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**THE RESEARCH INSTITUTE FOR AGRICULTURAL  
ECONOMY AND RURAL DEVELOPMENT  
BUCHAREST**



**International Symposium  
“Agrarian Economy and Rural Development  
- realities and perspectives for Romania”**



**The 3<sup>rd</sup> Edition  
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Bucharest, Romania**

***3<sup>rd</sup> Edition of The International Symposium  
Agrarian Economy and Rural Development (AERD'12)***

# **AGRARIAN ECONOMY AND RURAL DEVELOPMENT - REALITIES AND PERSPECTIVES FOR ROMANIA**

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# AGRICULTURAL INSURANCE SCHEMES FOR THE DEVELOPMENT OF RURAL ECONOMY

ABDUL RAHMAN IBRAHIM<sup>1</sup>

## Summary

*In the last decades, agricultural production became more and more expensive. Nevertheless, there are a lot of risks that affect agricultural production and agricultural producers' income. This income instability determines many of them abandon their business. The paper will approach the agricultural risk management from the perspective of agricultural insurances, with a general presentation at EU level, and a special focus on the situation of Romania and Turkey. There will be analyzed the factors which contribute to the development agricultural insurances, as well as the effect of the later on the development of the agriculture sector in each country. The aim of the paper is to improve the understanding of the importance of the agricultural insurance schemes as a risk management tool and of its role in increasing the agricultural production in Romania, given that the rural area in this country is subject to many climatic risks which affect its stability. An important input of the paper will be the good practice of Turkey in this field. General conclusions and considerations will close the whole paper. The author will use different information sources from European and national level, such as reports, country fact sheets, etc...*

**Keywords:** *agriculture insurance, rural area, risk management*

## INTRODUCTION

There are a lot of risks that affect agricultural production and agricultural producers' income. Nevertheless, the major risks which are of concern to the agricultural sector are (1) price risk caused by volatility in prices and (2) production risk resulting from uncertainty about the levels of production that primary producers can achieve from their current activities.

Even if the risks in the business of agricultural production cannot be avoided it can be a manageable element. Concern for risks that stifle investment and contribute to vulnerability of the rural poor is a driving force behind various types of agricultural insurance. Agricultural risk management relies on a combination of technical and financial tools which can be used to deal with the multiple sources of agricultural risk. In order to avoid risk, agricultural producers may transfer all or part of the risks to third party through an insurance contract.

Traditional risk management strategies have often proven not to be sufficiently effective in preventing serious economic loss or permitting a speedy recovery. One of the most important tools in risk management strategies is agricultural insurance, which is reemerging as a topic of interest, especially in the light of the need to improve agricultural competitiveness. Even if, the content of insurance is shaped by geographical location and climatic conditions, and insurance schemes cover those risks which affect agricultural production the most, there are common features which can be applied. The challenge is how to overcome obstacles and deliver efficient and sustainable agricultural insurance products. The principal obstacles are lack of high quality information, inadequate regulatory frameworks, weak supervision, lack of actuarial expertise, lack of professional expertise in designing and monitoring agricultural insurance products, a mass of low-income, dispersed clients, who may not be willing or able to pay actuarially sound premiums for multiple peril products, and the tendency of governments to undermine market development through inappropriate use of subsidies and disaster relief funds.

The paper will define what is meant by agricultural insurance, will present different types of agricultural insurance, and will explain the challenges of this type of insurance.

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## MATERIAL AND METHODS

The data used for documenting the paper was collected mainly through desk research. Different information sources from European and national level, such as reports, country fact sheets and articles were consulted.

## RESULTS AND DISCUSSIONS

### Definition and Types of Agricultural Insurance

In general, insurance is a form of risk management used to hedge against a contingent loss. The conventional definition is the equitable transfer of a risk of loss from one entity to another in exchange for a premium or a guaranteed and quantifiable small loss to prevent a large and possibly devastating loss.

Agricultural insurance is a special line of property insurance applied as a financial tool to transfer production risk associated with farming to a third party via payment of a premium that reflects the true long-term cost of the insurer assuming those risks. Agricultural insurance is not limited to crop insurance, it also applies to livestock, bloodstock, forestry, aquaculture, and greenhouses.

In many countries, the public sector involved in the provision of agricultural insurance, insuring small scale farmers against crop losses to adverse weather or other hazards. With few exceptions, such interventions have encountered severe problems owing to high administrative costs, moral hazard, and adverse selection. Government interventions should be aimed at improving the accessibility and quality of private sector insurance.

The most important types of agricultural insurance are:

*Single-risk insurance*: provides coverage against a single risk (peril). Among agricultural insurance mechanisms, hail insurance is one of the most widely applied single-risk insurances. The single risk insurance can also be supported by the private insurance companies since the risk is not systematic.

*Combined (Peril) Insurance*: known as multi-risk insurance in several countries, the insurer provides coverage against more than one risk. Hail and frost is a good example of combined (peril) insurance. In many cases, the coverage is extended to fire, earthquake, lightning, and other nature-related disasters.

*Yield Insurance*: insurance provides coverage against fluctuations in the farm yield. Thus any risk factor that affects the farm's productivity is covered by the yield insurance. These risks can be listed as, but not limited to flood, drought, frost, hail, disease, fire, etc. Usually, coverage against these risks is presented under a single policy, namely, multi-peril crop insurance policy. This is an costly coverage since almost all risks are covered. The difference between the premium farmer is willing to pay and the insurer's willingness to accept is subsidized by the government.

*Price Insurance*: this type of insurance provides coverage against fluctuations in the product prices. Thus, if the product price falls below a pre-specified level, indemnities are paid according to the insurance terms.

*Revenue Insurance*: provides coverage against changes in farm revenues. Since revenue equals price times quantity, revenue insurance offers protection against both price and quantity fluctuations.

*Whole Farm Insurance*: provides coverage against changes in the farm's yield or revenue. The farm revenue insurance is a special case of revenue insurance where the farm's entire activities are insured including but not limited to agricultural activities.

*Income Insurance*: This type of insurance provides coverage against the fluctuations in the farmer's incomes. Income is defined as the difference between revenues and costs. Thus, the income insurance covers risky changes in yield, price, as well as cost of production, since it covers all factors affecting the income of the farmers.

*Index Insurance:* The definition of the index insurance is based on the type of the index used to determine the losses. The index insurance provides coverage against the fluctuations in farmer's yield, revenue, or any other factor that affects the farmer's income. Usually, an external index, which is highly correlated with farmer's income is used as a threshold parameter. Once the index reaches the threshold, indemnities are released according to pre-determined conditions. There are two types of risks faced by the farmers. The general risk, such as low-yield in the area or high-temperature in the area (draught) is covered by the index insurance. Consequently, index insurance can be easily implemented in homogenous areas where several farmers face similar risks. However, the basis-risk is farmer specific. Thus, it is not covered by the index insurance. As an example, consider two farmers. The first farmer's output is significantly affected by the drought in the area whereas the second farmer's output was not affected. The indemnities will be released as long as the index reaches the pre-determined threshold. While, that might seem like a drawback of the system, the index insurance naturally eliminates moral hazard issues. The farmer's will still perform mitigation activities even if they are covered under index insurance.

### **The Situation of Agricultural Insurance at EU Level**

The risk and crisis management strategies at the level of EU are not currently integrated in the CAP (Common Agricultural Policy). Nevertheless, the European Commission and other EU institutions have elaborated several documents which review the agricultural risk management systems in the European countries.

*Risks and crisis management in agriculture: University of Naples (2005)* represents a study carried out for the European Parliament in 2005, and provides comments on the three options considered by the Communication of the Commission to the Council (EC, 2005a). The report is very critical with the first option (public participation on the insurance premium paid by farms and on the re-insurance scheme), obviously in contrast with the position of insurance companies. When commenting the possibility of a Common Agricultural Policy that would subsidize agricultural insurances, one of the points criticized in this report is that a substantial amount of the subsidies would be given in fact to the insurance companies, instead of finishing in the farmers' pockets.

*Risk Management Tools for EU Agriculture, with a special focus on insurance (EC, 2001).* The conclusions of this study do not look at a direct involvement of the EU on risk management systems, but rather propose that the EU has an accompanying or framing role. More specifically:

- Regarding price risks, it shows potential interest in promoting the development of futures and options markets
- Regarding production risks, it is considered that insurance systems are to be developed by the member states on a bottom-up approach. Co-insurance and re-insurance can be developed at the European level by private companies, under a common legal framework, but re-insurance could also be provided by the EU
- Anti-cyclical income support would be interesting to apply but it has some caveats or cons.

*Income insurance in European agriculture* The central questions studied by this report are whether there might be a case for farm income insurance in Europe in the future, under what conditions and in what form might such an income insurance scheme be feasible. The report explores a number of issues such as insurance coverage, loss assessment, multi-year versus single year insurance contracts, mandatory versus voluntary participation, etc. Feasibility is tested with a Monte Carlo simulation using panel data from six Member States. The investigation also includes a description of the agricultural sector in Europe and a review of current experiences on income insurance in other countries.

Some of the main conclusions are that, if a form of income insurance is introduced in Europe, it is recommended that:

- Gross revenue insurance should only be considered for crop, and not for livestock, commodities.

- Insurance should start with true market commodities, i.e. commodities for which no price support is available.
- If governments provide reinsurance (at zero costs, at fully commercial rates, or as a combination of these two options) they should only reinsure part of the risks underwritten by insurers.
- Before wide introduction, first some pilot tests should be carried out, to test the interest of farmers in insurance schemes that cover systemic risks such as floods, droughts and epidemic diseases, as well as the interest of insurance companies in setting up (mutual insurance funds for) such schemes. In setting up such pilot tests it is crucial for later implementation that governments are involved to no more than the necessary minimum extent, using transparent rules for such aspects as stop losses, i.e. from the beginning there should be no asymmetric information between insurers and governments.

### **The Turkey's Experience in Agricultural Insurance**

Agricultural insurance schemes in Turkey were first introduced in 1957 and these schemes have been maintained as animal and hail insurances.

Two programmes were available to help crop producers recover from the financial effects of natural disasters and protect them from unavoidable risks associated with adverse weather:

- Government Aid Programme
- Private insurers

Turkey has adopted a very similar system to the Spanish management structure, which allows those involved to cooperate on an effective platform in order to further develop the system defining risk management responsibilities. It meets all the following requirements:

- Mechanisms for public-private dialogue.
- Continuous updating using the contents of agendas.
- Development of policy tools for dialogue with the Government.

The main drive for the first companies which introduced these schemes was to protect the crops and animal products of farmers.

The total harvesting land in Turkey is 24.4 million ha of which 98% is exposed to hail risk and 47% to other natural risks. From a total of 40 insurance companies in Turkey, 9 are providing agricultural insurance services [1], which makes agricultural insurance share be 1.8 % in the insurance sector in Turkey [7]. Despite supporting farmers by financing 50% of agricultural insurance premiums by government [7], improvement of agricultural insurance is still back.

In 2005, with the agreement of government and the private commercial insurers, legislation was enacted under the Agricultural Insurance Law No 5363, dated June 14, 2005, to create an Agricultural Insurance Pool under the administration of a new managing underwriter, TARSIM, and to define the role and functions of federal government support in the form of financial subsidies and excess of loss reinsurance protection.

Tarsim Pool is a public-private partnership involving the government, the private insurance companies, and supporting organizations (insurance association, Ministry of Agriculture, etc). A management committee comprised of representation from each of these organizations is responsible for policy decisions regarding the operations of the Pool, for determination of crops, risks, and regions to be supported, and for determination of subsidy levels.

The TARSIM Agricultural Insurance Pool functions as a conventional coinsurance pool, and its shareholders and coinsurers include the 16 former agricultural insurance companies, each with a 6.25% share in the pool. The coinsurers issue TARSIM's approved and standard insurance contracts (policies) on their own paper; the companies receive an agreed commission for bringing business to the Pool, and all risks and premium are 100% ceded to the Insurance Pool. TARSIM is responsible for product design and setting standard rates, for premium collection, for loss assessment and claims settlement, and for reinsurance arrangements.



The agricultural GDP in Turkey is increasing year after year as we see in next table which it shows in 2002 was 23.7 billion\$ and it arrived to 62.7 billion \$ in 2011.

**Table 1 : Agricultural Growth**

| Years | Agricultural GDP(BILION\$) | Agricultural Growth |
|-------|----------------------------|---------------------|
| 2002  | 23.7                       | 8.8                 |
| 2003  | 30.2                       | -2                  |
| 2004  | 37                         | 2.8                 |
| 2005  | 45                         | 7.2                 |
| 2006  | 43.5                       | 1.4                 |
| 2007  | 49.5                       | -6.7                |
| 2008  | 56.4                       | 4.3                 |
| 2009  | 51                         | 3.6                 |
| 2010  | 61.7                       | 2.4                 |
| 2011  | 62.7                       | 5.3                 |

Source: Turkstat

TARSIM offers a wide range of specialist agricultural insurance products. The company does not underwrite multi-peril crop insurance (MPCI) covers. Rather, it offers a named-peril hail policy plus additional perils for all crops. For fruit and vegetables and ornamentals additional cover may be purchased against frost damage. The company also underwrites a material damage policy for loss of greenhouse structures and the crops grown under cover.

The company insures dairy cattle against a wide range of perils including diseases, but excluding notifiable diseases, and a similar comprehensive cover is offered for poultry. The company also underwrites a marine aquaculture policy against a wide range of perils including pollution, diseases, and algae bloom.

Public support to agricultural insurance is important in Turkey. The government provides a wide range of support under the new TARSIM Pool arrangement including:

- Agricultural insurance legislation enacted in 2005 to create the national Pool Scheme and to define the roles of public and private sectors;
- Agricultural insurance premium subsidies, which are fixed at 50% of the premium cost for both crops and livestock and which are paid by government directly to the Pool (TARSIM);
- Subsidies on TARSIM’s administration and operating expenses and on loss adjustment expenses;
- Government support to the reinsurance program; and
- Agricultural insurance premiums sales tax exemptions.

### **Agricultural Insurance in Romania**

Agricultural insurance in Romania started in 1871 when the first mutual insurance groups originated. The first agricultural insurance company was founded in 1906. During the Socialist period agricultural insurance was provided through the state company, ADAS, which insured farms and operated as reinsurance capacity. Agricultural insurance was mandatory. After 1990 agricultural insurance was reformed and became voluntary. Natural disasters had a very negative impact on agricultural production during last five years. The country suffered from droughts (2002, 2003), winterkill of crops (2003), and floods (2004, 2005, 2008). These disasters transformed agricultural insurance from an expensive risk mitigation tool into an important risk instrument. The agricultural insurance is currently undergoing changes under the leadership of the government.

Several companies offer crop and livestock insurance services. The list of companies participating in the subsidy program is approved by the government. The farmers can get premium subsidies only if they purchase insurance from the approved insurance providers. Romanian insurance companies try to offer different insurance products to meet farmers’ demand in risk mitigation. Competition in the market is fierce. Premium rates are set by the private insurance companies individually without control from the government. In 2005 about 70% of the market

(premiums collected) belonged to three insurance companies – AGRAS, Allianz TIRIAC, and ASIROM – but the market structure was volatile and changing yearly.

Insurers offer different insurance products trying to get better access to farmers’ target groups. The crop insurance policies are named-peril and can include up to nine weather risks and fire. The risk selection is done by the client. The standard deductible is 10% for field crops and 15% for fruit trees and grapes. Insurers also offer greenhouse insurance. Livestock policies cover all mortality risks except for infectious diseases. The government compensates farmers’ losses caused by infectious diseases, so there is no need for insurance coverage of this risk. There is aquaculture insurance in Romania.

| Crop Insurance Products Available |                        |                  |             | Greenhouse  | Forestry |
|-----------------------------------|------------------------|------------------|-------------|-------------|----------|
| MPCI                              | Named-peril            | Crop Revenue     | Index-based |             |          |
| No                                | Yes                    | No               | Yes         | Yes         | No       |
| Livestock Products Available      |                        |                  |             |             |          |
| All Risk                          | Accident and Mortality | Epidemic Disease | Other       | Index Based |          |
| No                                | Yes                    | No               | No          | No          | Yes      |

Source: World Bank Surety 2008

Premium rates are market-based, and the pricing policy is driven by market competition. The average crop insurance rate is 2% with a range from 1% to 3%. AGRAS introduced index policies for small farmers with an area up to 5 hectares. The policy compensates a fixed amount of production cost per area unit.

The agents’ network is the primary delivery channel for agricultural insurance products. Brokers are the second most important delivery channel. For livestock insurance the third channel is finance providers. Producer associations and cooperatives are the third channel for crop insurance. There are no special organizations for delivering agricultural insurance to small and marginal farmers. One company (AGRAS) introduced a specific index program for smallholders (1 to 5 ha). Small farmers can purchase agricultural insurance with a fixed amount of the sum insured per ha of USD 180. The premium is USD 5. The insurance coverage is equal to the cost of production of agricultural commodities per area unit (ha) and pays when a crop is destroyed by weather events.

Both crop and livestock insurance are voluntary for farmers. Loan providers can require credit-linked insurance, but this is subject to specific individual policy of finance institutions.

Agricultural insurance in Romania is governed by Law 381, dated June 13, 2003. This legislative document sets the framework for agricultural insurance and government assistance in case of natural calamities.

As of 2008, there is no premium subsidy program in Romania. The government decided to stop the agricultural insurance subsidy program.

According to national statistical data (2006) about 12% of the arable land is insured in Romania. Approximately 18% of commercial farms purchase crop and livestock insurance policies. Considering the total number of farms in Romania is 4.2 million, most of which are small farms with a cultivated area up to 10 ha, the overall participation rate is about 1% (43,003 farms being insured in 2006, out of which 41,818 are crop farms and the rest livestock producers).

In 2007 the government provided subsidies to small farms on the condition they present a valid insurance contract. This government policy increased farmers’ demand for crop insurance.

The government provides assistance to agricultural producers in case of disasters. In nearly each of the last five years the government provided ad hoc assistance to farmers suffering from droughts, floods, and winterkill (that is, total loss of winter crops due to unfavorable weather conditions during winter). The government also covers losses of livestock farmers in case of livestock death or slaughter due to epidemic diseases. During 2003 to 2006 the Romanian government provided *ad hoc* assistance to farmers for the total sum of USD 83.6 million.

## CONCLUSIONS

The main conclusion of the research paper is that a successful agricultural insurance system needs the support of the Government. The agriculture in Turkey has developed much and we can see their agricultural products in all markets; it is most probable that agricultural insurance was one of the conditions which determined this development. Nevertheless it cannot be considered the main cause as Romania has a similar insurance system yet Romanian agricultural products don't reach the international market.

Governments should identify and address market impediments, to help farmers complement their risk management activities with potentially cost-effective financial tools such as insurance. One of the central arguments for government intervention in the provision, administration, and oversight of agricultural insurance program involves the presence of systemic risk (that is, risk that affects a large number of economic units, such as farmers and herders, simultaneously). The systemic component of agricultural risks can generate major losses in the portfolio of agricultural insurers. Public intervention would be justified because no private reinsurer or pool of reinsurers has the capacity to cover such a large liability when the risks, even though small, may be difficult to diversify.

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# SOME POSSIBLE EFFECTS OF COMMON AGRICULTURAL POLICY (CAP) ON ROMANIAN AGRICULTURE DURING THE 2014-2020 FINANCIAL PERSPECTIVE. HOW MUCH DOES THE PARADIGM REALLY CHANGE?

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## Abstract

*Common Agricultural Policy has a major impact on the Romanian agricultural sector, being one of the most important European policies affecting such an important part of the economy and population, and now it is passing through a new reform. Reconsidering the perspective of Common Agricultural Policy (CAP) during the next financial framework 2014-2020, will impose new conditions, both in the European agricultural sector reform and to the Romanian one as well, including adaptation to the new realities imposed by the CAP philosophy. The paper presents a short analysis regarding the possible effects on the Romanian agriculture in the perspective of the new CAP reforms, taking into account two main aspects: reform of direct payments system and the greening measures adopted for 1<sup>st</sup> CAP Pillar.*

**Key words:** agriculture, budget, CAP reform, greening, direct payments

## INTRODUCTION

The new CAP reform attempts to correct some dimensions of operating mechanisms, as well as directing it towards the new ecological dimensions, in order to highly the European agricultural production potential and also to preserve the qualities of the rural environment and rural communities in general. The problem of CAP reforming was largely debated in studies like: [2, 5, 4] and it was among the disputed subjects in field, where only the increase integration degree of capital, taxation and labor market [9, 8] has enjoined these debates.

In this new context, Romania has to take a tough stance in the negotiation reform process of the CAP taking into account all the vulnerabilities, including a possible loss of financial allocations. The Romanian perspective of CAP should follow at least to correct the direct payments system, given that Romania has the lowest level among the EU-27 states, while promoting equal conditions of exploitation of national agricultural potential and capital endowment of agricultural holdings. However, as [4] highlight in a recent expert study, *the main problem identified relates to the future policy toolkit which actually knows no significant changes. Firstly it is about direct payments, which remain the main form of support, as financial scale in the CAP budget.* [4].

The need for further reforms of the CAP financing mechanisms, lies not only in significantly *reducing the financial community burden* [7] which it is assigned to but also in the need for correcting some regional inequalities, and in the need to orient this to the market. In this regard, the major objective of the CAP, found in literature must be *promoting competitive agriculture, able to feed the EU population at low cost to be economically viable* [1].

The CAP reform in the new financial perspective 2014-2020, will require Romania a massive reconsideration of the position adopted so far, in terms of identifying some concrete ways to increase the degree of absorption of EU agricultural funds, and the use of the national agricultural potential by promoting active policies to stimulate national farmers, of diversifying crops and agricultural technologies applied so far, as well as using the much more sensitive mechanism of tools designed for market and promoting active rural development and a multifunctional agriculture.

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Adapted and implemented in the new coordinates for achieving sustainable economic development, the recent CAP reform should harmonize the market demands with the measures of supporting the farmers, and the need for a multifunctional agriculture with the specific requirements of the rural areas and rural communities. As Chambon and Fernandes state in a recent study, *hopefully, in the new CAP, sustainable development will be expressed by the common goal of ensuring the safety of citizens, offering farmers incentives and promoting innovation* [3].

The effects of CAP reform on Romanian agriculture are multiple and it reflects at the level of entire national agricultural sector, based on determining the structures of production and shaping the agricultural behavior ending with the policies on rural community development. Of all the factors determined by applying the new CAP reform, I will stop in this analysis on two basic elements, namely the development of direct payments and greening measures of Pillar I of the CAP.

## RESULTS AND DISCUSSIONS

One of the most important dimensions of future CAP reform, with immediate direct effects on the evolution of Romanian agriculture, during 2014-2020, it is the remodeling and settlement of the system of direct payments on new grounds. Direct payments represented over the entire period of existence of the PAC the main tool in shaping the EU agricultural production, with direct impact on determining the incomes of European farmers. In the view of the new philosophy of the CAP, their level is not determined by the historical model, with the risk that their distribution should displease some of the European countries. Enlightening in this respect are the recent findings from the literature where [11] argues that *it is clearly mentioned that the distribution of direct payments between Member States, as long as it is no longer based on the historical origin of payments (but it is rather a compensation for the past CAP reforms), is a purely political issue.*

On this issue, in recent European Commission studies, are considered and promoted three main options [12]:

- a) establishing a unique direct payments system for all EU states. The total sum of the amounts distributed thus rises up to 4.5 billion € / year. Applying this option would produce misunderstandings between the old and the new Member States and does not include neither the agricultural specific of each state or the actual size of the European agrarian economies. Regarding the first aspect, in literature [4] it is also noted that using a uniform payment at the level of the EU will reduce the support for the productive regions in favor of less productive or marginal regions. Also the capitalization of direct payments will increase in the earth price.
- b) direct payments which should not fall below a minimum value of 80% of the current EU average. Applying this option, the minimum amount calculated would be at the level of 217 € / ha and would require a transfer from the 11 European countries that receive allocations situated above the average of 270 € / ha. The total amount redistributed would be 0.9 billion €. Establishing a minimum threshold of 80% of the European average would reduce some of the losses of the states situated above this level and would offset some of the losses suffered by these countries from the application of the principles of the old system;
- c) the tunnel option - with direct payments situated in the range 80% -120% of current EU average. This option is an ideal one, stabilizing direct payments around the current average level. The amounts distributed, through this choice, are of 0.8 billion € per year

As synopsis in table no.1 is presented the effect's evaluation on applying the EU Commission options on the redistribution of direct payments in the EU, for some Member States.

**Table 1: The effects of direct payments distribution options in some EU countries**

| Country   | The change of farm net added value on annual work unit (2009) |                         |          |                |
|-----------|---|-------------------------|----------|----------------|
|           | Basic   | A                       | B        | C              |
|           | Initial status<br>€/WAU                                       | Direct payment<br>UE-27 | Min. 80% | Tunnel 80-120% |
| Bulgaria  | 9 067   | 10%                     | 0%       | 1%             |
| Czech Rep | 22 933  | 3%                      | 0%       | 1%             |
| Germany   | 42 537  | -5%                     | -1%      | 1%             |
| Greece    | 15 586  | -7%                     | -1%      | -3%            |
| Spain     | 29 446  | 2%                      | 0%       | 1%             |
| Estonia   | 21 708  | 48%                     | 31%      | 32%            |
| France    | 37 928  | -4%                     | -2%      | 1%             |
| Italy     | 35 384  | -6%                     | -1%      | -3%            |
| Lithuania | 17 839  | 27%                     | 16%      | 17%            |
| Latvia    | 12 646  | 55%                     | 38%      | 40%            |
| Poland    | 12 697  | 7%                      | 0%       | 1%             |
| Portugal  | 10 430  | 18%                     | 7%       | 8%             |
| Romania   | 4 761   | 12%                     | 4%       | 5%             |
| UK        | 48 388  | 7%                      | 0%       | 1%             |

Source: author's own processing based on European Commission, 2011<sup>(ab)</sup>

From the data presented in the table above it can be seen that the application of these options will produce a deep division of the Member States in winning states and loser states, whichever option is adopted, *which would generate tensions* between them. Adopting the optimal option in this case would involve both limiting the financial losses among the old Member States which are the net contributors in the Community budget as well as a distribution at least in the last financial year for the other states. Direct payments, although they are a defining element in the CAP philosophy, regarding *the distribution problem between Member States and farmers is not new but is a long disputed topic, which generated differing views within the EU* [10].

In summary, [13] using the options described above, the following results would be obtained:

- By applying the first variant, net winning states would be Poland (7%), United Kingdom (7%), Romania (12%), Portugal (18%), Estonia (48%) and Latvia (55%) and the largest losers from among the old Member States are France (-4%), Italy (-6%) and Germany (5%).
- In the case of the second option, the biggest winners in absolute terms are Romania (4%), Portugal (7%), Lithuania (16%) and Latvia (38%) and the big states losers are Germany (-1%), Italy (-1%) and France (-2%).
- Application the tunnel option would make the winning states to be Romania (5%), Lithuania (17%), Estonia (32%) and Latvia (40%), and the losers states being Italy (-3%) and Greece (-3 %).

By examining the possible effects, resulted using one of the three options, presented in table above, it is apparent that our country is among the net beneficiary states of the application of these options. Using the first approach, which would require the establishment of a single EU direct payment, Romania would have an advantage of 12%. Since this first draft is hard to accept at European level and will have little chance of implementation, there remain as possible alternatives, options B and C, which in Romania's case would involve a net gain of 4% and 5% respectively.

Compared to these options expressed above, we should take into account the need for balancing direct payments between the Member States, which is an important challenge, to which the European Commission must identify a relevant solution, which would eliminate any disagreements that may arise between the Member States. In table no.2 it is presented the estimation of direct payments in 2017 perspective, without regarding the amounts designed for modulation, for some European countries, under the conditions in which CAP reform measures would not apply.

**Table 2: The direct payment estimation, for some European countries, by finance balancing between states and without modulation transfers, in 2017**

| Countries  | Direct payments (current regulations) in 2017 | Estimation of eligible surface (2009) | Direct payments (current regulations) in 2017 | Beneficiary (2009) | Direct payment on (current regulations) in 2017 |
|------------|---|---------------------------------------|---|--------------------|---|
|            | `000 Euro                                     | Ha                                    | Euro/ha                                       | Number             | Euro/beneficiary                                |
| Bulgaria   | 814.30  | 3 492 383                             | 233.2   | 81 980             | 9 932.9   |
| Czech Rep. | 903.03  | 3 511 090                             | 257.2   | 23 400             | 38 591.1  |
| Germany    | 5 372.19                                      | 16 864 123                            | 318.6   | 352 780            | 15 228.2  |
| Spain      | 4 814.89                                      | 21 027 315                            | 229.0   | 909 010            | 5 296.8   |
| France     | 7 849.16                                      | 26 496 003                            | 296.2   | 388 750            | 20 190.8  |
| Italy      | 4 121.57                                      | 10 199 249                            | 404.1   | 1 253 450          | 3 288.2   |
| Poland     | 3 043.42                                      | 14 150 577                            | 215.1   | 1 405 810          | 2 164.9   |
| Portugal   | 566.0   | 2 917 979                             | 194.0   | 193 980            | 2 918.3   |
| Romania    | 1 780.41                                      | 9 720 864                             | 183.2   | 1 077 340          | 1 652.6   |
| UK         | 3 649.85                                      | 15 941 629                            | 229.0   | 180 680            | 20 200.6  |

Source: author's own processing based on European Commission, 2011<sup>(ab)</sup>

According to the estimations in the table above, Romania would benefit, in perspective of year 2017, of an allocation of 1 780, 410 thousands Euros for a guaranteed area of 9,720,864 ha. Implemented in practice, this is a direct payment of 183.2 Euro/ha and 1 652.6 Euro/beneficiary, for a total of 1 077340 existing beneficiaries at the level of 2009. These data place our country under the European average of direct payments of 270 €/ha, as well as below the values of other states with comparable agriculture as Poland 215.1 €/ha or Bulgaria 233.2 €/ha. Labor productivity growth, the level of technical capital equipment, facilitating access to finance, improving production structures and the application of new technologies are viable solutions for reducing the disparities between Romanian agriculture and the European one. In this respect are the findings expressed by World Bank study, according to which *the direct support schemes still cannot replace the need to increase productivity and improve the competitiveness of Romanian agriculture. Increasing productivity and competitiveness remain the sustainable long-term solution for solving problems related to agricultural income* [14].

