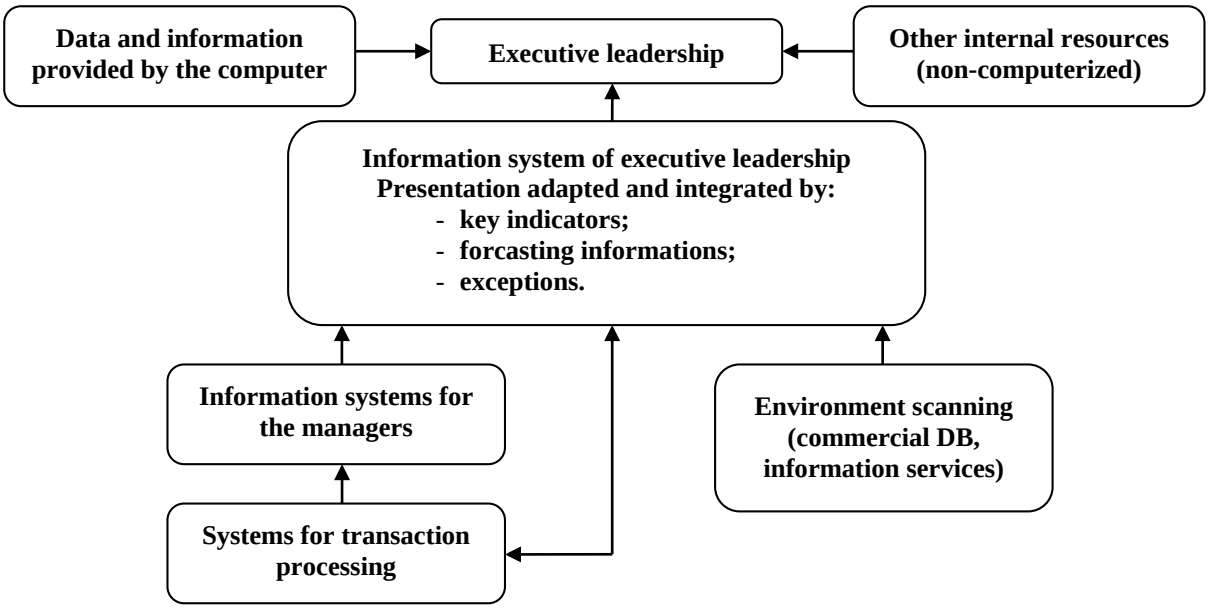

Fig. no. 2 – MIS adapted after Turban, E. McLean, Wetherbe J., Information Technology for Management: Improving Quality and Productivity, John Wiley & Sons Inc., New York, 1996 [18]

The avantages of **ISM** consist of:

- easy-to-use at all levels of management;
- current competence in computer using;
- provision of summaries of information presented timely or in real time allowing both a clearer understanding of the activities and the capitalization of data resources;
- effectively time management ensured by data filtering;
- ensuring an effective control of deployment of activities of the execution personnel.

The main disadvantages of **ISM** are:

- considerable cost;
- difficult and long lasting implementation;
- considerable slowdown in the beginning of the organization's activities due to the fact that the system introduces both new programs and changes in the work of ordinary employees used to use the old programs.

2. SPECIFIC MANAGEMENT METHODS AND TECHNIQUES

The professional managers do not ignore the specific management methods and techniques and they do not use them only for efficientization of the management process, being an inexhaustible source of ideas which constitute a robust support for decision-making both in normal conditions and in difficult periods for farms. Those who use these management methods and techniques contribute both to insurance and maintenance of a creativity climate among execution personnel and to obtaining of outstanding results in management and innovation plan.

The most common *forecasting management methods and techniques* at farm level are:

- *Extrapolation technique* - based on the idea that the law for growth in past may cause growth in future for a short or medium term;
- *Average rate technique* - assuming that it will be achieved an average trend similar to the one which characterizes the phenomenon evolution from the previous period, it allows stable future evolution of market phenomena;
- *Morphological method* - consists in the systematic search for solutions to a problem: the object, the system and the work are divided into basic parameters, fixing the results that may arise from the difficult combination of thereof; its application must follow these rules: the problem must be specifically defined, the basic parameters must be completely listed and each solution must be evaluated in terms of explicitly formulated criteria;
- *Delphi method* – also called *interactive investigation*, involves the use of intuitive thinking of the experts, who are required to make a numerical estimate for a given economic variable or to assess the likelihood of an event; it is used to predict events with a significant impact on the long term strategy for farms, especially where historical data on that situation do not exist.

Among the most commonly used **methods and techniques for stimulating the execution personnel** at farm level there are:

- *Brainstorming method (or assault / unleashing of ideas)* - is the method by which on the basis of discussions in smaller groups of 10 participants, the aim being to obtain many ideas on how to solve certain problems. Designed by Alex Faickney Osborn, it involves the following steps: preparation of discussing the issue for which that solutions are expected, analyzing within the group's work environment in order to reduce the participants's anxiety and to stimulate the thinking oriented on tasks, selection of the main ideas and encouraging the transfer of knowledge gained in practice.
- *Philips 66* m*ethod* - is applied in stimulating the creativity of large work groups from farms and

consists in dividing them into groups of six people who discuss 6 minutes about the addresed problem; the method offers advantages, such as: enables all the group members to express their opinion, allows to obtain a large number of solutions, familiarises the group members with the technique of argumentation, opinion supporting and giving up them for better solutions.

- *Diagnosis* - is the method by which the managers, with the direct participation of execution personnel, identify deficiencies and causes it generates; it highlights the strengths of farms and carries out recommendations for harnessing the strengths and eliminating the dysfunctions. The success of this method is largely conditioned by the participation of execution personnel with information, ideas and explanations to the the critical analysis of farms.
- *Meeting* - is the most common management method and brings together many persons for a short period of time by a manager, to jointly address some information and decision-making tasks. This is the main way of simultaneously transmitting information and gathering feed-back from a large number of performers, being directly involved in performing all the attributes of a manager: planning, organization, coordination, analysis and control.
- *Scoreboard* - is a collection of current information, presented in a form of a predetermined block diagram on the main results of the concerned execution personnel work and the main factors which determine its effectively management; it has four important functions, namely: managers' information on the state of the farms, warning on unfavorable situations or deviations from normality, evaluation of obtained results in achievement of objectives and decision making, meaning that pertinent information transmitted to the managers allows substantiation and adoption of appropriate decisions.

The positive effects of these methods and techniques are:

- increasing the awareness both for the high level personnel and for the execution personnel;
- amplification of degree of substantiation of the taken decisions;
- increasing the managers' accountability for performed work;
- facilitating the use of appropriate criteria for the evaluation of the working collective contribution to achieving the economic and financial results of farms.

The main disadvantages of these methods and techniques are:

- time consuming;
- repeated registration of some information;
- big workload for completing the situations required by the high level personnel;
- reduction of full operation.

CONCLUSIONS

Considering the above mentioned, the following can essentially be concluded:

- The results of studies about systems, modern management methods and techniques point out that the individual does not give up the job, but the manager who leads him / her. Boorish and condescension at the workplace hurt and cause anger and resentments. The main instrument for improving the relations between managers and execution personnel is their own behavior.
- The managers' role is to create an environment where motivation appears natural, to manage performers just as they would like their contribution to be managed in the role reversal situation. When the execution personnel feels oppressed, sees that the manager does not listen, sees that he / she is not involved in decision making or notices that he / she is treated as a truly subordinate, he / she will be really unhappy about the working environment and the manager who leads him / her.
- Comformation by the managers to the main values of the golden rule (treating the people with respect, fairness in the steps taken stating from the evaluation of the situation in which the roles were reversed, honesty in words and deeds, and accepting the cultural, social, sexual, family ethnic diversity by practicing empathy), highlighted by Stephen E. Kohn and Vincent D. O'Connell [6], is important for the following reasons:

- provides a consistent reference framework in situations where they are not sure how to relate /

behave with the execution personnel;

- enhances the ability of self-control by proactively evaluation the impact of spoken words and taken actions;
- increases the consistency in decisions and determines making as few decisions that the managers may later regret;
- improves the capacity of empathic communication;
- stimulates the managers to be better and more efficient in the management;
- causes concern for building a climate of trust, conducive to performance.

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SECTION 4: PROIECT ADER 16.1.2

MODELS OF DEVELOPMENT OF SHORT CHAINS OF CAPITALIZING ON SERVICE PRIMARY PRODUCTION-PROCESSING-STORAGE-MARKETPLACE

FRUITS AND VEGETABLES MARKET IN ROMANIA: BETTER UNDERSTAND CONSUMERS' PREFERENCES

ION RALUCA ANDREEA[1]

Abstract: *Fruits and vegetables are important for maintaining the human health, and, thus, they are present in everyday consumers' basket. They are seasonable and perishable products and, as a result, they need to be processed and transformed into cans and preserved products. The objective of this research is to identify the main directions of developing the sector of preserved fruits and vegetables products. Pursuing this, a survey was carried out, for collecting data about consumers' buying behaviour, their preferences for preserved fruits and vegetable, buying frequency and budgets spent for these products, on average, per month. Research findings show that over 94 per cent of respondents consume preserved vegetables and fruits. Among preserved vegetables, broth, tomato juice, pickles and frozen vegetables are consumed frequently. As regards preserved fruits, apples / pears juice is consumed more often than other products. The most important criteria for choosing canned vegetables and fruits products are composition, taste and origin. These results are useful for better understand consumers' behaviour of buying processed vegetables and fruits and to decide, further on, the directions of developing food processing industry for vegetables and fruits.*

Key words: *Preserved fruits, preserved vegetables, survey, consumer behaviour.*

INTRODUCTION

The study regarding consumers' preferences for preserved vegetables and fruits aims to explore a phenomenon important for Romanian agricultural economy: vegetables and fruits selling, reducing loses on their chains, increasing farmers' revenues and supplying internal market with Romanian products. For analysing vegetables and fruits market, a survey has been carried out, which enable to collect information regarding consumers' needs and preferences, aiming to identify the directions of developing processing industry of fruits and vegetables.

Previous research (Turek, 2008) finds out that internal production is not enough to satisfy consumers' demand for fruits and vegetable, considering the specificity of agricultural products' demand and supply and losses within the sector. As regards the first aspect, taking into account the fact that, on one hand, supply of vegetables and fruits is seasonable and, on the other hand, consumption is continuous, imports fulfil the supply on the market, in extra season. Imports of vegetables account for 10 per cent of total supply, and imports of fruits account for 23 per cent. Imports of vegetables are 17 times more than export, in 2007, meaning almost 400000 tons of vegetable. As regards the second aspect, losses of vegetables reached 328197 tons, in 2006, accounting for 10 per cent of total production. Losses of fruits reached 98612 tons, in the same year, meaning 4 per cent of total production. Losses occur in field, during transportation, because the latter is done using means inadequate to specificity of these perishable products and on improper roads, and during storage, because they are stored in inappropriate rooms, with no microclimate conditions.

The context of the period 2006-2007 changed, because the market of fruits and vegetables is dynamic. The value of goods sold through retail was raised from 1581911.5 lei in 2008 to 184 880.7 lei in 2012, meaning 116.9 per cent (National Institute of Statistics, 2014). Retail trade concentrated, statistical data showing a reduction in the number of stores from 134878 in 2008 to 129875 in 2012 (National Institute of Statistics, 2014). The number of small shops with sizes up to 120 square meters, decreased, while the number of large stores increased, even doubled, in the case of stores of 10,000 m² and over. As a result, in current situation when retail trade developed, the sales opportunities in the production of fruit and vegetable diversified, producers having more options to put products on the market. In deciding the directions to develop their businesses, producers must have information about market, about consumers' needs and preferences.

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This article seeks to investigate the market of fruits and vegetables, trying to answer the overarching research question: What are consumers' preferences for preserved fruits and vegetables? Other specific questions that this research tries to find out are: What are the average quantities of preserved fruits and vegetables bought or consumed in one year? What is the frequency of their consumption? What is the average money spent for buying preserved fruits and vegetables? What are the main drivers for choosing preserved fruits and vegetables?

For answering these questions, a piece of quantitative research was carried out: a survey based on a questionnaire. Data have been collected online and the sample has been selected using the quotas methods.

The research objectives and hypotheses are:

O1: Identify the number of consumers of preserved vegetables

P1: 80 per cent of respondents consume / purchase preserved vegetables

O2: Identify the average frequency of consumption of preserved vegetables

P2: Broth, tomato juice and pickles are consumed often; canned beans and frozen vegetables are consumed rarely, and potatoes and onion flakes are consumed occasionally

O3: Identify the average consumption of preserved vegetables

P3: One person consumes on average per year 500 g of broth, 2 litres of tomato juice, 100 g potatoes flakes, 100 g onion flakes, 4 kg of pickles, 2 kg of canned green beans, and 3 kg of frozen vegetables

O4: Identify the number of consumers of preserved fruits

P4: 90 per cent of respondents consume / purchase canned fruits

O5: Identify the average consumption frequency of preserved fruits

P5: Fruit juices are often consumed, jams are frequently consumed, and marmalade and compote are consumed occasionally

O6: Identify the average consumption of preserved fruits

P6: One person consumes on average per year 10 litres of apple juice, 5 litres of apricot / peach juice, 5 litres of other fruits' juice, 1 kg of plum jam, 1 kg of apricot / peach jam, 500 g of cherry jam, 500 g of strawberry jam, 500 g of apple / pear jam, 2 kg of compote and 500 g marmalade

O7: Identify the place of purchasing preserved vegetables and fruits

P7: 60 per cent of consumers purchasing preserved vegetables and fruits at hypermarkets

O8: Identify consumers' choice as regards the origin of preserved vegetables and fruits: imported or domestic

P8: 60 per cent of preserved fruits and vegetables consumed are domestic

O9: Identify the source of acquiring preserved vegetables and fruits

P9: Most people consume preserved vegetables and fruits more of their households, less from shops

O10: Identify the average budget allocated for the purchase of preserved vegetables and fruits

P10: Most people allocate, on average, 50 lei per month for purchasing preserved vegetables and fruits in winter

O11: Rank criteria for consumers' choice for preserved vegetables and fruits

P11: The most important criteria for choosing canned vegetables and fruits products are taste, composition and price.

MATERIAL AND METHODS

As a method for gathering information, a quantitative survey was used, and as investigation technique, the technique of structured investigation, like self-administered questionnaire, was used. As a method of sampling, the method of quotas was used, which consists of the principle of representativeness of the sample to the total community investigated (Manole, 2003). Representativeness tracked through independent criteria: gender, age and income. The justification of using the allowance resides in the assumption that if the sample is representative for the population studied in terms of the criteria considered during the sampling, it will be representative from the point of view of other features, such as customs, behaviours, and attitudes

and so on. The research results can be extrapolated to the entire population studied. The total population is the population of Bucharest, which is the main market for canned fruit and vegetables for producers in the region. At a total local population of 1677985 people (the population of Bucharest), a 95 per cent confidence level and an error interval of 6.9 per cent, the sample size is 202 people.

The questionnaire contains 11 questions. After being drafted, the questionnaire was tested on ten people, to gather feedback on questions and improve, thus, the quality of research. Each interview lasted an average five minutes. The questions refer to information on socio-demographic characteristics of respondents, so-called questions of identification of the population from the sample, questions on the model of purchasing, needs and consumers' preferences for preserved vegetables and fruits, the criteria for choosing canned vegetables and fruits, the money spent, on average, per year, for these products etc.

The variables used are: dependent variables: consumer preferences for preserved vegetables and fruits and independent variables: gender, age, income.

The sample respects the quotas of the total population, as seen in Tables 1–3. Almost 44 per cent of respondents are male and 56 per cent are female, close to the statistical data for the total population in Bucharest: 46 per cent, 54 per cent respectively.

Table 1. Sample structure by gender, compared to total population

	Gender			
	Total population		Sample	
Variable	Absolute (persons)	Relative (per cent)	Absolute (persons)	Relative (per cent)
Male	871,530	46.3	88	43.6
Female	1,011,895	53.7	114	56.4

Source: own calculations based on statistical data (Statistical yearbook 2013) and results of the questionnaire

Table 2. Sample structure by age, compared to total population

	Age			
	Total population		Sample	
Variable	Absolute (persons)	Relative (per cent)	Absolute (persons)	Relative (per cent)
15–24 years	225,820	13.7	32	15.8
25–44 years	668,253	40.5	86	42.6
45–65 years	483,045	29.3	74	36.6
over 65 years	272,151	16.5	10	5

Source: own calculations based on statistical data (Statistical yearbook 2013) and results of the questionnaire

Table 3. Sample structure by income, compared to total population

	Income			
	Total population		Sample	
Variable	Absolute (persons)	Relative (per cent)	Absolute (persons)	Relative (per cent)
< 700 lei (under 160 euros)	-	15	32	15.8
700–1500 lei (160–340 euros)	-	37	42	20.8
> 1500 lei (over 340 euros)	-	48	128	63.4

Source: own calculations based on statistical data (Statistical yearbook 2013) and results of the questionnaire

The sample consists of 15.8 per cent young people (ages between 15 and 24 years old), 42.6 per cent people aged between 25 and 44 years old, 36.6 per cent people aged between 45 and 65 years old, and 5 per cent aged over 65 years old. As seen in Table 2, the quotas of the sample are close to the quotas of the total population, except the segments 45-65 years and over 65 years.

With regards to income (Table 3), the sample slightly differs compared to the total population. Statistics show that 37 per cent of the population has an income between 700 lei and

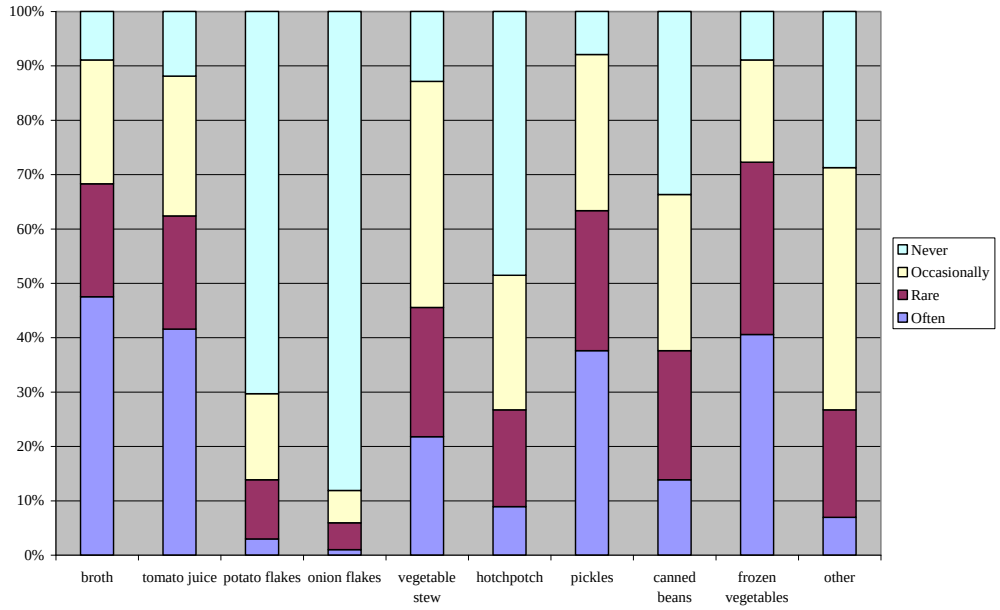
1500 lei, but 21 per cent per cent of respondents belong to this medium-income category. Statistics show that 48 per cent of the population has an income over 1500 lei, but 63 per cent per cent of respondents declare to have income over 1500 lei.

RESULTS AND DISCUSSIONS

Data issued from computer program compilation have been analysed. The first question: "Do you consume/purchase preserved vegetables?" revealed that 94.1 per cent of respondents consume these products and 5.9 per cent do not consume.

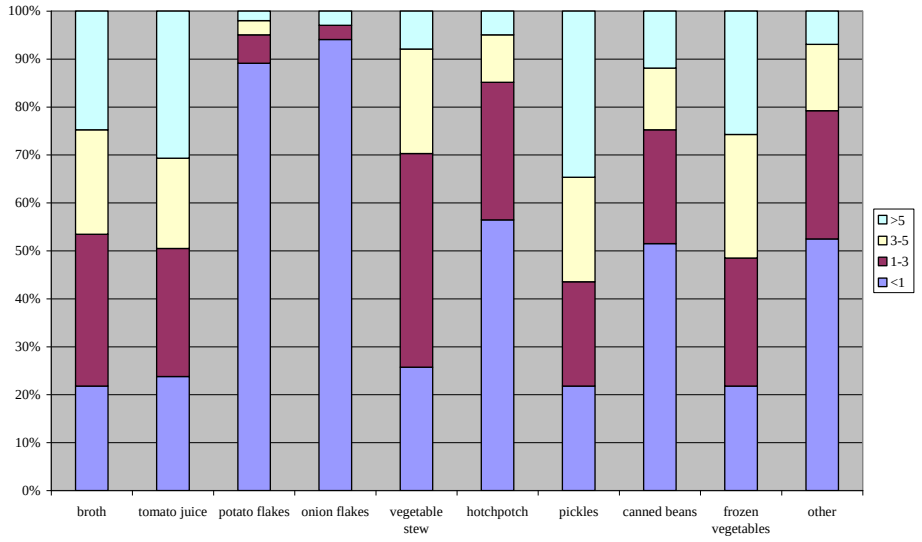
For the second question: "What kind of preserved vegetables consume/purchase more often?", answers focused in the area "often" for broth, tomato juice, pickles and frozen vegetables and in the area "never" for potatoes and onion flakes. Other preserved vegetables are consumed occasionally (Chart 1).

Chart 1 Answers for question "What kind of preserved vegetables do you consume more often?"



The question "What quantity of preserved vegetables do you consume, on average, per year?", people answer that they consume 1-3 kg of broth, over 5 litres of tomato juice; hotchpotch, potatoes and onion flakes under one kilogram, vegetable stew between 1 and 3 kilograms per year, pickles over 5 litres per year, canned beans under one kilogram and frozen vegetables between 1 and 3 kilograms (Chart 2).

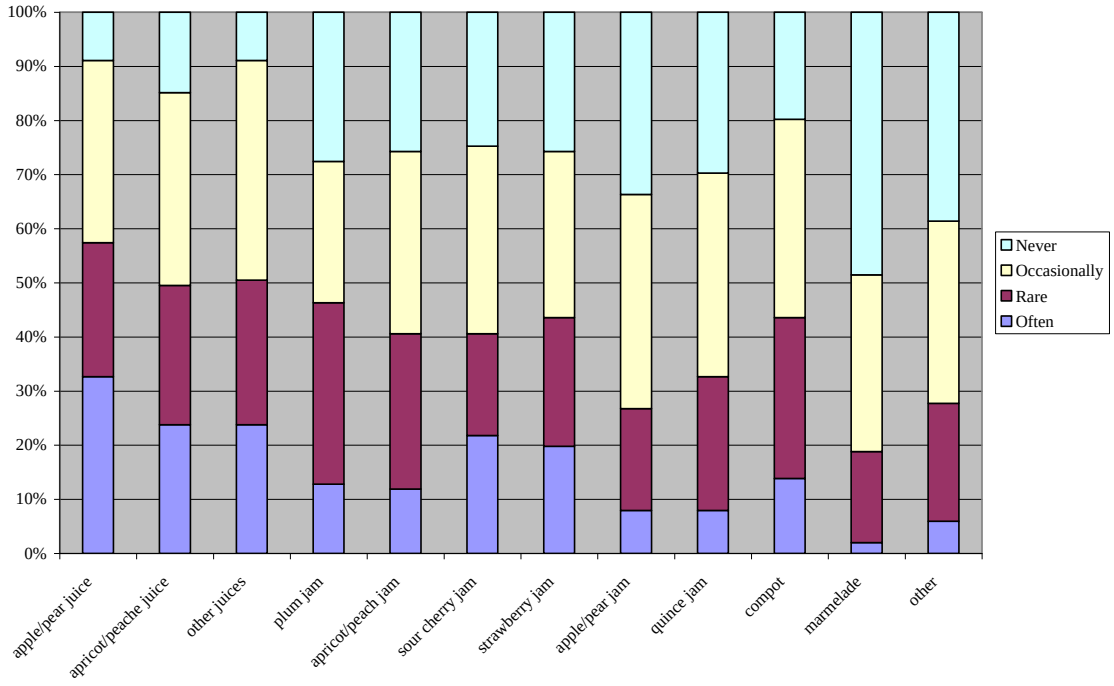
Chart 2 Answers for question "What quantity of preserved vegetables do you consume, on average, per year (kg or l)?"



The question "Do you consume/purchase preserved fruits?" revealed that 93.1 per cent of respondents consume these products and 6.9 per cent do not consume.

As regards the frequency of preserved fruits' consumption, the answers for the question "What kind of preserved fruits consume/purchase more often?", revealed that apples and pears juice are consumed often, plum jam rarely, and the other products: juices, apricot / peach, cherry, strawberry, apple / pear jams, and compote are consumed occasionally (Chart 3).

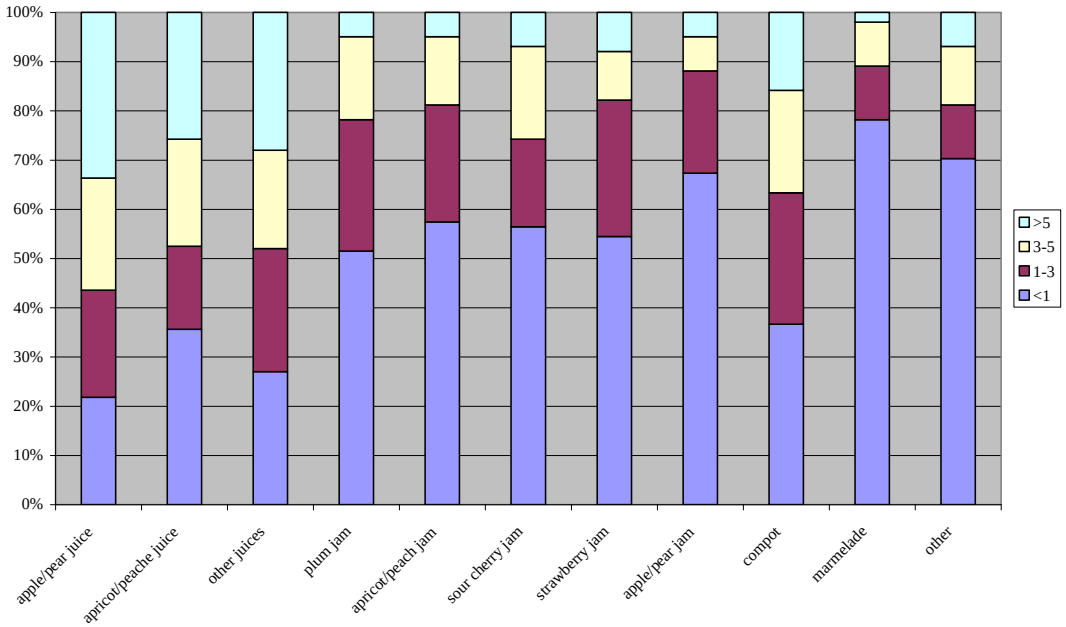
Chart 3 Answers for question "What kind of preserved fruits do you consume more often?"



To the question "What quantity of preserved fruits do you consume, on average, per year?", people answer that they consume over 5 litres of apple and pear juice, and other fruits' juice, and apricot and peaches juice under one litre per year. The other products: plum jam, apricot and

peach jam, sour cherry jam, strawberry jam, apple and pear jam, compote, and marmalade are consumed under one kilogram per year (Chart 4).

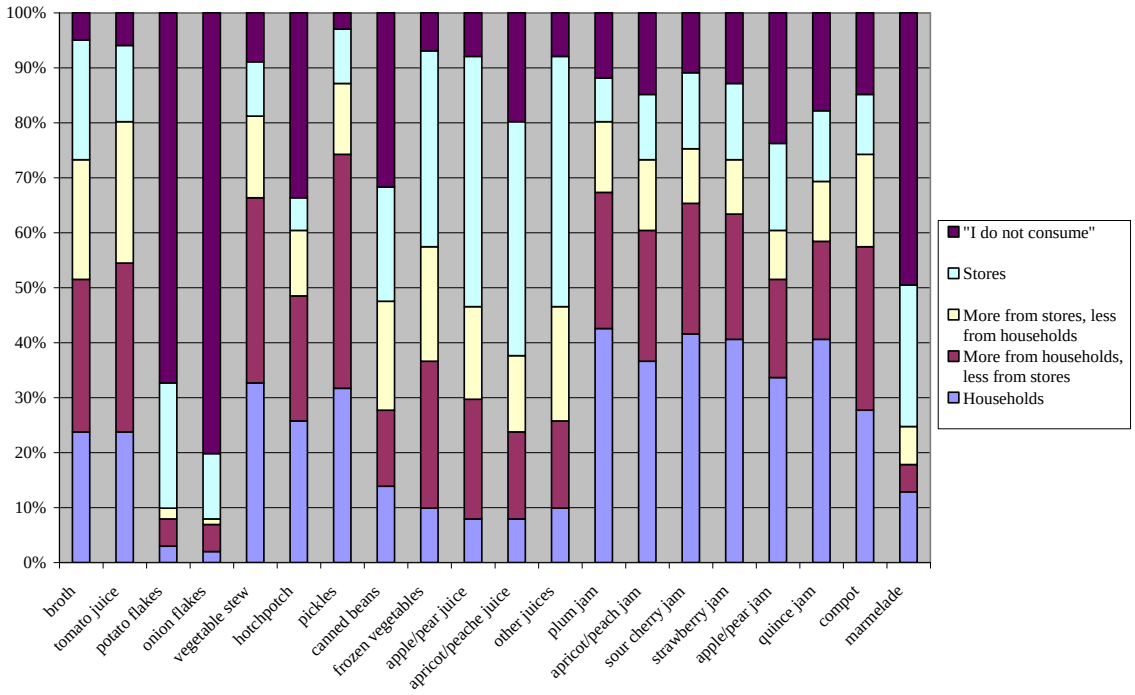
Chart 4 Answers for question "What quantity of preserved fruits do you consume, on average, per year (kg or l)?"



Preserved vegetables and fruits are purchased, mostly, from hypermarkets (39.6 per cent) and supermarkets (29.9 per cent). As regards their origin, domestic or imported, 94 per cent of respondents prefer domestic products and 6 per cent prefer imported products.

The question “What is the source of consumption of preserved vegetables and fruits?” revealed different answers. People declare that they consume broth more from their household and less from stores. Tomato juice is consumed both from households and stores. Potatoes and onion flakes, excluding respondents who chose "do not consume" are brought from stores. Vegetable stew is prepared mainly in households, as well as hotchpotch and pickles, which are purchased less from shops. Canned green / yellow beans, frozen vegetables, apple juice, apricot / peaches juice, other fruit juices are purchased exclusively from stores. Jams and marmalades are prepared within households and only marmalade is purchased from stores. Compotes are consumed more from households, and less from stores (Chart 5).

Chart 5 Answers for the question "What is the source of consumption of preserved vegetables and fruits?"



The average monthly amount allocated for the purchase of canned vegetables and fruit, during winter, is between 50 and 100 lei. However, the distribution between answers of the question is uniform, for example 33.7 per cent of respondents allocate less than 50 lei per month, 40.6 per cent allocate between 50 and 100 lei per month and 25.7 per cent allocate over 100 lei per month.

Taste, composition and origin are very important in purchasing preserved vegetables and fruits, and the rest features: price, appearance / packaging, promotions and brand are important (Table 4).

Table 4. Answers for the question "How important are the following criteria in choosing preserved vegetables and fruits?"

Criterion	Less important	Important	Very important
Taste	4	44	**154**
Composition	6	36	**160**
Price	24	**114**	64
Aspect/packaging	74	**98**	30
Promotions	70	**104**	28
Brand	44	**116**	42
Origin/producer	12	**96**	**94**

Source: own calculations based on results of the questionnaire

For each of the features listed, an average mark is calculated as a weighted arithmetic average of frequency of responses. The taste obtain an average mark of 2.74, the composition of 2.76, price 2.19, appearance / packaging 1.78, promotions 1.79, brand 1.99 and the origin/ manufacturer 2.44. The rank of criteria by which consumers choose preserved vegetables and fruit products is: composition, taste, origin / manufacturer, price, brand, promotions, appearance / packaging. The features can be grouped into two categories: important features, with marks over 2:

taste, composition, price and origin / manufacturer, and features less important, with marks below 2: appearance / packaging, promotions, brand.

CONCLUSIONS

In conclusion, over 94 per cent of respondents consume preserved vegetables and fruits, which validate the assumptions made, claiming that 80 per cent of respondents consume / purchase preserved vegetables and 90 per cent of respondents consume / purchase preserved fruits. Tomato broth, tomato juice, pickles and frozen vegetables are consumed frequently. Apples / pears juice is consumed often, as estimated, plum jam is consumed rarely and other products: apricot / peach juice, other fruit juice, apricot / peach, cherry, strawberry, apple / pear, quince jams and compote are consumed occasionally. Preserved vegetables and fruits are purchased, mainly, from hypermarkets (39.6 per cent) and supermarkets (29.9 per cent), although it was estimated that 60 per cent of consumers purchase canned vegetables and fruits from hypermarkets. Most people allocated, on average, between 50 and 100 lei per month to purchase canned vegetables and fruits in winter, more than estimated in the research hypotheses. The most important criteria for choosing canned vegetables and fruits products are composition, taste and origin / manufacturer, and less the price, as originally estimated. These findings are useful in deciding directions of developing processing industry for vegetables and fruits. We may conclude that juices, especially made of apple and pears are suitable branches for developing fruits' processing industry and tomatoes juice and broth, and pickles and frozen vegetables are, also, good directions of vegetables' processing industry.

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SCENARIOS OF DEVELOPING PRIVATE BRANDS FOR FOOD PRODUCTS

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Abstract: *Private brands are those manufactured or provided by one company for offer under another company's brand. They are often positioned as lower-price alternatives to national brands, and they are helping retailers to build sustainable relationships with their customers. The objective of this research is to identify the main directions of developing private brands for food products. Pursuing this, a documentary study was carried out, analyzing the situation of using private brands on different markets around the world. Research findings showed that private branding strategies differentiate themselves depending on the type of market: developed markets and emerging markets. In developed markets, there are great opportunities for development of premium segments, with top quality products and higher price, which gives the chance for higher differentiation of retailers and increased loyalty. In emerging markets, private label products have great potential, growing together with retail modernization and consolidation. These results are useful for retailers in their efforts to decide strategies for their private brands.*

Key words: *Private brands, food retail, emerging markets, premium products*

INTRODUCTION

This study tries to address the following question: What are the main features of using private brands world wide and what are the main directions of their development? Thus, we aim to enhance our understanding of the factors that drove the development of private brands, trying to identify the markets where they are successful and markets where efforts for their developments are needed.