A possible balancing of direct payments between European countries, and to receive an amount at least at the level of EU average, in the case of the eight states, including Romania, it is necessary, according to EU calculations, to achieve a transfer of 789,796,105 € / year from the 11 states above the average to the latter.

Another important aspect in the CAP economy reform, which is analyzed in this paper, is the measures adopted from the European desire of greening the direct payments, which is made in Pillar I of the CAP. Referring to *greening policy*, [11] argues that *the greening agriculture will generate lower revenues for every euro spent, than the SPS* [11].

The greening measures of Pillar I require bringing near the direct payments which are carried out under this component by considering some environmental requirements. In essence, this proposal imposes the restriction that 30% of the direct payments to be granted only to the extent in which a number of requirements for preserving environmental conditions are performed, by practicing organic traditional farming or maintaining unaltered the countryside. As observed in some specialized studies *the CAP greening component could become a kind of super cross compliance policy* [11].

In table no.3 are presented the results regarding the estimation of direct payments in the option of "greening" the Pillar I of the CAP, conducted by the European Commission, 2011. Implementing the measures to greening the CAP generates contrary effects at the level of the European states in terms of farmer's income levels. Most of these states recording losses, after the application of the options expressed. However, due to the requirements imposed, there is a

significant risk that the Member States do not fully access the amounts allocated. This could be the situation of Romania, which has not excelled in capitalizing the community agricultural machineries.

**Table3: The evaluation of direct payments considering the greening component of 1<sup>st</sup> CAP Pillar**

| Country   | FNAV/ AWU<br>(€/AWU) | FNAV/ AWU<br>- compared with 2010 as basis                  |  |   |  |   |                         |
|-----------|----------------------|---|--|---|--|---|-------------------------|
|           |                      | 80%<br>DPdistributed  | 80% PD<br>distributed                                    | 80% PD<br>distributed   | 80% PD<br>distributed                                    | 80% PD<br>distributed                                   | 80%-120%<br>distributed |
|           |                      | Basic   | 1  | 2   | 3  | 4   | 5                       |
|           |                      | 30% DP,<br>70% diver,<br>5% set-aside,<br>70% GP, PP,<br>EA | 30% DP,<br>70% diver, 5%<br>set-aside, 70%<br>GP, PP, EA | 30% DP,<br>70% diver,<br>10% set-aside,<br>70% GP , PP,<br>EA | 25% DP,<br>70% diver, 5%<br>set-aside, 70%<br>GP, PP, EA | 30% DP,<br>70% diver, 5%<br>set-aside, 70%<br>GP, PP,EA |                         |
| Bulgaria  | 9106                 | -2,3%   | -3,6%  | -1,1%   | -2,3%  | -1,5%   |                         |
| Germany   | 41990                | 0,2%  | -0,9%  | 1,6%  | 0,2%   | 2,1%  |                         |
| Estonia   | 28375                | -0,6%   | -0,5%  | 3,0%  | -0,6%  | 0,6%  |                         |
| France    | 37353                | -0,2%   | -0,3%  | 2,9%  | -0,2%  | 2,0%  |                         |
| Hungary   | 27598                | -2,1%   | -3,7%  | 1,3%  | -2,1%  | -1,3%   |                         |
| Ireland   | 25890                | 3,1%  | 3,8%   | 6,6%  | 3,1%   | 4,1%  |                         |
| Italia    | 35121                | 0,3%  | -0,1%  | 0,6%  | 0,3%   | -2,4%   |                         |
| Lithuania | 20631                | 1,3%  | 1,4%   | 5,6%  | 1,3%   | 2,3%  |                         |
| Latvia    | 17493                | 1,3%  | 1,4%   | 3,8%  | 1,3%   | 2,5%  |                         |
| Portugal  | 11191                | -2,3%   | -3,5%  | -3,2%   | -2,3%  | -1,4%   |                         |
| Romania   | 4950                 | -1,8%   | -3,5%  | 0,4%  | -1,8%  | -1,0%   |                         |
| UK        | 48298                | -0,9%   | -1,4%  | 1,0%  | -1,0%  | -0,1%   |                         |
| UE-27     | 23326                | -0,7%   | -1,3%  | 0,5%  | -0,7%  | -0,7%   |                         |

Where: FNAV = Farmnet added value; AWU = annual work unit; DP = direct payments; diver = diversification; GP = greening component; PP = permanent pastures; EA = ecological agriculture;

Source: author's own processing based on, *Common Agricultural Policy towards 2020. Impact Assessment*, European Commission, Brussels, 2011

Analyzing the data presented in the table above, one can see that most states, in the case of the application of the scenario of greening the direct payments, existent in the first pillar of the CAP, will record negative results, except for Ireland, Latvia and Lithuania. Applying the options in the scenario of greening the payments, in the case of Romania will generate mostly negative effects. The greatest loss is recorded in the case of applying the second variant, when the amounts are reduced by -3.5%, and the highest gain of 0.4% in the case of applying the third variant. For the rest of the simulated variants, the losses level range between -1% for the tunnel option and -1.8% in the case of the first option.

The effects of reorienting the direct payments to fund the greening process generate negative effects for most EU states, which translates into potential loss of funding for those countries. Greening the direct payments can be a potentially ambiguous procedure, given that environmental measures are generally supported by Pillar II of the CAP. An opinion expressed in this regard by a group of French authors argues that *changing the budget and orienting towards environmental payments is unconvincing. Firstly the budget of the first pillar remains limited and finances a wide range of heterogeneous measures which are not environmentally friendly* [1].

Against this background, Romania could argue the European estimations, turning itself into a potential beneficiary state of these measures of greening the direct payments, given that much of the national agricultural area can be allocated to farming. Romanian farmers affected by underfunding and a massive de-capitalization of the holdings were unable to apply chemical



treatments, maintaining involuntarily the label of ecological for lands. Some recent studies like [6], demonstrate that the energetic crops cultivation is an efficient way of Romanian arable land use in nowadays conditions, which we do not consider a proper manner to increase agriculture productivity and farmer's gains.

Capitalizing the national agricultural potential in 2014-2020 perspective, in terms of applying the new CAP philosophy and reforms largely depends on the ability of our country to explore and exploit the new agricultural policy mechanism. In summary, the possible results to obtain by Romania under the new financial perspectives of the CAP are presented in table no.4.

**Table 4: The estimation of CAP financial allocation for Romania during 2014-2020**

|  | 2014<br>(80%) | 2015<br>(90%) | 2016<br>(100%) | 2017  | 2018  | 2019  | 2020  | Total<br>2014-2020<br>(mil. Euro) |
|--|---------------|---------------|----------------|-------|-------|-------|-------|-----------------------------------|
| Direct payments<br>-Euro/ha-                               | 162,2         | 182,5         | 202,8          | 202,8 | 202,8 | 202,8 | 202,8 | -                                 |
| The annual amount of<br>direct payments<br>-millions Euro- | 1.576         | 1.774         | 1.971          | 1.971 | 1.971 | 1.971 | 1.971 | 13.205                            |
| Market measures<br>-millions Euro-                         | 100           | 100           | 100            | 100   | 100   | 100   | 100   | 700                               |
| Rural development<br>-millions Euro-                       | 1.160         | 1.160         | 1.160          | 1.160 | 1.160 | 1.160 | 1.160 | 8.120                             |
| Gross CAP financing<br>2014 – 2020<br>-millions Euro-      | 2836          | 3034          | 3231           | 3231  | 3231  | 3231  | 3231  | 20.025                            |

Source: author's own processing based on, *Common Agricultural Policy towards 2020. Impact Assessment*, European Commission, Brussels, 2011

As it can be seen from the data presented in the table above, the most important achievement is to reach the full level of direct payments per hectare of 202.8 Euro/ha, in 2016 and to maintain these allocations by the end of the financial year. Under these conditions, Romania has an allocation of direct support payments of 1325 million Euros, 700 million Euros for market measures and 8120 million Euros for rural development, which means a total allocation for the entire funding period of 20025 million euro. Under these conditions, the return to a national agricultural policy, under the new European developments, is virtually impossible *because there have been made so much progress that it is not possible to return to a national agricultural policy. The new CAP cannot be anything but European* [3].

## CONCLUSIONS

Capitalizing the potential of Romanian agriculture can be achieved only in the context and within the limits of the CAP, and from this perspective, promoting a sustainable agricultural production under the market conditions, strengthening farmers' income through a real support mechanism, capitalizing the national rural area, should represent Romania's major objectives in the CAP reform process.

Taking into account that Romania still records major deficiencies in the absorption of agricultural community funds, using well below capacity the market instruments at its disposal, (intervention price, production quotas, etc.) and does not have an articulated mechanism of promoting the instruments for rural development, as we previously demonstrated, requires an urgent reconsideration of the mechanisms and levers used in implementing agricultural policies in Romania, in order to increase the degree of capitalizing the national agricultural potential.

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# THE ECONOMIC AND SOCIAL IMPACT OF EUROPEAN FUNDS IN THE ROMANIAN AGRICULTURE

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## Abstract:

*This paper aims to identify and analyze the stages undergone by the Romanian agriculture, within the context of integration in the European Union, and the transformation that occurred in the aftermath of accession. On this line, the social and economic effects of agriculture integration and the direction of the Romanian agriculture development have been forecasted through a research conducted at the rural area level of the North East Development Region. The research was based on data collected from the village book that includes reference to the village social and economic environment, on information gathered from the statistical surveys and county institutions, which were supplemented by the answers to a questionnaire designed for achieving social and economic surveys on drafting the rural development in the investigated area. The results allowed the synthesis of the main effects of integration in the European Union on agriculture, with reference to the research area. The profile of local rural development in the next period was shaped after forecasting the effects of initiatives for development projects to attract European funds.*

**Keywords:** *European funds, agriculture, economic effects, social effects, rural development*

## INTRODUCTION

While acknowledging the ability of the European Union (EU) to advance towards greater political and economic integration, Holmes (2001) put in evidence that the full scope of EU integration reveals profound limits. The different aspects of the integration of the Western Europe countries, as economic integration and the policies promoted by the EU are analyzed by Gilbert (2011). Following the acceptance as EU country, the agriculture and rural issues of the new accepted countries will receive major attention from the rest of the EU. Munch (2000) focuses his research on agricultural market and budgetary effects for the five Central and Eastern European Countries included in the first wave of accession negotiations. Bachev identifies the major environmental challenges in Bulgarian agriculture due to EU integration and Common Agricultural Policy implementation [1]. He evidences that the main beneficiary of various new support measures will be the biggest operators, and income, technological and environmental discrepancy between different farms, sub-sectors and regions will be further enlarged. Concerning Romania, there is a significant gap compared to the developed countries, which requires a joint effort of public institutions, media, civil society, educational and health system in order to increase the level of rural development [2]. After the EU accession, the Romanian agriculture was assisted by its financing instruments which induce a lot of transformation as main effects [5, 7]. The fishery, as an agriculture activity is also affected by the EU policies, which represent a component of rural development policies [8, 9]. The National Rural Development Programme (NRDP) during 2007 – 2013, sustains a balanced rural development policy, which is a must for Romania, taking into account that agriculture and rural areas development has important national connotations.

## RESULTS AND DISCUSSION

The research aims to practically evaluate the economic and social effects of Romanian integration into the EU on agriculture in Murgeni area, Vaslui County. The starting point is represented by the estimation of possible financing proposals for the NPRD programme, developed in the analyzed area, whose completion, contracting and financing will generate multiple social and

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economic effects for the analyzed area. The research was based on two investigation tools. The first tool is the Village Book, which contains references to the economic and social life of each village included in the study, other than those that could be obtained from statistical sources, county institutions or from other complementary studies. The second is a questionnaire with open questions with the purpose to perform a socio-economic survey concerning the rural development in the investigated area. The target group was constituted of 139 respondents, located in the five analyzed villages. The respondents were divided into four distinct groups: people running successful business in the area, farmers with profitable farming activity, local notables involved in the village social life and local councilors, as exponents of local political life. The second part of the research compares the forecasting results with what was actually achieved in the Murgeni area during 2008 – 2011. For this purpose has been used the information available on the Payment Agency for Rural Development website, based on which has been identified and centralized the number of contracts and amounts received as financing for the Vaslui County and Murgeni development area.

***Projects financed through the NRDP measures: evaluation and contracting***

The ideas of projects considered feasible for being financed out of structural funds, identified following the research performed during 2007 – 2008, structured by measures, are shown in Table 1, the first column, corresponding to each locality. In the second column which corresponds to each locality are centralized the contracted projects.

**Table 1: Distributing the ideas of projects identified and projects financed in the Murgeni area, during 2008 – 2011, by measures and villages**

| Code | Measure  | Blagesti Village |     | Epureni Village |     | Malusteni Village |     | Murgeni Town |     | Suletea Village |     |
|------|--|------------------|-----|-----------------|-----|-------------------|-----|--------------|-----|-----------------|-----|
|      |  | **               | *** | **              | *** | **                | *** | **           | *** | **              | *** |
| 322  | Village modernization  | 37               | 1   | 45              | 1   | 36                | 0   | 40           | 0   | 28              | 1   |
| 125  | Improvement of the infrastructure for agriculture and silviculture | 15               | 0   | 17              | 0   | 7                 | 0   | 25           | 0   | 16              | 0   |
| 312  | Development of microenterprise                                     | 14               | 0   | 5               | 0   | 7                 | 0   | 12           | 0   | 12              | 1   |
| 413  | Life quality and diversification of rural economy                  | 3                | 0   | 3               | 0   | 2                 | 0   | 5            | 0   | 3               | 0   |
| 121  | Modernization of agricultural holdings                             | 6                | 0   | 1               | 0   | 4                 | 0   | 7            | 1   | 9               | 0   |
| 123  | Increasing the efficiency of agricultural and forestry products    | 3                | 0   | 0               | 0   | 0                 | 1   | 3            | 1   | 2               | 1   |
| 412  | Improving the environment and rural area                           | 1                | 0   | 0               | 0   | 1                 | 0   | 3            | 0   | 4               | 0   |
| 223  | First reafforestation of non – agricultural field                  | 1                | 0   | 1               | 0   | 1                 | 0   | 2            | 0   | 2               | 0   |
| 111  | Continuous professional training                                   | 1                | 0   | 1               | 0   | 1                 | 0   | 2            | 0   | 1               | 0   |
| 313  | First afforestation of agricultural field                          | 0                | 0   | 1               | 0   | 0                 | 0   | 2            | 0   | 0               | 0   |
| 221  | Projects of agriculture-environment                                | 1                | 0   | 1               | 0   | 1                 | 0   | 1            | 0   | 2               | 0   |
| 122  | Supporting semi - subsistence farms                                | 0                | 0   | 2               | 0   | 1                 | 0   | 4            | 0   | 2               | 0   |
| 214  | Setting up the young   | 1                | 0   | 1               | 0   | 0                 | 0   | 1            | 0   | 3               | 0   |

| Code         | Measure  | Blagesti Village |           | Epureni Village |           | Malusteni Village |           | Murgeni Town |           | Suletea Village |           |
|--------------|--|------------------|-----------|-----------------|-----------|-------------------|-----------|--------------|-----------|-----------------|-----------|
|              |  | **               | ***       | **              | ***       | **                | ***       | **           | ***       | **              | ***       |
|              | farmers  |                  |           |                 |           |                   |           |              |           |                 |           |
| 224          | Functioning of Local Action Groups, acquiring skills and animating the territory | 0                | 0         | 2               | 0         | 0                 | 0         | 0            | 0         | 0               | 0         |
| 141          | Village modernization  | 0                | 3         | 0               | 16        | 0                 | 17        | 0            | 22        | 0               | 15        |
| 142          | Improvement of the infrastructure for agriculture and silviculture               | 0                | 0         | 0               | 0         | 0                 | 0         | 1            | 0         | 1               | 0         |
| 143          | Development of microenterprise   | 0                | 0         | 1               | 0         | 0                 | 0         | 0            | 0         | 2               | 0         |
| 112          | Life quality and diversification of rural economy                                | 0                | 5         | 0               | 7         | 0                 | 5         | 0            | 5         | 0               | 2         |
| 431          | Modernization of agricultural holdings   | 0                | 1         | 0               | 0         | 0                 | 1         | 0            | 1         | 0               | 0         |
| <b>Total</b> |  | <b>83</b>        | <b>10</b> | <b>82</b>       | <b>24</b> | <b>61</b>         | <b>24</b> | <b>108</b>   | <b>30</b> | <b>87</b>       | <b>20</b> |

\* Processing after data has been taken over from www.apdrp.ro; \*\* Forecasted projects; \*\*\* Total of financed projects;

Using the information gathered from the reports drawn up by the Payment Agency for Rural Development have been identified and selected the projects that received funding from the structural funds of the Murgeni area, Vaslui County during 2008 – 2011. In Table 2 are synthesized the public and private financial allocations for the projects contracted, for each measure, as well as for each locality.

**Table 2: The financial allocation of NRDP in the area of Murgeni, Vaslui County until 31.12.2011**

| Measure           | Total financial allocation in the Vaslui county (euro) | Public financial allocation in the Vaslui county (euro) | Total financial allocation in Murgeni area (euro) | Public financial allocation in Murgeni area (euro) | Weight of the total financial allocation in the area of Murgeni from the total of Vaslui County (%) | Weight of the public financial allocation in the area of Murgeni from the total of Vaslui County (%) | Weight of the total financial allocation in the total of the area of Murgeni (%) | Weight of the public financial allocation in the total of the area of Murgeni (%) |
|-------------------|--|---|---|--|---|--|--|---|
| <b>Axis no. 1</b> |  |   |   |  |   |  |  |   |
| <b>111</b>        | 0  | 0   | 0   | 0  | 0.00  | 0.00   | 0.00   | 0.00  |
| <b>112</b>        | 5,112,547  | 5,112,547   | 607,902   | 607,902  | 0.43  | 0.49   | 6.34   | 6.92  |
| <b>121</b>        | 23,070,830   | 10,593,640  | 312,055   | 156,027  | 0.22  | 0.13   | 3.25   | 1.77  |
| <b>122</b>        | 0  | 0   | 0   | 0  | 0.00  | 0.00   | 0.00   | 0.00  |
| <b>123</b>        | 13,685,433   | 8,685,519   | 1,263,314   | 638,371  | 0.89  | 0.52   | 13.17  | 7.26  |
| <b>125</b>        | 883,469  | 883,469   | 0   | 0  | 0.00  | 0.00   | 0.00   | 0.00  |
| <b>141</b>        | 9,885,000  | 9,885,000   | 547,000   | 547,000  | 0.39  | 0.45   | 5.71   | 6.22  |
| <b>142</b>        | 423,465  | 423,465   | 0   | 0  | 0.00  | 0.00   | 0.00   | 0.00  |
| <b>143</b>        | 0  | 0   | 0   | 0  | 0.00  | 0.00   | 0.00   | 0.00  |
| <b>Total 1</b>    | <b>53.060.744</b>                                      | <b>35.583.640</b>                                       | <b>2.730.271</b>                                  | <b>1.949.300</b>                                   | <b>1.93</b>   | <b>1.59</b>  | <b>28.47</b>   | <b>22.17</b>  |
| <b>Axis no. 2</b> |  |   |   |  |   |  |  |   |
| <b>214</b>        | 0  | 0   | 0   | 0  | 0.00  | 0.00   | 0.00   | 0.00  |
| <b>221</b>        | 4,884  | 4,483   | 0   | 0  | 0.00  | 0.00   | 0.00   | 0.00  |
| <b>223</b>        | 0  | 0   | 0   | 0  | 0.00  | 0.00   | 0.00   | 0.00  |
| <b>224</b>        | 0  | 0   | 0   | 0  | 0.00  | 0.00   | 0.00   | 0.00  |
| <b>Total 2</b>    | <b>4,884</b>   | <b>4,483</b>  | <b>0</b>  | <b>0</b>   | <b>0.00</b>   | <b>0.00</b>  | <b>0.00</b>  | <b>0.00</b>   |
| <b>Axis no. 3</b> |  |   |   |  |   |  |  |   |

| Measure           | Total financial allocation in the Vaslui county (euro) | Public financial allocation in the Vaslui county (euro) | Total financial allocation in Murgeni area (euro) | Public financial allocation in Murgeni area (euro) | Weight of the total financial allocation in the area of Murgeni from the total of Vaslui County (%) | Weight of the public financial allocation in the area of Murgeni from the total of Vaslui County (%) | Weight of the total financial allocation in the total of the area of Murgeni (%) | Weight of the public financial allocation in the total of the area of Murgeni (%) |
|-------------------|--|---|---|--|---|--|--|---|
| 312               | 2,044,870  | 1,381,741   | 15,846  | 10,626   | 0.01  | 0,00   | 0.17   | 0.12  |
| 313               | 1,875,875  | 1,048,853   | 0   | 0  | 0.00  | 0.00   | 0.00   | 0.00  |
| 322               | 84,746,350   | 84,746,350  | 6,781,987   | 6,781,987  | 4.78  | 5.52   | 70.72  | 77.15   |
| <b>Total 3</b>    | <b>88,667,095</b>                                      | <b>87,176,944</b>                                       | <b>6,797,833</b>                                  | <b>6,792,613</b>                                   | <b>4.79</b>   | <b>5.53</b>  | <b>70.89</b>   | <b>77.27</b>  |
| <b>Axis no. 4</b> |  |   |   |  |   |  |  |   |
| 412               | 0  | 0   | 0   | 0  | 0.00  | 0.00   | 0.00   | 0.00  |
| 413               | 0  | 0   | 0   | 0  | 0.00  | 0.00   | 0.00   | 0.00  |
| 431               | 119,918  | 95,935  | 61,250  | 49,000   | 0.04  | 0.04   | 0.64   | 0.56  |
| <b>Total 4</b>    | <b>119,918</b>   | <b>95,935</b>   | <b>61,250</b>                                     | <b>49,000</b>                                      | <b>0.04</b>   | <b>0.04</b>  | <b>0.64</b>  | <b>0.56</b>   |
| <b>TOTAL</b>      | <b>141,852,641</b>                                     | <b>122,861,002</b>                                      | <b>9,589,354</b>                                  | <b>8,790,913</b>                                   | <b>6.76</b>   | <b>7.16</b>  | <b>100.00</b>  | <b>100.00</b>   |

### *The analysis of the local impact of the projects financed through the NRDP measures*

Murgeni area is a compact geographical area composed of autonomous rural areas, located in the southeast of Vaslui County and takes up 6.62% of its surface. From the administrative point of view, the area is made up of the villages Blagesti, Epureni, Malusteni, Suletea and the villages belonging to the town of Murgeni. This is located in North Eastern Development Region, a region known as the least developed Romanian region in terms of economics, agriculture being the prevalent economic activity. The North Eastern region stands, at the country level, through the largest share of population employed in agriculture. As concerns the Murgeni area, the population is relatively dense, in incipient decline and in course of aging. The rural development area falls within the areas with agricultural profile and slight availability of economic activities diversification. This can be boosted through the economic development of the Murgeni town and the higher capitalizing of the existing agricultural potential. Therefore, it needs to be attracted funds for the modernization of villages, agricultural development, diversifying the economy and promoting social programmes. The area major issues are: the need of villages' modernization, development of agricultural holdings and reducing the poverty level. The area may develop on its own through policies and local projects and by stimulating the development of a semi-intensive agricultural economy.

Following the understanding of contribution the fundraising may have for agricultural and rural development projects, as reflected by the data in Table 1, during 2008 – 2011, 106 projects have been contracted and financed, approximately 25.18% of the total of 421 project proposals identified as feasible and for which there were elaboration initiatives to and 6.32% of total of projects financed in Vaslui County. The total financial allocation in the area of Murgeni, during 2008 - 2011 was a satisfactory one: the amount of EUR 9,589,354.00, a percentage of 6.76% of the total amount allocated in the same period in Vaslui County, out of which the public financial allocation of EUR 8,790,913.00, a percentage of 7.16% of the total public financial allocation of Vaslui County. Further, it is shown the way in which the proposed projects identified as feasible and for which there was elaboration initiative have turned into contracted and financed projects, are analyzed for each measure separately, based on information from Table 1.

Within the framework of Axis No.1 has been identified a number of 135 potential projects and have been contracted and financed 101 projects, which represent 6.02% of the total projects funded in Vaslui County, 95.28% of all projects financed in the area of Murgeni, with a reduced weight of financial allocations of 1.93% in the total costs, respectively 1.59% in the total public expenses in Vaslui County, and an average weight of 28.47%, 22.17% in the expenditures total,

respectively the total public expenses of the Murgeni area. Within the measures 111, 122, 125, 142, 143, it has been identified a total of 100 potential projects, the beneficiaries interest in the area of Murgeni being minimal. No project proposal has been submitted. For the measures affecting agricultural structures – 141 and 112, although have not been identified possible proposals, 97 projects have been contracted, with an average budgeted financial weight and with various degrees of response. For the projects connected with the production and transformation process improvement: measures 121 and 123, only 4 projects have been contracted, with an average financial weight in the budget and a medium – low degree of response. The average degree of financial allocation is an indicator of the phased state of measures implementation. Axis 1 has taken into account the structural transformation and value added incorporation into food manufacturing, promoting the value added increase in manufacturing processes, introducing technical and structural improvements. Although the NRDP programming established in an appropriate manner the synergy between its axes and measures, the implementation of Phased Programme and financial crisis did not allow to completely taking advantage of these. A number of Axis 1 measures have not been implemented or had a very low degree of implementation, existing a few projects or no project, thus reducing the financial allocations weight for the Murgeni area.

The implementation of measures within the axis framework led to the creation of jobs, keeping the population in rural areas and increasing the life quality level, as follows:

- Measure 112 - the measure impact was positive for beneficiaries, but produced little effect as concerns the farm structure, the maximum level of support was not enough to finance the farms structural transformation, most of the achieved investments were small, but the measure has been successful in youth participation and creating jobs for them;
- Measure 121 - average public allocation was a beneficiary reduced to a single investment project managed the average value measure favored mainly a commercial medium, low participation of the beneficiaries of this measure are due to difficulties to develop business plans required and obtain private financing to carry out their;
- Measure 123 – although only 3 projects have been financed, it had a significant weight within the financial allocations; the measure is successful in promoting the businesses engineering, in this way beneficiaries introducing new capabilities within the production processes, engineering them and improving their quality, small businesses that represent the majority beneficiaries group have been supported, so it directly contributed to reducing the inequalities with regard to business size;
- Measure 141 – attracted a large number of projects, but with a low financial allocation, favoring the participation of semi-subsistence farms and beneficiaries of agriculture – environment payments, which exceeded by far the participation percentage initially planned; therefore, it is deemed necessary resizing of the amount for supporting the measure, in order to directly promote the farm structural transformation, considering the participation degree of persons under 40 years old and women among the beneficiaries group is high;

Within the Axis No. 2, playing a part in reducing the territorial disparities, environmental and biodiversity protection, there have been identified 22 potential projects, a forecast which resulted in no financing. Cause is the nonproductive purpose of the measures in the Axis. Also, the low degree of efficiency indicates the fact that the forecast of support on the beneficiary is higher than average aid each of them gets and, consequently, the resources associated with the specific objectives achievement of measures of are lower than the planned budgetary allocation. For the measures intended for boosting productive investments and setting up microenterprises: 312 and 313, has been identified a number of 53 projects, which was financed only one measure 312 having a reduced financial allocation - 0.17%. For the measure 322, which has the destination of ensuring a certain level of basic services in rural areas, there has been identified a large number of potential

projects - 186, out of which only 3 projects have materialized that have benefitted from a high financial allocation - 70.89% of the total expenses incurred in the Murgeni area. It is considered that the measure responds to a low extent to the needs identified in the Murgeni rural area.

As within the Axis no. 1, the measures implementation under Axis no. 3 has led to the creation of jobs, keeping the population in rural areas and increasing the life level quality in the villages of Murgeni area, as follows:

- Measure 312 – it is noticed a very low interest for the implementation of this measure, which recommends the potentiating of promoting non-agricultural production, with emphasis also on handcrafted production and stimulation of its development, intensity of the support provided to beneficiaries in order to improve their possibilities of co-financing is average, being necessary to foster the support of services for population, whereas the majority weight is represented by the agricultural services;
- Measure 322 – a measure intended to equip with infrastructure and basic services in rural areas has recorded positive results concerning the number of supported villages and the number of activities undertaken. The number of projects contracted through the measures with the purpose of supporting productive investments is reduced – 3, taking into account the investments capacity and extent, of more than 77.27% from the total public expenditure, as well as the number of jobs created, the increase of living standard quality in rural areas, with significant effects on sustainable development, it is recommended to enhance the amounts assigned for this measure, due to the acute need for modernization of the rural area.

Under the Axis no. 4, 25 projects have been identified, the only measure financed within Axis no. 4 is measure 431, which from the territorial point of view has integrated through the local development strategies, creation of jobs, maintaining the population in rural areas and increasing the living standard quality levels, on a single project and the following localities relating to the area of Murgeni: Blagesti, Malusteni, Murgeni.

The local development, diversification and development strategies had a minimal impact on Murgeni the area, the activity being indicated by a limited financial allocation of a project, as follows:

- Measure 431 – the low level of effectiveness and efficiency derive partly from the lack of experience they have, particularly the measure beneficiaries, implementation is in its infancy, and measure 431 was effective as concerns the information and training actions for the elaboration of local development strategies.