Private labels were introduced into American supermarkets in the late 1970s (Anderson, 1992), when, consumers' perceptions about private brands were "a cheap and nasty generic substitute for the real thing, rolled out by retailers during recessions and discarded once the economy picked up again" (Bontems, 1999). In Romania, private brands were introduced in modern trade channel in 1999, in Metro Cash & Carry and in Billa supermarkets (Boboc, 2015).

Although private labels are well appreciated worldwide, still, their market shares vary depending on the region. They are higher in developed countries, especially on mature markets such as Europe, North America, and Australia. Private brands have been successful in categories where purchase is oriented to product need itself and consumers perceive small differences between products: milk and bakeries, for example. The main reason of developing private brands is retail system consolidation on mature markets in the regions mentioned above. This does not mean that private labels do not have potential of development in other markets, like Asia and North Africa. The challenge is that, in these markets, consumers' loyalty for producers' labels is very strong.

Other studies are trying to describe the development of private labels and to understand how private brands' purchasing pattern has changed (Batra, 2000; Bettman, 1974; Fei, 2006; Kwon, 2008). Their results are showing that private brands occupy an emerging position in the global food market and in global purchasing processes. The number and the volume of private brands are expected to grow significantly.

The literature is mainly based on survey methods. In this article, a documentary study was carried out, aiming to identify the opportunities of development private labels on emerging markets, considering their potential and the modernization of retail system in the region.

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MATERIAL AND METHODS

Pursuing the objective of this article: to identify the main directions of developing private brands for food products, the research should start from analyzing the current situation of using private labels worldwide. Private brands have distinct evolutions depending on markets: mature or emerging markets. Thus, they have the most spectacular development on mature markets from Europe, North America and Australia. Conversely, private brands have low market shares in emerging economies: Asia, South America, and the Middle East. In these regions, they have potential of development, considering demographic dynamic in the area. As a result, the analysis is carried out separately on mature markets and emerging markets.

Mature markets

Europe

Private labels are seeing the strongest growth in Europe, especially Western Europe, where they hold a 30% market share. They have the largest share in the region and the world, in Switzerland 45%, followed by Great Britain and Spain by 41% each. Private labels are less developed in Central and Eastern Europe, where rates range from 24% in Poland and 5% for Ukraine. Products sold as private label became a main item in the basket of buyers and their perceptions are positive: 70% of consumers think that private labels are good alternatives for national brands and 69% believe that their purchase means a good deal (Nielsen, 2014, p.15).

In Switzerland, private labels are used mostly for complex products such as: watches, chocolates and care products.

In Britain, the market share of private labels is increasing, even though the economy has recovered (Gray, 2014). During the economic crisis, consumers bought lower priced products such as private label products. This buying behaviour remains today and is likely to remain high in the future.

Big retailers in the UK permanently launching new products and improve the existing ones, while maintaining low prices. The most important own brands are developed by:

- Waitrose is a supermarket chain in the UK, which has over 300 stores, 5% market share and over 700 Essential Waitrose own brand products;
- Co-op introduced 1,000 product lines in September 2013 plus 200 for winter holidays in 2014 and pursued a policy rebranding of existing products for 1900;
- Sainsbury's has a strategy to improve the quality of own-brand products for 3000;
- Tesco launched its own-brand products, My Fit Lifestyle categories belonging to healthy products, giving the chance to retailer to differentiate more versus main competitors.

In Spain, studies show that private labels have 42% market share in 2014, 0.7% less than in 2013 (Eales, 2014 p.24). This reduction began from the moment the price is not the only factor influencing the buying decision, but now, the convenience in purchasing and consumption, exclusivity and value of the products procured with money (value for money) are considered. Mercadona is the market leader, followed by Carrefour and Eroski. The top ten retailers in Spain have 84% market share.

North America

The market shares of own brands in the United States and Canada are 17.5% and 18.4%, above the world average of 16.5%. In the USA, after the economic crisis, private labels rates have stagnated, while those of manufacturer brands grew, based on innovative promotional activities and efforts. In Canada, the share of private labels has stalled, too, as buyers turned to promotional offers and manufacturer brands registered increases in sales through low price strategy.

Australia-Pacific

Private labels market in Australia and New Zealand resemble private labels market in North America and Western Europe, the shares being 21% and 13%. The results of a market survey (Nielsen, 2014, p.20) show that all households in the area have bought private label products in 2013, and increased sales of own brands (6.6%) is higher than sales growth the average retail (2.4%) in Australia.

Emerging markets

Asia

Low market shares held by private brands in these markets (0.6% -8%) show consumer attachment to the brand of the manufacturer. Modern trade and private labels are not new concepts in Asia, being present in the region for over thirty-five years. The first hypermarket opened in the '80s, and in the '90s the first own brands were launched. Tesco Thailand, for example, launched its own brand in 1998 (Nielsen, 2014 p.25).

Even if they are present for more than fifteen years on the Asian market, private labels' shares have reduced. Sales increased, since their launch, but continued with stagnation, even regression, due to intense promotional activity of manufacturer brands.

The main reason for low levels of market shares of private labels is that Asians are strongly loyal to brands manufacturer. In addition, retailers have not invested enough in convincing consumers to be confident with their own brands.

Latin America

In Latin America, the market share of private label products have increased in the period 2010-2014, the highest increases of approximately 3% was recorded in Chile and Colombia. The increase is due to the efforts of retailers in terms of product quality. According to market surveys (Nielsen, 2014), 76% of consumers in Latin America positively perceive private label, with small differences between countries: Peru 84%, Mexico 79%, Chile 78% and 78% Columbia. In addition, two thirds of respondents consider quality own brand products as being as good as the product brand manufacturer. Most positive perception is recorded in Venezuela, 74%, and Peru, 73%, and the least in Argentina, 62%.

Africa and the Middle East

Own brand development in Africa is still in its infancy, the market share of which is 1% or less. The growth of this segment can only be achieved as trade modernization in the region. Today, modern trade is met only in urban areas. Even in South Africa, the largest market of private labels in the region, 30% of trade exchanges come from traditional trade. As modern trade will develop, discount stores are important for market growth of private labels. These stores are developed networks in Turkey or in North Africa: Morocco and Egypt. Buyers from the Middle East spend their free time in shopping malls and supermarkets and hypermarkets are entertainment venues. Therefore, more and more international retailers: Carrefour, Spinneys and Choithrams begin to devote more space for private labels.

RESULTS AND DISCUSSIONS

Considering the findings identified in different regions of the world, some considerations regarding private labels development can be worked out.

Scenarios of developing private labels on mature markets

In Europe, private brands account for over 40% of market share in Switzerland, Great Britain and Spain.

In Britain, studies (MSLGROUP London, 2014) show that in 2011-2013, private label food sales rose 1.32% to account for a share of 48% in February 2014 with 0.88% more than the same period in 2013. In the agro-food segment, private labels hold 54% of sales. Not only prices lower than manufacturer branded products, but also the trust that consumers are beginning to have in the private labels of these products will help to increase sales, especially for premium category.

On the British market, retailers own brand products brought innovations, especially in terms of packaging and ingredients. Research shows that 71% of consumers believe that private label products have improved in terms of quality compared to 62% EU average. The results of study also show that 44% British would pay more for own brand products better quality, 28% more than four years ago. Six out of ten consumers consider private label products as good as branded products manufacturer, compared to 34% four years ago.

By product categories, private labels hold the largest market share in baby products, fresh products (57.5%) and frozen food products (46.1%) (IRI, 2014).

In general, prices of private label products are 30% cheaper than branded products manufacturer, and, over time, the gap is narrowing. We consider that a successful business for a retailer in those markets will be when he will convince his loyal customers to pay almost same price for his brands, instead of manufacturer's brands. Also is obvious that businesses with own brands moves to the premium sector, in mature markets, including the UK. As these markets are most evolved ones for private brands, we recommend to retailers to build their strategies, in order to get a higher share in consumers mind space, where actually moved the competition battle.

In Spain (Canadean, 2015), own brand development stagnates, as producers have responded to competition with private labels through aggressive promotional and pricing strategies. Although the Spanish economy has recovered, seven out of ten Spaniards do not believe that the current economic condition is stable. The insecurity and uncertainty have led Spanish consumers to purchase further and after the crisis, cheap food. Trend "great value for money" dominated the Spanish market in recent years and turned into a model of buying behaviour. Although Spanish consumers have stable jobs and higher incomes than four-six years ago, yet they continue to spend money carefully.

According to the study carried out by Canadean, private brand sales have increased in recent years. However, this upward trend will slow down, as producers respond by promotional offers. One third of Spanish consumers plan to buy in the future own-brand products, while buyers seek actively deep discount brand promotional offers on products manufacturer. Research shows that 57% of Spanish consumers are searching promotions and discounts, while 49% use vouchers and coupons and 38% use the Internet to compare product prices in different stores, before shopping decision. Price wars have implications for retailers and manufacturers, and consumers who focus too much on price and promotional offers and less on other attributes of products such as those linked to health benefits or convenience of use.

Strategies of retailers in Spain are different from those of retailers from other countries. New shops appeared: low-cost ones. The structure and offers are similar to cash and carry format, but included items that are addressed to specific segments, such as actively working people or large families. Supeco owned by Carrefour Group, the new Costco and Dealz (Poundland) is using low price strategy to offer "everything to 1.5 euros.", and Eroski Club is using customer oriented price strategy "as the consumer wants to offer".

Thus in Spain's stores, private label products are launched, most often at the same price with the brand manufacturer, however, consumers will purchase branded products manufacturer, considering that they are of better quality. We recommend retailers to go for more holistic marketing strategies, giving the chance to highlight quality of their products. This can be done through accurate and complete information on the label, containing the origin of the product, including manufacturing methods, and most important benefits for the customers, coming from related attributes. This tactic will encourage consumers to think twice when deciding on product choice between the brand and the private label manufacturer.

Like other mature markets in Europe, the largest market share of private label products is recorded in frozen products (57.6%).

In France, the market share of private labels rose to a ceiling of 29%, followed by a slightly downward trend. French consumers are not yet convinced of the quality of products offered by private label brand products and they still prefer manufacturer's ones. These results do not include, however, the channel Click and Collect from France, which lists system everyday purchases, including many own brand products. Supermarkets and hypermarkets, however, use strategies of limited product ranges under private labels. This strategy is complemented by intense promotional activity of producers, who use aggressive tactics of persuasion to attract customers to their products. An example of this is the Carrefour hypermarket, which reduced the number of private label products space in the shelves, grating it to products for which producers apply significant promotional activities.

Regarding the analysis of private labels by categories, the largest decline was recorded in food products. While highest share remains in frozen products, 45.7% of the market, or fresh food products for children, 39% share.

We recommend to French retailer strategies like differentiation in product ranges driven by innovation and product customization; or changes in the distribution policy, by intense distribution of own brands on their omni-channel capabilities, already existing in the market .

In Italy, private labels are having 18% market share. The marketing strategies of retailers vary depending on geographical region. Thus, in Northern Italy, large networks of stores operate: Coop, Conad, Carrefour and Esselunga, which reports about 60% of sales revenue. In South Italy, trade is dominated by small retailers who do not have the financial strength required to develop their own brands and to meet competition coming from the big chains.

We recommend that strategies of Italian retailers to adapt for buying pattern of consumers, who became more cautious and sensitive to price changes, seeking bids from private labels type. As in most European countries, in Italy there is a significant market competition between private label products and branded products of manufacturer, which are accompanied by promotional offers. The price difference between private label and branded goods manufacturer reduced. Some retailers are choosing price repositioning strategies to compete with products that manufacturers activate via promotions.

In Germany, private labels hold 24% market share. Strategies used by German retailers in product policy are innovation and widening the range of products. Promotional policy is marked by different strategies to increase the sales pull. What differentiates German retailer's strategies from those of other European countries is that he is not invest in promotional activities as the domestic producers for national brands. For food products price gap was enlarged, while promotional activities during sales continue to rise. Germany also differs from other European countries in terms of categories that dominate sales of private brands, such as: home care products lead their top-selling brands, with a market share of 41.1%. These are followed by frozen products, with a share of 37.3%, and fresh food products for children with a share of 36.2%.

United States is a mature market for private labels, although they hold a lower rate than many European countries: 16.4%. Studies (Eales, 2014) show that, in total, US consumers spent $ 120 billion on private label products in 2013.

Scenarios of developing private labels on emerging markets

In India, organized retail is primitive and basically there are no own brands. However, trade has great potential. Two countries: China and India, highest populated countries worldwide, have commercial network of stores over 5000-6000. Private labels have only 10% of organized retail trade and their market share is growing. Among the main actors in food retail, the highest rate of penetration of own brands holds Trent, with 90%, followed by Reliance Retail (80%), Pantaloon (75%), Nilgiri's (38%), Indiabulls / Piramyd (30 %) and Food World (22%), as shown the outcomes of some studies (Subha, 2014).

KPMG reports show that India experiences increasing presence of private labels in various segments and their adoption by different traders. The tendency is increased acceptance of private labels and thus penetration into new categories like: apparel, consumer durables, home care products and consumer goods manifests. Development of private labels will continue in the current environment, as it will change the perception of consumers that private label products are just cheap products.

Specialists (Subha, 2014) consider that, in future, private labels will reach 50% market share, after which it will saturate. If retailers will try to occupy more than 50%, consumers will have no longer sufficient alternative choice, as happened in Switzerland and the UK, where private labels have reached these limits, and the market was saturated. But they will continue to develop in other countries, not reached this level, such as in India and China.

China, a market of over 1.2 billion customers, offers great opportunities for retailers in selling their own branded products. The reasons for accepting Chinese manufacturers to produce ranges that are sold under the retailer's brand are different compared to reasons that lead

manufacturers in mature markets of Western Europe to do so. The reasons are: survival of business producers who do not have sufficient financial resources to support promotional policies for their products; entering new markets and making full use of production capacity without the need for new investment; reduction of cannibalization risk and improving competitive advantage in the future (Song, 2014). According to legal regulations in China, supplier of products sold by the retailer under private label must appear on the label. The buyers recognize products provided by certain manufacturers, and they do not carry out promotional activity expenses. By accepting the sale of products under private label, manufacturers reduce their costs, giving a chance to maximize the profit.

In Latin America, as in Asia-Pacific region, private labels are still in infancy, as launch stage. In South America, their launch and development was possible in the economic crisis that forced consumers to seek high value for the money spent (Capizzani, 2012, p.23-24). Argentina is an interesting case, where, although low market share of private labels, sales of the top five retailers own brands are just beyond the first twenty manufacturers. Argentine traders' strategies focus on improving product quality and reduced prices on average 30% lower than manufacturer branded products.

We believe that the future development of private labels is linked to the strengthening of hypermarkets and supermarkets, with the development of economies of scale. Both the economy and therefore trade are fragmentary in Latin America, so retailers are small businesses and they do not have the financial strength to develop private labels. As big retail chains entering the markets of Latin America, will develop and own brands segment.

CONCLUSIONS

In conclusion, the main advantage of own brand products, which was the basis for their launching and development worldwide, is lower price compared to manufacturer branded products. During time, however, the price difference has decreased, while the market share of private label products has decreased in mature markets, largely due to the financial efforts of the manufacturers who had invested in promotional activities to attract the customers. They also prefer manufacturer brands on a large scale, being easier to compare prices between different channels and retailers for products of the same brand, when actively looking for promotions and offers.

We consider that private labels will be successful if retailers will manage to bring more innovations to products and to differentiate them from the brand of manufacturer, to meet customer needs at the same level, but with a slightly lower price. For own brand products, we believe there are great opportunities for development of premium segment, with top quality products and higher prices, which will create more differentiation among retailers and customer loyalty. In emerging markets, private label products have great potential, growing together with retail modernization and consolidation.

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COMPARATIVE ANALYSIS OF THE PRODUCTION-MEDIUM CONSUMPTION RATE PER INHABITANT - PHYSIOLOGICAL REQUIREMENT IN ROMANIA AND IN THE EU COUNTRIES

ANCUŢA MARIN[1], PETRUŢA TUREK-RAHOVEANU[2]

Summary: *Mankind's concern for population's health and malnutrition prevention starts from the physiological requirement, from the food resources of each country, from the culinary customs and traditions from that area. According to the data published by NSI and EUROSTAT, the surface cultivated with vegetables and fruit trees has been constant, the variations were small from one year to another in both Romania and European Union countries, the differences from a country to another resulting from the average hectare production, the varieties and the used technologies. In Romania, the annual average vegetables, respectively fruits consumption, per inhabitant varied according to the data published by NSI between 148,7-162,9 kg fresh and processed vegetables and 65,7-74,7 kg fresh and processed fruits, per year. The surfaces in Romania cultivated with vegetables and fruit trees and the intern productions of vegetables and fruits placed under the consumption requirement, which let to substantial imports in order to complete it. In conclusion, it is recommeded to support/fund the domestic producers of vegetables and fruits throughout the process, from the production to the production capitalization, for covering the intern consumption requirement from the domestic production, as well as to deliver the surplus production to export.*

Key words: *cultivated surface, average production, physiological consumption, eating habits*

INTRODUCTION

Mankind's concern is about the „public" and „individual" health of each country's population. This concern manifests by preventing, controlling and guarding people against diseases caused by some foods or by malnutrition. Starting from the physiological requirement, from the food resources of each country, from the culinary customs and traditions from that area, the individual food consumption is assessed. This takes under consideration the trading of fresh vegetables and fruits as well as processed ones. People's interest in cultivating plants, vegetables and fruits is old and imposed, just like any other activity, the necessity to name it. In short, „the science of cultivating the garden or the science of gardening" got the name of *Horticulture.* Today it becomes an „art" of cultivating fruits, vegetables and ornamental plants, because besides the actual cultivating technology it also includes the marketing of the horticultural products.

This paper, intends to make a comparative analysis of the production-consumption-requirement rate per inhabitant, in Romania as well as in the EU countries, in progress, on a 5 year period, in order to highlight it, to give changing solutions in favour of the final consummer.

MATERIAL AND METHOD

The used research method is the quality analysis by studying and analyzing the data published by the National Statistics Institute, by EUROSTAT, by the Ministry of Agriculture and Rural Development and by studying the specialized literature, that would highlight the potential of the vegetables and fruit trees cultivated surfaces in order to ensure the consumption requirement in Romania as well as in the EU countries.

RESULTS AND DISCUSSIONS

Through thier content of vitamines, carbohydrate and minerals, vegetables and fruits

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contribute in maintening and increasing population's health. That's why they need to represent an important part of man's daily food requirement. In our country, in the last years, the change is detected on scientific bases, in the population mentality. Fruits and vegetables contribute substantially in balancing the food intake, their consumption, especially in a fresh state, preventing diseases caused by sedentarism, stress and other factors that have a negative influence on modern man's life.

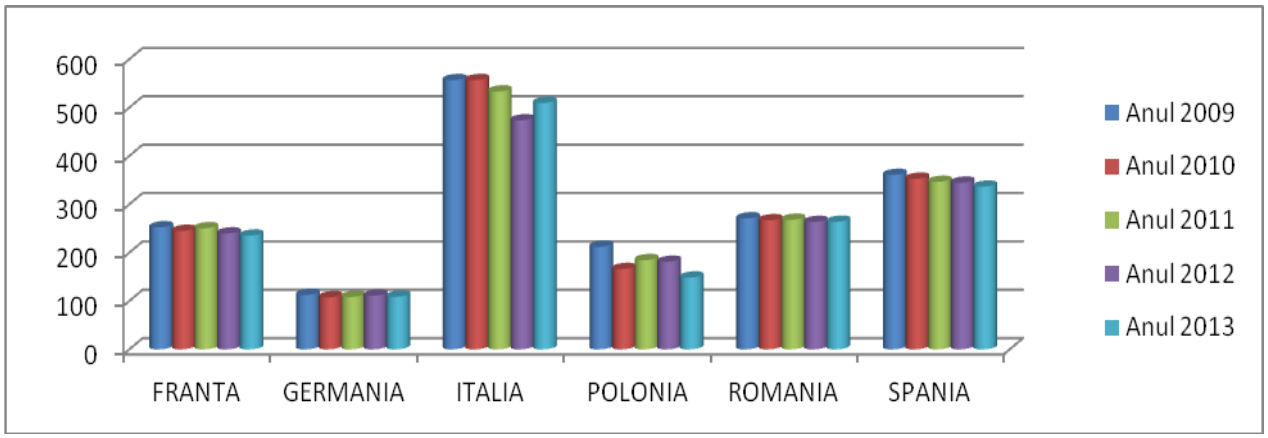
According to the data published by NSI and EUROSTAT, the surface that was cultivated with vegetables was relatively constant, the variations were small from one year to another, in Romania as well as in the European Union countries (*Table nr.1 and Chart nr.1).*

Table nr.1

THE SITUATION OF THE SURFACES CULTIVATED WITH VEGETABLES IN ROMÂNIA AND IN THE EU COUNTRIES – thousands of ha					
	Year 2009	**Year 2010**	**Year 2011**	**Year 2012**	**Year 2013**
FRANCE	252,3	245,03	250,49	239,65	235,21
GERMANY	112,55	107,51	108,34	111,18	108,78
ITALY	556,66	556,8	533,27	473,53	509,56
POLAND	212,13	165,97	184,48	181,07	148,47
ROMANIA	270,78	266,94	268,00	263,44	263,75
SPAIN	360,59	352,79	346,39	344,59	336,41

Source: data processing N.S.I., FAOSTAT and EUROSTAT

Chart nr. 1 – The situation of the surfaces cultivated with vegetables in România and in the EU countries



As evidenced in Table nr.1, the country with the largest vegetable surface is Italy, while the smallest vegetable area is in Germany. In Romania, the vegetable surface was situated a little under the calculated averages (between 294,17 and 267,03 thousands ha) for the analyzed countries, varying between 92-98% from the average.

In Romania, the vegetable total production registered a maximum in 2011, and the smallest value was in 2012, as it results from Table nr.2 and Chart nr.2. Even though production increased, the agrarian producer representatives face difficulties regarding production sale due to:

- imports with very small prices,
- tax evasion and
- the existence of multistage agents.

Regarding productions, the biggest total production is registered in Italy, while Spain and Germany register the biggest production per hectare (Chart nr.3). The explanation is given by the fact that these countries use more productive soils and technologies.

Table nr.2

THE SITUATION OF THE VEGETABLE PRODUCTIONS IN ROMANIA AND EU COUNTRIES							
Specification		**MU**	**2009**	**2010**	**2011**	**2012**	**2013**
FRANTA	Total production	thousand tons	5.685,13	5.593,00	5.494,49	5.283,46	5.235,33
	Average production	tons /ha	22,53	22,83	21,93	22,05	22,25
GERMANIA	Total production	thousand tons	3.661,99	3.350,70	3.593,62	3.820,72	3.416,09
	Average production	tons /ha	32,54	31,16	33,17	34,36	31,41
ITALIA	Total production	thousand tons	15.481,77	14.564,98	14.242,28	12.960,90	13.049,17
	Average production	tons /ha	27,81	26,16	26,71	27,37	25,61
POLONIA	Total production	thousand tons	5.804,78	5.113,40	5.801,70	5.656,02	5.210,69
	Average production	tons /ha	27,36	30,81	31,45	31,23	35,09
ROMANIA	Total production	thousand tons	3.912,81	3.876,81	4.191,54	3.550,57	3.976,65
	Average production	tons /ha	14,45	14,52	15,63	13,47	15,08
SPANIA	Total production	thousand tons	13.342,98	12.728,85	12.714,07	12.962,76	12.701,30
	Average production	tons /ha	37,01	36,08	36,71	37,61	37,75

Source: data processing N.S.I., FAOSTAT and EUROSTAT

Chart nr. 2 – The situation of the total vegetable productions in Romania and EU countries

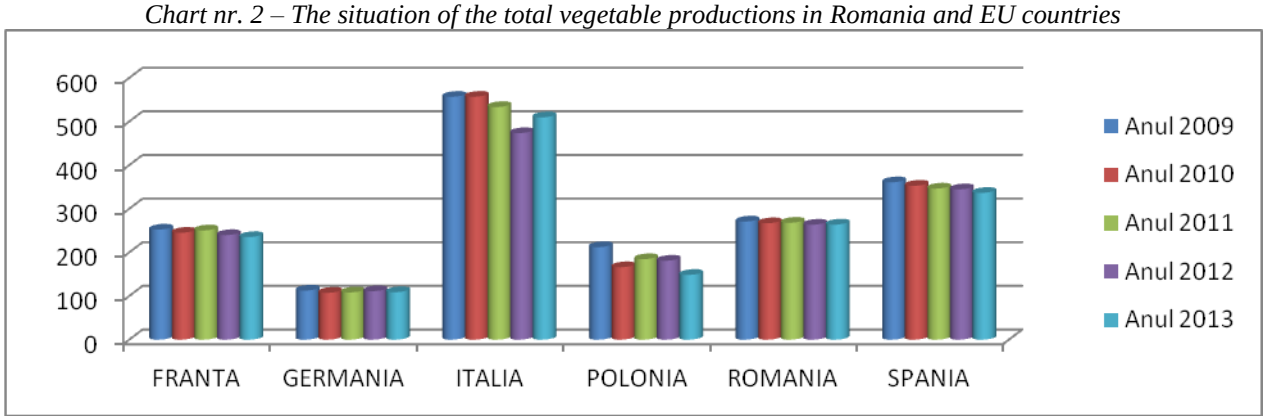
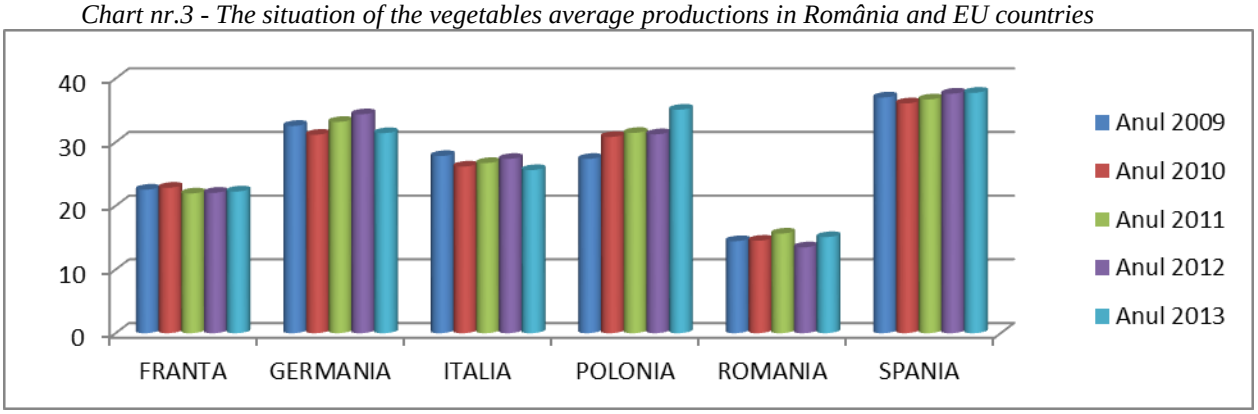


Chart nr.3 - The situation of the vegetables average productions in România and EU countries



According to official statistics, Romania loses every year around 250 million euro in the vegetable sector alone. The balance between vegetable export and vegetable import is scarce. In 2012, according to data published by the Ministry of Agriculture and Rural Development, the vegetable export was 11.575 tons, while the import was 242.775 tons.

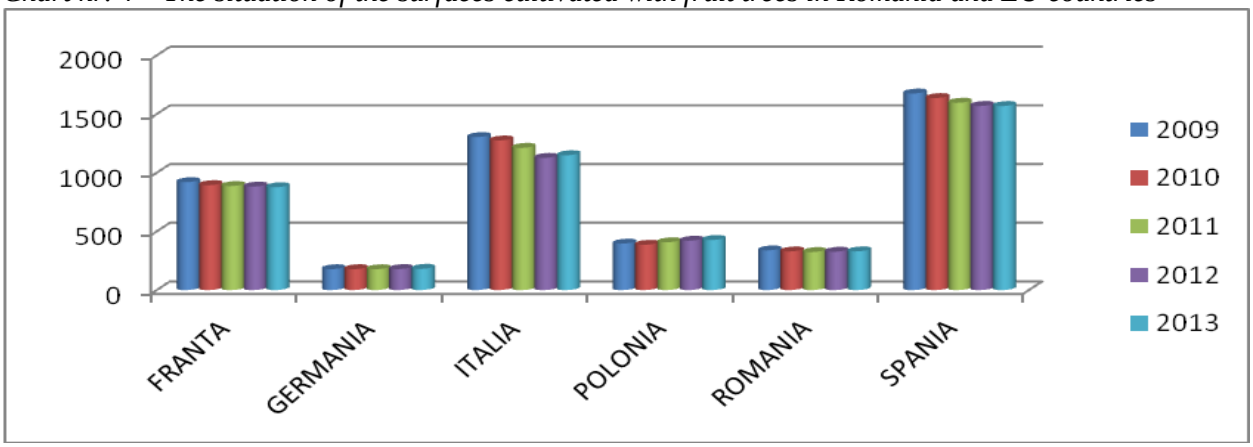
Regarding the fruit trees cultivated surfaces, according to data published by NSI and EUROSTAT we can see in Table nr.3 and Chart nr.4 that Spain is the country with the largest surface covered with orchards. Romania is situated well below the average of the calculated surfaces for the 6 countries, which varies between 750,49 and 801,71 thousands hectares.

Table nr. 3

THE SITUATION OF THE FRUIT TREES CULTIVATED SURFACES IN ROMÂNIA AND IN EU COUNTRIES – thousands of hectares					
	2009	**2010**	**2011**	**2012**	**2013**
FRANCE	919,69	894	886,34	881,53	876,36
GERMANY	178,08	178,13	177,85	178,83	180,93
ITALY	1.303,47	1.274,92	1.211,84	1.126,51	1.148,77
POLAND	395,74	385,85	407,37	420,49	426,83
ROMANIA	**338,08**	**329,45**	**323,95**	**326,68**	**329,94**
SPAIN	1.675,21	1.636,48	1.596,54	1.568,90	1.568,32

Source: data processing N.S.I., FAOSTAT and EUROSTAT

Chart nr. 4 – The situation of the surfaces cultivated with fruit trees in Romania and EU countries



However, using quality breed led to the increase of the fruit total production, as it results from Table nr.4 și Chart nr.5.

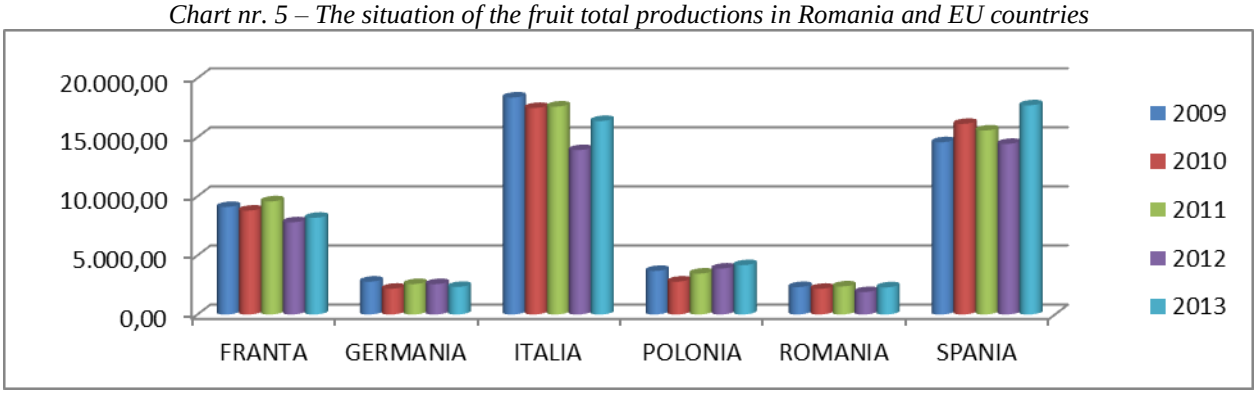
Table nr. 4

THE SITUATION OF THE FRUIT PRODUCTIONS IN ROMANIA AND EU COUNTRIES							
		MU	**2009**	**2010**	**2011**	**2012**	**2013**
FRANCE	Total production	thousand tons	9.098,08	8.791,36	9.573,09	7.800,55	8.183,10
	Average production	tons /ha	9,89	9,83	10,8	8,85	9,34
GERMANY	Total production	thousand tons	2.778,97	2.176,50	2.571,52	2.569,08	2.333,81
	Average production	tons /ha	15,61	12,21	14,46	14,36	12,9
ITALY	Total production	thousand tons	18.361,94	17.478,46	17.596,70	13.913,79	16.370,57
	Average production	tons /ha	14,09	13,71	14,52	12,35	14,25
POLAND	Total production	thousand	3.685,28	2.780,66	3.461,94	3.888,60	4.176,69

		tons					
	Average production	tons /ha	9,31	7,21	8,5	9,25	9,78
ROMANIA	Total production	thousand tons	2.320,57	2.173,92	2.373,26	1.898,31	2.294,27
	Average production	tons /ha	6,86	6,59	7,32	5,81	6,95
SPAIN	Total production	thousand tons	14.573,00	16.131,59	15.574,28	14.436,25	17.699,31
	Average production	tons /ha	8,7	9,86	9,75	9,2	11,28

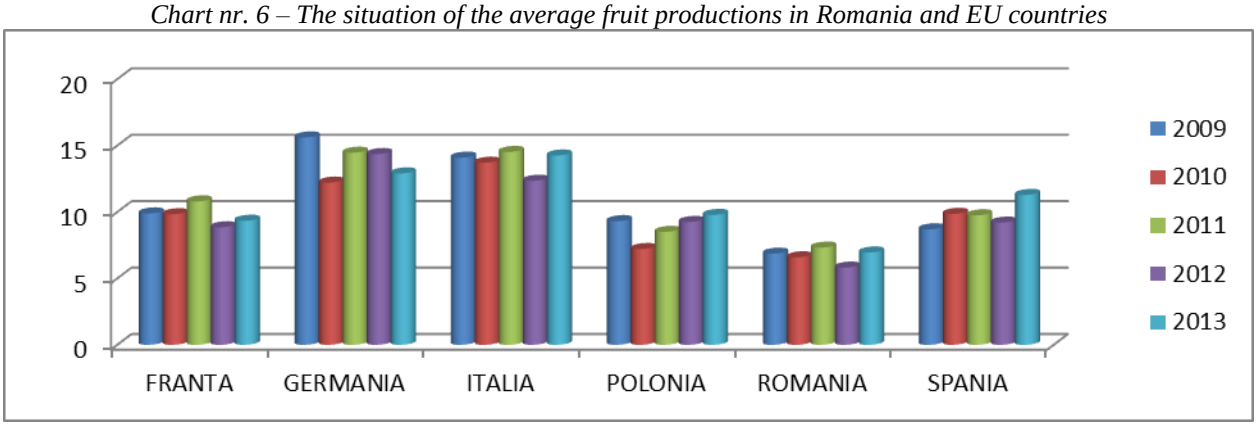
Source: data processing N.S.I., FAOSTAT and EUROSTAT

Chart nr. 5 – The situation of the fruit total productions in Romania and EU countries



By comparison, in a few of the EU member countries the situation of the surfaces covered with orchards and fruit productions in the studied period was the following (Chart nr. 6):

Chart nr. 6 – The situation of the average fruit productions in Romania and EU countries



By calculating the productions average per hectare, there is an increasing trend throughout the analyzed period. Just like the vegetable sector, in the fruit production also the producers have difficulties, due to small and very small price imports and due to a lack of legislation that would prevent tax evasion in this sector.