Romania's EU integration has direct effects, with a high impact on the development of agriculture and rural development, which is mainly due to the punctual financial support that the Romanian agriculture and rural areas benefitted from. Based on research carried out, there has been performed an analysis of how forecasts have been fulfilled regarding the projects application, contracting and financing through the NPARD programme, between 2008 – 2011. In the first part of research, 421 feasible projects ideas have been identified in order to obtain funding through the NRDP. This priority addresses the following measures:

- 186 project proposals are intended to finance through the measure 322 – Village renovation and development, improvement of basic services for the rural economy and population and putting the rural heritage forward;
- 80 project proposals are aimed at financing through measure 125 – Improvement and development of the infrastructure related to the development and adaptation of agriculture and silviculture;
- 50 proposals for projects are intended to finance by measure 312 – Support for the creation and development of microenterprises;



- 27 project proposals are aimed to finance through measure 121 – Modernization of agricultural holdings;
- 16 project suggestions are destined to fund through measure 413 – Quality of life and rural economy diversification;
- 9 project proposals are meant for financing by measure 122 - Improving the forest economic value;
- 9 proposals of projects have the purpose to finance by measure 412 – Improvement of environment and rural areas;
- 8 project submissions are meant for funding through measure 123 – Increasing the added value of agricultural and forestry products;
- 8 project proposals are intended to finance through measure 223 – The first afforestation of non-agricultural lands;
- 6 proposals of projects are designed for funding through measure 111 – Professional training, information and knowledge distribution;
- 6 project submissions are aimed to funding by measure 214 – Agriculture-environment payments;
- 6 project suggestions are meant for financing by measure 221 – The first reafforestation of agricultural lands;
- 3 proposals of projects are intended to finance through measure 143 – Provision of guidance and consultancy services for agriculturalists;
- 3 project submissions are designed to finance by measure 313 - Encouragement of tourism activities;
- 2 proposals are meant to fund through measure 142 - Establishment of producer groups;
- 2 project proposals are aimed at financing by measure 224 – “Natura 2000” payments per forestry land.

As it results from the information centralized in Table 1, the 421 potential projects identified for the Murgeni area are distributed, on average, by 84 projects per village, respectively by 19 projects per village, which indicates the existence of a development potential on multiple plans of the local village that has never been seen before. This is due to the identification, by local authorities and business environment in the rural area, of the opportunity to finance the objectives they proposed, through the funds made available to Romania by the EU following the accession. From the same table, we notice that, for the same period for which the forecast has been elaborated, 106 projects have been financed in the Murgeni area, on average 21 projects per village or 5 projects per village, representing 25.2 %. For the Murgeni area has been allocated EUR 9,589,354, representing 6.76% of the total amount allocated to Vaslui County. As regards the public expenditure, for the Murgeni area has been assigned EUR 8,790,913.00, respectively 7.16% of the total public expenditure in Vaslui County.

## **CONCLUSIONS**

Analysis of the agricultural and regional policies promoted by the EU indicates that the weight of allocations for agriculture will yearly increase by about 16.5%, while the coverage degree of EU funds allocation will increase to the detriment of national budget funds, from 57.1% in 2007 to 100% in 2016. At the analyzed area level, it is estimated that additional development sources will have an average annual growth rate of 3-5% with coverage from bank loans or 2-3% with the coverage of farmers’ own funds. Under these circumstances, in the next ten years, the local farmers’ own capacity for development will enhance by 50-80%. Also, within the same ascending trend enters the evolution of own development efforts of local public authorities and, partly, of the county council. With regard to the structure of funded projects, it is found that 68.87% are meant for

supporting the semi-subsistence farms, 0.94% for the farm modernization, 22.74% for setting up young farmers, 0.94% for increasing the added value of agricultural and forestry products, 2.83% for the villages renovation and development. The remaining proposals are intended for the other four measures and represent 3.68% of the total. On analyzing the contracted amounts structure, it is noticed that 70.72% of the funds are directed towards the villages renovation and development, 13.17% for increasing the added value of agricultural and forestry products, 3.25% for the agricultural holding modernization, 6.34% for establishing young farmers, 5.71% for supporting the semi-subsistence farms. The difference is allocated to the other measures.

Among the major effects of these projects implementation on the local village, the most significant are: modernization and development of the main rural infrastructure, improvement and development of agricultural holding infrastructure, agricultural holding modernization, consolidation and development of trading agricultural holding, raise of agriculture competitiveness, diversification of non-agricultural activities, enhancement of life quality in rural areas, development of agriculture-environment programmes, silviculture development, development of social programmes and improvement of labor resources efficiency. Also, it is outlined a series of very important side effects of the economic development, as follows: improvement of the institutional system, improving the social framework, diminishing the poverty, natural environment protection, change of mentality, development of civic spirit and strengthening of private property.

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# THE POSSIBLE FOCAL POINTS OF SMALL REGIONS'S / HARGHITA COUNTY'S DEVELOPMENT IN THE 2014-2020'S EU BUDGET PERIOD

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## Summary

*It is a known fact that EU funds absorption rate in Romania is very slow. We were curious about the situation of our region – Center Region – and its counties, and we wanted to see what are the main differences between the region's counties. We used information from official statistical sites, websites of local authorities, press releases and we also based on own experience. Analyzing the situation, development plans and SWOT results of the counties, we realized that according to infrastructure differences our county in the near future will not be as good performer like Brasov, Sibiu and Mures, so we further focused on similarities. The most important common characteristic of all these counties is the loyalty for land, for culture, for local products. Almost every settlement has something special (pie, sausages, dairy, manufacture products), and the demand for slow- and healthy food is growing. So we have to fructify this like strength, and offer the tourists something special, a piece of our region, our culture, and our rural life. We also have to pay attention of our recognized potato plantations, and exploit the possibilities for livestock-breeding. The main sectors which still need to be developed are the infrastructure, agriculture, tourism and the competitiveness of the companies. All these with the help of educated human resources. So in the next budget period we have to focus to these sectors and pay attention for not only apply for resources just for attracting funds, but to have sustainable projects that will ensure a sustainable development both for individuals, companies and local authorities.*

**Key words:** EU funds, sustainability, local products, agriculture, tourism

## INTRODUCTION

Like the other countries of Eastern Europe, Romania also started the transitional period with small differences between its regions. Once the centralized control of the communism has finished, there appeared a lot of development opportunities. Naturally, the economical development started in the country's capital – Bucharest, and the other major cities which had adequate infrastructure. As a consequence of this fact, the discrepancies between the regions had grown visibly. Romania's accession to the EU enabled a wide range of resources in order to reduce the differences.

Regarding the EU sources absorption level, the Central Region is on the 3rd place, with 16,7% usage, which is higher than the national level (14,72% in November 2011). However, there are significant economic and social differences between its counties, the most advanced being Brasov and Sibiu, and the most vulnerable Harghita and Covasna.

In Harghita County the EU and national funds were exploited as much as possible both by local authorities both by entrepreneurs. After the initial difficulties – the lack of institutional infrastructure and specialists, inadequate technical resources – were fight, we reached grate results and the resources used by local authorities and companies is higher than the national average. Of course, there is still room to attract more resources and constantly develop our region. The 2007-2013's development period served with a lot of lessons not only for Romania, but for all the regions and Harghita County as well. There is a growing demand for natural and local products, healthy lifestyle and bio-energy.

Our research aims to examine the successes and pitfalls of the past, the results of Central Region and its counties, to learn from the other counties and thereby determine the guidelines for 2014-2020 development period, in order to attract even more resources than till now.

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## MATERIAL AND METHODS

The research is based on secondary databases (national, regional and county statistics) and local experience. The possible development focuses were defined by using the official documents of local authorities, and on the other side using the releases, information and documents found on the main key actors (organizations and companies) internet sites.

## RESULTS AND DISCUSSIONS

### Center Region

**Table 1 The situation of regions in EU funds absorption**

|                    | Nr of contracts | Total eligible value<br>(billion lei) | Payments<br>(billion lei) | % of eligible value |
|--------------------|-----------------|---------------------------------------|---------------------------|---------------------|
| South-Est          | 793             | 7,091                                 | 1,42                      | 20                  |
| South-Muntenia     | 769             | 7,091                                 | 1,234                     | 17,4                |
| Center             | 1010            | 6,626                                 | 1,111                     | 16,7                |
| North-East         | 1036            | 8,56                                  | 1,415                     | 16,5                |
| West               | 615             | 4,722                                 | 0,761                     | 16,1                |
| South-West Oltenia | 719             | 5,467                                 | 0,863                     | 15,8                |
| North-West         | 962             | 7,47                                  | 0,986                     | 12,23               |
| Bucharest-Ilfov    | 1908            | 21,977                                | 0,780                     | 3,55                |

Source: Razvan Diaconu, Topul absorbtiei fondurilor EU: Bucuresti-Ilfov, codasa regiunilor de dezvoltare, on [www.cursdeguvernare.ro](http://www.cursdeguvernare.ro)

In terms of EU funds usage the Center Region is on the 3<sup>rd</sup> place and it's absorption rate is higher than the national average. The main focus points of the region are the infrastructural developments, environmental projects, companies, tourism, agriculture and rural developments. According to analysts, the main strengths of Center Region are the diversity of nature and the culture, which means high potential for tourism (18,5% of tourists were in our region in 2010); the existence of some very strong poles like Brasov, Targu Mures and Sibiu; high foreign investments rate (Center Region is on the 2<sup>nd</sup> place after Bucuresti – Ilfov); the main industries are food, textile, wood, constructions and spare parts for autos. The food industry has developed very fast in the last years and it's based mostly on local products. The main weaknesses are: migration and aging of the population; lack of highways; bad roads; economical polarization in the region – the most valuable activities are concentrated in the larger towns and their surroundings; small absorption rate of EU funds (16,7% for our region); unequal placement of tourism infrastructure (the highest concentration being in Brasov County, the lowest in Alba); economical dependence of one sector – agriculture – in the majority of villages; subsistent agriculture; the negative perception about cooperatives; improper forest exploitation.

There are opportunities in attracting EU funds for the modernization of roads and to improve the access to all parts of the region, the existence of well-known universities which can help in research, development and innovation, in many places tourism can be the main sector, agriculture can be profitable, and there are many ecologic resources for renewable energy.

Center Region's counties are (in order of economical development) Brasov, Sibiu, Mures, Alba, Harghita and Covasna. One of the main reasons for Harghita being the last but one is the lack of a proper road infrastructure. The nearest airport (Mures) is by 169 km distance, the one in Cluj Napoca by 243 km, and Bucharest by 262 km. Also the road conditions were very bad till last year. Another reason is that here are only small towns, and the majority of the population lives in rural area. Naturally, any weakness can be turned on strength, so we will have to fructify our values. In the following text we will present some of our county's characteristics.

## Harghita County

In Harghita county 73,70% of the total yearly turnover is given by trade and industry. Regarding the number of companies in these two sectors, trade occupies the first, and industry the third place. For a sustainable economic development, the county would need production and processing of produced goods. The manufacturing sector is mainly represented by the food industry (dairy, meat, bred and bakery products, mineral water), textile industry, printing industry, and also wood and furniture industries.

The sector of logging and woodworking is in a relevant decline. The consequences of irrational forestry, the decreasing raw material need of the furniture industry, and the restraint of construction led to the closing of former plants.

The food industry in the dairy and bread segments can't show much innovation. Small and medium-sized factories can properly provide the population with these products. However, there are still problems in the relationship between the dairy farmers and milk processors as collectors. By the farmer's side the quality of the milk doesn't meet every time the requirements, and by the side of buyers there are still problems in paying in time the farmers.

The changes are expected in meat industry: lot of outdated, small-scale slaughterhouses have been closed in the last decade. Here is an opportunity to focus on modernization. Large slaughterhouses and processing plants would not have future, but small-sized, well-equipped local facilities could offer opportunities for producing local products, which are growing in popularity among the customers, as both residents and tourists demand traditional products (there already exists two local product brands like Gobe and Sekler).

A project of the County Council creates opportunity for small slaughterhouses<sup>5</sup>, helping the start-up businesses in this domain. Till now there are a small number of claims, but the Council is optimistic and certain that there will be more candidates from all over the county, as the local farmers – local abattoir – local processor chain would be in benefit of both producers and customers.

The county's economic situation is illustrated in the following table, which serve to show the number of companies and employees, as well as some basic financial indicators.

**Table 2 The situation of Harghita county's companies (based on 2010 financial results) A Hargita**

| Sector                          | Companies |       | Yearly turnover |       | Net profit  |       | Net loss    |       | Employees |       |
|---------------------------------|-----------|-------|-----------------|-------|-------------|-------|-------------|-------|-----------|-------|
|                                 | nr        | %     | billion RON     | %     | billion RON | %     | billion RON | %     | nr        | %     |
| Research, innovation, high tech | 199       | 2,28  | 36,6            | 0,52  | 3,7         | 1,44  | 1,4         | 0,61  | 420       | 0,85  |
| Industry                        | 1.687     | 19,31 | 2.229,8         | 32,84 | 114         | 44,37 | 92,5        | 39,02 | 21.882    | 44,17 |
| Agriculture, forestry           | 171       | 1,96  | 64,8            | 0,93  | 2           | 0,81  | 5,5         | 2,35  | 519       | 1,05  |
| Construction                    | 991       | 11,35 | 650             | 9,28  | 20,4        | 7,95  | 26          | 10,98 | 5.289     | 10,68 |
| Services                        | 2.240     | 25,64 | 960             | 13,72 | 37,8        | 14,73 | 48,2        | 20,31 | 7.702     | 15,55 |
| Trade                           | 2.728     | 31,23 | 2.861,4         | 40,86 | 75,3        | 29,32 | 48,6        | 20,52 | 11.388    | 22,99 |
| Tourism                         | 325       | 3,72  | 59,9            | 0,86  | 2,5         | 0,97  | 7,7         | 3,27  | 994       | 2,01  |
| Restaurants, bars               | 394       | 4,51  | 69,2            | 0,99  | 1           | 0,41  | 6,9         | 2,95  | 1.342     | 2,71  |

Source: Harghita County's Chamber of Commerce

The agricultural sector represents a very small proportion of the county's economy, is a sector that has been neglected lots of years, so there could be and must be discussions and actions in this direction. There is the greatest need for European, national and local resources to be involved. In terms of soil quality, there is only class III and IV soils in this region.

Because of the cool climate which characterizes the most regions of the county, only crops that are resistant can be grown. The most common plants are: wheat, rye, winter barley, spring barley and oats. There can be grown also corn, broomcorn, potato, sugar beet, sunflower, flax, peas,

beans, silage corn, fodder beet, alfalfa, clover, carrots, parsley, celery, onions, cabbages, but these mostly serve the self-sustaining needs of farmers. In the gardens near houses local people grow cucumbers, tomatoes and paprika, but their quantity is negligible, since they need a milder climate.

We can find fruits as apples, pears, plums, cherries, walnuts. The significant areas of meadow and pasture are favorable for stock-rising. The most common species: cattle, pigs, sheep, goats, chickens, ducks, geese, horses. Low numbers of colonies and rabbits are held. Tables nr 3 and 4 presents the county's agricultural structure and the proportion of some products in the total national production.

**Table 3 Distribution of Harghita County by cultivation areas**

| Arable | Pasture | Meadow | Vineyard | Fruit | Forest | Water | Other |
|--------|---------|--------|----------|-------|--------|-------|-------|
| 23,5%  | 19,2%   | 15,4%  | 0,2%     | 0,5%  | 33,1%  | 0,6%  | 7,5%  |

Source: Anuar Statistic Harghita 2010

**Table 4 The role of Harghita county in the Romanian production**

| Részarány (%)        |      |      |      |      |      |      |      |
|----------------------|------|------|------|------|------|------|------|
| Megnevezés           | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
| Wheat and barley (t) | 0,7  | 0,6  | 0,6  | 0,4  | 0,7  | 0,4  | 0,5  |
| Corn (t)             | 0,1  | 0,1  | 0,2  | 0,2  | 0,4  | 0,1  | 0,2  |
| Potato (t)           | 5,1  | 5,8  | 4,4  | 4,8  | 7,4  | 5,1  | 4,6  |
| Fruit (t)            | 0,5  | 0,3  | 0,3  | 0,4  | 0,4  | 0,4  | 0,4  |
| Cattle (nr)          | 2,5  | 2,6  | 2,6  | 2,7  | 2,7  | 2,7  | 3,1  |
| Pig (nr)             | 1,1  | 0,9  | 1,1  | 1,0  | 1,0  | 0,8  | 0,8  |
| Milk (hl)            | 2,5  | 2,6  | 2,4  | 2,4  | 2,6  | 2,7  | 2,9  |
| Wool (kg)            | 1,7  | 1,6  | 1,4  | 1,5  | 1,6  | 1,7  | 1,4  |
| Eggs (tsd pieces)    | 0,8  | 0,7  | 0,8  | 1    | 0,8  | 0,8  | 0,9  |

Source: Anuar Statistic Harghita 2010

Another important field is the tourism, as in Harghita County there still is unused potentials. The characteristics of the nature, the fresh air and the local culture make the county attractive for tourists. We can talk about health-, cultural- and religious tourism. Yearly, hundreds of thousands pilgrims are arriving to Sumuleu Ciuc, to the Pentecost Pilgrimage. Other forms of tourism practiced in the county are sport-, rural- and eco-tourism. We have mineral water (both for drinking and bathing), volcanic mofettas and ozone-rich mountain villages. Fructifying this opportunities would be in the favor of the county's economic development.

However the significance of agriculture has been gradually reduced its role in the retention and welfare of the rural population continues to be of primary importance. Therefore is important that the farmers, besides applying for area based subventions, to have the possibility to apply for other resources which can be used for development and modernization.

For individuals a very important project was and still is the Green House program, which sustains the implementation of heating systems based on renewable energy. The Green House program's popularity is evidenced by the fact that in 2011 during one month there were received as many applications as during six month in the previous year – more than 18 thousand. In 2010 the highest number of applications were in Harghita, the request was so high that the initial amount of 1,6 million lei had to be supplemented to 7,7 million lei.

In 2011 the annual budget of the Green House program – 100 million lei – was distributed between counties based on its population, so in Harghita slightly more than 1,5 million lei were received. This value represents approximately 250 requests, since the majority of requests were for purchasing solar panels, which worth 6 thousands lei. Fortunately all the unused founds by other regions were redistributed also in 2011, so the allocations for Harghita were multiplied again. In 2010 there were 1295 requests for solar panels, and in 2011 applied 1529 families.

Regarding institutions, Harghita County's Council already implemented lots of successful applications which helped them to realize major projects in every possible area of regional development. There is a great number of applications which are under implementation, and also

projects that are waiting for approval and are important for us. EU funds were used mostly for infrastructural development, but nor the environmental, institutional and human resource development related projects are not negligible.

If we talk about sustainable development, sustainable economy, we have to mention that the local population is convinced that our region has the natural resources that with an adequate organization can ensure the livelihood of the people living here. On the website of the County Council is an abundance of information about implemented, current and ongoing projects, and also about the proposals which are under evaluation.

Instead of highlight the large investments and major projects, we have chosen to speak about some small, but more eye-catching initiatives, which closely relates also with sustainable development. One of these projects, which is important both for tourism and environment, is the Road of Mineral Water. It is a project that started in 2005 and Harghita County Council and Covasna County Council applied for it together. With the resources from this project, six springs in Harghita and eight springs in Covasna were renewed and also their surroundings were made attractive and tourist pathways were marked. The total amount of the project was 10 million Euros, and in Harghita the beneficiary were Baile Tusnad, Baile Jogodin (Miercurea Ciuc), Borsec, Remetea, Vlahita, Baile Homorod, and Baile Seiche (Odorheiu Secuiesc).

It was an interesting initiative and it have been increasingly popular the “Sekler Product” brand name. This program it also was the idea of Harghita County Council and a strict evaluation scheme was developed for producers of traditional products in order to earn the certification. Food, handicraft products, industrial products, intellectual property can get the mark if they comply with the rules. On local fairs there are regularly present the producers and their products, and since last year this brand was placed in a multinational hypermarket’s Hungarian stores, and since this year, also in Romanian stores of the same hypermarket. When first appeared these products in Hungary, the stocks which were calculated to be enough for three weeks, were finished in three days

The strategic development should be focused on sustainability and the values of rural life. Small regions have to have rural policy objectives, principles, implementation plans which will help farmers to achieve an optimal scale, and where the production structure matches with ecological endowments.

Analyzing the other counties and excluding the infrastructural differences, we focused on similarities. We discovered that agriculture is one of the most sensitive areas, followed by tourism, and still there is place to develop and fructify the opportunities that are given by nature. In every county, health and local products became important and the demand for slow-food concept is growing both by local people and foreign tourists. People are interested to find something different, to try local gastronomy, to see local habits, elements of local culture. Some of these local products are: Alba - onion pies from Petresti, sausage from Vadu Motilor, kefir from Bucurdea Granoasa, walnuts with honey from Blaj, syrup of roses, sausages “La Meseni”; Mures – apple, vinegar and juice from Batos, telemea cheese from Ibanesti; Brasov – burduf cheese from Bran, brad from Crihalma, sausages from Fagaras; Sibiu – bread from Gura Raului, brooms from Fofeldea; Harghita – Gobe and Szekler products.

## **Proposals**

Rural area will be viable only if the people living there will have a vision. This requires an integrated rural development, which narrows the differences between rural and urban areas and ensures the convergence of rural area.

The towns of Harghita County are considered to be small towns. The two largest – Miercurea Ciuc and Odorheiu Secuiesc – hardly reaches the number of inhabitants of 40 thousands, and the other have well under 20 thousands. In our country, the rural people’s tidiness to the land and agricultural activities is very high. With the new Land Law which entered in force in 1991 regarding, there appeared the wired situation that the descendants of those who reclaimed their parents’ former lands, have already lived in cities and are not interested in agriculture. Working in

this domain isn't fashionable for the young generation, but is considered a shame. It is very important to change this concept and educate in the school the youth, starting with first classes, showing them the importance of this sector in the population's need for healthy food.

Harghita is very good in cultivating potatoes, so we should focus on the development of these plantations. A proper irrigation system could help the farmers to fend off the negative impacts of drought and to grow the quantity of production. For that is necessary also to think together, to work together, to cooperate and to establish cooperatives. We have to forget the negative effects of the forced cooperatives. It could be helpful again the education in professional schools and universities, and also more seminars for older farmers.

The current situation doesn't allow for rural areas to rise only according to agricultural developments. The next budget period also should offer alternative solutions for the urban area. The projects that are intended for the development of companies both from EU and local government side, would offer the opportunity for further progress.

The future of the county is considered to be the tourism, however this needs a good infrastructure. There were progresses in this area in the last few years, but it's still not enough to provide adequate services and programs for the tourists through the whole year. The responsible management of the existing natural resources should be part of any strategy of the county's development. We cannot continue with building more pensions, without having a concrete plan. That's not we need. If we only build a pension and then we are waiting for tourists to come, we will not have any success. Unfortunately a very small number of entrepreneurs are offering programs for their guests. So that is on what we have to focus: offering them a piece of local culture, local gastronomy, healthy local products and rural life feeling.

For all of these development plans, the keystone and a driving force have to be the adequately trained human resources. We have to find those financial resources that continue to allow the education and training of specialists, as well as effective institutional developments.

## CONCLUSIONS

Regarding EU funds absorptions, the former period was characterized by learning, exploration and the desire to attract as much resources as possible. This resulted some projects that were not always based on real needs – in this case, mostly among the freelancers and small companies there were applications for building new pensions because they considered it fashionable and they thought that tourists will come by itself. Unfortunately in the last years many of these pensions were closed, so that leads to the conclusion that conscious planning needed. In the next period, both individuals and companies have to apply for projects which fit their real needs. Local authorities have to continue to develop the infrastructure, to promote local products, to educate youth about the importance of agriculture and to educate older farmers in order to establish cooperatives, because together they can be stronger and competitive. Regarding companies, there is a need for discussions and collaboration with universities (researches), banks (ways of financing) and finding more local partners. The chain with local farmers – local processors – local distribution lines can be a possibility for sustainable development both for Harghita and other small regions.

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# RESEARCH ON THE PRODUCTION POTENTIAL ACCORDING TO ECONOMIC SIZE OF FARMS IN THE SOUTH COUNTRY

BEREVOIANU ROZI LILIANA<sup>1</sup>, VLAD MIHAELA CRISTINA<sup>2</sup>

## Summary

*Analysis of overall farms in South Development Region highlights from the outset correlation between territorial dimension and the economic dimension and state farms in the area. Economic size reflects the size of a farm production and increases its level at each holding analyzed. The analysis extends to the correlation between the area under cultivation, total production and average yields per hectare, technical equipment and synthetic indicators resulting from the analysis of the main data processing. These synthetic indicators reflect the economic and financial results, highlighting the link between size and economic performance of farms analyzed in South Development Region of Romania.*

**Keywords:** unit of economic size, synthetic indicators, economic efficiency, farms

## INTRODUCTION

Although Romanian agriculture in South Development Region has significant land resources are low agricultural performance. It was found that in the region South Development in the relationship between size and economic size of a farm can be large in terms of area or number of animals owned and small, in terms of production volume, the annual business and profits. Also holding a small agricultural area but powerful capitalized obtain economic results than another who has an agricultural area bigger, but using small amounts of inputs. Given the concentration and specialization of agricultural production in the study area, farm economic activity cannot take place only within certain limits of magnitude, with technical and material production when used with high efficiency. This is one of the reasons that in determining the economic optimum size fundamental studies are needed region-wide Development studies that used indicator of economic size unit expressed by a Community measure, or European size unit (ESU = 1200 euro).

## MATERIALS AND METHODS

Primary objective is to achieve a technical and economic analysis of agricultural holdings in Romania South Development Region, based on data collected in the region, determining the standard gross margin level, in compliance with the Community typology.

The objectives sought to be achieved to ensure improved management and technical and economic performance of farms in the study area by:

1. Identify existing farms of different sizes, type of organization and structure of production operating profit;
2. Determination of economic indicators synthesis that economic size and economic and technical guidance based on standard gross margin level;
3. Farm classification in accordance with the Community typology.

These targets were designed made through a series of structured activities focused study on the current situation of farms in South Development Region, or production structures and operating systems, technical and economic performance recorded material and technical equipment and investment performed, labor and management quality made and received financial support from the state in 2008-2010.

Based on these field studies and statistical evidence has developed a knowledge of farms in South Development Region, a determination of the standard gross margin level, the size of the

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economic and technical-economic orientation, and finally, their classification into classes technical and economic size.

## RESULTS AND DISCUSSION

Seen from the point of view of the Romanian agriculture technical and economic development has three main forms, forms that are found in the analyzed farms in South Development Region, as follows:

- ✓ The traditional type, individual holdings where the owner shall provide revenues from other industries or services, complete with agricultural income obtained;
- ✓ Type the household, family associations with average technical level, the territory organized in specialized farms (sized and shaped);
- ✓ For industrial, agricultural societies with limited liability in specialized (plant, animal, mixed).

The evolution of these three forms of development is conditioned by technical progress, the application of modern technology, mechanization of production processes, optimal application of fertilizer and labor qualification.

Many farms today are less competitive to survive. Although it may seem that they are productive and very efficient, they are not durable. They exploit and degrade the natural resource which, ultimately, depends on their productivity. Agricultural occupation has become one poorly qualified farmers bringing one thing less qualified and poorly paid. Therefore, the productivity and efficiency of such farms are not sustainable.

Farms studied can be grouped according to the number of EDU into three types, as follows: small (less than 2 ESU - 8 ESU), medium (8 ESU - 40 ESU), large (40-100UDE ESU).

**A. Small farms** in the study, which are less than 2 ESU to 8 ESU belong economic size classes I, II, III, IV.

The whole agricultural area of these farms is the arable land. Form of organization where individual representative household is cultivated areas as property owned by the household head.

Agricultural units as main production profile of grain, oilseeds and forage plants and in size class II is found mixed profile unit (plant and animal).

Endowment with equipment and agricultural machinery is relatively good, they can do mechanical work related to crop them besides owning tractors and combines and complementary equipments (plows, harrows stars, cultivator, sowing, weeding, trailers). Labor is usually represented by family members and sometimes temporary staff to meet the needs works best moments.

The production structure shows that trends in average yields per hectare are low and varies from year to year due to unfavorable weather conditions, the non-use of the optimum technological links and lack of irrigation. Harvests were intended mostly for domestic consumption and their market capitalization.

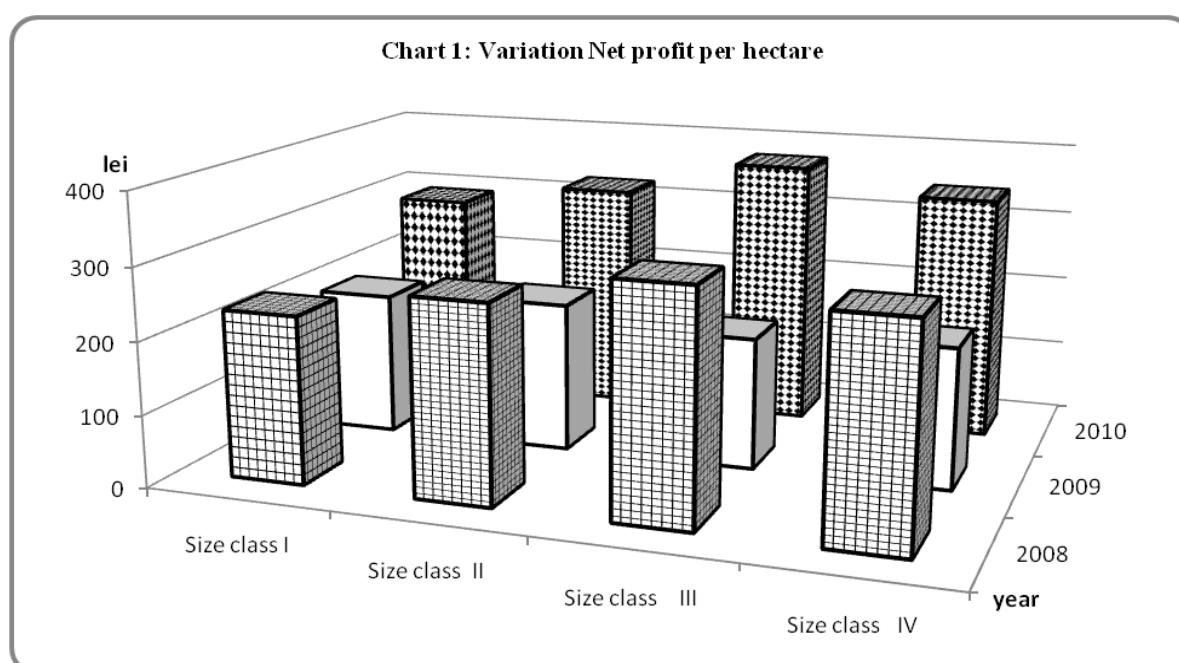
Resulting from the analysis of the main synthetic data obtained from the study are as follows:

- ✓ Total spending on small farm level representative of each class of economic size had an increasing trend, a level factors influence the cost of production, average yields and default output obtained as follows: economic size class I expenses increased in 2010 compared to 2008 by 16.6%,for economic size class II increased by 3% for class II economic size increased by 3% for class III economic size by 16% for class IV economic size by 57%;
- ✓ It appears that income holdings are greater than the costs incurred, leading to a positive outcome, resulted in profit or benefit. Thus, a net profit units/ha between 199-291 lei/ha in economic size class I, 208-323 lei/ha in economic size class II, 183-374 lei / ha in economic size class III, 195-342 lei/ha in economic size class IV;

- ✓ Of the 12 farms analyzed two of them have received subsidies per hectare, because they do not have the required documentation;
- ✓ The structure of each agricultural unit under study, for each activity was estimated standard gross margin for area planted. MBS estimated production activities obtained in each unit sets a key dimension of economic efficiency achieved in the farming sector, the share of standard gross margin gross product value for the year 2010 was 59% for economic size class I, 65% for economic size class II, 62% for economic size class III, 60% for economic size class IV, weights that do not provide structural costs at farm level selected.

**Table 1: Indicators synthetic**

| Specification / MU                 | unit A<br>Size class I |       |       | unit A<br>Size class II |       |       | unit A<br>Size class III |       |       | unit A<br>Size class IV |       |       |
|------------------------------------|------------------------|-------|-------|-------------------------|-------|-------|--------------------------|-------|-------|-------------------------|-------|-------|
|                                    | 2008                   | 2009  | 2010  | 2008                    | 2009  | 2010  | 2008                     | 2009  | 2010  | 2008                    | 2009  | 2010  |
| Production value (lei)             | 10898                  | 10156 | 12427 | 17290                   | 14170 | 23145 | 26727                    | 22733 | 29402 | 32040                   | 27725 | 46250 |
| Total expenditure on holding (lei) | 11150                  | 10925 | 13010 | 24250                   | 20300 | 24958 | 25900                    | 24730 | 29975 | 31400                   | 30950 | 49212 |
| Total income per farm (lei)        | 13306                  | 12769 | 15713 | 28140                   | 23391 | 29770 | 30790                    | 27557 | 35762 | 38140                   | 35363 | 58970 |
| Profit Margin on farm (lei)        | 2156                   | 1844  | 2703  | 3890                    | 3091  | 4812  | 4890                     | 2827  | 5787  | 6740                    | 4413  | 9758  |
| Product Margin / holding (lei)     | 13306                  | 12769 | 15713 | 28140                   | 23391 | 29770 | 30790                    | 27557 | 35762 | 38140                   | 35363 | 58970 |
| Total subsidiers / holding (lei)   | 2408                   | 2613  | 3286  | 3050                    | 4221  | 6625  | 4063                     | 4824  | 6360  | 6100                    | 7638  | 12720 |
| Turnover (lei)                     | 13306                  | 12769 | 15713 | 28140                   | 23391 | 29770 | 30790                    | 27557 | 35762 | 38140                   | 35363 | 58970 |
| Net profit / holding (lei)         | 1811                   | 1549  | 2271  | 3268                    | 2596  | 4042  | 4107                     | 2375  | 4861  | 5662                    | 3707  | 8197  |
| Net profit / ha(lei)               | 232                    | 199   | 291   | 272                     | 208   | 323   | 316                      | 183   | 374   | 298                     | 195   | 342   |
| Standard gross margin (euro)       | 2178                   | 1779  | 2240  | 5349                    | 3358  | 4660  | 5539                     | 3942  | 5362  | 6658                    | 4954  | 8525  |
| Economic size (class)              |                        |       | I     |                         |       | II    |                          |       | III   |                         |       | IV    |
| ESU (number)                       | 1,8                    | 1,5   | 1,9   | 4,5                     | 2,8   | 3,9   | 4,6                      | 3,3   | 4,5   | 5,5                     | 4,1   | 7,1   |



Many small family farms are organized to generate a profit, achieving good results in achieving this goal. Firm also specializes in cultures with low costs of inputs and marketing niche is not very different from that of large enterprises. But to remain profitable firm should also maintain a healthy relationship with the land, protecting it from negative effects of industrialization, as well as with customers and their neighbors. Thus, the economic success of small farms is intrinsically linked to the overall quality of life of farmers, regardless of the purpose for which it is intended.

**B. Farms middle** of the study, that between 8 and 40 ESU belong economic size classes V, VI, VII.

The whole agricultural area of these farms is the arable land. Association representative form of organization is a family farm and limited liability companies. In the agricultural associations family owned some land as property association members and the remaining areas are leased. If limited liability companies around the acreage is leased.

Agricultural units as main production profile of grain, oilseeds and forage plants, and these generally heterogeneous production structure.

Although endowment with agricultural machinery is good, it needs work covering surfaces mechanized cultivation, harvesting is optimal during calls and third party services.

Permanent labor for family farming associations consists mostly family members and if the limited liability company is comprised of administrators units and members of specialists, in both forms of organizing farm work during peak agricultural seasonal resort and staff.

In terms of production characters can be seen that the units studied have a specialty cereals, followed by oil seed crops and fodder plants.

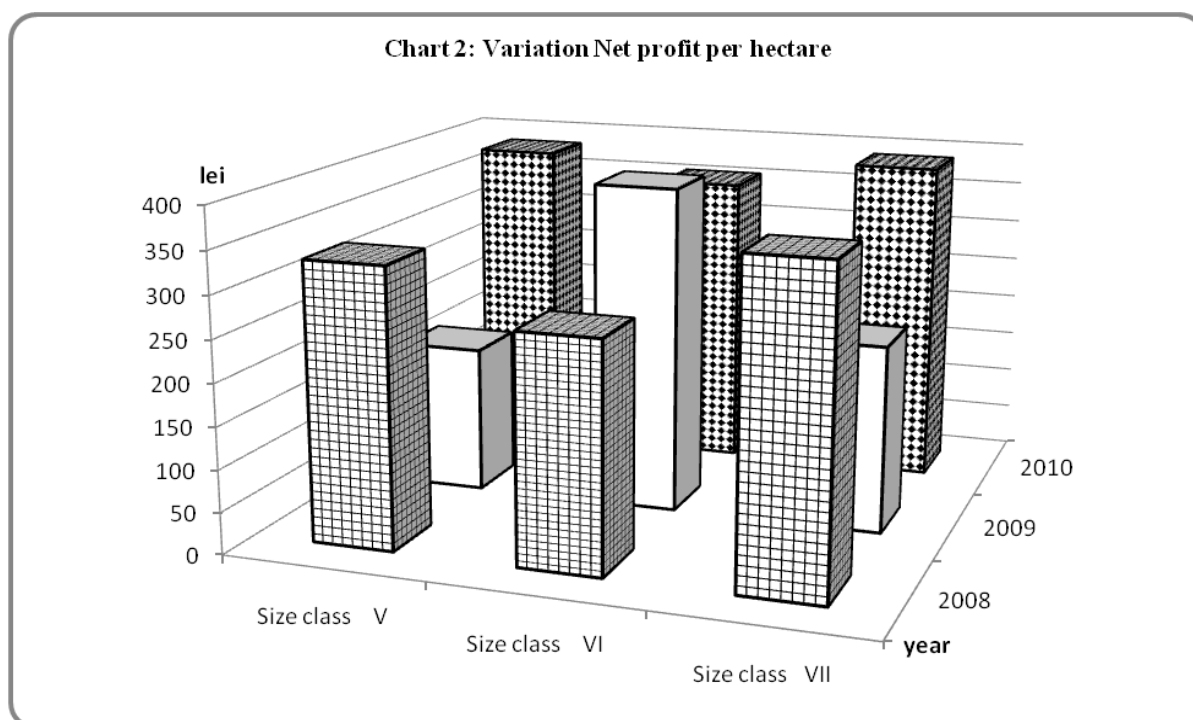
Resulting from the analysis of the main synthetic data obtained from the study are as follows:

- ✓ Total expenditure in the medium-sized farms representative of each class of economic size had an increasing trend, influenced the level of cost of inputs (oil, pesticides, fertilizers, etc.), mechanical work performed, the cost of force work as follows: economic size class V expenses increased in 2010 compared to 2008 by 25%, for economic size class VI have increased by 26%, for economic size class VII with 4%;
- ✓ Income holdings are greater than the costs incurred, leading to a positive outcome, resulted in profit or benefit. Thus, a net profit units/ha between 176-389 lei/ha in economic size class V, 270-390 lei/ha in economic size class VI, 223-389 lei/ha in economic size class VII;
- ✓ From 9 farms analyzed one family agricultural association has received subsidies per hectare, for not accessing the required documentation;
- ✓ The structure of each agricultural unit under study, for each activity was estimated standard gross margin for area planted. MBS expected to achieve production activities in each unit sets a key dimension of economic efficiency achieved in the farming sector, the share of standard gross margin gross product value for the year 2010 was 65% for economic size class V, 44% for economic size class VI, 61% for economic size class VII, weights that do not provide structural costs at farm level selected.

**Table 2: Indicators synthetic**

| Specification                | UM  | unit A<br>Size class V |       |       | unit A<br>Size class VI |        |        | unit A<br>Size class VII |        |        |
|------------------------------|-----|------------------------|-------|-------|-------------------------|--------|--------|--------------------------|--------|--------|
|                              |     | 2008                   | 2009  | 2010  | 2008                    | 2009   | 2010   | 2008                     | 2009   | 2010   |
| Production value             | lei | 50700                  | 40106 | 62475 | 122490                  | 159475 | 138170 | 174940                   | 145880 | 168950 |
| Total expenditure on holding | lei | 42420                  | 35710 | 52900 | 159800                  | 200950 | 201400 | 164350                   | 153800 | 170900 |
| Total income per farm        | lei | 50700                  | 40106 | 62475 | 182654                  | 239521 | 236008 | 198140                   | 174020 | 206050 |
| Profit Margin on             | lei | 8280                   | 4396  | 9575  | 22854                   | 38571  | 34608  | 33790                    | 20220  | 35150  |

| farm                              |        |       |       |       |        |        |        |        |        |        |
|-----------------------------------|--------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| <b>Product Margin / holding</b>   | lei    | 50700 | 40106 | 62475 | 155515 | 193177 | 181630 | 198140 | 174020 | 206050 |
| <b>Total subsidiers / holding</b> | lei    | 0     | 0     | 0     | 33025  | 33702  | 43460  | 23200  | 28140  | 37100  |
| <b>Turnover</b>                   | lei    | 50700 | 40106 | 62475 | 155515 | 193177 | 181630 | 198140 | 174020 | 206050 |
| <b>Net profit / holding</b>       | lei    | 6955  | 3693  | 8043  | 19197  | 32400  | 29071  | 28384  | 16985  | 29526  |
| <b>Net profit / ha</b>            | lei    | 331   | 176   | 383   | 270    | 390    | 355    | 373    | 223    | 389    |
| <b>Standard gross margin</b>      | euro   | 9169  | 5500  | 9720  | 20601  | 21535  | 19075  | 35293  | 24790  | 29946  |
| <b>Economic size</b>              | class  |       |       | V     |        |        | VI     |        |        | VII    |
| <b>ESU</b>                        | number | 7.6   | 4.6   | 8.1   | 17,2   | 17,9   | 15,9   | 29.4   | 20.7   | 25.0   |



**C. Large farms** have between 40 and 100 ESU ESU and belong economic size classes VIII, IX and X.

Form of the farm is a limited liability company where the entire acreage is leased.

Agricultural units of economic size classes VIII and IX as main profile cereal and oilseeds production and provision of agricultural machinery is good, but because they have a high proportion of winter crops for some maintenance and harvested resort to the third party service.

In economic size class X main activity is crop and unit size class representative profile is mixed. Providing agricultural machinery is very good, they sure and technological work under own.

Labor in agricultural holdings is represented by manager and specialists units and sometimes temporary staff to meet the needs works best moments.

Farm yields obtained were for the most part to capitalize on their market, their production structure is heterogeneous, accounting for a high share of cereals, reaching over half the agricultural area cultivated in each farm unit, the difference being occupied by oil seed crops (sunflower, rape).

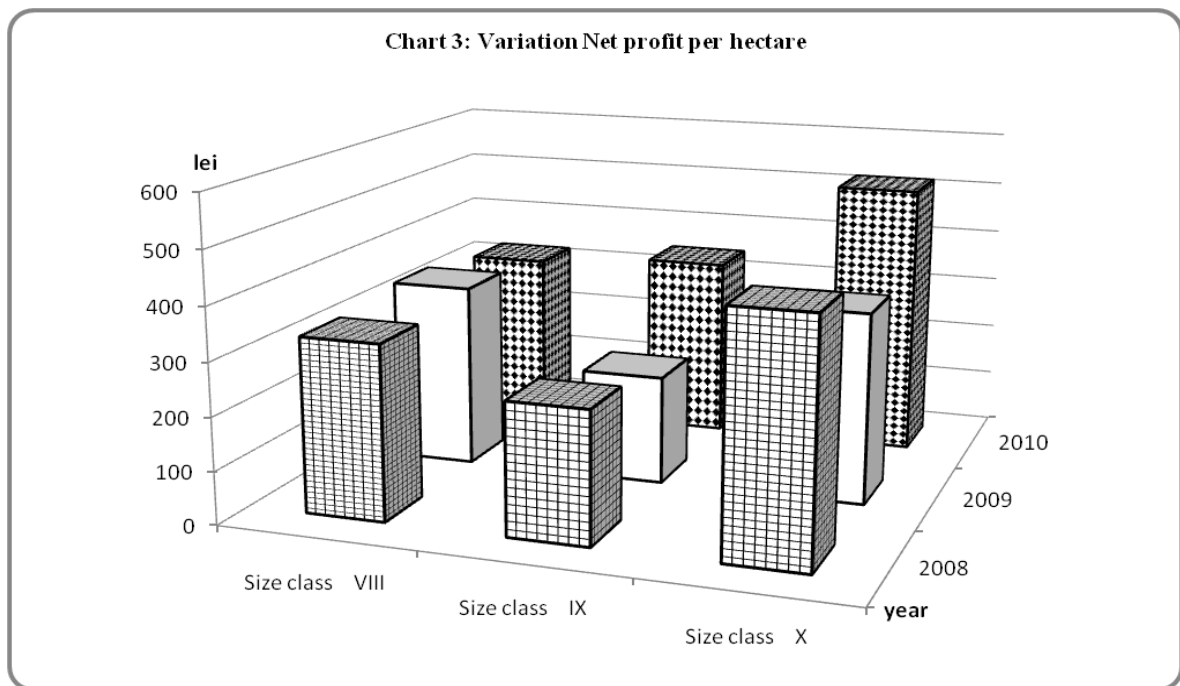
Main synthetic indicators resulting from data obtained from the study are as follows:

- ✓ The total costs at farm level large class representative for each economic dimension had an upward trend, as follows: economic size class VIII expenses increased in 2010 compared to 2008 by 9% for class IX economic size increased by 17% for class X economic size by 48%;

- ✓ Income holdings for each class representative economic size, resulting in profit per hectare are between 325-347 euro/ha in economic size class VII, 205-345 lei/ha in economic size class IX, 360 - 518 euro/ha in economic size class X;
- ✓ Representative farms for each class of economic size have received subsidies per hectare;
- ✓ The structure under study each agricultural unit for each activity was estimated standard gross margin for area planted. MBS estimated production activities obtained in each unit establishes an essential dimension of economic efficiency achieved in the farming sector, the share of standard gross margin gross product value for the year 2010 was 61% for economic size class VIII, 62% for economic size class IX, 64% for economic size class X, weights that do not provide structural costs at farm level selected.

**Table 3: Indicators synthetic**

| Specification                       | UM     | unit A<br>Size class VIII |        |        | unit A<br>Size class IX |         |         | unit A<br>Size class X |         |         |
|-------------------------------------|--------|---------------------------|--------|--------|-------------------------|---------|---------|------------------------|---------|---------|
|                                     |        | 2008                      | 2009   | 2010   | 2008                    | 2009    | 2010    | 2008                   | 2009    | 2010    |
| <b>Production value</b>             | lei    | 666600                    | 637800 | 660440 | 1215918                 | 1188000 | 1377800 | 3086730                | 2496500 | 4198500 |
| <b>Total expenditure on holding</b> | lei    | 650500                    | 637800 | 706600 | 1261458                 | 1314250 | 1473900 | 2736410                | 2504600 | 4043236 |
| <b>Total income per farm</b>        | lei    | 775850                    | 766350 | 831100 | 1486140                 | 1509600 | 1802860 | 3421463                | 3036716 | 5147184 |
| <b>Profit Margin on farm</b>        | lei    | 125350                    | 128550 | 124500 | 224682                  | 195350  | 328960  | 685053                 | 532116  | 1103948 |
| <b>Product Margin / holding</b>     | lei    | 775850                    | 766350 | 831100 | 1486140                 | 1509600 | 1802860 | 3421463                | 3036716 | 5147184 |
| <b>Total subsidiers / holding</b>   | lei    | 109250                    | 128550 | 170660 | 270222                  | 321600  | 425060  | 334733                 | 540216  | 948684  |
| <b>Turnover</b>                     | lei    | 775850                    | 766350 | 831100 | 1486140                 | 1509600 | 1802860 | 3421463                | 3036716 | 5147184 |
| <b>Net profit / holding</b>         | lei    | 105294                    | 107982 | 104580 | 188733                  | 164094  | 276326  | 575444                 | 446977  | 927316  |
| <b>Net profit / ha</b>              | lei    | 329                       | 347    | 325    | 248                     | 205     | 345     | 447                    | 360     | 518     |
| <b>Standard gross margin</b>        | euro   | 128753                    | 111797 | 119785 | 239350                  | 210524  | 264754  | 619112                 | 456060  | 789040  |
| <b>Economic size</b>                | class  |                           |        | VIII   |                         |         | IX      |                        |         | X       |
| <b>ESU</b>                          | number | 107.3                     | 93.2   | 99.8   | 199.5                   | 175.4   | 220.6   | 515.9                  | 380.0   | 657.5   |



## CONCLUSIONS

Analysis of overall economic holdings of different sizes under study reveals poor use of their resources and achieve low production due to limiting factors related to management, farm structures, lack of productive capital and investment. Consumption of inputs carriers of technical progress (fertilizers, pesticides, seeds) are reduced. Providing tractors and agricultural machinery is relatively good in this area, they yet are low tech degree, feeling lack of investment, the purchase of new equipment with high performance.

Subsidies to the farmers analysis shows that farms of different sizes in South Development Region, mainly oriented towards crops, reporting net income subsidies obtained from one hectare reveals their major influence on the economic performance holding.

South Development Region analysis emphasizes the need restructuration farms by increasing the physical size and economic firm specialization and diversification of economic sectors linked to the development of the livestock sector in order to develop viable medium farms have specialized production to be sold, so that ensure market competitiveness and increase income at farm level. At the same time an improvement in production to meet consumer demand can be achieved by stimulating the development of intensive production and economic diversification in farming.

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# SIZE ECONOMIC AND TECHNICAL GUIDANCE FROM THE FARM ECONOMIC DEVELOPMENT SOUTH REGION FOR ECONOMIC CLASS SIZE X. CASE STUDIES

BEREVOIANU ROZI LILIANA<sup>1</sup>, VLAD MIHAELA CRISTINA<sup>2</sup>

## Summary

*One of the most important structural problems of the agricultural sector is the formation of economic size of an agricultural holding. Even if they have their own specialized production structure within the agricultural unit size of branches and activities are established in shaping the economic dimension, which requires knowledge of economic indicators of production and their influence on the results effectively. Economic size of a farm is given by the optimal combination of inputs for each product and the minimum production costs which could achieve the highest profit.*

**Keywords:** *economic dimension, structure of production, technical and economic indicators, economic efficiency*

## INTRODUCTION

Technical-economic dimension and economic orientation of farms can be considered to be of prime importance in increasing their economic performance. Studied farms must adapt production structures with the development of sustainable agriculture. Structure of agricultural holdings must satisfy the technical requirements of production, economic and managerial and contribute to efficient End-use resources available to them. In these circumstances, the economic size of farms can be played and turnover that can be associated profits from other economic indicators that help raise their economic performance.

General indicator used in the analysis of farms in South Development Region is standard gross margin element used in assessing the technical and economic potential crop and animal species in the area analyzed to assess the technical and economic farm size and in determining their technical and economic orientation.

Analytical research methods used to determine the economic size and orientation techno-economic farm in South Development Region based analysis of technical and economic results of farms analyzed. These technical and economic results are based on the concept of statistical correlation, given the links between potential indicators and results indicators and economic efficiency of agricultural farms.

## MATERIALS AND METHODS

The methodology used in data collection is based on techno-economic system forms - questionnaires and achieving technical and economic classifications by size of farms in South Development Region.

To the smooth conduct case studies on implementation of agricultural holdings by size classification of technical and economic, as methodological support to reflect real issues of structure, organization and management of farms in the study area was prepared questionnaire form the main synthetic economic indicators. Form questionnaire design was done taking into account the specifications for the data to be used information from surveys.

In determining the sample were considered following known variation in the southern region development: the number of individual households, existing companies; areas planted with wheat, corn, considered major crops (have a high level of frequency and size of cultivated area).

Investigative methods used in the field:

- Based on existing economic evidence;

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- Based on survey by direct query of individual producers in the village of residence of the village, on the information contained in the observation schedule;
- Based on opinion surveys (demoscopic) who had a different character as a method of investigation in the form of:
  - survey targeted (directed) performed on a set of questions (written or verbal) on the subject seated in a certain form and order established by forms and instructions and
  - untargeted survey interviewed on the topic of conversations without questions prepared in advance.

## RESULTS AND DISCUSSION

Data processing at farm level is based on the collection and processing of information. Agricultural units analyzed were selected on the basis of scientific criteria of size and organization thus ensuring an appropriate level of representation for the area under study. Depending on the number of ESU agricultural units analyzed were grouped by economic size classes. Economic size class X were selected and analyzed every three farm units so:

**Table 1: Land resources, and technical workforce in 2010**

| Specification                          | UM  | unit A                           | unit B                           | unit C                           |
|--|-----|----------------------------------|----------------------------------|----------------------------------|
| <b>Organizational form</b>             |     | Limited liability company<br>SRL | Limited liability company<br>SRL | Limited liability company<br>SRL |
| <b>Profile agricultural unit</b>       |     | Mixed<br>(vegetable + animal)    | vegetable                        | vegetable                        |
| <b>UAA (surface agricultural used)</b> | ha  | 1789.97                          | 1400                             | 1856                             |
| <b>cultivated area</b>                 | ha  | 1789.97                          | 910                              | 1828                             |
| <b>Number of heads that:</b>           | nr. | 80                               | -                                | -                                |
| <b>-dairy</b>                          | nr. | 80                               | -                                | -                                |
| <b>Permanent staff</b>                 | nr. | 14                               | 8                                | 11                               |
| <b>Number of tractors</b>              | nr. | 8                                | 5                                | 8                                |
| <b>Surface resting on a tractor</b>    | ha  | 223.7                            | 182                              | 228.5                            |
| <b>Number of combine</b>               | nr. | 3                                | 3                                | 3                                |
| <b>The surface is a combined</b>       | ha  | 596.6                            | 303.3                            | 609.3                            |

Organizational form of agricultural units under study is limited liability company (SRL). A unit owned the entire area is leased. In unit B of the 1400 ha, 600 ha are owned remaining 800 hectares are leased. In unit C of the 1856 ha, 28 ha and 1828 ha property leased.

The main activity of units B and C is crop and in unit A profile is mixed (plant and animal). Providing agricultural machinery agricultural units is very good and it sure works under its own technology. Permanent labor used is the unit managers and specialists in the field and during periods of peak resort to personal work seasonally.

Crop structure in the total utilized agricultural area in 2010 is as follows:

**Table 2: Structure of crops and animals in 2010**

| Structure              | unit A         |            | unit B     |            | unit C      |            |
|------------------------|----------------|------------|------------|------------|-------------|------------|
|                        | ha             | %          | ha         | %          | ha          | %          |
| Wheat                  | 483.11         | 27         | 430.0      | 47         | 601.0       | 33         |
| Corn                   | 528.92         | 29         | 100.0      | 11         | 32.0        | 2          |
| Barley                 | 105.05         | 6          | -          | -          | 151.0       | 8          |
| Sunflower              | 572.59         | 32         | 180.0      | 20         | 480.0       | 26         |
| Rape                   | 100.30         | 6          | 200.0      | 22         | 354.0       | 19         |
| Mustard                | -              |            | -          | -          | 210.0       | 12         |
| <b>TOTALvegetables</b> | <b>1789.97</b> | <b>100</b> | <b>910</b> | <b>100</b> | <b>1828</b> | <b>100</b> |
| Dairy                  | 80             | 100        |            |            |             |            |
| <b>TOTAL animal</b>    | <b>80</b>      | <b>100</b> |            |            |             |            |

In general, agricultural enterprises have heterogeneous production structure. Thus, the unit A has a high share of 62% grain group, the difference being occupied by oil seed crops, 32% sunflower and 6% rape. Besides crop production, the unit A also has a herd of 80 head of dairy cows, herd which had a downward trend since 2008. Unit B, in terms of production character has a specialty in cereals accounted for 58% and crop oil at a rate of 42%. Unit C, with heterogeneous production structure has a profile characterized by cereal crops production (48%), followed by oilseed crops (45%) and seasoning cultures (12%).

The average yields per hectare are as follows:

**Table 3: Average yields per hectare and per animal**

| Specification | UM    | unit A |      |      | unit B |      |      | unit C |      |      |
|---------------|-------|--------|------|------|--------|------|------|--------|------|------|
|               |       | 2008   | 2009 | 2010 | 2008   | 2009 | 2010 | 2008   | 2009 | 2010 |
| Wheat         | Kg/ha | 3617   | 3919 | 3829 | 3750   | 3800 | 3837 | 3020   | 2497 | 2689 |
| Corn          | Kg/ha | 3650   | 4418 | 4159 | 3000   | 3200 | 3100 |        |      | 6563 |
| Barley        | Kg/ha | 5112   | 5063 | 6245 |        |      |      | 3667   | 2000 | 4570 |
| Sunflower     | Kg/ha | 1286   | 1892 | 1484 | 1800   | 2000 | 2111 |        |      | 1779 |
| Rape          | Kg/ha | 2312   | 2038 | 2293 | 1700   | 1600 | 2000 | 2364   | 1229 | 2887 |
| Mustard       | Kg/ha |        |      |      |        |      |      | 722    | 342  | 848  |
| Melons        | Kg/ha |        |      |      |        |      |      | 12600  |      |      |
| Dairy         | l/cap | 2414   | 3313 | 3500 |        |      |      |        |      |      |

The production structure of the 3 units used agricultural developments average yields per hectare for cereals and oilseeds are oscillating from one year to another. In general, average yields achieved in the period specific level of intensification of agriculture with the environment. They were influenced by the climatic conditions of those years, the failure to implement fully the relevant technologies and unused irrigation system to all cultures.

Main economic indicators resulting from the processing of synthetic components in the 3 study agricultural units, include: agricultural output value, total spending, total income from farm unit level, grants and subsidies received by farmers and the finally, calculation and presentation of standard gross margin, the synthetic indicators, high complexity and in accordance with EU norms and standards.

Level indicators are as follows::

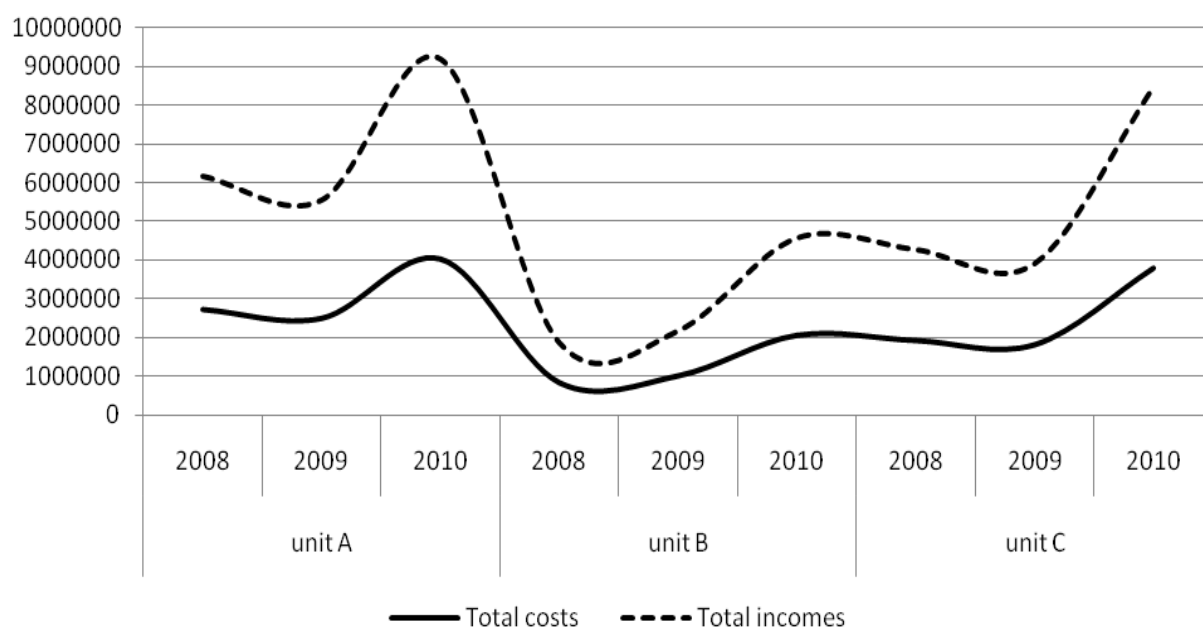
- ✓ The cost of agricultural units had a fluctuating trend during the analyzed period. A unit within most expenditures were made in 2010, expenses increased by approximately 61% compared to 2008. In units B and C shows that the expenditure was doubled in 2010 compared to 2009 levels influenced by the cost of inputs (oil, pesticides, fertilizers, etc.) Applied mechanical works and labor costs etc.
- ✓ In the agricultural units is found that revenues are greater than costs incurred, leading to a positive outcome, resulted in profit or benefit. Thus: in drive A is an increase of revenues in 2010 to approx. 69% compared to 2009, in units B and C value income more than doubled from the same year, production-level influence, the prices of agricultural products and inputs and support policies for farmers.
- ✓ Agricultural prices at the 3 agricultural units did not increase in the same proportion as those of the inputs. Even if the price of agricultural products has been liberalized, it remains under the influence of processors that have an interest in that price to their advantage so as to be reduced.
- ✓ Level of subsidies had a progressive disease; the share of total income per unit for the year 2010 was about 18% in unit A and C and approx. 19% in unit B.
- ✓ Net profit hectare varies from one unit to another. Thus, the unit A recorded a profit in 2010 of 518 lei / ha, profit was approx. 15% higher compared to 2008. Unit B make a profit in 2010 of 399 lei/ha, profit was higher by approx. 15% compared to 2008 and Unit C make a profit in 2010 of 390 lei/ha, profit by approx. 36% higher than 2008.