In the country there are counties, like Gorj, Caraş-Severin, Hunedoara, Alba, Sibiu, Maramureş, Bistriţa, Harhita, Covasna, Braşov, Prahova, in which the vegetable demand surpasses production, which leads to a considerable shortage. The shortage is determined on the one hand by the high relief and the agro-climate conditions that don't favor vegetable crops, and on the other hand the large number of inhabitants in these counties, which implicates higher consumption.

The surfaces, the total vegetable and fruit productions and the productivity reflected by average production per hectare reflects upon the average consumption per inhabitant. From the data published by NSI, FAOSTAT and EUROSTAT, we processed and got the following situation:

Table nr.5

AVERAGE VEGETABLE CONSUMPTION PER INHABITANT IN ROMANIA AND EU COUNTRIES – kg/person			
	2009	**2010**	**2011**
FRANCE	105,17	102,62	103,63
GERMANY	91,71	90,13	94,25
ITALY	174,84	144,49	144,51
POLAND	126,09	113,51	129,35
ROMANIA	148,7	155,7	162,9
SPAIN	158,5	140,7	123,8

Source: data processing N.S.I., FAOSTAT and EUROSTAT

Annual average vegetable consumption per inhabitant varied in Romania, between 148,7 - 162,9 kg fresh and processed vegetables. At country level, the produced vegetable quantity covers the annual average consumption, throughout the analyzed period, the registered values being over the physiological requirement of 140 kg/inhabitant.

Table nr. 6

ANNUAL AVERAGE FRUIT CONSUMPTION PER INHABITANT IN ROMANIA AND EU COUNTRIES			
	2009	**2010**	**2011**
FRANCE	115,84	111,24	110,09
GERMANY	79,09	76	80,37
ITALY	163,62	141,37	140,79
POLAND	54,69	53,4	54,31
ROMANIA	65,7	67	74,7
SPAIN	71,84	85,29	79,65

Source: data processing N.S.I., FAOSTAT and EUROSTAT

One can't say the same thing about the fruit consumption. The fruit production was under the annual average consumption, the difference being covered by imports. Production, as well as fruit consumption registered values well under the physiological requirement of 100 kg/inhabitant, due to Romanian's eating habits and to high selling prices of fresh fruits, and especially of the processed fruits.

In order to reduce the shortages and syncope in the vegetables and fruits domestic production supply it's important to zone the crops. By zoning one understands distribution or territorial casing of the crops based on climate, relief and soil factors that favors or diminishes the capitalizing possibilities of the biological potential of the plants.

CONCLUSIONS AND RECOMMENDATIONS

The vegetables and fruit trees cultivated surfaces in Romania and the vegetables and fruits domestic productions were under the consumption requirement, which led to substantial imports in order to supplement it.

In conclusion, it is recomended to support/ fund the vegetable and fruit domestic producers throughout the process, from the production to the production capitalization, for covering the internal consumption requirement from the domestic production, as well as to deliver the surplus production to export.

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THE STRUCTURE OF AUTHORIZED SPACES FOR THE STORAGE OF AGRICULTURAL PRODUCTION IN ROMANIA 2014

MICU ANA-RUXANDRA[1], ALECU IOAN NICULAE[2], TUDOR VALENTINA[3], MICU MARIUS MIHAI[4]

Summary: *This work aims to present a study that consisted of researching, interpreting of statistical data, combined with theoretical aspects that allowed a brief but pragmatic analysis of storage spaces existing in Romania at present and assessing the deficit storage space of the total vegetal production of the main categories of vegetal crops in 2014. Thus, knowing these matters there can be developed national strategies to prevent imbalances and distortions which can appear in the correct formation that prices of crop production, representing a real advantage for agricultural producers in Romania. Thus, at the end of 2014 in Romania for a total of 25,602,657 tons of total agricultural production of the main crops and a total storage capacity of 20,817,496 tons, according to the working hypothesis mentioned, it follows a deficit of 4,785,161 tons of storage.*

Keywords: *warehouse, storage deficit, agricultural production, Romania*

MATERIAL AND METHOD

The performance of the study was to research, analyze and interpret statistical data. These, in conjunction with theoretical aspects extracted from specialized literature have estimated a deficit of storage space in the total vegetal production to the main categories of crops in 2014.

The data required for such analysis were collected through public institutions, including the National Institute of Statistics and the Ministry of Agriculture and Rural Development.

To determine the estimated deficit storage of total plant production to the main categories of crops, 2014 was considered as point 0, and all production harvested was stored until the end of the year and was not recovered.

This deficit of storage of the total agricultural production resulted from the difference of total production by category of culture and assessing the storage capacity for each category of culture in part.

The storage capacity for each category of crops was performed by extrapolating the production share by category of vegetal crops presented in tables / graphs in the paper.

It should also be remembered that it was not taken into account the occupancy of the deposits in pre-harvest and post-harvest periods or no period's sale.

INTRODUCTION

In the agricultural sector in Romania farmers are divided into two categories, the small and medium ones using about half of the total farming land and the big farmers that exploit the other half of the agricultural area of the country.

The imbalance that creates in terms of material and technical base and the technologies used between these two categories of farmers lead to imbalances and distortions in the correct formation of prices of crop production.

The storage capacity is essential in order to hold the role of a major player in the market. Holders of deposits (silos) impose a price they impose a purchase price of products from small and medium agricultural producers, and later they transact at higher prices.

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Based on these considerations, this paper presents an analysis of the existing storage facilities in Romania today and the storage deficit of the total vegetal production of the main categories of crops in 2014. Thus, knowing these aspects there may be developed national strategies to prevent imbalances and distortions which can appear in the formation of vegetal crop production prices, representing a real advantage for agricultural producers in Romania.

RESULTS AND DISCUSSIONS

Analyzing the total agricultural production of the main crops produced in Romania in 2010 - 2014 we can find that it had an increasing trend, except in 2012 when there is a decrease in most cultures studied. Except the category of oily plants whose acreage fell in 2012, the other categories of crops this decrease in total production was due to unfavourable climatic conditions which are either inadequate cultivation technologies applied (Table no. 1).

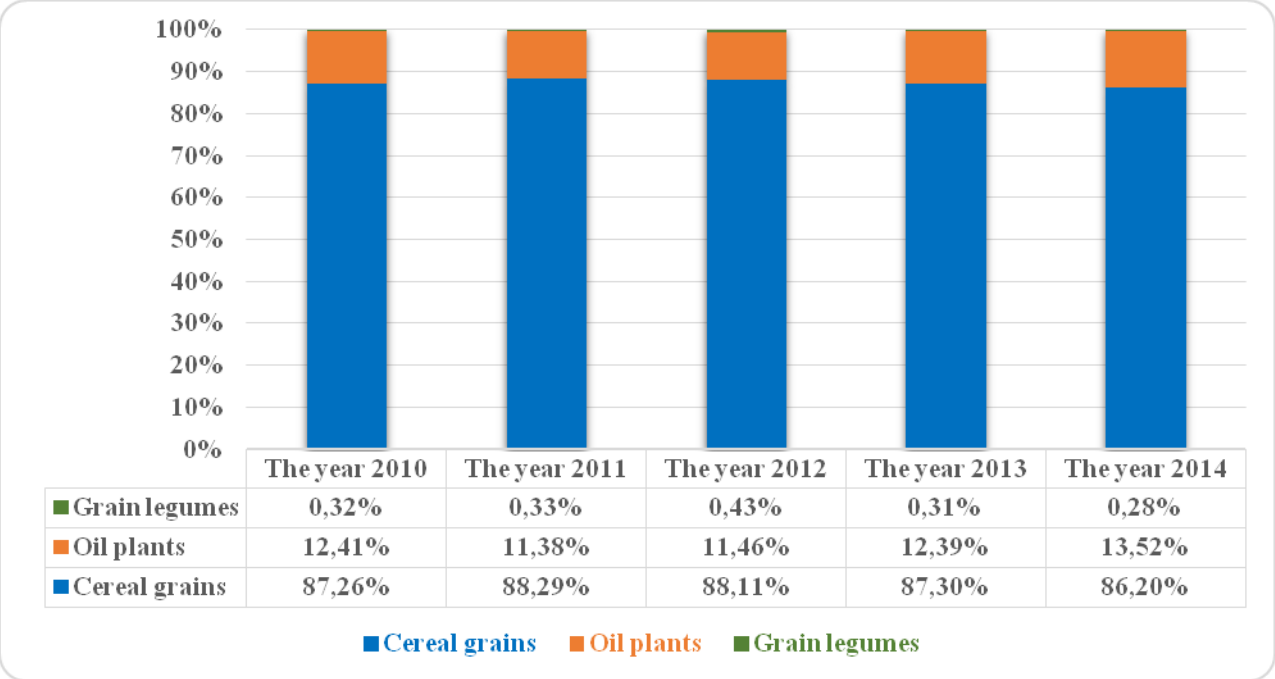
Table no. 1

The situation of total vegetal crop production for main crops in Romania during 2010 -2014

Main crops	Years				
	2010	2011	2012	2013	2014
	Unit size: tones				
Grain cereals:	**16712883**	**20842160**	**12824138**	**20897076**	**22070736**
- **Wheat**	5811810	7131590	5297748	7296373	7584814
- **Barley**	777074	712830	540933	930515	1085573
- **Two-row Barley**	533961	616862	445428	611732	626936
- **Oats**	304462	375855	338998	373783	381626
- **Grain Maize**	9042032	11717591	5953352	11305095	11988553
- **Other productions**	243544	287432	247679	379578	403234
LEGUMINOASE PENTRU BOABE:	**61344**	**76830**	**62934**	**74214**	**71363**
- **Shelling peas**	39677	55076	45878	54590	51017
- **Beans**	21059	21351	16603	18861	19748
- **Other productions**	608	403	453	763	598
OILY PLANTS:	**2377651**	**2686860**	**1667601**	**2966621**	**3460558**
- **Sunflower**	1262926	1789326	1398203	2142087	2189309
- **Cole**	943033	738971	157511	666097	1059121
- **Soya Beans**	149940	142636	104330	149931	202892
- **Other productions**	21752	15927	7557	8506	9236

Following the share of total vegetal crop production in the main categories of crops in Romania it is noted that in the period analyzed cereal grains (wheat, barley, oats, maize) occupy the largest share in the total crop production for main crops made at the country level, varying from 87.26% in 2010 to 88.29% in 2011, 88.11% in 2012, 87.30% in 2013, 86.20% in 2014 respectively (Figure no. 1).

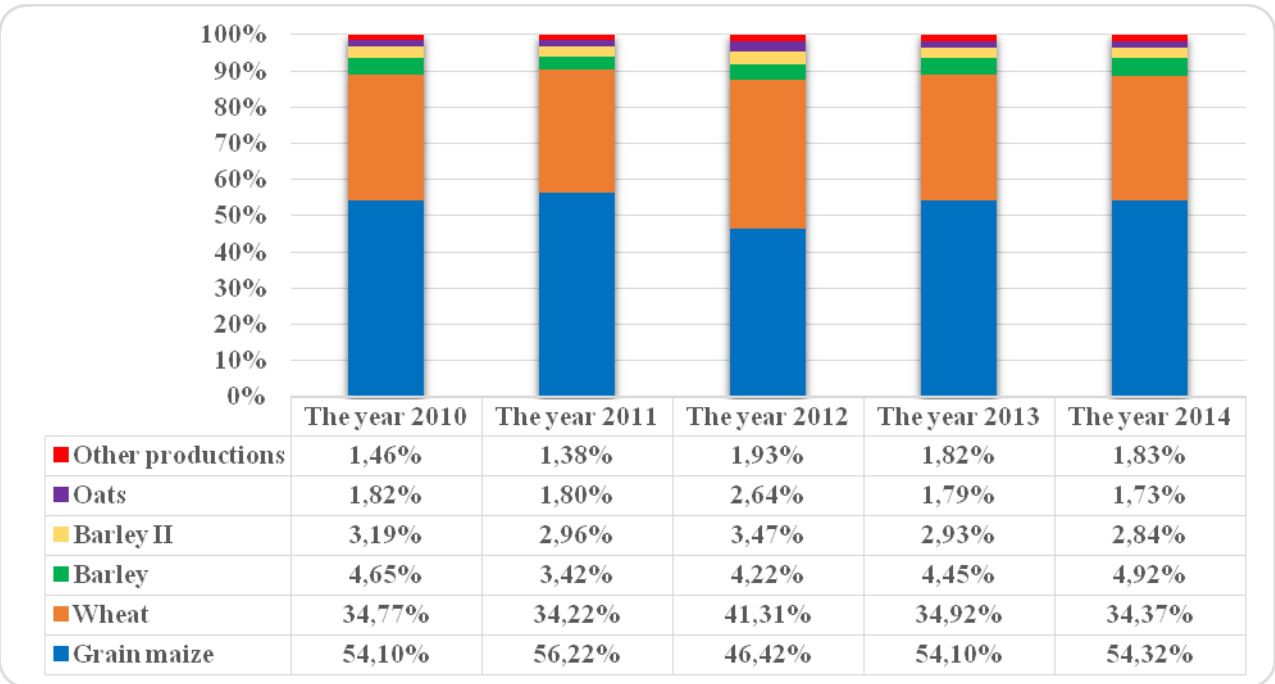
In terms of total production of oily plants, it held a 12.41% share between 2010, 11.38% in 2011, 11.46% in 2012, 12.39% in 2013 registering a 13.52% slight increase from 2014 (out of crop production analyzed). Although they are important crops, grain legumes for the period 2010-2014, occupied small share in total crop production analyzed as follows: 0.32% in 2010, 0.33% in 2011, 0.43% in year 2012 0.31% 2013 0.28% 2014 (Figure no. 1).



	The year 2010	The year 2011	The year 2012	The year 2013	The year 2014
Grain legumes	0,32%	0,33%	0,43%	0,31%	0,28%
Oil plants	12,41%	11,38%	11,46%	12,39%	13,52%
Cereal grains	87,26%	88,29%	88,11%	87,30%	86,20%

Figure no. 1 – Distribution of total crop production for the main categories of crops in Romania, in the period 2010 - 2014 (%)

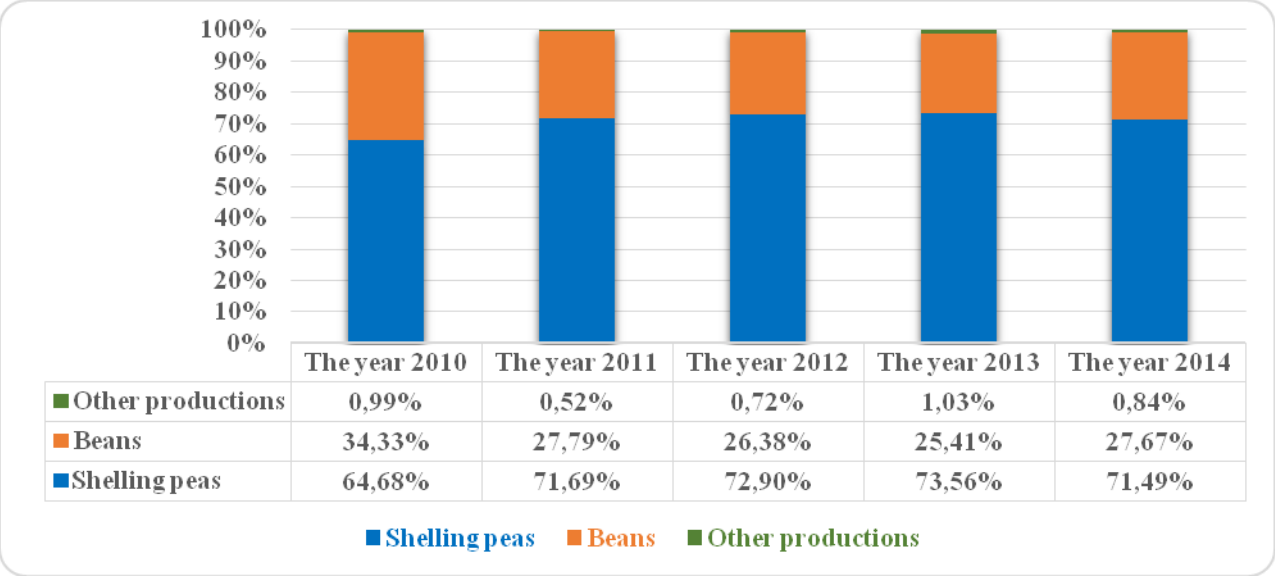
Analyzing the distribution of agricultural production in major grain cereals, maize is highlighted in all the years that records a majority share of 46.42% in 2012 to 56.22% in 2011 and 54.32% in 2014 at the distance of about 20% of corn production is localized production of wheat with weights ranging between 34.22% and 41.31% in 2011 of total 2012 cereal grain production. Harvests crops of barley, oats and barley had a relatively constant share of total cereal grain production in the period analyzed (Figure no. 2).