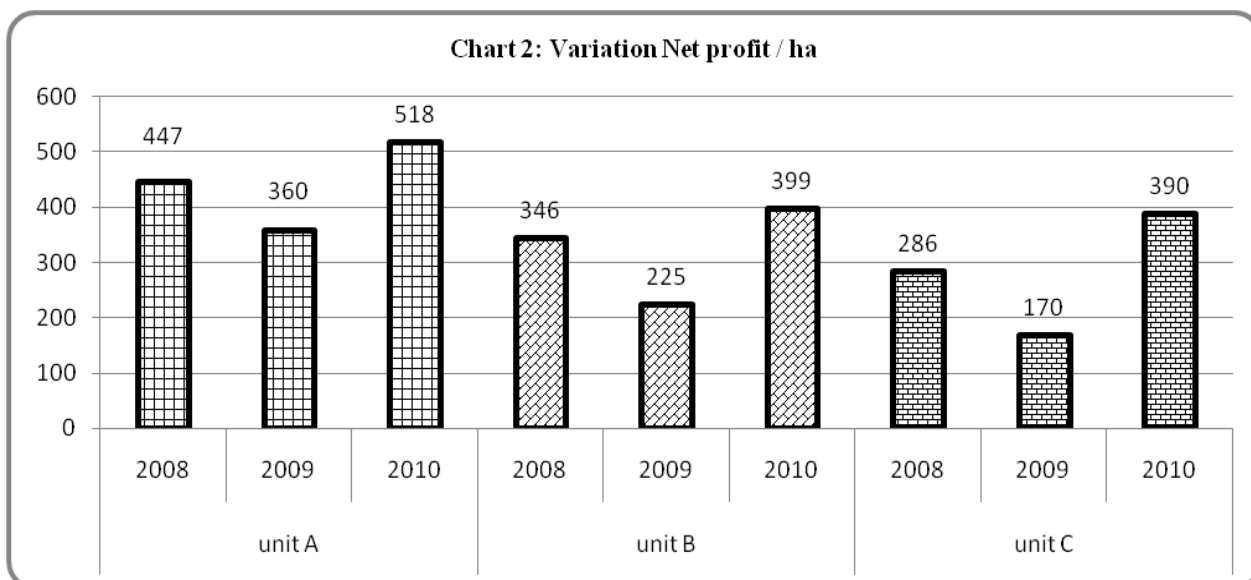
- ✓ Turnover in agricultural units studied had an increasing trend in the period under review, thus increasing the premise that draws profit growth in future perspective.
- ✓ Within the structure of each studied farm units for each activity was estimated standard gross margin area or number of heads. MBS estimated production activities obtained in each agricultural unit is widespread scientific support at EU level to determine the economic size and technical-economic orientation of agricultural units under study, while giving a key dimension of economic efficiency achieved within agricultural activities.

**Table 5. Indicators synthetic**

| Specification                     | UM     | unit A  |         |         | unit B  |         |         | unit C  |         |         |
|-----------------------------------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                   |        | 2008    | 2009    | 2010    | 2008    | 2009    | 2010    | 2008    | 2009    | 2010    |
| <b>Total costs on holding</b>     | lei    | 2736410 | 2504600 | 4043236 | 839400  | 1013600 | 2066000 | 1931790 | 1820635 | 3808500 |
| <b>Total income per farm</b>      | lei    | 3421463 | 3036716 | 5147184 | 1020400 | 1150020 | 2498300 | 2331810 | 2083018 | 4656160 |
| <b>Profit Margin on farm</b>      | lei    | 685053  | 532116  | 1103948 | 181000  | 136420  | 432300  | 400020  | 262383  | 847660  |
| <b>Product Margin / holding</b>   | lei    | 3421463 | 3036716 | 5147184 | 1020400 | 1150020 | 2498300 | 2331810 | 2083018 | 4656160 |
| <b>Total subsidiers / holding</b> | lei    | 334733  | 540216  | 948684  | 142000  | 205020  | 482300  | 386600  | 441798  | 857540  |
| <b>Turnover</b>                   | lei    | 3421463 | 3036716 | 5147184 | 1020400 | 1150020 | 2498300 | 2331810 | 2083018 | 4656160 |
| <b>Net profit / holding</b>       | lei    | 575444  | 446977  | 927316  | 152040  | 114593  | 363132  | 336017  | 220402  | 712034  |
| <b>Net profit / ha</b>            | lei    | 447     | 360     | 518     | 346     | 225     | 399     | 286     | 170     | 390     |
| <b>Standard gross margin</b>      | euro   | 619112  | 456060  | 789040  | 170053  | 154754  | 357281  | 514914  | 388669  | 884180  |
| <b>Economic size</b>              | class  |         |         | X       |         |         | X       |         |         | X       |
| <b>ESU</b>                        | number | 515.9   | 380.0   | 657.5   | 141.7   | 129.0   | 297.7   | 429.1   | 323.9   | 736.8   |

**Chart 1: Total costs and total incomes per units**





## CONCLUSIONS

Based on data obtained in a study of the 3 agricultural units A unit was selected as being representative of the economic size class X in the south of the country.

**Table 6: Indicators synthetic agricultural unit - 2010**

| Indicators                                 | UM               | Total agricultural unit A - X |
|--|------------------|-------------------------------|
| <b>The value of farm production, d.c.:</b> | <b>lei</b>       | 4198500                       |
| - Value of crop production                 | lei              | 3935300                       |
| - Value of livestock production            | lei              | 263200                        |
| <b>Subsidies</b>                           | <b>lei</b>       | 948684                        |
| <b>Product Margin</b>                      | <b>lei</b>       | 5147184                       |
| <b>Total expenses</b>                      | <b>lei</b>       | 4043236                       |
| <b>Profit before tax</b>                   | <b>lei</b>       | 1103948                       |
| <b>Profit rate / holding</b>               | <b>%</b>         | 23                            |
| <b>Standard gross margin / farm</b>        | <b>Lei /euro</b> | 3313968 lei / 789040 euro     |
| <b>UDE</b>                                 | <b>Nr.</b>       | 657.5                         |
| <b>European size class after MBS</b>       |                  | X                             |

- ✓ At this profile production predominates the value of crop production to livestock done, because that includes cereal-grain production for feed consumption.
- ✓ Crop production in 2010 had a total value of 3935300 lei and animal production had a value of 263200lei, which resulted in a value of agricultural output unit at 4198500 lei. Comparison with the area of culture, this indicator is 2345 lei/ha.
- ✓ Total subsidies in the agricultural unit in 2010 was 948684 lei, the average about 530 lei/ha. This is a high amount of subsidies to support domestic agricultural production, which may impact the overall level of production achieved and incentives to producers.
- ✓ Gross product in this way has a value of 5147184 lei and 2875 lei/hectare, including livestock.
- ✓ Total expenses recorded in the agricultural unit are 4043236 lei, of which 3763236 lei for vegetable production and 280.000 lei for animal production. It is noted that the value of crop production and the total expenses of this type of activity, have a dominant proportion to animal production, but that while economic efficiency achieved is superior in crop production, livestock from which they directly reflected in the gross margin.

- ✓ The standard gross margin achieved in crop production was 3087308 lei, representing about 60% of the gross product. Standard gross margin levels obtained in animal production was 226660 lei, which recorded a lower value than crop production and a lower rate of about 4%. In all production activities performed in this type of agricultural unit were obtained 3313968 lei, MBS efficiency rate of about 64% can not ensure expenses.
- ✓ Standard gross margin (euros) at the rate of 2010 is 789040 euros. Is determined based on its economic dimension is of 657.5 agricultural unit ESU, the Class X fits in economic size.

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# STRUCTURES FOR REGIONAL DEVELOPMENT TO SUPPORT RURAL DEVELOPMENT

BUHOICIU FLORIN MARIAN<sup>1</sup>, BUHOICIU DRAGOS HORIA<sup>2</sup>

## Abstract.

*The purpose of this paper is to identify and evaluate directions, methods and specific instruments of territorial development having a major positive impact both economically and socially, on rural development. This is based on information obtained in the county of Galati, in close correlation with those similar in neighboring counties of Braila and Tulcea, all three counties being structures located in the Development Region 2 South- East. At Galati county level analysis and studies were carried out on the opportunity and economic efficiency of the establishment of a Metropolitan Area enabling economic and social development of Galati Municipality as well as of an adjacent rural areas, to include cities from neighboring counties Braila and Tulcea. The principle behind the research was the Galați Metropolitan Area shall include the polarizing city and rural settlements with direct, permanent and varied interrelationship, forming together a functional area system. The methodology used followed the interrelations, primarily the economic ones, between the settlements, depending on the values of territorial development indicators such as the number and specificity of economic entities in villages, the level and the skill of the existing labor force, the economic attraction exerted by the Municipality of Galati as well as by certain villages more economically developed from its area of influence. The results consist in finding bi-univocal economic flows between the Municipality of Galati and villages in rural areas within a radius of 30 km. from it and that can cause significant economic development of the entities concerned. The conclusions of our study substantiate the opportunity of such a Metropolitan Area to support faster development of administrative territorial units of its component.*

**Key words:** regional development, rural development, Metropolitan Area,, pole of urban development, zone of economic influence.

## INTRODUCTION

Sustainable economic development is a highly specific socio-economic evolution in our century, a process and a target that each human settlement wants to achieve in a short time interval. One of the important directions in which action can be effective is the implementation of the concept of *urban-rural partnership*. The notion of partnership requires cooperation and coordination, involves initiatives to formulate, adapt and implement integrated policies in the regions economically interdependent.

Urban-rural partnerships tend to play an increasingly important role in balancing economic processes of the administrative territorial structures, both economically and socio-demographic. Our study aimed to present the advantages that can be provided by a structure of territorial development such as the Metropolitan Area for its component localities, both rural and urban areas. We considered that during the current period, such structures of territorial development can become vectors for rural and urban development too. Moreover, support for development can be enhanced by different types of joint cooperation in sectors of primary economic importance for the respective communities.

The objective of our study was to substantiate the possibility of reaching a Galati Metropolitan Area, with connections in neighboring counties Braila and Tulcea, and even with openings to the Republic of Moldova. To achieve this we studied the experience of development of metropolitan areas in Europe and the predilection in our country. The need for such a study left from the reality under which access to European funds is easier within a region (area) of economic development than at a level of a locality, either rural or urban. Bibliographical research for issues of our study included field research studies [1] and related professional conferences, statistical information, the laws of Romania (harmonized with the European one). Following this goal,

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economic and demographic flows have been identified in the suburban areas of Municipiul Galati [2], in rural areas, which can lead to an important development of settlements in the area.

## MATERIAL AND METHOD

In Romania, in consonance with the program documents at community level, it has been developed the Concept of Romanian Territorial Development Strategy 2030 (CSDTR, 2007-2030), in order to substantiate the correlation between a strategy of territorial development and implementation of the process of absorption of European funds by 9 guidelines:

1. Recovery of periferality by assuming the identity of the connector and relay at the continental and intercontinental level
2. Joining the European network of territorial development poles and corridors
3. Structure and balanced development of the network of urban settlements
4. Affirmation of solidarity urban-rural
5. Proper development of different types of territories
6. Rural Development
7. Strengthening and developing inter-regional linkages in support of regional development
8. Increasing regional competitiveness
9. Protection, development and capitalization of natural and cultural heritage.

We note that *rural development* occurs explicitly in two guidelines, and *territorial* and *regional development* also in two. We can make a direct link between rural development and structures of territorial/ regional development, such as a Metropolitan Area with its capital city of Galati. Currently in Romania there are metropolitan areas that have the capital cities of Iasi, Oradea, Baia-Mare, Bacau, Brasov [3], Cluj-Napoca, Targu-Mures, Craiova, Ploiesti, Timisoara, Constanta, being in the process of achievement Bucharest and Suceava

According to the Urban Law no. 350/2001, the metropolitan territory may fall within a surface located around the cities of rank I, such as Galati, including remote villages up to 30 km, within which it can be created relationships of mutual influence in several areas, among which the economic and social (demographic). Also of great importance is the development of Inter Development Associations (IDA) between localities in the respective area, a locality being in a more advantageous position as part of several A.D.I

### **Methods and indicators for determining the formation of Metropolitan Areas**

Metropolitan Areas, as detailed above, are systems consisting of a polarizing city (or more if they are united in space) and settlements in its surrounding territory, strongly linked to it. Must be brought before the delimitation of peri-urban areas (outside city) which do not include the element of social and economic concentration, that is just core, polarizing the city [4].

Determination of settlements that can be part of a Metropolitan Area is a complex process, which was addressed by various methods by specialists (geographers, economists, statisticians, sociologists, planners), starting from the simplest, establishing the maximum distance from central city and to the most elaborate, considering interrelations between central city and its outer area (with different names: the suburban areas, the preurban area, extra area, the shuttle, the pre-municipal area, premetropolitana area, etc.). International and Romanian experience can result, so, by considering several indicators further examples:

- maximum distance from the city (often estimated as the traveling time calculated in time, with the means of transportation most widely used by the population of the surrounding cities)
- share of local people who come daily to work in the metropolis
- share of population in these localities occupied in non-agricultural activities related to the city (at least 75% of the employed population working in non-agricultural activities)
- share of population employed in production activities designed for the city ,
- share of thoes residing in the city
- touristic potential of the city, capitalized by the townspeople



- share of commuting, calculated as follows:

$$I_i = \frac{C_{ij}}{REA_i}$$

where:  $I_i$ = measure of commuting in area  $i$ ;  $C_{ij}$ = level of commuting  $i$  between areas  $i$  and  $j$ ;  $REA_i$ = active economic residents (occupied population) in area  $i$ .

This indicator was proposed by the European Coordination and Research Centre in social sciences in Vienna, which has developed in 1972-1973, the model for determining the Functional Urban Region (The Functional Urban Region) as the SMLA (Standard Metropolitan Labor Area ) and MELA (Metropolitan Economic Labor Area), where SMLA comprises the area in which over 15% of economically active residents moves daily in the metropolis and MELA comprises the area in which the population go daily to work in the central city.

- A different model was used by Reilly (1931), which elaborating the Law of retail gravity, bearing his name spelled out: commercial appeal of two centers on the intermediate space is directly proportional to their size and inversely proportional to the square center distance between them.

The formula of calculating the point of interest zero is as follows:

$$Db = \frac{Dab}{1 + \sqrt{\frac{Pa}{Pb}}}$$

where :

$Db$  – point of interest zero;

$Dab$  – distance (or time) between cities A and B;

$Pa$  – population of larger city;

$Pb$  – population of smaller city.

In **formulating hypotheses for demarcating metropolitan area of Galati**, the authors had considered two options

- According to the influence zone of 30 km
- According to the enlarged area of influence of 50 km

## RESULTS AND DISCUSSIONS

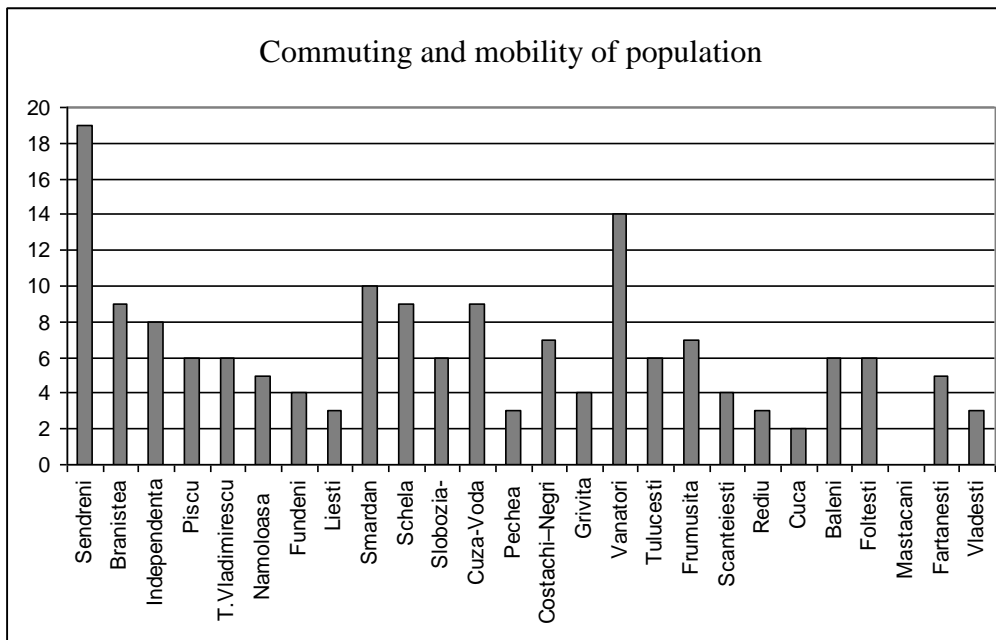
### I. Measurement commuting

The first indicator that we took in the analysis was commuting, a socio-professional phenomenon difficult to calculate because the data are difficult to obtain (the County Statistics do not calculate this indicator anymore). To obtain the necessary data we have made our own questionnaires which were completed by the major companies operating with passengers in Galati county, the results being presented in tables and graphs below

#### *1. Commuting and mobility of population ( people who moved into town)*

|   |
|---|
| Commuting and mobility of population = $\frac{\text{new homes (completed in 2010)}}{\text{total homes}} \times 100$ |
|---|

**Graph nr. 1: Arrivals in % in the village**



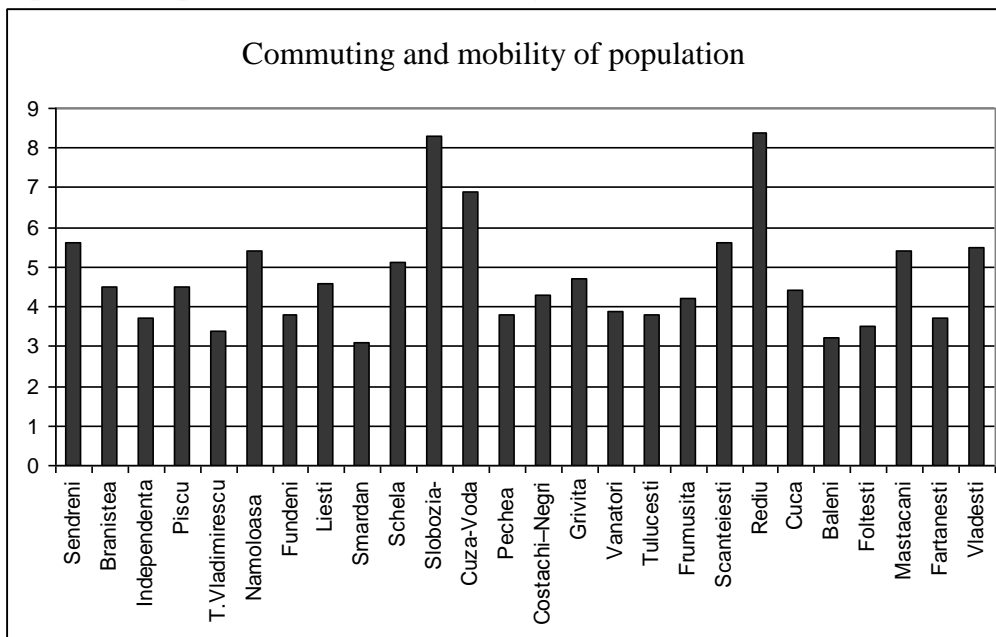
Source: D.J.S. GALATI, C.J. GALATI 2011

It can be noticed that the most people moved in the villages Sendreni, Tulucesti, Smardan, Vanatori, Frumusita, Branistea, Foltesti.

**2. Commuting and mobility of population (people who left the town)**

$$\text{Commuting and mobility of population} = \frac{\text{people who moved from the village}}{\text{total households in the village}} \times 100\%$$

**Graph nr. 2: Departures in % from the village**



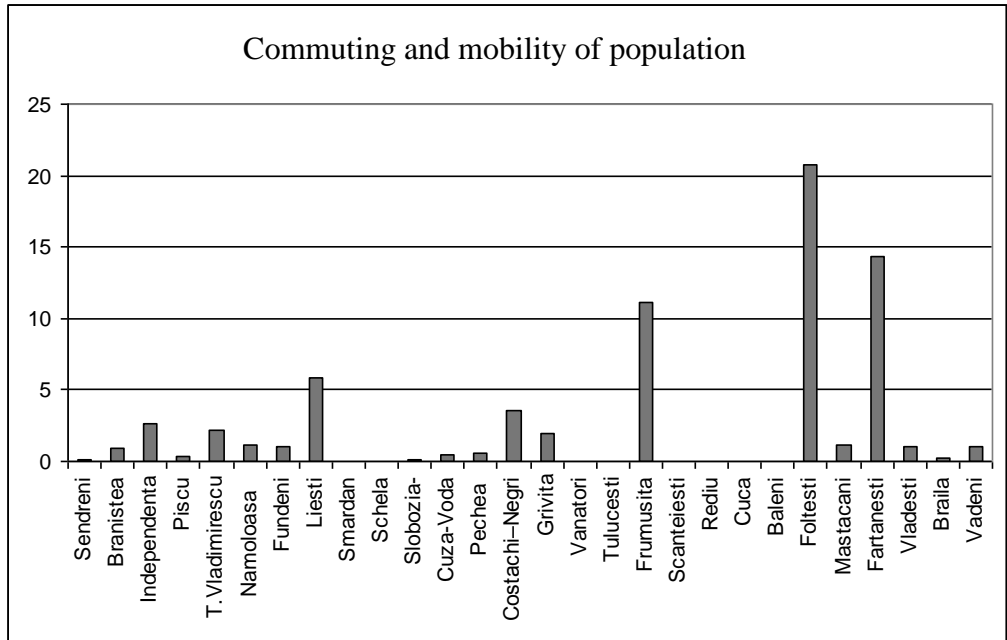
Source: D.J.S. GALATI, C.J. GALATI 2010

It can be noticed that the most people left from the villages Rediu, Slobozia-Conachi, Cuza-Voda, Vladesti, Namoloasa.

**3. Commuting and mobility of population** (commuters towards the are of influence, Municipality of Galati)

$$\text{Commuting} = \frac{\text{new homes (completed in 2010)}}{\text{total homes}} \times 100$$

**Graph nr. 3: People in % commuting daily to the Municipality of Galati**



Source: D.J.S Galati and C.J. Galti 2010

The highest rates are met in Slobozia Conachi, Rediu, Cuza Voda, Namoloasa and Scanteiesti, villages with a lower level of economic development, the main town commuting towards being the city of Galati.

The results show an increased commuting from the villages Foltesti, Fartanesti, Frumusita, Liesti, Independenta, Tudor Vladimirescu and Grivita to Galati.

**II. The commercial attraction of two settlements over the territory between them (Reilly’s model of calculation).**

It confirms that the radius of 50 km proposed is correct, the resulting calculations having the following values:

- in interrelation with the town of Tecuci (78 km far from Galati), the area of influence of Galati is at 56 km, i.e. 22 km from Tecuci
- in interrelation with the town of Tg. Bujor (54 km far from Galati), the area of influence of Galati is at 46 km, i.e. 8 km from Tg. Bujor
- in interrelation with the city of Braila (25 km far from Galati), the area of influence of Galati is at 14 km, i.e. 11 km from Braila

**CONCLUSIONS**

**The versions proposed to form the Galati Metropolitan Area**

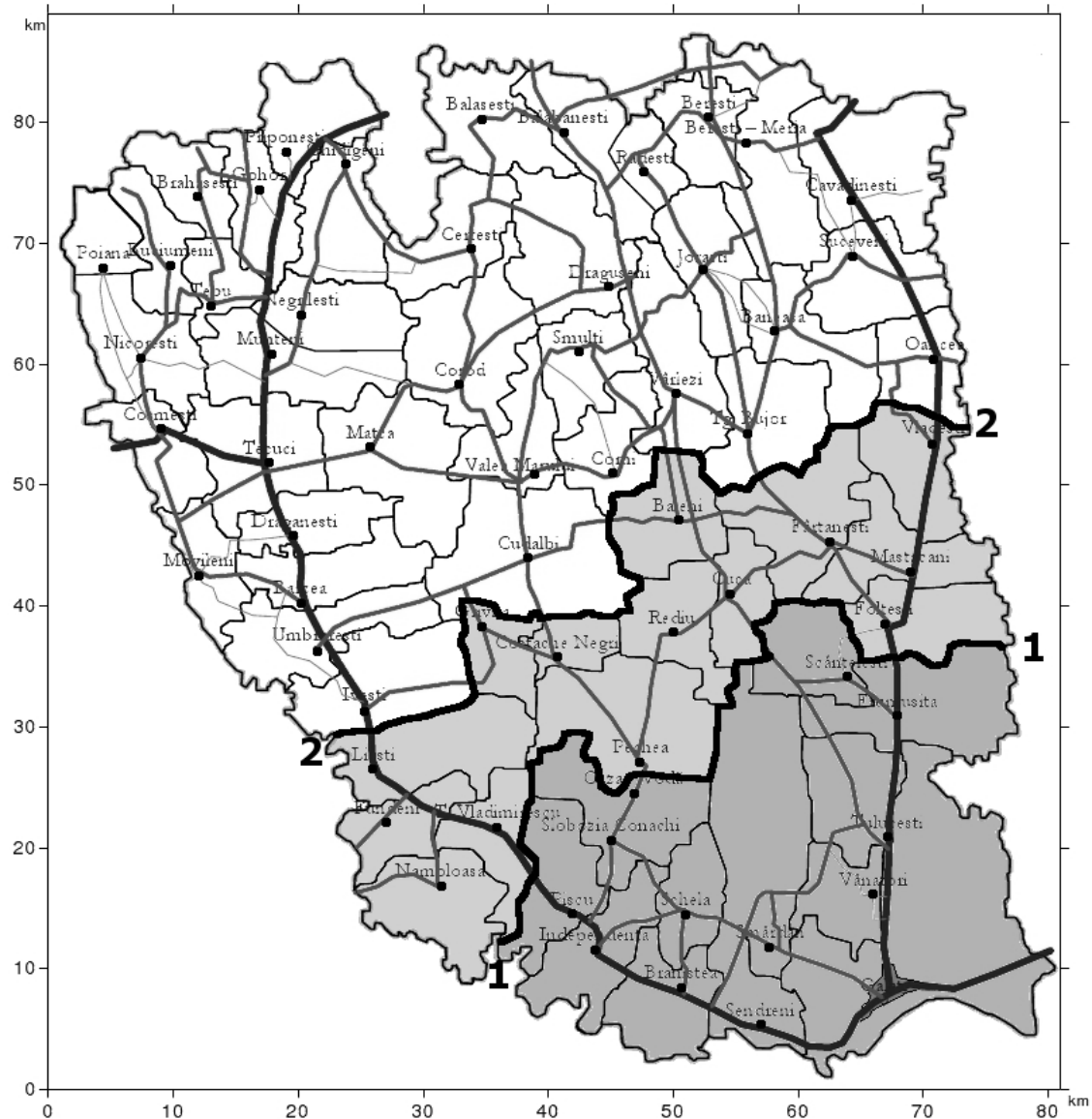
The conclusions drawn are largely partial and preliminary, but with great opportunities to identify some zonal elements of potential and conditioning

The conclusion that emerges following the analyzes is that two options have been

identified for setting up Galati Metropolitan Area:

- first option includes localities situated at a distance up to 30 km far from the Municipality of Galati;
- second option includes localities situated at a distance up to 50 km far from the Municipality of Galati.

The future Metropolitan Area can support on a strong urban core, with an area of influence of upward growth, which finally, as a metropolitan area, shall form a strategic goal with exemplary interrelating opportunities both within the country and outside it.



Option 1 - Metropolitan Area with localities situated up to 30 km far from Mun.of Galati  
 Option 2 - Metropolitan Area with localities situated up to 50 km far from Mun.of Galati

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# THE DEVELOPMENT OF THE VRANCEA VILLAGE IN THE CONTEXT OF EUROPEAN UNION

BURGHELEA LIVIU<sup>1</sup>

## Abstract

*Rural areas had represented for Romania cradle of civilization and prosperity, the convergence place for social, cultural and economic activities with complex implications on the Romanian reality. Tifesti commune, located in the Northeast of the Vrancea County will depend in the near future on the European funds for the development of agricultural activities, non-agricultural, services, the tourism potential developing of the area by promoting activities in winery.*

**Key words:** rural area, social convergence, European funds, Vrancea County

## INTRODUCTION

Romania must adopt agricultural and rural development policies consistent and long term to transform the Romanian rural area into a modern economic and social system, flexible to social and economic times changing that we are.

To create a adhesion solid base to the EU, through SAPARD program have been undertaken investments in rural areas designed to ensure its social and economic development through direct support to private farmers, businesses, associations of producers in the agriculture and local councils.

Paper refers to the analysis of Vrancea countryside, part of the SOUTH EAST region which includes other 5 counties: Brăila, Buzău, Constanța, Galați and Tulcea.

## MATERIAL AND METHODS

Vrancea County is situated between 45°23'and 46°11' north latitude and 26°23'and 27°32' east latitude. Located in the south, south-east of the country, the at the Eastern Carpathians curvature, Vrancea, ancient hearth of Romanian civilization, is a bridge between the three historical provinces – Moldova, Transylvania and Romanian Land. As settlement, is bordering to the north with Bacau County, east with Vaslui and Galati, south, south-east with Braila and Buzau counties, and to the west with Covasna.

Vrancea County with a total area of 4857 km<sup>2</sup> which represent 14% of the Romania Country, have 2 municipalities (Focsani and Adjud) and 3 cities (Odobesti, Marasesti and Panciu). Rural area consists of 68 communes amounting a total of 331 villages. County population is 391.641 inhabitants of whom 62.47% are in rural areas. Active population was 151.500 people. (NSI - Romanian Statistical Yearbook, 2009).

The structure land of Vrancea County is as follows:

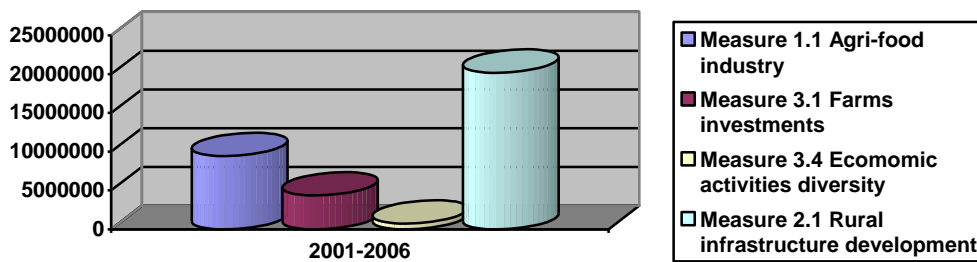
- Total land area 485,703 ha of which 255,417 ha total agricultural and non-agricultural total 230,286 ha. (NSI - Romanian Statistical Yearbook, 2009);
- Structure of agricultural land by main categories of use are as 147,956 ha arable, pasture and meadow 76,612 ha, vineyards and nurseries 27,141 ha, orchards and nurseries 3,708 ha (NSI - Romanian Statistical Yearbook, 2009).

Agriculture is an important sector for Vrancea county's economy, both in the county and the region. As it knows, Vrancea county represent the wine heritage of the country, both in terms of surfaces and production. Quality wines Vrancea is recognized and appreciated both at home and abroad. Thus in Vrancea County, SAPARD were completed a number of 113 projects with a value of 34,679,632.56 Euro grant public.

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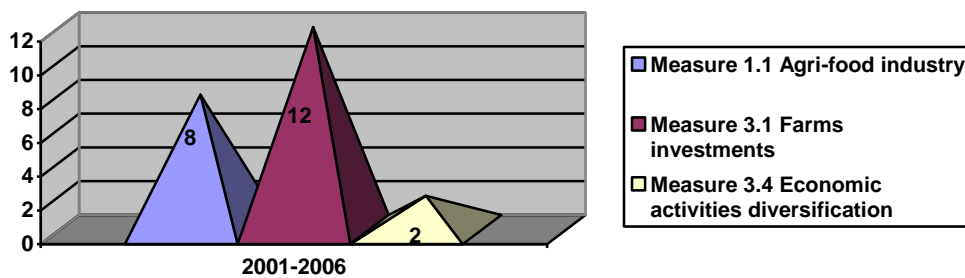
<sup>1</sup> PhD at University of Agronomical Science and Veterinary Medicine

**Total values of investments projects**

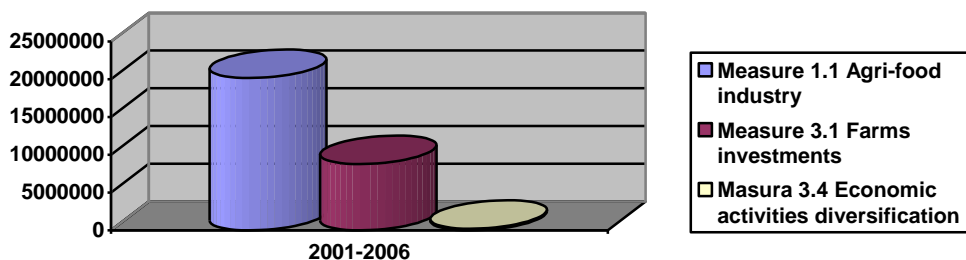


By Romanian SAPARD program were completed a total of 22 projects with a value of 29,097,840.65 lei grant public.

**Projects total by investments type**



**Total values of investments projects**



In this section it was considered appropriate to establish a coherent methodology for analyzing rural areas respectively defining terminology and the reference indicators that quantify the status, characteristics, economic and social potential. There were established indicators that can quantify potential rural development based on social, economic and cultural.

In the analyze there was included one of the most important rural development programs undertaken by the Romanian government in partnership with the European Community, named SAPARD (Special Accession Programme for Agriculture and Rural Development), Romanian SAPARD program (approved by Ordinance 59/2006 on insurance the state budget co-financing grants public investment projects under SAPARD) presenting their impact on rural Vrancea.

To analyze the countryside of the county starting from the realities and reaching to development assumptions have been used three specific research methods:

1. Economic and social dynamic analysis, deductive and quantitative based on some synthetic indicators
2. Survey method that involves collecting information directly from the source, using research techniques "interview" and "questionnaire" established to a representative sample of subjects.
3. SWOT analysis.

## RESULTS AND DISCUSSIONS

To make diagnose of the real situation the countryside of Vrancea County there have been established the analysis of some representative communes of the county, corresponding to the three main forms of relief: mountain, hill and plain. In the second phase we analyzed Tifesti village, a hilly village of Vrancea County.

This commune is located at 22° North latitude and 46° East, in the contact area of Subcarpathians with Râmnic Plain at the foot of the N-E Magura Odobești, and SE of Hill Momâia, on the left bank of the Putna river and on the right bank of Șușița river, at 6 km. to Panciu. The Common borders are: North - common Straoani, Panciu city and Marasesti at the South - common Bolotesti and Garoafa at East – Garoafa village and West - Vidra. The first document of the village was 374 years ago.

The commune has subordinated 8 villages: Tifesti, Bătinești, Clipicești, Igești, Oleșești, Pătrășcani, Serbs, Vitănești.

By SAPARD program were contracted and complete:

- Measure 3.1 a number of 9 projects with a value of 508,143.73 Euro grant public of which 3 projects have as target investments in field crops farms, wine farms 5 projects and 1 project for setting up dairy farm;
- The Measure 3.4 was contracted and completed one project with a public assistance grant of 27,010.91 Euro which targeted an investment in heliculture;
- The Measure 2.1 was contracted and completed also one project with a grant public value of 533,855.90 Euro investments to modernize and expand the water supply network.

A twelve public project contract with a value of 698,353.5 Euro grant with the target to establishing a poultry farm could not be implemented due to lack of private companies.

By Romanian SAPARD was contracted and completed a project on Measure 3.1 with a public grant of 223,915.20 RON in a field crops farm.

We have analyzed the current situation of rural development in terms of access to community Tifesti public grants and SAPARD Romanian SAPARD menus in three major directions of development, namely:

- Social impact. These 11 projects have created a total of 29 new jobs. This led to the decrease of population migration from rural to urban and rural incomes increased;
- Economic impact. By implementing these projects have secured investment of approximately 1.1 million Euro, was provided material and technical basis for the operation of field crops and vineyards by providing tractors, combine harvesters and related range of agricultural machinery for milk cows and snails exploitation;
- The quality of life in terms of basic services to the population. Public investment for modernization and expansion of water supply network served a total of 5,222 people, so in 2010 was ensured a water consumption of 810 m<sup>3</sup> per day.

For all these aspects mentioned above making global SWOT analysis carried out in the village Tifesti indicate the following:

**Strengths** - existence of county roads 205E and 205B paved and in good condition; availability and low cost of labor; the existence of strong associative forms in viticulture, the growing interest of the authorities to develop and promote the region in terms of viticulture and tourism, making requests for contracting authorities to European funds (for setting up an information center agro-tourism "Wine Road" establishment Welfare Centre for elderly, upgrading of local roads, building kindergarten in the village Bătinești normal program, rehabilitation home Bătinești cultural building a grape markets, rehabilitation of village stadium Clipicești) high agricultural potential for practicing viticulture (wine basin is shared Panciu), and vegetable (Bătinești village has a natural source of water-river Putna) , no pollution, local interest shown accessing European funds.

**Weaknesses** - difficult access to sources of funding, limited access to basic services for the population, poor training of residents.

**Opportunities** – accessing European funds to encourage agro tourism activities and especially through diversification of activities at the farm level horticultural farms, vineyards and grape processing centers, rural cultural and natural heritage, encouraging crafts and craft activities specific to the cooperage, the association between farmers would lead to projects financed by the European Agricultural Fund for Rural Development in agriculture, manufacturing and processing of agricultural, non-agricultural activities as well as in the service sector. Making an investment to collect wastewater in common and there is no sewerage network.

**Risks** - poor competitiveness of existing businesses and agricultural holdings, more pronounced aging population, low diversification of economic activities, agriculture being the main occupation of the inhabitants of the area, low skilled population.

## CONCLUSIONS

Development Tifesti community in the next period depends on many factors among which the most important are:

- Successful of local authorities in structural funds to improve the quality of life in rural areas by promoting and developing sound business environment;
- Creation of processing micro-enterprises for agricultural products, services for people in common;
- Accessing European funds for the development of livestock farming activities in order judicious use of local labor conditions and feed;
- Development of tourism and agro-tourism which must be encouraged in order to create for the residents additional income.

The Municipal City Council has a number of measures to develop documentation for public investments in sustainable rural development.

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# STANDARD GROSS MARGIN FOR POULTRY

CHETROIU RODICA<sup>1</sup>, IURCHEVICI LIDIA<sup>2</sup>

## Abstract

*The standard gross margin (SGM) is the difference between the gross product (GP) of a product and the direct proportional expenditures (DPE). The standard gross margin shall be calculated on one activity unit: surface (1 ha) or per head:*

$$SGM = GP - DPE$$

*The standard gross product at poultry is calculated per kg of meat and per 1000 eggs and includes the total output value plus the supplied subsidy. Direct proportional expenditures (DPE) are expenditures that vary directly with the changes in the size of agricultural production (biological material expenditures, feeding stuffs, energy, medicine, insurance and other material expenditures). Are called variable expenditures. Fixed production expenditures such as machinery, buildings (their amortization), permanent labor expenditures, rents or variable costs such as fuel and lubricants, equipment and machinery maintenance and works contracted with third parties are not included in costs for calculation of standard gross margin SGM. The standard gross margin for poultry was calculated for an average daily gain of 45 g at broiler chickens and for an average annual output of 260 eggs / head, to laying hens. The study results show that, in relation with the variable expenditures level, is realized an economic efficiency of the activity performed, which leads to a positive and bigger standard gross margins.*

**Keywords:** *standard gross margin, poultry, gross product, direct expenditures*

## INTRODUCTION

Among the economic indicators used in the management of production activities of agricultural holdings, the gross margin has a central place, due to the fact that it provides opportune and relevant information that substantiate decisions in the specific farm conditions, relating to: planning the structure of production, reducing variable costs based on the analysis of different combinations of resources allocated, establishing deviations causes between partial planned results and the achieved ones.

Standard Gross Margin is an economic indicator, expressed in monetary terms, per hectare, for crop production, or per head, for animal production.

Standard Gross Margin (SGM) of agricultural activities is the gross product of the activity (GP) minus corresponding specific costs directly proportional (variable) (SVC). SGM is unitary (per hectare, per animal) and expressed in RON or Euro, as follows:

$$SGM = GP - SVC$$

Gross product (GP) of an activity includes: primary and secondary production value priced delivery, plus subsidies to business. The data used to calculate the total production value and specific variable costs, meet a production period of 12 months (either calendar year or agricultural production year). If the period of crop and animal production is more or less than 12 months, it must be transformed to represent a period of 12 months.

Specific costs directly proportional (variable) are directly linked to the specific activity and according to Commission Decision 85/377/EEC represent some of variable production costs that can be allocated directly to certain categories of crops or animal species eg seed, fertilizers, pesticides, feed, drugs, etc.[2] Other variable costs such as fuel and lubricants, equipment and machinery maintenance and works with third parties are not included in variable expenses to calculate specific SGM.

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## MATERIAL AND METHODS

In animal breeding, standard gross margin is calculated per head, for adult animals and per built place for animal fattened, for each species and each category of animals of interest to obtain the efficiency of their production.

The standard gross margin calculation for poultry (poultry meat and eggs) is based on the following technical and economic indicators:

- *The average main production:*
  - average daily gain - g/head/day;
  - average eggs production - eggs/head/year;
- *Secondary production:*
  - manure;
- *Gross product:*
  - the result of adding primary and secondary production value to subsidies allocated, taken from the product budget;
- *Variable specific costs:*
  - taken from the product budget, deducted from gross product value:
    - ❖ feed costs;
    - ❖ costs with biological material;
    - ❖ energy and fuel costs;
    - ❖ drugs and veterinary material costs;
    - ❖ other material costs;
    - ❖ insurance costs.[3]

## RESULTS AND DISCUSSION

The level of standard gross margin depends on the productive potential of breeds, on the level of production achieved per head, and on the breeding systems and technologies and prices level.

The main characteristics of the standard gross margin are:

- differ from one product to another, from one period to another, from one farm to another, due to the technological conditions, level of production and prices, which affect the gross product value / head and variable costs;
- standard gross margin share of a category of animals or poultry of 2/3 of total farm gross margin, it shows the farm direction of specialization;
- standard gross margin is a tool for analyzing the activity efficiency and for planning technologies that allow, through the variable costs level, in relation to the products obtained, achieving a positive gross margin and bigger;
- the product negative gross margin indicates that the activity causes losses and must be improved;
- at farm level, some activities may have negative gross margins, and some positive, but overall the total gross margin must be positive. [1]

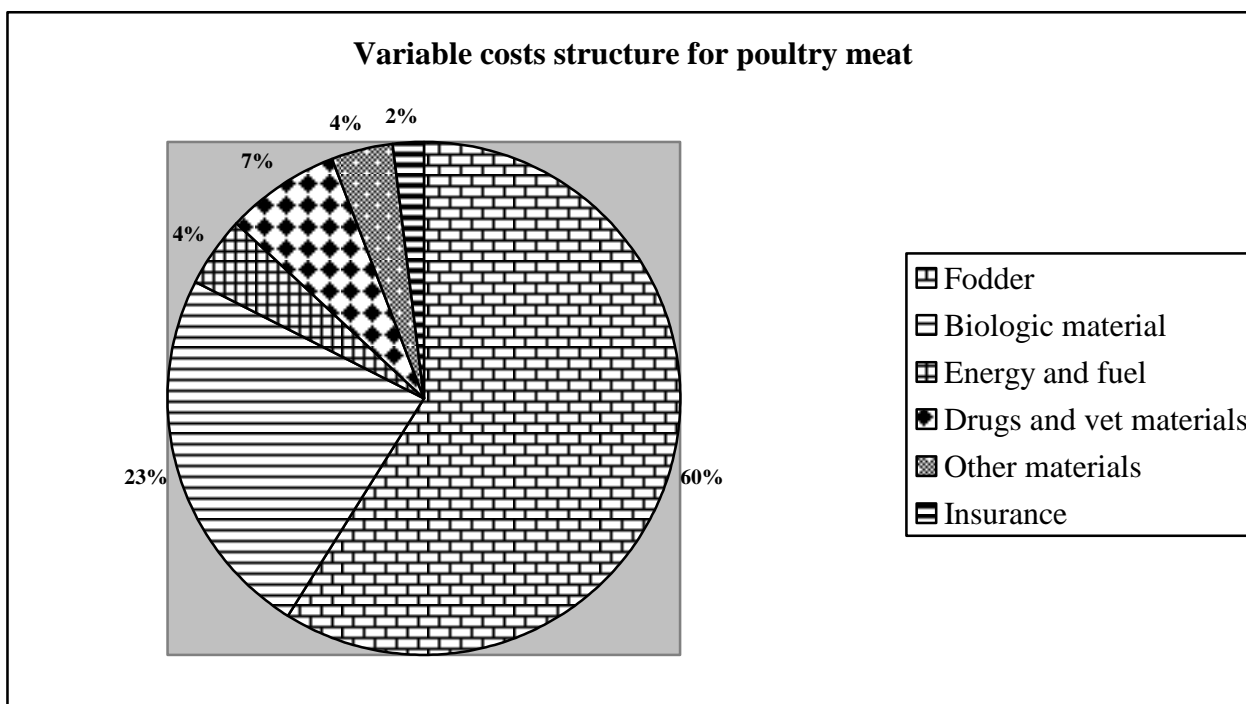
Based on the above indicators, was obtained the gross margin as the difference between the gross product value and specific variable costs and standard gross margin share in the gross product

Standard gross margin value for poultry was calculated for an average daily gain of 50g/head/day at broilers (Table 1) and for an average eggs production of 260 eggs/head/year (Table 2).

**Table 1 - Standard gross margin - unitary at poultry meat**

| <b>POULTRY MEAT</b>                       | <b>Delivery price</b>                   |                        | <b>EUR (1EUR = 4.55 RON)</b> |      |
|---|---|------------------------|------------------------------|------|
|   | <b>RON /kg</b>                          |                        |                              |      |
| Average production - 50 g/head/day        | 6.70                                    |                        | 1.47                         |      |
| Secondary production                      | 0.00                                    |                        | 0.00                         |      |
| <b>Gross product RON</b>                  | <b>Per kg</b>                           |                        | <b>EUR/kg</b>                |      |
|   | 7.78                                    |                        | 1.71                         |      |
| Subsidies RON                             | 1.08                                    |                        | 0.24                         |      |
| Variable costs RON                        | 5.23                                    |                        | 1.15                         |      |
| <b>Gross margin RON</b>                   | 2.55                                    |                        | 0.56                         |      |
| <b>Gross margin share in raw product%</b> | <b>32,75</b>                            |                        |                              |      |
| <b>Variable costs</b>                     | Quantity<br>kg fodder/kg<br>weight gain | Price<br>RON/kg fodder | Total RON/kg<br>weight gain  | EUR  |
| Fodder                                    | 1.87                                    | 1.61                   | 3.02                         | 0.66 |
| Biologic material                         |   |                        | 1.20                         | 0.26 |
| Energy and fuel                           |   |                        | 0.23                         | 0.05 |
| Drugs and vet material                    |   |                        | 0.37                         | 0.08 |
| Other materials                           |   |                        | 0.20                         | 0.04 |
| Insurance                                 |   |                        | 0.10                         | 0.02 |
| <b>Total variable costs</b>               | x                                       |                        | 5.12                         | 1.12 |

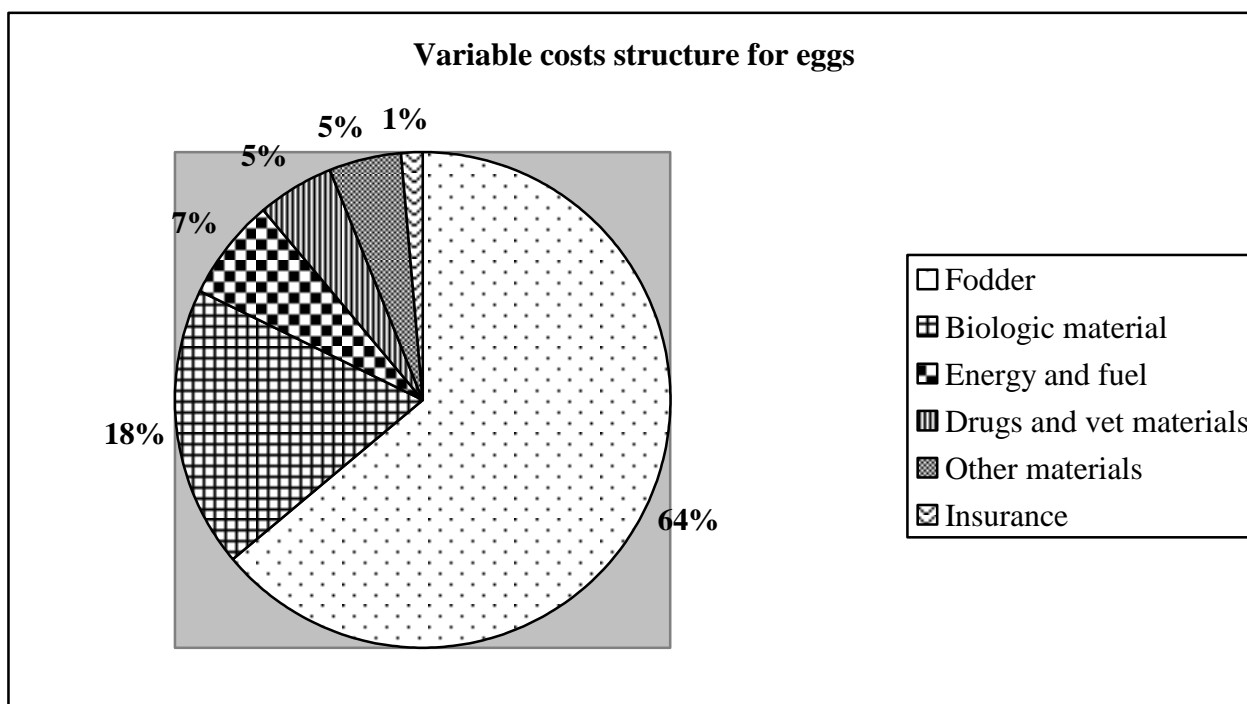
**Chart1**



**Table 2 - Standard gross margin - unitary at eggs**

| EGGS FOR CONSUMPTION                      | Delivery price RON /1000 eggs | EUR (1EUR = 4.55 RON) |                     |       |
|---|-------------------------------|-----------------------|---------------------|-------|
| Average production - 260 eggs             | 400.00                        | 87.91                 |                     |       |
| Secondary production                      | 30.00                         | 6.59                  |                     |       |
| <b>Gross product RON</b>                  | <b>Per 1000 eggs</b>          | <b>EUR/1000 eggs</b>  |                     |       |
|   | 486.30                        | 106.88                |                     |       |
| Subsidies RON                             | 56.30                         | 12.37                 |                     |       |
| Variable costs RON                        | 306.26                        | 67.31                 |                     |       |
| <b>Gross margin RON</b>                   | 180.04                        | 39.57                 |                     |       |
| <b>Gross margin share in raw product%</b> | <b>37.02</b>                  |                       |                     |       |
| <b>Variable costs</b>                     | Quantity kg fodder /1000 eggs | Price RON/kg fodder   | Total RON/1000 eggs | EUR   |
| Fodder                                    | 140                           | 1.37                  | 191.52              | 42.09 |
| Biologic material                         |                               |                       | 55.0                | 12.09 |
| Energy and fuel                           |                               |                       | 19.8                | 4.35  |
| Drugs and vet material                    |                               |                       | 15.00               | 3.30  |
| Other materials                           |                               |                       | 14.00               | 3.08  |
| Insurance                                 |                               |                       | 4.40                | 0.97  |
| <b>Total variable costs</b>               | x                             |                       | 299.72              | 65.87 |

**Chart 2**



## CONCLUSIONS

Analyzing the standard gross margin for poultry it can conclude the following:

For poultry meat:

- for an average daily gain of 50 g/head/day, with a raw product of 7.78 RON/kg and for level of specific variable costs of 5.23 RON/kg, the standard gross margin is 2.55 RON/kg, respectively 0.56 € / kg (1 € = 4.55 RON);
- gross margin share in raw product for poultry meat is 32.75%;
- In the variable costs structure for poultry meat (Chart 1), 60% is fodder, followed by biologic material costs – 23%, drugs and vet materials 7%, energy and other material costs – 4% each, and insurances 2%.

For eggs:

- for an average eggs production of 260 eggs, outcomes a raw product of 486.3 RON/1000 eggs, with a level of specific variable costs of 306.26 RON/1000 eggs, and the standard gross margin is 180.04 RON/1000 eggs, respectively 39.57 €/1000 eggs;
- gross margin share in raw product for eggs is 37.02%;
- In the variable costs structure for eggs (Chart 2), 64% is fodder, followed by biologic material costs – 18%, energy 7%, drugs and other materials – 5% each, and insurances 1%.

Thus, both for poultry meat and for eggs for consumption, the largest share in variable costs structure are the expenditures with fodder, over 60%, followed by those for ensuring the biological material. To achieve higher gross margins is, therefore, need to apply an appropriate management to feeding stuffs, regarding providing technical and economical balanced fodder rations, which determine to express the productive potential of poultry breeds and hybrids, with maximum economic efficiency.

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# TECHNICAL ECONOMICAL EFFECTS OF THE MEASURES ON THE PIGS WELFARE AND PROTECTION

CHETROIU RODICA<sup>1</sup>

## Abstract

*The term of animal welfare was chosen to describe the animal life quality. It is derived from the English language. This notion includes health, productive comfort and also involves the animal protection. The Universal Declaration on Animal Welfare, issued by the World Society for Animals Protection, defines welfare as: Degree in which the animal physical, behavioural and psychological requirements are met. As a member state, Romania has implemented EU legislation on the animal welfare and protection, including farm animals. There are seven measures to ensure the minimum standards concerning animal welfare on farms and they include: flooring, lighting, fights prevention, potable water, microclimate, dry bedding, health. Increasing the number of farms in which are applied superior measures in comparison with the mandatory technological measures and improving the welfare of pigs leads to improving the environment and the rural space. The animal welfare superior standards often involve additional costs and therefore the state provides some tools to compensate producers for higher production costs for: increasing by at least 10% of available space allocated to each animal, ensuring at least 11 hours / day artificial light with a value of 50 lux of lighting, improving pig welfare conditions during transport, correction the nitrites and nitrates level in the water, reducing pollutants by 30% in comparison with the mandatory minimum level, by maintaining optimal microclimate parameters limits, improving the rest area.*

**Keywords:** *welfare, pigs, holding, protection, microclimate.*

## INTRODUCTION

The concept of animal welfare means the animal life quality and derived from English language, which uses the term welfare. This notion includes health, productive comfort and also involves animal protection. The Universal Declaration on Animal Welfare, drafted by World Society for Protection of Animals, defines welfare by: Degree in which physical, behavioural and psychological requirements of the animal are met.

In the same Declaration, are presented the five principles, which must be ensured concomitantly:

- ensuring access to fresh water and specific food;
- ensuring appropriate environment including shelter and rest;
- preventing pain, hurts, diagnosis and treatment of diseases;
- relief of suffering;
- providing space, facilities for expressing normal behaviour.

Animals that live in the same conditions, can pass from one level of welfare to another, depending on physiological requirements and behaviour. Some noises have adverse effects to the health and behaviour (mental stress), by the irritant effects triggered by certain characteristics of intensity and strength of sounds. It may be that against certain excitant environmental stimulus, acting intense and repeated (fans noise or scrapers etc.), the first reaction of animals to be intense and after that getting used to note, accompanied by gradual reduction of the response, up to ignore these stimulus.

The welfare is also influenced by the conditions of feeding, watering, microclimate, and the information flow between animals and their environment. Prolonged isolation in small spaces, closed, without contact with the natural environment and with other animals can lead to stress. For these reasons, even for animals kept in individual boxes is mandatory visual communication and by smell with the animals in the same shelter.

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## MATERIAL AND METHOD

The paper studies the technical and economic effects of additional welfare and protection of pigs measures relating to:

- increasing with at least 10% of space allocated to each animal;
- ensuring at least 11 hours / day artificial light with a value of lighting of 50 lux;
- improving the welfare of pigs during transport;
- correct the level of nitrites and nitrates in the water;
- pollutants reduction by 30% compared to the minimum mandatory required, by maintaining optimal microclimate parameters limits;
- improving the rest area conditions.

## RESULTS AND DISCUSSION

### Increasing with at least 10% of space allocated to each animal

The surface higher by 10% compared with that which sets minimum mandatory standards for protection of swine from categories of pigs for fattening, gilts and sows, gives increased welfare conditions by reducing the stress of cohabitation. Thus, increases feeding front, is easier access to drinkers and reduces stress produced during rest. Besides feeding, when animals from the box stalls are simultaneously involved, other physiological activities (drinking, resting) are dispersed in the remaining period of the day and are independent activities of animals they need space for.

Reducing the number of sows and gilts with 10% increases the free space for motion, reduces stress of cohabitation, reduces fighting for more space to forage and rest and the risk of hurts, contribute to a better batching of sows and gilts in preparation for service or calving. The measure imposes lowering the density fat pigs, gilts and sows by eliminating a sufficient number of animals out of the box stalls, so that each animal remained available space to increase by at least 10% compared to the density resulting from application of minimum mandatory norms.

Reducing pigs density on the surface leads to:

- reduce gas emissions into the atmosphere,
- reduce quantities of manure and wastewater,
- reduce feed consumption.

Table 1 presents indicators for minimum requirements and for the superior ones on space allocated to each category of pigs:

**Table 1: Minimum and superior requirements on the space allocated to pigs**

| Indicator for superior requirement   | Indicator for mandatory minimum requirement  |
|--|--|
| The floor area available in superior welfare conditions:<br>-pigs with a live weight between 50-85 kg - 0.605 m <sup>2</sup> /head<br>-pigs with a live weight between 85-110 kg - 0.715 m <sup>2</sup> / head<br>-pigs with a live weight over 110 kg - 1.1 m <sup>2</sup> / head<br>-gilts and sows kept in groups - 1.804 m <sup>2</sup> / head, respectively 2.475 m <sup>2</sup> / head | The minimum mandatory available floor area:<br>-pigs with a live weight between 50-85 kg - 0.55 m <sup>2</sup> / head<br>-pigs with a live weight between 85-110 kg - 0.65 m <sup>2</sup> / head<br>-pigs with a live weight over 110 kg - 1 m <sup>2</sup> / head<br>-gilts and sows kept in groups - 1.64 m <sup>2</sup> / head, respectively 2.25 m <sup>2</sup> / head |

Source: Ord. 149/13.07.2012; Ord. ANSVSA no.202/2006

Income losses by reducing the number of animals are due to a decrease of 10% of total sold production of fat pigs, piglets and breeding gilts. Savings achieved under this measure come from the reduction of feed consumption.

## Ensure at least 11 hours / day artificial light with a lighting value of 50 lux

The light provides the normal metabolic processes of the animal body, a state of comfort to animals and easy access to the box facilities. Providing a lighting value of 50 lux requires, depending on brightness index of different types of buildings for accommodation of swine, additional consumption of electricity by lighting equipment. In this respect, by applying the measure, an additional consumption of electricity is registered. In the reproduction sector, the light ensures a normal breeding cycle at both sows and gilts and boars.

In Table 2, are presented the minimum and superior lighting requirements.