	The year 2010	The year 2011	The year 2012	The year 2013	The year 2014
Other productions	1,46%	1,38%	1,93%	1,82%	1,83%
Oats	1,82%	1,80%	2,64%	1,79%	1,73%
Barley II	3,19%	2,96%	3,47%	2,93%	2,84%
Barley	4,65%	3,42%	4,22%	4,45%	4,92%
Wheat	34,77%	34,22%	41,31%	34,92%	34,37%
Grain maize	54,10%	56,22%	46,42%	54,10%	54,32%

Figure no. 2 - Distribution of crop production for the main crops of cereal grain in Romania, in the period 2010 -2014 (%)

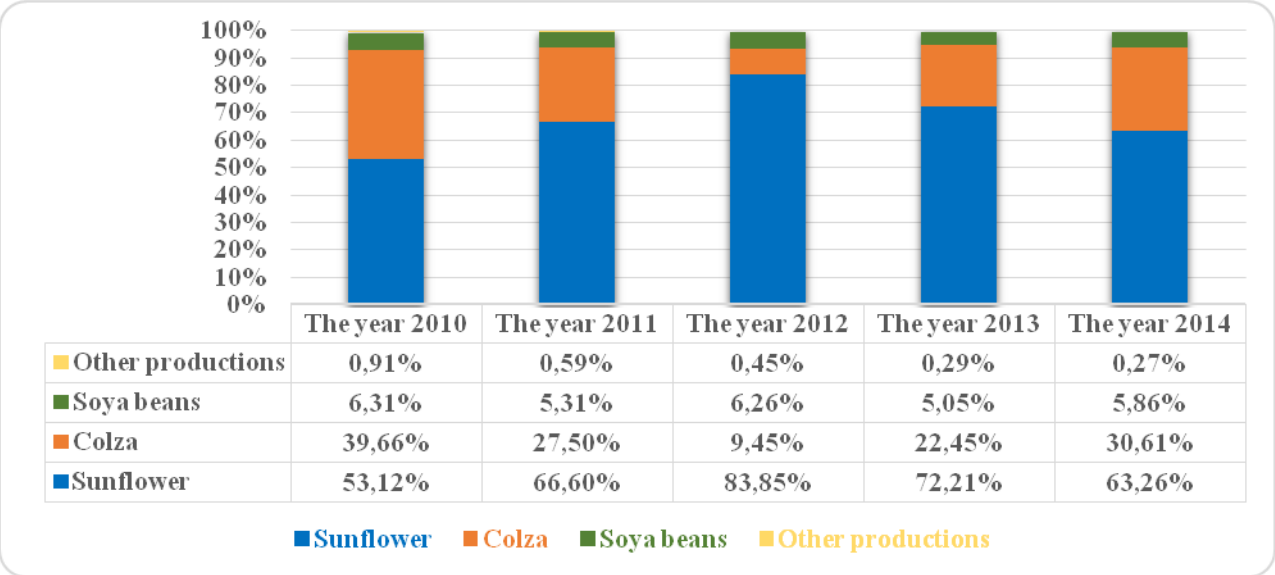
Regarding legumes crops, the largest share of total output a record crop of peas varying between 64.88% and 73.56% in 2010 to 2013, followed by bean culture (Fig. 3).



	The year 2010	The year 2011	The year 2012	The year 2013	The year 2014
Other productions	0,99%	0,52%	0,72%	1,03%	0,84%
Beans	34,33%	27,79%	26,38%	25,41%	27,67%
Shelling peas	64,68%	71,69%	72,90%	73,56%	71,49%

Figure no. 3 - Distribution of crop production for the main crops of legumes in Romania, in the period 2010 -2014 (%)

Analyzing the distribution of total output in the major oil crops, we find that the largest share of sunflower production has varying between 53.12% and 83.85% in 2010 to 2012, its share in total oil production plants 2014 being 63.26%. The year 2012 is different from other years in the study in that rapeseed production occupied only 9.45% of total oil production plants. Soybean production has consistently held a 5.05% share between 2013 and 6.31% in 2010 (Figure no. 4).



	The year 2010	The year 2011	The year 2012	The year 2013	The year 2014
Other productions	0,91%	0,59%	0,45%	0,29%	0,27%
Soya beans	6,31%	5,31%	6,26%	5,05%	5,86%
Colza	39,66%	27,50%	9,45%	22,45%	30,61%
Sunflower	53,12%	66,60%	83,85%	72,21%	63,26%

Figure no. 4 - Distribution of crop production for the main oil crops in Romania, in the period 2010 -2014 (%)

Analyzing the licensed premises for the storage of crop production for main crops in Romania, in the year 2014 there were a total of 4288 (silos and warehouses) which had a capacity of 20,817,496 tons of storage (9,749,452 tons in silos and 11,068,044 tons in warehouses). In the developing regions is remarkable existence of a number of 1,169 premises approved for the storage of 5,414,824 tons in South-Muntenia, this mainly due to climatic characteristics of the region, favourable crops. This is followed by South East with a number of storage spaces 875 and 735 West Region authorized storage spaces. Conversely remember the Bucharest Ilfov 50 storage and Centre with 206 storage spaces. It should be considered that the existence of such storage and capacity are closely related to compliance with the agricultural potential of the area (Table no. 2).

Table no. 2

Situation licensed premises for the storage of crop production for main crops in Romania in 2014

Region	Deposits	Storage capacity	From which:	
			Silo	Store House
	Unit size:			
	Number	Tons	Tons	Tone
North-West	347	1201632	440750	760882
Centre	206	1239208	319255	919953
North-East	550	1809100	584122	1224978
South-East	875	5545221	2745594	2799627
South-Muntenia	1169	5414824	3069017	2345807
Bucharest-Ilfov	50	196425	116965	79460
South-West Oltenia	356	1675071	835124	839947
West	735	3736015	1638625	2097390
TOTAL	**4288**	**20817496**	**9749452**	**11068044**

Analyzing the distribution of storage capacity premises licensed warehouses and silos, we note that in the South-Muntenia and Bucharest-Ilfov most of the production is stored in silos, while in other regions it is stored in warehouses (Fig. 5).

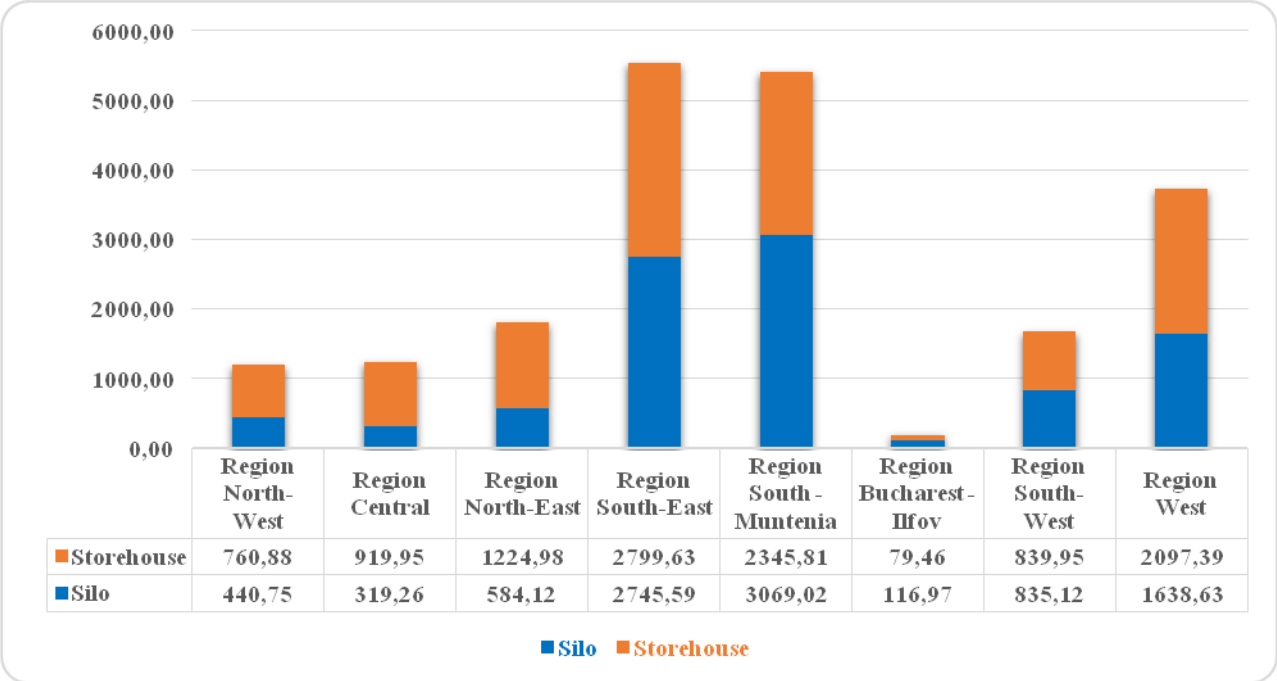


Figure no. 5 - Distribution of storage capacity for crop production for main crops in Romania in 2014 (tons)

Following the above analysis performed, we consider that the storage space of the determination of total production plant to the main categories of crops.

For 2014 it was considered the point 0, and all production harvested whatever crop was stored until the end and was not recovered.

This deficit storage total agricultural output resulted from the difference of total production by category of culture and assessing storage capacity for each category of culture in part.

The storage capacity for each category of crops was performed by extrapolating production share by category of vegetable crops presented in tables / graphs above.

It should also be remembered that not taken into account occupancy deposits, pre-harvest and post-harvest periods or no periods sale.

Thus, a total of 25,602,657 tons total agricultural production of the main crops and a total storage capacity of 20,817,496 tons, according to the aforementioned working hypothesis follows a deficit of 4,785,161 tons of storage (Table no. 3).

Table no. 3

Estimating storage capacity for crop production in the main categories of crops in Romania in 2014

The main categories of crops	Production	Storage capacity	From which:		Deficit space
			Silo	Warehouse	
	UM: Tons				
Cereal grains	**22070736**	17945694	8404502	9541192	**4125042**
Oil plants	**3460558**	2813776	1317775	1496001	**646782**
Grain legumes	**71363**	58025	27175	30850	**13338**
TOTAL	**25602657**	20817496	9749452	11068044	**4785161**

Looking at total crop production for main crops and existing storage capacity in the year 2014 appears a shortage of storage space grains 4,125,042 tons, 646,782 tons and 13,338 tons oil plants legumes (Figure no. 6).

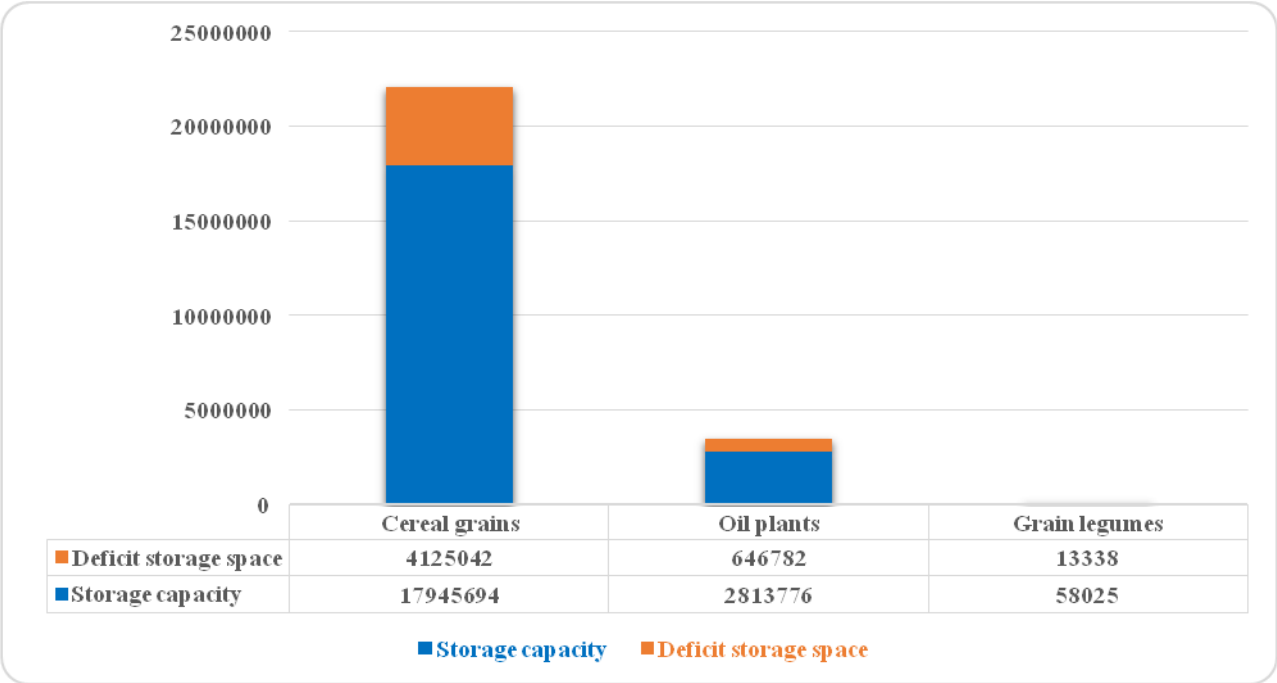
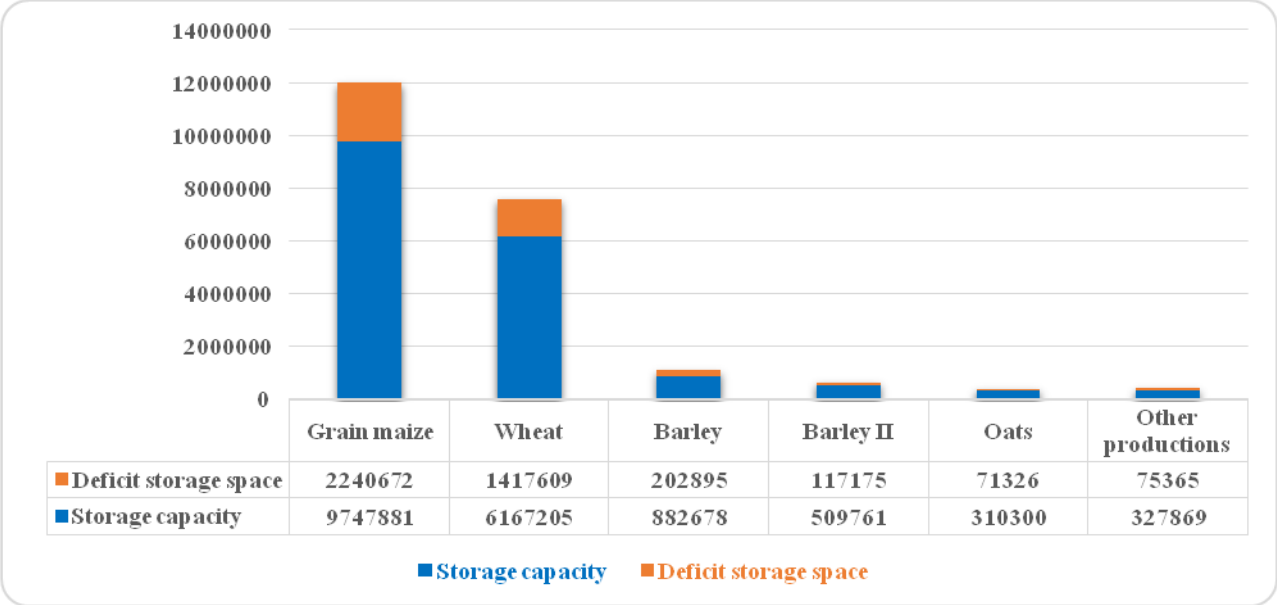


Figure no. 6 Storage capacity estimated deficit of crop production in the main categories of crops in Romania in 2014 (%)

Thus, in terms of crop production in major grain cereals in Romania for 2014 to a deficit estimated storage capacity:

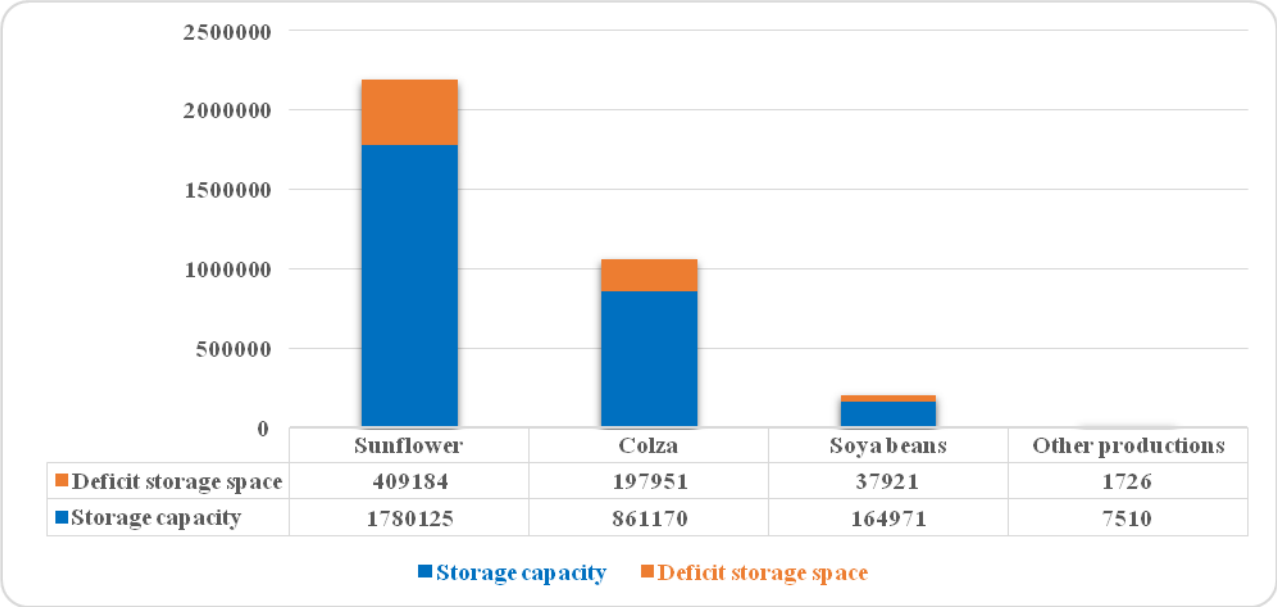
- 2,240,672 tons of maize;
- 1,417,609 tons wheat;
- 202,895 tons of barley;
- 117 175 tons of two-row barley;
- 71.326 tons oats;
- 75.365 tons of other grains.