**Table 2: The minimum and superior requirements on lighting for pigs**

| Indicator for superior requirement  | Indicator for mandatory minimum requirement   |
|---|---|
| Superior lighting conditions:<br>-period of minimum 11 hours / day artificial lighting<br>-50-lux lighting (at least a 150W power lamp every 33 m <sup>2</sup> , in the time slot established through commitment) | Minimum mandatory lighting conditions required:<br>-minimum of 8 hours / day lighting<br>-40-lux lighting (at least a 100 W power lamp for each 42 m <sup>2</sup> ) |

Ord. 149/13.07.2012; Ord. ANSVSA no.202/2006

Income losses and additional costs:

- cost of electricity consumed additionally for 3 hours / day;
- cost of electricity consumed additionally for a surplus of 10 lux 11 hours / day.

## Improvement of pig welfare during transport

Improving the welfare conditions of pigs during transport is achieved by reducing the density of pigs during transport by at least 30%, so not to exceed 165 kg/m<sup>2</sup>. This measure refers only to transport animals outside farm, or transport animals from other farms.

In Table 3 are presented the minimum and superior requirements on density for pigs during transport.

**Table 3: Density of pigs during transport**

| Indicator for superior requirement                                     | Indicator for mandatory minimum requirement                            |
|--|--|
| Density of pigs during transport must not exceed 165 kg/m <sup>2</sup> | Density of pigs during transport must not exceed 235 kg/m <sup>2</sup> |

Ord. 149/13.07.2012; Reg. EC no.1/2005

Losses of income and additional expenses: 30% reduction in the density of pigs during transport involves additional costs for additional transport operations.

## Correction of nitrites and nitrates level in the water

The quality water is essential for animal health and performance.

Usually, water is provided from own sources (wells drilled), or from surface water and does not meet levels of nitrites and nitrates specific to additional protective measures.

In order to ensure superior welfare standards for pigs, installations and equipment are necessary to correct level of nitrites and nitrates, by treatment with substances indicated by laboratory for environment chemistry (chlorine, salts, resins, etc.) and the use of filters and other materials. At these additional costs are added energy costs.

Correction of nitrites and nitrates level in water used for watering pigs directly affect the health of pigs (reduction treatments and drugs) and quality of wastewater.



In Table 4, are presented the minimum and superior levels of nitrites and nitrates in the water for pigs:

**Table 4: The minimum and superior levels of nitrites and nitrates in the water for pigs**

| Indicator for superior requirement   | Indicator for mandatory minimum requirement              |
|--|--|
| Nitrates – 50 (mg/l)<br>Nitrites – 0.5 (mg/l)<br>$[\text{nitrates} / 50] + [\text{nitrites} / 3] \leq 1$ | Nitrates + nitrites – 100 (mg/l)<br>Nitrites – 10 (mg/l) |

Ord. 149/13.07.2012; Ord. ANSVSA no.20/2012

Additional expenses attracted through applying this measure refers to treatment with substances indicated by the environmental chemistry laboratories (chlorine, salts, resins, etc.), and the use of filters and other consumables, as well as additional expenses for the source water quality control and after treatment (6 additional analyzes / year).

**Pollutants reduction by 30% compared with the minimum mandatory level, by maintaining microclimate parameters in optimal limits**

In order to ensure the physiological constants together with optimal conditions of accommodation, feeding, watering and hygiene, it is necessary that pigs to have provided the microclimate in optimal limits, leading to reduction of pollutants from animal shelters.

These factors (temperature, relative humidity, air volume per head and winds velocity) should always assured in optimal limits by adequate equipment and constantly monitored by specific sensors or control devices.

If the parameters of microclimate are maintained in optimum limits, does not accumulate gas (CO<sub>2</sub>, ammonia, etc.) and excess dust, which are harmful to animals, may even be reduced to a level that provides superior comfort conditions to animals.

Reducing pollutants by maintaining microclimate within optimal limits, without variations affecting animals, reduces the risk of disease of pigs, increases immunity and improves their overall condition. Consequently, decreases the amount of medication needed for treatment of animals, decreases the amount of water consumed.

The pollutants reduction by maintaining microclimate conditions within optimal limits requires additional consumption of electricity.

The pollutants reduction by maintaining optimal intervals provides increased conditions for pigs protection, disease prevention, stress reduction, etc.

**Table 5: The pollutants level in the shelter**

| Indicator for superior requirement   | Indicator for mandatory minimum requirement  |
|--|--|
| The pollutants level in the shelter in superior welfare conditions:<br>-max. 10.5 mg/m <sup>3</sup> dusts<br>-max. 700 ppm CO <sub>2</sub> | The pollutants level in the shelter in mandatory minimum conditions:<br>-max. 15 mg/m <sup>3</sup> dusts<br>-max. 1000 ppm CO <sub>2</sub> |

Ord. 149/13.07.2012; Ord. ANSVSA no.20/2012

The additional expenses related to the application of this measure shall cover the consumption of additional electricity and additional expenses to change with increased frequency of air filters for pollutants reduction.

**Improving conditions of rest area**

To promote the animal welfare, given the investigated natural behaviour of pigs, it is necessary to be a dry area at all times for the rest period. A continuous dry resting area meets the

needs of physical and thermal comfort. For the area of rest, the minimum standard refers to a concrete area, which is washed and dried in the hall conditions.

Achieving of this zone with increased comfort needs the purchase and distribution of hygroscopic materials, which attracts additional expenses.

**Table 6: Requirements for resting area of pigs**

| Indicator for superior requirement  | Indicator for mandatory minimum requirement   |
|---|---|
| The resting area in superior welfare conditions must be permanently kept dry, by using appropriate absorbent bedding material | The buildings for pigs must be constructed so as to allow the animals to have access to a physically and thermally comfortable resting area, drained and cleaned properly and to allow all animals to rest at the same time |

Superior standards of welfare for pigs involve additional costs. The support for animal welfare is a form of fixed annual payments per livestock unit (LU) as compensation for loss of income and additional costs incurred by farmers, as shown in Table 7:

**Table 7: Financial support for the welfare of pigs (Ord. 149/13.07.2012)**

| Specification  | Fat pigs      | Gilts         | Sows          |
|--|---------------|---------------|---------------|
| <i>LU conversion factor, according to Annex V of Regulation (EC) no. 1974/2006</i>   | 0.3           | 0.3           | 0.5           |
| The amount paid annually to cover additional costs and loss of income due to the application of measures for animal welfare                  | EUR / LU/year | EUR / LU/year | EUR / LU/year |
| Pack 1 a)<br>Increase by at least 10% of available space allocated to each animal  | 41.40         | 165.00        | 23.30         |
| Pack 2 a)<br>Ensure at least 11 hours / day artificial light with a lighting value of 50 lux   | 19.10         | 17.20         | 15.80         |
| Pack 3 a)<br>Improvement of pig welfare during transport   | 4.80          | 4.80          | 5.40          |
| Pack 4 a)<br>Correction of nitrites and nitrates level in the water  | 12.00         | 25.00         | 18.50         |
| Pack 5 a)<br>Pollutants reduction by 30% compared with the minimum mandatory level, by maintaining microclimate parameters in optimal limits | 16.80         | 48.00         | 22.90         |
| Pack 6 a)<br>Improving conditions of rest area   | 7.20          | 15.90         | 13.10         |
| <b>TOTAL MEASURES EUR/LU</b>   | <b>101.30</b> | <b>275.90</b> | <b>83.20</b>  |

Ord. 149/13.07.2012

Although during the period that requires investments at farm level to ensure superior standards of animal welfare, increase the costs of production and revenues are down, after, these technological improvements in growth and exploitation conditions of animals become favourable factors for the increase in quantity and quality of production, the animals responding positively to optimization of production factors allocated, and finally leading to the efficiency of activities.

## CONCLUSIONS

Besides the characteristics of products, farmers must meet the environmental and animal welfare norms provided by law, because they are related to protection of natural resources and a series of ethical requirements. Some products have added value because they come from a particular region or produced by a traditional method (quality labels), or because the methods of production pays special attention to environmental and animal welfare (eg. organic farming).

To act properly in order to promote a full welfare of farm animals is necessary to develop the scientific basis for assessing the welfare status, must be determined the value of ethics and human attitudes to animal welfare and must have developed tools to promote it at the farm level by other means than through legislation and policy.

For a realistic assessment of animal welfare, should be performed measurements on the production level, behaviour, anatomy, physiology, health and immunity. But we need to consider other factors such as:

- impact on the environment (soil, water, air);
- health and safety of employees and workers;
- farm economic efficiency;
- community interactions of farm (in connection with pollution or other factors).

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# IMPACT STUDY THE COSTS NECESSARY TO CONSERVE BIODIVERSITY ON THE FARM "AGROZOOOTEHNICA ROSETI"

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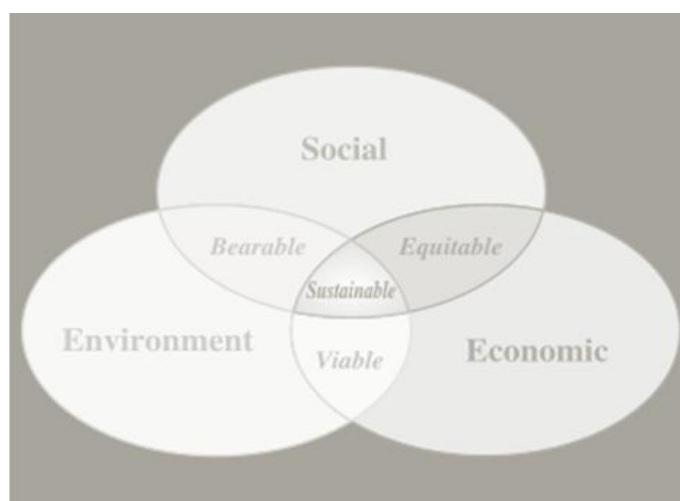
## Summary

*Biodiversity embraces the variety of genes, species and ecosystems that constitute life on Earth. We are currently witnessing a steady loss of biodiversity, with profound consequences for the natural world and for human well-being. Appears necessary to increase the positive contribution of agriculture to the environment, the need to reduce pollution from agriculture and adoption of agricultural policy so that it takes account of the environment. Standards or requirements that farmers must meet to be eligible for subsidies contribute to maintain biodiversity. The purpose of this paper is to estimate the costs needed to implement environmental standards and their implications for farm profitability. This study was made in a farm in the south part of Romania. Compliance with these rules increases variable costs. Therefore, an appropriate method for measuring the profitability of farm production activities would be gross margin calculated for each type of farm activity. Even if it can be seen a increase of production expenses which lead to a light decrease of farms profitability, the long-term benefit of biodiversity conservation is considerably.*

**Key words:** *biodiversity, costs, gross margin, profitability, standards or requirements.*

## INTRODUCTION

Biodiversity - the extraordinary variety of ecosystems, species and genes that surround us - it's our life insurance, giving us food, fresh water and clean air, shelter and medicine, mitigating the effects of natural disasters, pests and diseases and helping to regulate the climate. Biodiversity is also our natural capital, providing ecosystem services that underpin the economy. Damage and biodiversity loss threaten the provision of these services: losing species and habitats and prosperity and jobs it generates nature, and endanger our own welfare.



*Figure 1. The concept of sustainable development*

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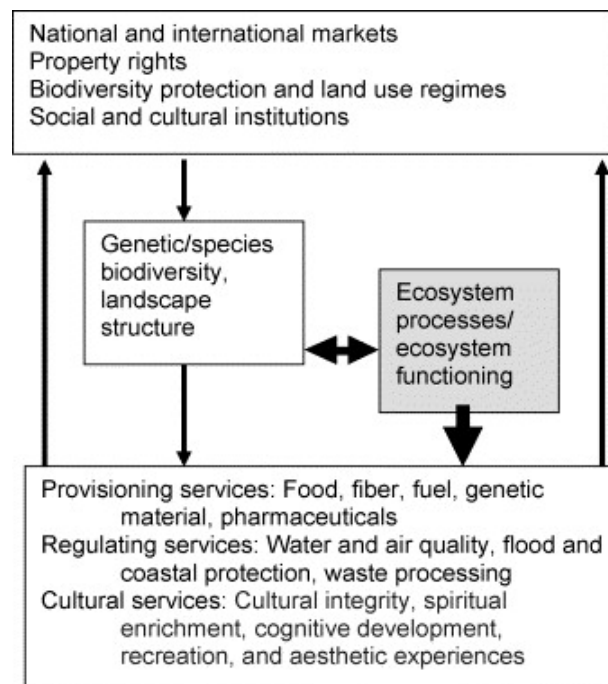
(Source: European Environment Agency)

The biodiversity for sustainable agriculture is a potential solution for many of the problems associated with intensive agriculture, and for greater resilience to the environmental and socioeconomic risks that may occur in the future. The challenge is to understand the combined ecological and social functions of agro-biodiversity, determine its contribution to ecosystem goods and services and value for society at large, and evaluate options for the sustainable use and conservation of biodiversity across the agricultural landscape.

In addition to the intrinsic value, biodiversity and the services it provides have significant economic value which is rarely reflected in markets. Because it does not establish a price and is not reflected in the financial statements of companies, biodiversity is often a victim of competing demands on the nature and use of her.

Although measures to halt biodiversity loss involve certain costs, loss of biodiversity is itself costly for society as a whole, especially for agricultural businesses that depend directly on ecosystem services.

Common Agricultural Policy (CAP) must adapt to the new challenges of European agriculture, such as climate change, water management and biodiversity protection. Adaptations provided allow farmers to take better account of market developments in order to guide production and contribute to rural development.



*Figure 2 Flow chart showing that knowledge of ecosystem processes and functions aid in the accurate assessment of the value of biodiversity in agricultural landscapes. (Adapted from a diagram by L.E. Jackson, U. Pascual, T. Hodgkin - Utilizing and conserving agro biodiversity in agricultural landscapes. Agriculture, Ecosystems & Environment, Volume 121, Issue 3, July 2007, Pages 196–210.)*

Three steps are highlighted in such process: demonstration (valuation), capture and sharing of conservation benefits (mechanism design). This information is then used to examine the potential success of nascent market creation incentive mechanisms for biodiversity conservation, including: (i) payments/rewards for ecosystem services, (ii) direct compensation payments, (iii) land use development rights, and (iv) auctions for biodiversity conservation [3].

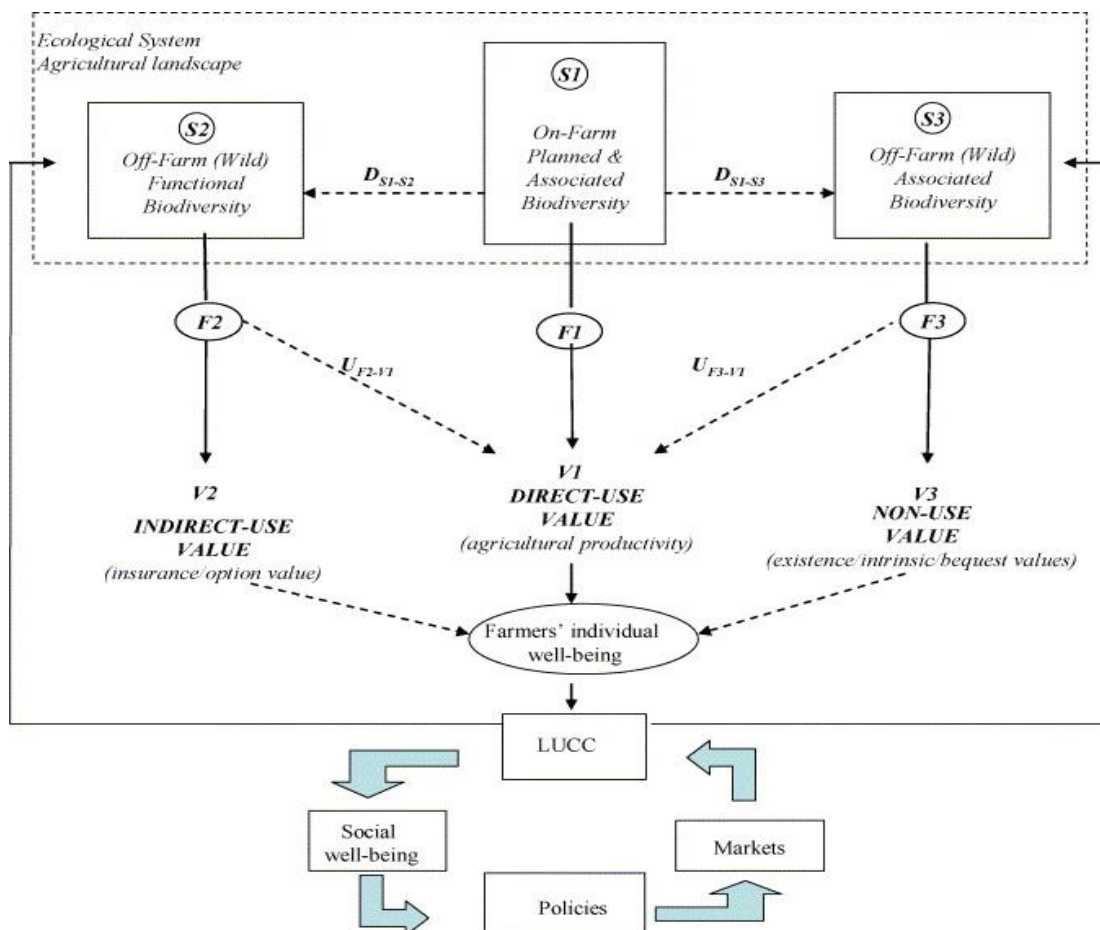


Figure 3 A stylized framework of the linkages between biodiversity levels (stocks, S), flows of ecological services (F) and economic values (V) in agricultural landscapes leading to LUCC and policies that aim at aligning the private and social values of agro biodiversity. The ecological system governing the interaction between on- and off-farm biodiversity stocks within agricultural landscapes provides flow of ecological services that benefits individual land users and society as a whole in different ways. Individual land users compare the directly perceived benefits of conservation and the opportunity costs to decide their privately (decentralized) optimal land use and the level of (dis)investment in biodiversity. This in turn affects social wellbeing and policies are sought to change such perceived net benefits.

Direct payments are benefits granted directly to farmers under support schemes listed. Direct aids are subject to the "cross-compliance" principle that farmers must meet that of requirements to qualify for such payments.

**Table 1. Good agricultural and environmental conditions**

| Subject   | Obligatory standards   | Optional standards               |
|---|--|----------------------------------|
| Soil erosion<br>Protect soil by appropriate measures                            | Minimum soil cover   | Land terracing to strengthen     |
|   | Minimum land management reflecting local conditions specific |                                  |
| Soil organic matter:<br>Maintain soil organic matter levels through appropriate | Arable stubble management                                    | Standards for crop rotation      |
| Soil structure:<br>Maintain soil structure through appropriate                  |  | Appropriate machinery use        |
| Minimum level of maintenance  | Retention of landscape features,                             | Minimum livestock stocking rates |

|   |  |   |
|---|--|---|
| Ensure a minimum level of maintenance and avoid the deterioration of habitats | including, where appropriate, hedges, ponds, ditches trees in line, in group or isolated and field margins | and / or arrangements adequate bond   |
|   |  | Establishment and / or retention of habitats  |
|   | Avoiding the encroachment of unwanted vegetation on agricultural land                                      | Solitary tree clearing prohibiting  |
|   | Protection of permanent pasture  | Maintaining plantations of fruit trees and grape vines in good vegetative condition |
| Protection and water management   | Establishment of buffer strips along watercourses  |   |
| Protect water against pollution and run-off and management water use          | If using water for irrigation is subject to authorization, the procedures for obtaining permits            |   |

## MATERIAL AND METOD

The adoption of biodiversity-based practices for agriculture, however, is only partially based on the provision of ecosystem goods and services, since individual farmers typically react to the private use value of biodiversity, not the “external” benefits of conservation that accrue to the wider society.

Evaluating the actual value associated with goods and services provided by agrobiodiversity requires better communication between ecologists and economists, and the realization of the consequences of either overrating its value based on ‘received wisdom’ about potential services, or underrating it by only acknowledging its future option or quasi-option value.

Agrobiodiversity is most likely to enhance agroecosystem functioning when assemblages of species are added whose presence results in unique or complementary effects on ecosystem functioning, e.g., by planting genotypes with genes for higher yield or pest resistance, mixing specific genotypes of crops, or including functional groups that increase nutrient inputs and cycling. Simply adding more species to most agroecosystems may have little effect on function, given the redundancy in many groups, especially for soil organisms.

These additions on ecosystem functioning and application of the principles of variable cross-compliance increases variable costs. Therefore, an appropriate method for measuring the profitability of farm production activities would be gross margin calculated for each type of farm activity [1].

Knowing farm income and variable costs, gross margin can be calculated by subtracting all variable costs of production related revenues one production unit; relationship for calculating the gross margin is:

$$\text{Gross margin} = \text{Revenue} - \text{Variable costs}$$

At the level of a firm that carries out several activities (with several branches of production), by adding together the gross margins of all branches of production, total gross margin is obtained. Usually, it offers a image more complex on farm profitability, but for the image to be complete, it requires the correlation of the total gross margin with amount of fixed costs [4].

By calculating gross margins to the branches of farm, can be obtained and observed trends of final financial results (profit or loss), practically, gross margin values allow the separation of information on:

➤ **Profitability of the branches of production;**

In the branches of production profitable, gross margin will be positive and the production unprofitable branches may have negative gross margin. Gross margin, calculated for each species or

category (gross margin / cow / pig / poultry etc..) or for each type of crop (gross margin / ha maize silage / ha barley / rape etc ha. ) allows the branches hierarchy according to their profitability.

➤ **Profitability of farm;**

We believe that gross margin is a barometer of profitability, positive margin is an indication that the activity is worthwhile and that business can continue in this direction. Conversely, negative gross margin could portend financial deficit. In achieving gross margin, are included many expenses of the farm and so can be shown, projected or demonstrated the effect of any changes.

## RESULTS AND DISCUSSION

Farm located in the south of Romania is organized as a limited liability company. The main activity is the crop production cultivated agricultural area of 1480 ha is fully leased. Technical equipment of the unit is very good, 8 tractors and 4 combine the majority performing and relatively new equipment.

The crops efficiency from economically is proven trough gross margin comparison of different activities, in our case, different crops. Farmers will have to turn to those cultures which assure a positive gross margin, profit and give up increase to the crops with negative gross margin, leading to financial losses.

**Table 2 Structure influence on gross margin per farm crops**

| Crop              | Surface     |            | Gross margin<br>RON/ha | Gross margin/activity<br>RON |
|-------------------|-------------|------------|------------------------|------------------------------|
|                   | ha          | %          |                        |                              |
| <b>Wheat</b>      | 1034        | 72         | 190                    | 196460                       |
| <b>Corn</b>       | 209         | 14,5       | 1516                   | 316844                       |
| <b>Sun flower</b> | 60          | 4          | 797                    | 47820                        |
| <b>Rape</b>       | 138         | 9,5        | 1030                   | 142140                       |
| <b>Total Farm</b> | <b>1441</b> | <b>100</b> | -                      | 703264                       |

Analyzing crop structure is observed the high percentage of gross margin to maize achieved in gross margin the total holding, while the share in crop structure is 14.5%. All activities have positive gross margin, which indicates a profitable activity. Unit profitability may increase if changes crops structure are in favor to maize, sun flower and rape.

Variable costs at the farm level there are to RON 1,882,611 or a percentage 48.5%. of the total expenditure structure.

Specific expenses for biodiversity conservation were made to achieve the following objectives consistent cross compliance and good agricultural and environmental conditions:

- purchase of seed material with high productive potential, resistant to drought, pests and diseases, adapted to local conditions, to reduce the number of phyto-sanitary treatments performed;
- the cover with winter crops at least 20% of the total arable land of the farm (72%);
- the maintenance to the fallow land in winter in good agricultural and environmental conditions;
- respect for the crop rotation so as to not cultivate sunflowers on the same plot for more than two years;
- avoid installing unwanted vegetation on the entire farm;
- combating invasive alien species.

An analysis to the variable holding costs structure reveals that the percentage for achieving these objectives is approximately 30 %.



There are possibilities for the agriculture exploitation profitability in conditions of biodiversity conservation, as follows:

- further cultivation of varieties with high productive potential, resistant to drought, pests and diseases, adapted to local conditions.
- compliance plan of crop rotation on the farm;
- application of modern technologies;
- sampling and analysis of soil samples, periodically, to determine the exact amount of nutrients needed by fertilizer be given without making waste;
- reducing chemicalization by finding new solutions to fertilize soil: manure, green manure;
- rational use of equipment;
- severe selection of suppliers based on reliability and price as the better;
- creating opportunities for more advantageous market capitalizing to the products and thus increase of gross margin, profit growth and the rate of profit;
- improving crop structure., after the comparative analysis of of gross margin achieved on different activities;
- applying for eco-environmental measures and if possible conversion to organic farm.

## **CONCLUSIONS**

The activity of the farm is a profitable, under compliance to the cross - compliance measures for biodiversity conservation. This is possible in conditions of granting of subsidies. Lack of subsidies for the vegetal sector would reduce the profitability of agricultural holdings.

Exist the possibility increase crop yield of the farm under biodiversity conservation by increasing gross margin and reducing variable costs.

In the first case this is possible by increasing production per hectare by using varieties with high yield potential, resistant to drought, diseases and pests, adapted to local conditions, or by products valorification at a favorable price.

Reduce variable costs per hectare can be done by: negotiation of the purchase price; reduce the amount used for various inputs; use of performance equipment and technologies and finding new solutions to reduce the amount of fertilizer per hectare (manure, green manures)

Partnerships between researchers, farmers, and other stakeholders to integrate ecological and socioeconomic research help evaluate ecosystem services, the tradeoffs of different management scenarios, and the potential for recognition or rewards for provision of ecosystem services.

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# THE SIMULATED ENTERPRISE AN ESSENTIAL FACTOR IN PROFESSIONAL TRAINING FOR SUSTAINABLE DEVELOPMENT

COSTEA-MARCU DUMITRA<sup>1</sup>

## **Summary**

*Practice Enterprise is a simulated model, which serves as the perfect solution for the current demand for new ways of teaching and learning. The new work place requirements were and are still incompatible with the training in which the student is „passive recipient”. In a business simulation students are required to actively participate in company activities and be responsible by playing a central role in all aspects of company management: accounting and the preparation of a statement, organizational, administrative and fiscal charges, domestic and international trade management, financing, investment banking relationships, the application of ICT, so on.*

**Key words:** *management, knowledge economy, human capital, employment, human resources, information technology, organizational culture*

## INTRODUCTION

Knowledge representing the essential force of development and growth in an active process of globalization cause radical changes in individual organizational level. Knowledge-based organizations experience changes related to the structure and dynamics, which take into account the weight given to intangible assets, forming a new mentality and organizational culture.

The existence of a culture for continuous learning for creative development, acquisition of information, skills and capabilities that can generate value in a market where competition is based on intellectual capacity, which is undoable most important characteristic of excellent companies.

Intellectual capital is an accumulating factor of production which creates and facilitates the exchange of new knowledge among the organization members.

The ability of individuals to produce knowledge and innovation places human being in a determinant position of successes in keeping the organization competitive advantage.

## MATERIAL AND METHODS

Electronic market (virtual) facilitated the appearance of virtual products and virtual digital services interacted by sellers, buyers or intermediaries, which radically changed the traditional business environment with a hyperactive one in view of globalization size business and technological evolution without before.

Such a web made marketing create the possibility of online identity, probing market and competition with the Internet, online promotion, e-commerce development, establishment of community business(eBay, stock catalog, directories of companies, E-community, links), so that both producers and retailers can use advanced marketing techniques.

Virtual market demand is how to turn the changes it generates(development, integration) at the organization level production and distribution and chain, resulting in the synchronization process, dematerialization and deliberating information, horizontal and vertical integration of firms, growth of world trade software, expanding distribution channels and stimulation of intelligent agents.

The flexible organization requests its employees behave accordingly an effective informational system able to mobilize human resource around dynamic targets.

They are new occupations and occupations disappear; there is the possibility of changing those who may still be working.

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Knowledge economy induces outsourcing trends and information outsourcing of information services involving the design, operation and maintenance of information systems, development of computer applications, management, relationship information, computer service so. That is avoiding those activities that would develop slowly and can not be increased rapidly.

Outsourcing activity predominantly informational nature of the employees who work outside the company sometimes from great distances, is a widespread phenomenon at the moment due to reduced costs and efficient activity.

One of the most spectacular developments in the knowledge economy and the information society is the emergence of virtual enterprise germs.

It is considered that the company or organization can be described as a virtual network or individuals, which can operate in an amalgam approach as a very flexible organizational way (C. Barnatt, 1996).

Regarding the virtual organization we can highlight two aspects:

- at managerial level it incorporates many elements of computer information and performing information particularly as hardware and software.
- it is in fact a transitional form towards knowledge-based company, which is the basic component of the new type of economy to which is currently evolving.

There is evidence that traditional learning models do not work anymore. Today's students must be involved in meaningful and challenging tasks in real life.

The goal of this methodological aspect is essential for the acquisition of transversal competences in future job placement and growth of each student's motivational base while respecting their individual characteristics peculiarities.

The first Junior Achievement student undertaking started in New York in 1934, migrating to Europe in 1960. The official statement of the organization is to inspire and prepare young people to succeed in a global economy.

**Table 1 Evolution, JA Worldwide, the global regions in the period 2010-2011**

| ZONA/ANII    | Students  |           | Volunteers |           | Classes   |           | Contact Hours Worldwide |
|--------------|-----------|-----------|------------|-----------|-----------|-----------|-------------------------|
|              | 2009-2010 | 2010-2011 | 2009-2010  | 2010-2011 | 2009-2010 | 2010-2011 | 2010-2011               |
| SUA          | 3913482   | 4036865   | 167714     | 177796    | 173044    | 176490    | 79519430                |
| Europa       | 3117936   | 3117978   | 150491     | 137220    | 122441    | 130723    | 30991410                |
| Asia/Pacific | 1309939   | 1751391   | 18183      | 20211     | 59483     | 46813     | 30355389                |
| America      | 1152889   | 1230442   | 39130      | 45701     | 40180     | 41283     | 11085938                |
| MENA         | 196227    | 232671    | 4506       | 5246      | 5093      | 6081      | 1683580                 |
| Africa       | 175670    | 208913    | 2613       | 2897      | 3608      | 5142      | 3339306                 |
| Total        | 9866143   | 10578260  | 382637     | 389071    | 403849    | 406532    | 156975053               |

Source: Processing by JA Worldwide Fiscal Year 2010-2011 Annual Fact Book compiled

By involving business in education it is developed the socio-economic dynamics. Nationally or regionally depending on the particular system of education and training, there is a wide range of programs that stimulate entrepreneurship and training in accordance with new economic and social trends from primary education up to university education and the training for adults.