	Grain maize	Wheat	Barley	Barley II	Oats	Other productions
Deficit storage space	2240672	1417609	202895	117175	71326	75365
Storage capacity	9747881	6167205	882678	509761	310300	327869

Figure no. 7 - Storage capacity estimated deficit of crop production in major grain cereals in Romania in 2014 (tons)

Vegetal crop production in the main oily plants crops in Romania, for 2014, based on known storage capacities estimated a deficit storage capacity : sunflower at existing capacity of storing 1,780 .125 tons estimated a deficit of 409 184 tons; colza culture at a capacity of 861 170 tons existing storage was estimated a deficit of 197 951 tons; the soybean crop at a capacity of 164 971 tons existing storage was estimated a deficit of 37 921 tons; in other productions, the existing oil plants at a capacity of 7.510 tons of storage was estimated a deficit of 1,726 tons (Figure no. 8).



	Sunflower	Colza	Soya beans	Other productions
Deficit storage space	409184	197951	37921	1726
Storage capacity	1780125	861170	164971	7510

Figure no. 8 - Storage capacity estimated deficit of crop production for the main oil crops in Romania in 2014 (tons)

With regards to vegetal crop production for the main crops of legumes in Romania, for 2014, based on known storage capacities there was estimated a deficit storage capacity: the culture of peas in an existing capacity of storage of 41.482 tons estimated a deficit of 9535 tons for growing beans in a storage capacity of 16 057 tons existing estimated a deficit of 3,691 tons and other grain legumes category was estimated a shortfall of 112 tons (Figure no. 9).

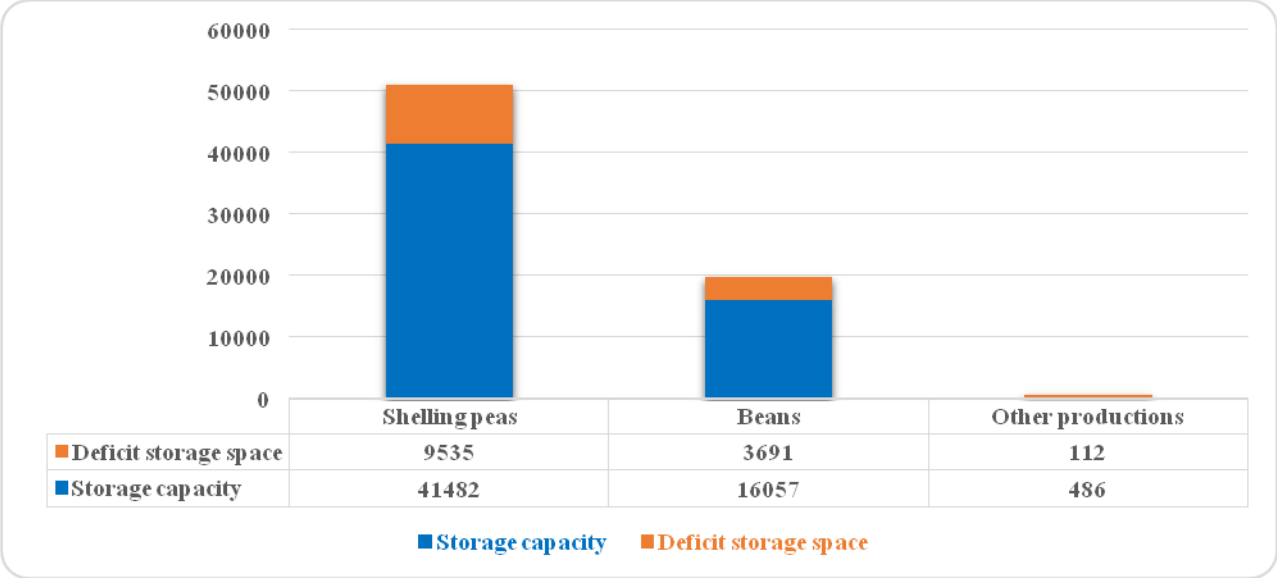


Figure no. 9 - Estimated storage capacity deficit of crop production for the main crops of legumes in Romania in 2014 (tons)

CONCLUSIONS

In 2014, at a total of 25,602,657 tons of total agricultural production of the main crops and a total storage capacity of 20,817,496 tons, according to the mentioned working hypothesis, follows a deficit of 4,785,161 tons of storage.

Due to the fact that farmers do not have sufficient storage, they are forced to be sold as yields obtained directly from the field when the selling price reaches the lowest point in a crop year.

Storage capacity is essential in order to hold the role of major player in the market. Holders of deposits (silos) command a price they can purchase products from small and medium agricultural producers, and later they transact at higher prices.

Thus, knowing the deficit storage capacity and agricultural production we can develop national strategies to prevent imbalances and distortions which can appear in the correct formation that prices of crop production, representing a real advantage for agricultural producers in Romania.

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ANALYSIS OF ROMANIAN AGRICULTURAL COOPERATIVES STRUCTURE IN 2014

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Summary: *This work aims to present a study which consisted of researching, analyzing and interpreting statistical data, combined with theoretical aspects that allowed assessing the state of agricultural cooperatives existing in Romania and the economic and financial situation recorded in 2014.*

Thus, at the end of 2014 in Romania there were 690 agricultural cooperatives. Most of these are found in the South-Muntenia, respectively North-West, totalling 231 cooperatives. Also, 40% of all agricultural cooperatives are represented by the vegetal genre.

In 2014 agricultural cooperatives in Romania totalled a turnover of 383 million lei, representing about 85 million euros, a significant sum indeed. The most significant income were achieved in South-Muntenia about 124 million lei (almost a third of the total income registered by the cooperatives), representing 28 million.

Keywords: *agricultural cooperatives, vegetal sector, Romania*

MATERIAL AND METHOD

The performance of the study consisted of researching, analyzing and interpreting statistical data. These, in conjunction with theoretical aspects extracted from specialized literature, allowed assessing the state of agricultural cooperatives existing in Romania and the economic and financial situation at their level recorded in 2014.

The data required for such analysis were collected through public institutions, including the National Trade Register Office.

INTRODUCTION

The association or the idea of association came to our country from the first half of the XIX century along with the young people who returned home after studying in Western Europe, so that after 1900 there is a substantial development of more cooperative forms, from rural lease communities, rural communities of consumer cooperatives of purchase or production, knowing such a strong impulse, they are diversifying and the number of members and cooperatives increasing significantly.

Romania was marked by the historical, economic, social and political conditions, even after the Second World War, so 1949 was a less good period for agricultural cooperatives, based on Decree no.133 / 2 in April 1949, which initiated the forced collectivization program. The new forms of organization of Romanian agriculture - agricultural production cooperatives – did not complied with all the classical principles of the cooperative movement.

After 1989, the restructuring process of Romanian agriculture and strengthening of private ownership of land requested replacement of agricultural production cooperatives, a cooperative system based on the principles of competitive economy, but even after a long period of transition in agriculture it has not been created a modern and competitive agricultural structure convergent with the agricultural structures of the European Union. Romania has not succeeded like other former communist countries to maintain and transform the old structures in free associations of producers, based on private property and on the respect for democratic principles.

Unfortunately, the word "association" has left deep scars on Romanian farmers, who after 25 years refuse or do not really know the benefits and advantages that association can bring.

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RESULTS AND DISCUTION

In agriculture association has a very old tradition, throughout history, there were various forms of association representing primitive forms. Agriculture is one area where the association and cooperation have been more necessary than in any other field of human activity, the farmer feeling isolated and practically helpless, where the key to the development of cooperation is the idea of mutual benefit. The association has been practiced by farmers from ancient times; the established groups have not got a legal form from the beginning (10).

Cooperatives are, in fact, formed associations that are organized to achieve personal gains. In terms of economic behaviour, people decide for a cooperative solution when the expected benefits exceed the costs. Because there is the possibility for someone to take action alone in decentralized market or to form a vertically integrated business with others, the net benefits of cooperation must surpass the alternative ones (9).

In the agriculture of developed countries cooperative movement has gained a wide recognition, increasing and multiplying its manifestation forms. Cooperation has emerged and developed in these countries as a solution for individual producers who are committed to both the market impact of production resources and market agricultural products. The emergence and development of co-operatives in agriculture is determined by the existence of several basic premises. The necessity of association in these types of organizations must be felt by agricultural producers, if they have complete freedom of action.

The development of cooperatives in Romania has risen since 2005 after Law 566 of 9 December 2004 (12) (with subsequent amendments) establishes the legal framework of the organization and functioning of cooperatives in Romanian agriculture (3).

The agricultural cooperative is an autonomous association of physical and/ or legal persons having the status of a legal entity of private law established under the expressed consent of the parties to promote the interests of the cooperative members.

The agricultural cooperative can have an unlimited number of members with variable capital, but not less than five (5) people and it pursues an economic activity, technical and social-providing goods, services and jobs exclusively or predominantly for its members.

In Romania there are functioning so far the following types of agricultural cooperatives, cooperative of first degree, which consist of associations of individuals and cooperative of second degree, which are formed of legal persons constituted of cooperatives of first degree in majority or physical and legal persons.

The fields and branches of activity of agricultural cooperatives are providing services, purchasing and sales, processing agricultural outcome, manufacturing and small industries in agriculture, mining and land management for agriculture, forestry, fisheries and livestock, finance, mutual assistance and agricultural insurance and other fields and industries.

The agricultural cooperative places a priority for commercial activities, being a producers of goods and services for its members.

The cooperatives are organized and operate at the basis of the association, accompanied by statute. They operate as legal persons since their establishment date.

The governing bodies of the agricultural cooperative are the General Assembly of Cooperating Members and the Administration Board.

Agricultural cooperatives can join the union branch and these may constitute federations, federations of marketing that ensure the development of agricultural products or in federations of medical insurance for cooperative members. In all member states of the U.E. cooperatives are organized into federations having the ability to consult each other (2).

Currently the association is starting to push through hesitatingly among farmers, registering an upward trend in the latest period compared with the period immediately following the revolution. These increases were favored by the measures taken by the Ministry of Agriculture and Rural Development, which facilitates the absorption of European funds by forms of association,

consisted primarily of producer groups and cooperatives. Based on the above, the study proposes an analysis of existing cooperatives in Romania.

Thus, at the end of 2014 in Romania there were 690 agricultural cooperatives. Most of these are found in the South-Muntenia, respectively North-West, totalling 231 such cooperatives. Also, 40% of all agricultural cooperatives are represented by the vegetal profile.

The number of cooperatives in the North-East region represents approximately 39% of total agricultural cooperatives registered in the region, compared with 25 cooperatives in Bucharest-Ilfov region, where the vegetal profile is just 10%.

Table no. 1

The structure of agricultural cooperatives in Romania in 2014

Region	Total number of cooperatives	Number of cooperatives from the vegetal sector (only)	Share of vegetal genre cooperatives (from total)
North-West	104	32	30.77
Centre	75	19	25.33
North-East	167	65	38.92
South-East	88	49	55.68
South-Muntenia	127	56	44.09
Bucharest-Ilfov	25	10	40.00
South-West Oltenia	55	29	52.73
West	49	16	32.65
Total	690	276	40.00

Source: Processed data from ONRC.

In 2014 agricultural cooperatives in Romania totalled a turnover of 383 million lei, representing about 85 million, a significant sum indeed. The most significant income were achieved in South-Muntenia about 124 million lei (almost a third of total income registered cooperatives), representing 28 million euros.

The gross profit amounted by the cooperative raised at about 8 million lei (1.8 million euros). Also, the most profitable region was represented throughout South-Muntenia with a financial plus of 1.5 million lei (approximately 10% of profits made at the country level), followed by the North East region ranking with a gross profit of 1.35 million lei and on the third place is South-East region recorded a gross profit worth about 1.32 million lei.

Table no. 2

Economic and financial situation recorded in the agricultural cooperatives 2014

Region	Total turnover	Gross Profit	Gross Loss	Number of members - individuals	Number of members – legal entities
North-West	50762587	921241	144345	1475	459
Centre	39564320	1215636	1730769	1591	254
North-East	33323698	1351419	10125903	1295	113
South-East	119978487	1319424	639048	637	273
South-Muntenia	124757293	1514306	1552945	952	383
Bucharest-Ilfov	532337	50851	128907	139	272
South-West Oltenia	1566318	276675	550308	427	42
West	12816822	1049183	141078	760	230
Total	383301862	7698735	15013303	7276	2026

Source: Processed data from ONRC.

The number of cooperative members without legal personality (2014) was more than 3 times higher than members of societies with legal personality, totalling a number of 7276 members (without legal personality).

With a total of 276 cooperatives w with vegetal profile, exclusively, representing 40% of all cooperatives, they registered a turnover of 163 million lei (36 million euros).

Table no. 3

Structure of cooperatives from the vegetal sector in Romania 2014

Region	Number of cooperatives from the vegetal sector (only)	Total turnover	Gross profit	Gross Loss	Number of members - individuals	Number of members – legal entities
North- West	32	13666514	223904	89049	390	93
Centre	19	5119920	16169	40459	311	46
North-East	65	6438167	459032	189431	536	65

South-East	49	96943290	1152903	118985	347	195
South-Muntenia	56	39609994	788486	504456	460	83
Bucharest-Ilfov	10	159672	21486	55690	100	59
South-West Oltenia	29	1367010	72486	174470	273	10
West	16	180409	7296	68899	363	66
Total	276	163484976	2741762	1241439	2780	617

Source: Processed data from ONRC.

The highest grossing were achieved in South-East region (approx. 97 million lei), followed at a great distance from the South-Muntenia (40 million lei), even if the number of cooperatives in the region is higher than above mentioned region. The same ranking was maintained in the event of gross profit where South- East region has achieved about 1.2 million lei. The lowest profit was achieved in the West region only 7296 lei.

In case of the gross loss, the first place was achieved in South-Muntenia with approximately 500 thousand lei, followed by the North-East. The number of members without legal personality was 2780 compared to those with legal personality 617, where most members with legal personality were registered in the region with the highest income and profit (South East) (Table no. 3).

Relating to the total number of cooperatives in the vegetal sector, we can say that the average income amounts to 592.337 lei value (Table no. 4).

We can say that the highest average per cap of association was recorded in the South East of about 2 million lei (444,000 euros). Regarding the profit, the average is 2,000 euros (9.934 million lei). The highest average number of members with legal personality lies in Bucharest-Ilfov region with 5.9 members per cooperative (Table no. 4).

Table no. 4

The average of economic and financial situation of agricultural cooperatives registered in the agricultural cooperatives with vegetal profile in Romania

Region	Total turnover	Gross profit	Gross loss	Number of members - individuals	Number of members – legal entities
North-West	427079	6997	2783	12	2.9
Centre	269469	851	2129	16	2.4
North-East	99049	7062	2914	8	1.0
South-East	1978434	23529	2428	7	4.0
South-Muntenia	707321	14080	9008	8	1.5
Bucharest-Ilfov	15967	2149	5569	10	5.9
South-West Oltenia	47138	2500	6016	9	0.3
West	11276	456	4306	23	4.1
Total	592337	9934	4498	10	2.2

Source: Processed data from ONRC.

Also, the total turnover of the vegetal sector represents approximately 42% of total turnover from the agricultural cooperatives in Romania and in terms of profit, it represents 35%. At the same time the number of members with legal personality associated with cooperatives with vegetal profile have a share of 30% from all members with legal personality of agricultural cooperatives (Table no. 5).

Table no. 5

Share of economic and financial structures profile compared with cooperatives with vegetal profile (only) and agricultural cooperatives (total)

Region	Total turnover	Gross profit	Gross loss	Number of members - individuals	Number of members – legal entities
North-West	26.92 %	24.30 %	61.69 %	26.44 %	20.26 %
Centre	12.94 %	1.33 %	2.34 %	19.55 %	18.11 %
North-East	19.32 %	33.97 %	1.87 %	41.49 %	57.52 %
South-East	80.80 %	87.38 %	18.62 %	54.57 %	71.43 %
South-Muntenia	31.75 %	52.07 %	32.48 %	48.32 %	21.67 %
Bucharest-Ilfov	29.99 %	42.25 %	43.20 %	71.94 %	21.69 %
South-West Oltenia	87.28 %	26.20 %	31.70 %	63.93 %	23.81 %
West	1.41 %	0.70 %	48.84 %	47.86 %	28.70 %
Total	42.65 %	35.61 %	8.27 %	38.21 %	30.45 %

Source: Processed data from ONRC.

The regions with vegetal profile cooperatives (only) are represented by the South-East and South-West Oltenia, managing over 80% of income from agricultural cooperatives to be made exclusively from vegetal sector. On the other hand the largest losses (gross) are recorded in the North West (62%) (Table no. 5).

CONCLUSIONS

Currently, the cooperative system in Romanian agriculture is in an early stage of formation of different types of cooperatives, but the process is running hesitatingly though it is supported by the state through a series of important tax incentives, through measures taken by the Ministry of Agriculture and Rural Development, which facilitates the absorption of European funds by forms of association, they are consisted primarily of producer groups and cooperatives.

A priority for agricultural cooperative movement is the horizontally expanding and covering a larger number of farmers or farms.

The association of agriculture, whatever its purpose, is the only solution that Romanian farmers can become competitive in a free market, highly competitive and it does nothing but put pressure on the weakest

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ANALYSIS OF THE FORMS OF ASSOCIATION /COOPERATION IN ROMANIA

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Summary: *This paper analyzes the evolution of the modern agrarian associations and cooperatives in Romania. Right now, our country is far behind the west-european countries regarding the development of the associative sector in the agricultural domain, from the diversity point of view and also from the presence on the market. One of the biggest problems of the small farmers from Romania represents selling the production, the traditional markets are being suffocated many times by agents. The agrarian sector is confrunting with problems marked mainly by the poor organization of the farmers regarding the production marketing and a slow structuring of their commercial behavior. The biggest problem of the agrarian cooperatives in Romania is the access to funding. This is due to the business related problems and their specific legal form. In Romania a law for crediting cooperatives doesn't exist, they are not found in the bank nomenclature and they are treated like any LLC. Also, there is an accute need for founding a high level training program intended for the agrarian cooperatives and associations leaders. The purpose is to present a current state synthesis in order to have a real image of their situation. The main object of this study is to make an assessment of the agrarian cooperatives's situation in Romania with the purpose of offering solutions and recommendations, by setting the development directions in order to become compatible with the European systems of agrarian cooperatives.*

Key words: *association forms, agrarian cooperatives,agrarian associations, producer groups.*

INTRODUCTION

Agriculture is the most important economical branch of a country, because it's the one that ensures people's and animal's food. In order to become a powerful country economically speaking, Romania has to act in sense of growing agricultural productivity. Because of the global population growth the need for food products will intensify. In this regard, high fertilisation of the lands alone, is not enough in order to have a performant agriculture.

Romania is far behind the West European countries at the moment, regarding the development of the associative sector in agriculture, from the diversity point of view and also from the presence on the market. In our country,association is based especially on the interpersonal relations and on trust relations within communities, without having contractual relations. The agrarian associations with a representative character are dominant, and the economical purpose associative forms are very little developed very little. One of the biggest problems of the small farmers in Romania consists in selling the production, because traditional markets are many times being suffocated by agents.

The agrarian sector is confronting with the problems, market especially, by the poor formation of the farmers in order to trade the production and a slow structure of their commercial behavior. In this situation we are asking the question "What are the causes of such a low level of contracting in the Romanian agrarian chain?". To the institutional causes which are based on the land retrocessions in the `90 and on the agrarian politics incoherence until 2007, which led not only to the fragmentation of the lands, but also to the fragmentation of the production-storage-distribution-marketing chains, for a long period of time there was also the farmer's reluctance to associate/cooperate.

The main reasons for which the cooperation/association represents an instrument of improving commercial relations would be: increasing chains efficiency, decisions regarding production planning and farmer investments, increasing vertical integration level, consumer requirements achievement – food safety, animal wellbeing, environment protection – chain

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transparency growth, risks sharing.

The main objective of this study is making an assessment of the agrarian cooperatives in Romania with the purpose of offering solutions and recommendations, setting the development directions in order to become compatible with the European systems of agrarian cooperatives

MATERIAL AND METHODS

„The actors" that come to support the modern agriculture are the agrarian holdings, the producer associations, the cooperatives and the producer groups. They play a key role in the rural economy, by supoporting farmers to market their products better, by obtaining better prices for them, by contributing to the economical growth and creating new jobs within the economy. The associated forms are still at the beginning in our country, as compared to the European ones, that work by the same principles after decades. In Romania, in the last 10 years everyting was started from zero, small steps have been made, but theese need to be rebuilt after solid principles, with pacience and capable and well-intentioned people.

The used research method is the quantitative analysis by studying the documents and data taken and processed from the National Statistics Institute and of the specialized literature, in order to highlight the association and cooperation forms potential in agriculture. The pieces of information have been centralized and processed in order to make a SWOT analysis that highlights the advantages and disadvantages of the association forms, the opportunities and reccomendations that can be made.

RESULTS AND DISCUSSIONS

The agrarian society is a private type society, with variable assets and an unlimited and variable number of assocites, covering agrarian holding of the land, tools, animals and other means brought to society, as well as making investments of agrarian concern. The agrarian society doesn't have a commercial character. The agrarian tools and other gears, material and pecuniary means, as well as animals can be brought into society, in its property or in its use only, depending on the case. The agrarian lands are only used for society, the associates keeping the ownership over them. Upon entering the agrarian society, the movable and immovable assets, as well as the animals will be evaluated in order to determine the social parts subscribed by each of the associated member.

The producer association is the holder of rights and obligations, made up by three or more persons, which based on an agreement, put in codominium and without a restitution title material contribution, knoledge or their working contribution in order to achieve some activities of general interest, comunitary or, depending on the case, in their personal non-patrimonial interest. The purpose and the advantages from the founding of an association are following a general, local or based on a group interest, facilitating associations and foundations acess to private and public resources, facilitating partnerships between public authorities and associations, sustainable development of the agrifood production, correlating the production level and the product quality, according to the market requirements, production growth, improving the information system regarding demand and offer, the development of the agrifood markets, promoting agrifood products on the national and international market, ensuring equal rights for all the members, defending the member's interests in their relations with the govermental bodies and the state administration, promoting practices and technologies that ensure environment protection, providing aid for association, management and marketing.

The producer groups can be founded in order to commercialize the agrarian products of animal and silvan. The legal forms that can be acknowledged are trading companies, agrarian companies, associations, agrarian cooperatives and other forms of association. The advantages of the recognition as a group of producers are numerous, among them the most important being: the posibility of placing reliable commercial contracts, offering of a large quantity of homogenous quality products, the increase of the negociation power and obtaining better financial conditions,

ensuring the outlet, production planning, proper marketing, setting the producer price, getting financial support from The European Fond for Agriculture and Rural Development (FEADR) within the National Program for Romanian Rural Development for 2014-2020.

Agrarian cooperative represents the autonomous association of physical and/or juridical persons, depending on the situation, having a private law juridical person status, established upon free consentment by the parties with the purpose of promoting the interests of the cooperative members. The agrarian cooperative conducts mainly commercial activities, because it's a producer of goods and services for its members. Agrarian cooperatives can associate in branch unions, and they, in their turn, can form federations, marketing federations, that ensures the capitalisation of the agrarian products or in a federation of mutual insurance of the cooperative members. As to define, it can be said that the cooperatives are associations that are formed in order to accomplish the personal advantages of those who associate. From an economic behavior point of view, the persons decide on a cooperative solution in the situation in which the anticipated advantages surpass the expenses. Besides the maximizing advantages, the cooperation science reminds of some, those can be split into two groups: minimizing the tranzaction costs and blunting opportunistic behavior and limiting the riscs that branch from those.

Immediately after 1945, in order to settle the critical crisis determined by the war, the European countries adopted a series of political, legal and social character measures that had in mind the recovery of the national economies and most of all of the agriculture, highlighting the necessity of increasing the agrarian production and insuring food for the population. In all the E.U. member states the cooperatives are structured into federations having the capacity to consult each other. In Europe, the agrarian cooperatives have proven to be the most performant farmer organizations, benefiting a series of amenities from the state. The professional studies show the fact that the cooperative sector from the E.U. agriculture trades over 50% from the agrarian production's total. More, the E.U. statistics report the existence of over 38.000 cooperative entities, in which more than 7 million cooperative members are active, from a total of 13 million farmers.

The association forms are different from one country to another in name, as much as in content. In order to have a starting point and to lay the foundation from which the necessary measures can be taken to organize the agrarian producers and to make romanian agriculture more efficient we elaborated a study regarding the form of association and cooperation at the agrarian cooperatives level in România, with support from ONRC and MADR.

After analysing public data, centralizing the result at a region level, in 2014 compared to 2009, a drastic decrease in the number of agrarian cooperatives and agrarian associations operating in Romania has been found.

Fig.1- The number of agrarian cooperatives in Romania by development region

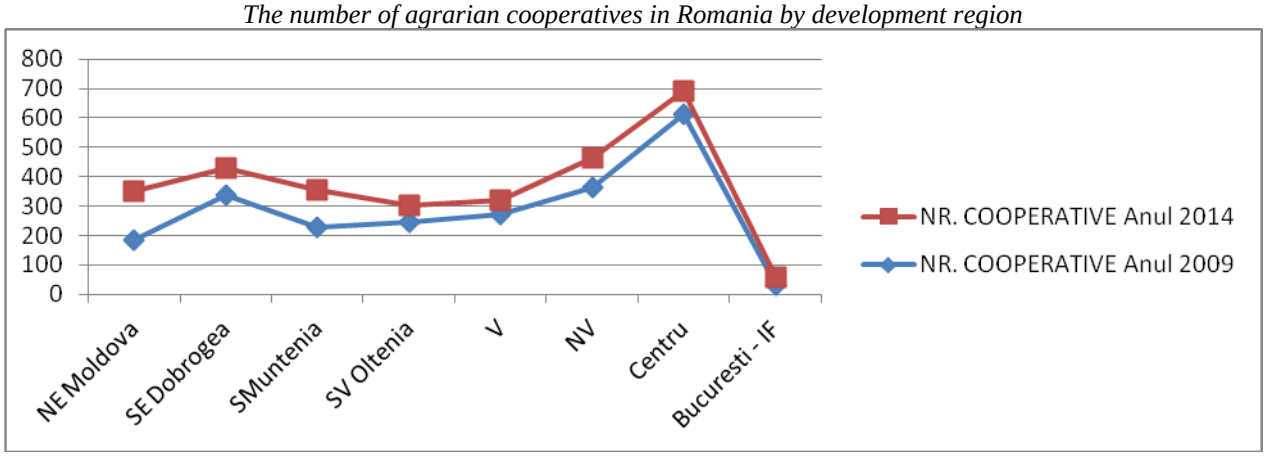
Table nr.1

THE NUMBER OF AGRARIAN COOPERATIVES IN ROMANIA BY DEVELOPMENT REGIONS		
REGION	**COOPERATIVES NR.**	
	Year 2009	**Year 2014**
Development region North –East of Moldova	186	165
Development region South-East of Dobrogea	339	89
Development region South of Muntenia	229	128
Development region South - West of Oltenia	245	59
Development region West	271	51
Development region North – West	363	101
Development region Center	612	79
Development region Bucuresti- Ilfov	33	25
TOTAL	**2278**	**691**

The graphical representation renders suggestively the decreasing trend of the number of agrarian cooperatives (Chart nr. 1)

Chart nr.1

The number of agrarian cooperatives in Romania by development region



Possible explanations for the drastic decrease of the number of agrarian cooperatives and associations come from the following directions:

a) The romanian agrifood market is strongly infuenced by imported products, by the price that is many times smaller than that of the endemic products. The fact that we don't have enough economic levers to protect domestic producers, forms a real problem for romanian agrarians.
b) All types of associations/cooperatives in agriculture are tax compliant, by enforcing the 16% flat tax, not having any other type of tax deductions. There are no fiscal deductions in order to set up indivisible funds. The applied tax exemption is progressive, of 5% from the owed contribution until it reaches the 20% level from the joint stock.
c) The agrarian cooperatives from Romania's biggest problem is the access to finances. In Romania there is no law for lending agrarian cooperatives/associations, they are not registered in the bank nomenclature and are treated just like any LLC, without keeping in mind the agrarian production's features.
d) An accute need of founding a professional trainig program at the agrarian cooperatives / associations leadeship level is sensed.

The main activities developed by the agrarian cooperatives and associations in Romania, according to the activity sector are: buying and trading production obtained by the cooperative members and supplying farms with: cereal seeds, industrial plants, forage crop, pesticides, gas-oil, fertilizer, agro-technical advice; live animals wholesale; mixt farms activities; pig breeding; agrarian raw materials, live animals, raw materials and semifinished goods trade agent; dairy

products wholesale; fruits and vegetables wholesale; cereals stock-pile, cold storage, cereal storage and cultivating tanks (exclusively rice), leguminous plants and oilseeds producing plants.

In 2014, the agrarian cooperatives and associations structure by activity sectors was the following:

Table nr. 2

Nr crt	Activity sector	Nr. of agrarian cooperatives	Nr. of agrarian members
1	Cereals, leguminous plants and oilseeds producing plants cultivation	82	1359
2	Vegetables, melons, root crops and tubers, other annual crop plants cultivation	40	363
3	Fruit cultivation	17	268
4	Landscape architectural plants and nursery cultivation	2	21
5	Animals and birds breeding	173	2230
6	Mixed farms activities (vegetal crop combined with animal breeding)	116	1586
7	Auxiliary activities	30	440
8	Fishing and aquaculture	6	84
9	Canned meat	12	405
10	Canned vegetables and fruits	9	56
11	Oils and fats manufacture	1	7
12	Dairy products and cheeses manufacture	3	168
13	Bread and pastry products manufacture	1	5
14	Other food products manufacture	2	71
15	Fabricarea preparatelor pentru hrana animalelor de fermă manufacture	5	53
16	Grape wines manufacture	5	51
17	Agrarian raw materials, live animals, materials and semifinished goods trade intermediation	27	414
18	Intermediation of products that are not included in the other codes	1	5
19	Cereals, seeds, foffer and raw tobacco wholesale	57	439
20	Agri-food product trade	91	1508
21	Cereals storage, cold storage, storage tanks	5	49
22	Accommodation facilities	2	10
23	Business and management aid activities	3	11
24	Renting and laesing agrarian cars and equipments activities	1	5
	TOTAL	**691**	**9608**

Source: Processed data from The National Trade Register Office, 2014

The collective political action is essential in agriculture in order to make a more equitable food system that will allow the food producers to live from their production.

The advantages of the farmers that found a cooperative/association:

- the reduction of the number of agents in the distribution chain and in the one of non-traiding obtained products;
- the increase of the producers's infuence regarding setting the selling price;
- reducing or eliminating the syncope in raw materials and materials supply;
- adopting new technologies that allow passing from traditional exercises to more productive ones.

The disadvantages of the farmers that found a cooperative/association:

- Romanian agrarian's mentality, the lack of democratic exercise, the distrust, the aversion towards the tax system, the difficulty in seeing beyond his own interest, the lack of vision;
- insufficient knoledge regarding association and business management;
- insufficient fonds in order to form and finance cooperatives;

- difficulty in competing with import products, that come with very low prices;
- the high average age of the farmers.

Opportunities:

- transparency in the relation with the members in setting the prices;
- increasing of the training degree of the Romanian farmers.

Limits:

- the contradiction between the egalitarian structure of the group members and the hierarchical structure of the organizing activity;
- the risk of levelling performaces;
- the advent of some subgroups can be avoided when the asignment of the management positions is voluntary accepted by the members, in turns;
- conflicts in profit allocation can be avoided when the leaders are found among the cooperative members;
- reduced capital due to the principle: one vote per person; the cooperative members are not motivated to make capital investments;
- the lack of qualified personnel within the members; it is recommended to increase the education degree of the members, expert advice, hiring a specialist, if the regulation allows it.

CONCLUSIONS

Almost all the agrarian cooperatives in Romania are realtively newly founded compared to those from the west that are active for decades and even hundreds of years. The agrarain cooperatives in Romania are not engaged yet in relevant activities of informing, communication, research and innovation, in supporting general promotion projects, social corporative responsability, economic development, social, cultural, environmental, of food safety, rural development and should start such campaigns.

Unfortunately in the top of the agrarian cooperatives in Romania there are only cooperatives and agrarian cooperative associations that perform services of buying imports and trading the raw materials obtained (cereals, industrial plants, live animals, etc.) to the members, as opposed to the western ones where collecting/storing/processing and trading services jointly are dominant, which is why they obtain high value products.

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