The concept of simulated enterprise at different levels of education in programs implemented by a number of suppliers, from the necessity of a framework as close to the real and entrepreneurship.

This form of professional development has grown greatly in the world, wearing different forms depending on the particular political, social, economic and cultural needs of each country.

Food industry is a complex field that provides a framework with features related to both climatic factors, political and social, given the education level of the work force, but also may be

influenced by people with well defined entrepreneurial culture, a strong personality, desire and courage to believe they can achieve great things.

In the period 2007-2011 the simulated enterprise internal network of the Faculty of Management, Economic Engineering in Agriculture and Rural Development worked over 76 companies.

This was a modern method of approach to business and direct confrontation with dynamic virtual markets.

**Table 2 Statistics simulated enterprises from 2007 to 2011**

| ACADEMIC YEAR | ENGINEERING ECONOMIC |       | AGROTURISM |       | TOTAL COMPANY SIMULATED |
|---------------|----------------------|-------|------------|-------|-------------------------|
|               | STUDENTS             | FIRMS | STUDENTS   | FIRMS |                         |
| 2007-2008     | 7                    |       | 18         | 1     | 1                       |
| 2008-2009     | 120                  | 8     | 266        | 17    | 25                      |
| 2009-2010     | 182                  | 12    | 240        | 16    | 28                      |
| 2010-2011     | 100                  | 6     | 248        | 16    | 22                      |
| Total         | 409                  | 26    | 772        | 50    | 76                      |

Considering that simulate the enterprise activity includes:

- Individualization of learning process (each student rotates in different departments deploying workloads predefined activities each job, the residence time related to the objectives)
- Develop skills of professional conduct, simulated inside the company and externally with other companies
- Acquiring, managing and experimenting a role while participating in a process of transfer of technical knowledge with real operational complex situations
- Increase basic motivation through greater participation in learning, cooperative climate, the perception of the results of employment, visualization objectives and goals, understanding the importance of consistency between objectives and methods adopted

Ownership of decision-making for solving real problems occur via a customer, supplier or delayed mail.

Rural informatization and information systems requires default connection paradigm shift, adopting solutions, digital literacy and skills training, radical change of all economic activities and the social environment, the impact on critical gaps related to cost, quality, organization and sustainability.

Appear in leading this transformation and promotes:

- Remote teleworking
- Develop a systemic thinking like virtual enterprise composed of organizations able to conduct this type of activity
- Create and foster virtual forums
- Develop database access to information and services
- Changing sale and distribution strategies:
  - E-commerce
  - Development of Distribution network and markets
  - Operation Just-In Time

Managing a simulated company in food industry can act accordingly, synchronized and effectively through communication with remote information, so that all parties involved in the quality, quantity and availability of service to produce a performance in comparison with individual actions.

Communication and relevant and necessary information exchange must take into account the need for compatibility of IT technology, hardware and software virtual trading partners within the organization.

Solution of efficient supply chain processes is its ability to accelerate the integration of these technologies for communication, collaboration and control between the parties.

In fact we can discuss on some opportunities that simulation can occur both at operational, tactical, strategic level and real-time operation for increased market demand.

Students identify the centers of decision, focus on aspects of management decision systems and can build models to turn on a virtual market given the global business opportunity. Thus production is correlated by market requirements, coordinates and manages resources establishing the program of delivery strategies while additional measures are necessary if a market demand is to be honored in a short time.

Among students, the promotion of mechanisms to develop skills and competencies, collaborative team working skills of communication and self-assessment will result in superior vision on organizational and business management in general.

More closely linking education to economic problems by involving real talent for the development of innovative programs in multidisciplinary teams to develop the enterprise culture, anticipating the development of risk factors lead to understanding the complexity of interrelated processes and infrastructure in international context.

## **RESULTS AND DISCUSSIONS**

The objectives of the course on business simulation in a company are: social skills, typically working environments, reducing the differences in labor market entry and improve behavioral skills, understanding employee attitudes and role so that application of acquired knowledge to generate new values, used in later stages of their careers.

The students' debates to put into practice a business idea developed in an organizational environment started by identifying strengths (market demand, competition reduced field, the original business, small initial investment, so on) and weaknesses (low experience in the field, inadequate equipments, supply of products on the market, so on).

The form of organization, means of work, work procedures and exemplary manner with other firms simulated the characteristics of actual companies and products except money and products which are virtual elements.

In the case of simulated firms there are many aspects of marketing aimed at the activity of selling products with other companies using the same procedures as network real companies or simulated production activities where the manufacturing preparation and production tracking program are simulated.

Participants in the program will know the functioning of various departments such as human resources, production, trade, finance-accounting, so on.

Implementing the concept of simulated enterprise within the Faculty of Management, Economic Engineering in Agriculture and Rural Development was made in autumn 2007 when it was registered and integrated in the international network.

Thus from the beginning until now have been involved in this program approximately 1,200 students, some of them set their own business as a result of accumulated skills and experience.

## **CONCLUSIONS**

Rethinking the education system as projective and reactive system, with effective participation of students in line with global trends has results of the main learning problems and learn to participate in their resolution, and a close relationship with real economic and social life.

The Simulated Enterprise offers a framework for both self-awareness, personal development, integration, communication, but also by developing a model leads to reflections generating ideas that can be solutions for program participants and society as a whole.

It can be concluded that universities should be involved in making knowledge- based economy and society based on all of four dimensions which aim at:

- producing knowledge through research;
- transmission of knowledge through education and training;
- dissemination of knowledge through information and communication technologies;
- the use of knowledge in technological innovation

In this respect universities hold the key to knowledge- based economy and society that lies at the intersection of education research and innovation(C.Barnatt,1996).

In these circumstances institutional strategies must know changes to reflect new goals of higher education.

Adapting curricula to the skills required for higher economic trends is an outstanding need for the establishment of „ the Entrepreneurship University ”.

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# TRENDS ANALYSIS IN PRIMARY AGRICULTURAL PRODUCTION OF SERBIA<sup>1</sup>

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## Abstract

*Primary agricultural production is a significant factor of the total national economy, primarily due to its share in GDP and total employment. Together with food industry, this sector has over 15% of Serbian GDP. Although the share of the primary agricultural production in realized GDP has constantly decreasing since the beginning of 2000 (owing to bigger growth of GDP in other sectors of Serbian economy), the primary agriculture significantly contribute to other industrial sectors, which directly depend on raw materials from agriculture, then inputs industry for agriculture, as well as accompanying service activities. Initiated changes in the field of agriculture, although under influence of numerous factors, which have an amortization effect on them, have acquired a character of irreversible processes. A reform of agricultural sector can hardly return to a starting position, but there, first of all, can talk about its vacillating tempo and agrarian policy instruments, which often should set up a balance between diametrically opposite goals. In such conditions, Serbian agriculture has extraordinary place and role in the total economic development of the country, especially in the process of adjusting economic mechanisms for realization of specific social goals, on conduction of reforms and transition, and primarily on mitigation of the world economic/financial crisis' impact, which seriously jeopardize a revival and development of economy.*

**Key words:** *primary agriculture, natural resources, crop farming, livestock breeding, agricultural husbandries.*

## INTRODUCTION

The Republic of Serbia has favourable natural conditions for development of heterogeneous agricultural production, regarding that it is located on the most favourable area of north latitude. Together with the **climate, the land** represents the most important natural condition for development and dispersion of agriculture. According to the SORS data, Serbia disposes with around 5.097.000 ha of agricultural land (0,69 ha per capita), and arable land occupies around 3.301.000 ha. Thereat, 65% of the total Serbian territory does agricultural land, which is 82% in family husbandries' ownership.

Most of arable land is acidificated, which is a result of uncontrolled use of chemical means, and in Vojvodina is salted. In accordance, there are necessary agro-technical measures aiming to improve land structure – calcification, increasing use of organic fertilizers etc. As for **water resources**, the Republic of Serbia disposes with sufficient quantities for satisfying own needs, but only if uses rationally and protects from accidental or intentional pollution. The significant wealth represent mineral and thermo-mineral waters, which diversification of physical and chemical characteristics classifies our country into the richest areas on European continent.

**Forest resources** in the Republic of Serbia amount 2.349.720 ha. State forests cover 50,2%, and private 49,8%. The high origin forests cover the area of 44,1%, sprout forests 45,5%, plantations 1,6%, and bushes and shrubberies 8,8%. The least afforested region in Europe is the AP Vojvodina. A state of forests as a resource is unsatisfying and is distinguished by high share of bad quality forests, in inappropriate way cultivated artificial forests – therefore would preservation and improvement of forests' state and forestry development would be the state's task of high priority.

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## MATERIAL AND METHOD

In realization of research task was used a desk research of data which relate on trends in the primary agricultural production in Serbia. Such research implies using the data from the official sources: the data of the Statistical Office of the Republic of Serbia, materials of Serbian Chamber of Commerce etc; using the data from domestic and foreign literature; using internal documentation. There were also used quantitative methods, primarily – time series analysis. With combination of the stated research methods can get more reliable answer to the key questions, which impose within the trends analysis in the primary agricultural production in Serbia.

## RESULTS AND DISCUSSION

**Production of cereals.** The largest area of agricultural land in Serbia uses for cereals production and this production occupies around 60% of total plough-lands and gardens. A maize is the most represented culture with over 1,2 million sowed hectares, while a wheat is right behind, with around half million hectares. Due to large sowed areas under cereals, they are among sectors with the highest value of the primary production, which additionally increases by further processing. Serbia is the biggest regional producer of cereals, and according to the FAO data, it is on 19<sup>th</sup> position in the world regarding maize production and in 35<sup>th</sup> position regarding wheat production (2008) [5]. The production of cereals satisfies needs of domestic processing industry, while some quantities export. For example, in 2009, in total export value of goods from Serbia, in the first place is maize with 261 million USD of export value [6]. Market chain of cereals is short and very often exist informal channels of sale. Regarding average yields of cereals, Serbia is on the European bottom, and especially are low yields of wheat. There is little innovations in production and sale, and a price has an expressed seasonal trend, depending on balance needs, price and quality competitiveness.

**Industrial plants production.** Around 400 thousand hectares of plough land is under industrial plants (or around 12% of total plough lands and gardens). The most of areas under oleaginous plant is on the territory of Vojvodina, where also processing capacities have been placed. Besides a fact that average share of oleaginous plants in plant production value is around 5, 00% (i.e. around 6, 00% on family agricultural husbandries), sunflower and soy are among the most important agricultural cultures in Serbia (in last decade has been noticed also the growth in rape production). Serbia falls into a group of the biggest rape producers in Europe, and in the world, according to the FAO data, it takes 14<sup>th</sup> place in soy production and 15<sup>th</sup> in sunflower production [5]. Thanks to a long tradition and favourable climatic and land conditions for production, there achieve satisfying average yields of oleaginous plants. Domestic needs satisfy with oleaginous plants production, while significant export products are sunflower and soy oil. In accordance to the SORS data, in Serbian export commodity structure for 2009, the export of refined sunflower oil was on 40<sup>th</sup> position, and the export of raw sunflower oil was on 45<sup>th</sup> place [6]. The territory of Vojvodina disposes with the best land and climatic conditions in this part of Europe for growing sugar bear. The areas under sugar beat, as well as yields in last period have significantly varied. Although, sugar is significant export product and, according to the realized export value, is among 10 leading products.

The production results in crop production in 2011 were followed by poor financial effects, due to price decrease of some cultures (*table 1*). According to these financial results, only regarding sunflower and sugar beat were realized the positive effects, which had influenced to the total weaker result, i.e. the production value decrease of basic crop cultures, in regard to 2010 (19%). In accordance to the first evaluations, the total value of agricultural production in 2011 was amounted around 6 milliard euros [1].



**Table 1. Production value of basic crop cultures**

| NAME         | 2010.       |        |                | 2011.       |        |                | Index 11./10. |
|--------------|-------------|--------|----------------|-------------|--------|----------------|---------------|
|              | in 000 tons | din/kg | in million RSD | in 000 tons | din/kg | in million RSD |               |
| Wheat        | 1.630       | 26     | 42.380         | 2.076       | 20     | 39.444         | 93,1          |
| Maize        | 7.207       | 21     | 151.347        | 6.463       | 16     | 103.408        | 68,3          |
| Sugar beat   | 3.325       | 3      | 9.975          | 2.822       | 4,5    | 12.699         | 127,3         |
| Sunflower    | 378         | 20     | 7.560          | 432         | 35     | 15.120         | 200,0         |
| Soy          | 541         | 35     | 10.470         | 441         | 36     | 15.876         | 83,8          |
| <b>TOTAL</b> |             |        | <b>230.197</b> |             |        | <b>186.547</b> | <b>81,0</b>   |

Source: *Agriculture in 2011 with foresseing for 2012 – evaluations, assessments and proposals, SCC, Association for Agriculture, Food and Tobacco Industry and Water Management, Belgrade, February, 2012, p.4*

**Vegetable growing.** Vegetables in Serbia grow on around 280.000 ha (9% of totally sowed areas) and in total value of agricultural production participate with 11,31%. In structure of vegetables production dominates a potato (potato mostly grows on the territory of Central Serbia – in Cacak, Ivanjica and Guca surroundings). The significant vegetable cultures are cabbage and pepper. The most famous place in Serbia after the cabbage production is Futog, while sauerkraut from Futog represents very important export product. Except on this location, big cabbage producers are located also in Central Serbia. The domestic market's needs for the cabbage is increasing from season to season, which classifies it among one of the most wanted vegetable products in Serbia. Two recognizable production and commercial centres for the pepper production in Serbia are Leskovac surroundings and north part of Vojvodina. Outermost north of Banat and a part of Backa fall into the most favourable terrains for production of spice red pepper in Europe. Although the vegetable production in cloches and greenhouses is still insufficiently represented, trends of production growth at the most vegetable cultures, as well as the positive balance of foreign trade exchange, point out to a profitable production.

**Fruit growing.** Very favourable climatic-edaphic conditions, as well as relief and terrain configuration in Serbia, provide a successful and diversified fruit production. The areas under orchards occupy around 240 000 hectares, or 4,7% of total agricultural areas. The highest percentage takes plum plantations (around 50% of totally fruits plantations), then apples and sour cherries. Of total areas under soft fruits, the plantations of raspberry are on 64%. Over 90% of areas under orchards are on the area of Central Serbia, i.e. in Zlatibor, Macva and Kolubara region. The highest production of raspberries is in North Serbia, of sour cherry in South Serbia, while apple and plum are grown on the entire Serbian territory. The fruit production realizes mostly on small parcels in individual sector, and this production has recorded the biggest growth in last decade. In the total value of agricultural production, the fruits production participates with 15,7%. A share of fruits and manufactured fruits export in total export value of agricultural-food products is around 15%. Mostly exports in the EU states, the countries of the CEFTA agreement and Russian Federation. The raspberry is the most profitable fruit kind in Serbia – it exports the most and realizes the highest export value. According to the FAO data (2008), Serbia is in the second place in the world regarding the raspberry production (in the first place is Russian Federation, and on third Poland) [5].

**Viticulture and wine production.** Serbia distinguishes by long tradition of grape and wine production, and the most of this production is realized on private family husbandries, within nine viticultural regions, sixteen sub-regions and 65 viticultural regions. The viticultural regions are characterized by extremely favourable and mutually different climatic and land conditions. During the long period (1955-2009) has been noticed a tendency of areas under grapevine decrease in Serbia, and it also refers to the total amount of produced grape. The areas under grapevine in Serbia, in 2009, were 58.000 ha (or 1,1% of the total agricultural area in Serbia), and average grape production in the period 2007-2009 was amounted 385 thousand tons. In previous assortment were mostly represented autochthonous sorts, which had worse quality in regard to the grape sorts in Europe and other countries.

Thanks to affirmative measures of the state increases a number of wine producers of wines with geographic origin, improves the production technology, eno-tourism, as well as the wine quality.

**Livestock production.** Meat production in Serbia has a long tradition, and this production is full of structural problems and records constantly negative trends for several decades. Mainly uncompetitive, the meat production will find itself in front of additional challenges, owing to forthcoming liberalization processes within the SAA and the WTO. Although Serbia is the biggest producer, exporter and consumer of all kinds of meat within the CEFTA countries, this production is still low in regard to the one in the EU countries. That is to say, livestock breeding in Serbia has characterized, for a long time, by significant stagnation in regard to major of European countries, which has manifested by low share of livestock units per a hectare of agricultural area and by low productivity in meat production.

Low percentage of livestock production shows underdevelopment in this sector of agriculture. The value of livestock production in agriculture value of some European countries amounts 50% -60%, like Denmark and the Netherlands [1]. Number of livestock can be seen in table 2.

**Table 2. Number of livestock (in 000 pcs)**

|                           | 2000   | 2003   | 2004   | 2005   | 2006   | 2007   | 2008   | 2009   | 2010   | 2011   |
|---------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Cattle                    | 1.272  | 1.112  | 1.102  | 1.079  | 1.106  | 1.087  | 1.057  | 1.002  | 938    | 936    |
| Cows and pregnant heifers | 817    | 741    | 742    | 720    | 674    | 648    | 625    | 586    | 560    | 542    |
| Pigs                      | 4.066  | 3.634  | 3.439  | 3.165  | 3.999  | 3.832  | 3.594  | 3.631  | 3.489  | 3.287  |
| Sows, pregnant gilts      | 887    | 825    | 692    | 654    | 685    | 550    | 502    | 477    | 519    | 485    |
| sheep                     | 1.611  | 1.516  | 1.586  | 1.576  | 1.556  | 1.606  | 1.605  | 1.504  | 1.475  | 1.460  |
| Sheep for reproduction    | 1.233  | 1.133  | 1.157  | 1.169  | 1.167  | 1.192  | 1.198  | 1.149  | 1.131  | 1.117  |
| Horses                    | 37     | 24     | 26     | 25     | 20     | 18     | 16     | 14     | 14     | 11,5   |
| Poultry                   | 20.372 | 17.676 | 16.280 | 16.631 | 16.555 | 16.422 | 17.188 | 22.821 | 20.156 | 19.103 |

Source: *Agriculture in 2011 with foresseing for 2012 – evaluations, assessments and proposals, SCC, Association for Agriculture, Food and Tobacco Industry and Water Management, Belgrade, February, 2012, p.15*

A significant part of livestock production is in hands of small producers, with predominantly extensive production. The most of meat production realizes in family husbandries – goods producers with about ten bullocks, about hundred pigs and sheep or a thousand chickens in fattening. The market chain in meat production mostly has been unorganized and short, because most of livestock goes to the local/regional markets, often through “black” or unofficial channels of turnover.

**Dairy industry.** Milk production in Serbia is the one of the most important agricultural activities, which unites, as milk production, as well as the production of breeding and fattening material. This production significantly contributes to rural development (comprises more than 280 thousand of primary agricultural producers) and has very important role in the country’s food safety. Over 90% of totally produced milk is cow milk, while the rest is sheep and goat’s milk. About 50% of produced milk repurchases by the milk industry, while around 50% consumes in households or for making the traditional products, like cheese and cream (kaymak). Although in past several years, thanks to the MAFWM of RS support, directed to selection measures and new heads acquisition, has come to improvement of genetic composition of animals and increase of average milking capacity – the dairy sector has been characterized primarily by problem regarding monopolized market structure, as in repurchase of raw milk, as well as on the milk and dairy products retail market (so called, market oligopson situation). Such market structure significantly limits the primary agricultural producers regarding higher investments, more significant milk production, enlargement of livestock fund and improvement of raw milk quality. The milk exports mostly on the markets of the countries – signatories

of the CEFTA agreement, and export in the EU limit numerous factors, from insufficiently high milk quality, non-introduced quality standards, to low productivity and price incompetitiveness.

**Organic production.** There are natural conditions in Serbia for development of organic agriculture, which reflect in, primarily, unpolluted agricultural areas, as well as in existence of husbandries in mountain areas with encircled cycle of plant and livestock production. The organic production is becoming increasingly popular and economically more significant, while demand for certified organic products in the world constantly increases. The areas from which collect uncultivated plants and wild animal species from their natural habitats by organic production methods in the Republic of Serbia amount around 1.000.000 ha, while arable areas are significantly smaller and amount 600 hectares. The organic production is regulated by the Law on Organic Production and Organic Products, and control and certification in the organic production are entrusted to organizations for issuing certificates and re-certificates, authorized by the MAFWM of the Republic of Serbia. The organic agriculture has been based on essential connection between agriculture and nature, with an accent on natural balance estimation. Preconditions for stimulating export and improvement of social-economic position of rural environment and the national economy create by the organic production and supply of health-safety food.

**Carriers of the primary agricultural production: agricultural husbandries, enterprises, cooperatives.** According to the census of population, households and flats in 2002, in the Republic of Serbia was registered totally 778.891 **agricultural husbandries** (17,8% of these husbandries, according to income sources fall into agricultural, and 62,3% into non-agricultural husbandries). At the same time, according to the data of the Treasury Administration, until December 31<sup>st</sup> 2009 were registered 440.139 agricultural husbandries, and according to the data of the Republic Fund for Pension and Disability Insurance, in September 2010, the total number of agricultural pension users amounts 222.941 (right to use subsidies from agrarian budget since 2009 have only those agricultural producers who are insured at the republic Fund for Pension Insurance) [7].

Extremely high percentage of all agricultural funds is in ownership of family husbandries (82% of agricultural land, 91% of livestock unit). Instantaneously, there are a small number of development-oriented multifunctional husbandries and entrepreneurs which develop intensive primary agricultural production and follow-up activities in agricultural sector, which owe own investment capital, credit bonitet for encumbrance or/and entrepreneurial spirit and initiatives. The family (agricultural) husbandries are characterized by small and fragmented property – which causes that small percentage of husbandries fall into a category of goods producers: the production is mostly directed to satisfaction of own needs, and market surpluses are small and changeable (insecure) [2].

*Average size of totally used land per an agricultural husbandry* amounts 3,7 ha, and even 76,8% of husbandries own land up to 5 ha (the highest is share of husbandries which use land of 1-2 ha, 18,7% of them). According to the data of Life Standard Survey - LSS 2007, the average size of used land per a husbandry in Serbia amounts 4,93 ha, and husbandries with property smaller than 5 ha make 73% of the total number of surveyed agricultural husbandries [4]. In comparison with the EU-27, where the average size of agricultural land per a husbandry amounts 20,7 ha – shows the best a size of domestic property [2]. Big husbandries (over 10 ha) are mostly registered in South-Banat and South-Backa district, while the most of husbandries with medium property size (5-15 ha) is in Macva and South-Banat district.

*It is obvious that a number of agricultural husbandries decreases, which is parallel followed by their polarization by property size.* In accordance to the LSS data in 2002 and 2007, can be registered the following changes in structural characteristics of agricultural husbandries: 1) number of agricultural husbandries is decreasing; 2) also is decreasing a share of husbandries with small property (smaller than 5 ha) from 80% (2002) to 73% of the total agricultural husbandries number (2007), which can point out to ownership structure's polarization. Dual structure of farms (transformation of family farms in big commercial husbandries and enterprises) exists in north part

of the country (Vojvodina, Posavina (Sava region) and Podunavlje (Danube region)), where land market, and especially lease market are much more active.

The results of the LSS in 2007 *bring together poverty in rural areas and size of used agricultural land*: husbandries below the poverty line have an average size property of 3,3 ha, and above the poverty line 5,06 ha. At the same time, the results of mentioned survey point out that middle size husbandries (1-5 ha) have performances of semi-natural husbandries: rent out a little of land, have obsolete mechanization, far less than others use hired labour, and the market surpluses are not significantly higher than in husbandries with small property. Educational structure of rural population is low, and innovation capacity in production is very small.

**Agricultural enterprises.** The agricultural enterprises have based their business, in previous period, on size economy (business in factory-farm system), which has created the conditions for applying modern techniques and technology and setting up and development of seed production. As such, they were a stimulating factor for establishment and development of food industry in the same organizational frames of factory-farm type. The important part of food industry was privatized at the beginning of transition, and was, in organizational and ownership sense, separated from agricultural enterprises' structure. In this moment, the agricultural enterprises have unfavourable business performances and unfavourable results in regard to course and results of privatization. A number of agricultural enterprises: 1) have not yet finished the privatization process or the privatization was unsuccessful (new owners have not yet had a clear vision of enterprises development/enterprises in bankruptcy or insolvent), 2) a number of enterprises have transformed to state property, 3) regarding a number of privatized enterprises, new owners have great problems to keep a production profitability level, to service capital which origin from bank encumbrances and invest in development and strengthening of capacities.

**Agricultural cooperatives and other forms of agricultural producers' association.** Disunity of agricultural producers, their poor negotiating power in regard to purchasers, problems of placement<sup>5</sup> are the result of undeveloped agricultural cooperatives<sup>6</sup>, as well as the agricultural producers' association (major associations is only formally registered, have small membership and small size of business activities). Reasons for such state are numerous: 1) in agriculturer's character is expressed a tendency (affinity) for individual work and placement, 2) uncertainty of sale contracts and weak protection of proprietary rights – additionally affect the greater preferences to individual work, 3) underdeveloped legal groundwork for cooperative associations development and affirmation of association processes. For example, the Law on Associations was passed in 2009, and still waits to passing the new law on cooperatives. The existing law on Cooperatives has no full practical application, especially from the aspect of cooperative revision and sanctioning the cooperative which do not business according to cooperative principles (numerous private cooperatives). There are still controversial questions about cooperative property ownership, status changes (associations, annexations), investment policy and method of cooperative management (democracy principle limits higher investment activity of cooperatives). Successful business of cooperatives significantly limits a big percentage of black economy in repurchase courses, which leads to disloyal competition, as well as insufficient institutional organization of the market. Additional problems the agricultural cooperatives are facing with are: non-existence of fiscal policy measures and other forms of support to the cooperatives; impossibility of applying for credit resources; poor management capacities, etc.

**Associations of agricultural producers.** Agricultural cooperatives, agricultural producers' associations, clusters and other forms of agricultural producers' correlation – represent a significant factor of productivity improvement and competitiveness of Serbian agricultural production and rural development and, at the same time, represent a precondition of small and medium husbandries

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<sup>5</sup> Great number of agricultural producers who have no enough own production for big buyers' and hypermarkets' needs, and at the same time have great supply and heavy placement on the local market.

<sup>6</sup> Small number of cooperatives, which do business after cooperative principles, and great number of, so called, donors and private cooperatives, then "old" cooperatives, which still do business after public capital principles, where the employees run a cooperative.

survival in market terms of business. However, it is important to emphasize: 1) absence of the key laws practical applying in the field of agriculture, 2) substantially underdeveloped competition on repurchase market and agricultural products' retail market, 3) significant share of “black” economy in turnover courses – lead to a fact that agricultural producers still do not comprehend a real purpose and need of association.

Revitalization of agricultural cooperatives is the most suitable model for surpassing developmental restrictions of small husbandries, which dominate in Serbian agriculture. The cooperatives could contribute to the market stabilization, decrease of business risk for producers and more correct allocation of profit among all actors in the market chain of production and sale. Nevertheless, this role of the cooperatives is possible only under a condition of all previously mentioned systematic issues resolution in this field, where only partly problem resolution (through, for example, passing new law on cooperatives) will not lead to affirmation of agricultural cooperative association, i.e. it will not significantly change the current market position of the cooperatives.

## CONCLUSION

The agriculture represents one of the pillars of the Republic of Serbia economic development, and its significance for the national economy, besides economic, has also both social and ecological component. However, besides great potential in the sector of agricultural production, which has been a result of favourable climatic conditions, natural characteristics of land and available water resources, it has not been optimally used. Exactly owing to such potential, the agriculture in Serbia does not represent a common economic branch, considering that in all municipal and regional strategies it has been defined as one of development strategic directions.

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# EFFECTS OF THE ECONOMIC CRISIS ON RURAL HOUSEHOLD INCOMES IN ROMANIA

DACHIN ANCA<sup>1</sup>, SERCIN ALI<sup>2</sup>

## Abstract

*The rural area in Romania has experienced a transformation process in the last decade mainly due to overall economic growth and to the effects of EU integration. The agricultural activity is still dominant, even if the share of employment in this sector followed a strong decreasing trend. The economic crisis starting in 2008 produced structural changes in the use of labor force, with impact on the population's income. The paper presents an empirical analysis of the economy's evolution from macroeconomic perspective and focuses on the effects of the crisis on the rural area. The research uses the multiple linear regression to analyze the impact of economic growth and employment on investment in agriculture and on total income of rural households. The results show that investment in agriculture is connected to the variation of GDP and has a negative correlation with employment in agriculture. The household income has a high sensitivity to GDP changes, which have effects on salaries and social provisions in rural areas. However the subsistence component of the rural activities determines an important inertia of the total household income, which is very little influenced by investments in agriculture and is less reactive to the economic crisis compared to urban areas.*

**Key words:** *economic crisis, investment, employment in agriculture, income of rural households*

## INTRODUCTION

The European Union is concerned to identify the trends and drivers that will determine the future of the agricultural sector and rural areas ahead to 2020 [2]. Besides the objective of increasing the economic efficiency of farms, the new vision of agriculture as a multifunctional activity reshapes the role of rural areas and provides new ways to reduce the rural-urban income gap. In 2009 the GDP per inhabitant in the EU predominantly rural regions was 73% of the European GDP average [4]. However the growth of GDP per inhabitant in the period 2000-2008 in the rural areas was more pronounced than in urban areas, showing a catching-up process.

According to the new Eurostat methodology, the predominantly rural area in Romania covers 46.2% of the population, which is similar to other EU countries such as Slovakia (50.3%), Estonia (48.5%), Hungary (47.9%), Greece (44.2%) and Slovenia (44.1%), and lower than Ireland (70.5%) [3]. In Romania the GDP per inhabitant in 2009 was however only 70.1% of the national average, lower than in the above mentioned countries, except Estonia.

In Romania the low household income level in rural areas is closely connected to the low labor productivity in the main economic activities, while a significant share consists of the subsistence economy. In the last decade the major change was the gradually decrease of the employment rates in agriculture. A large part of the rural economy is disconnected from the market economy and agriculture still plays the traditional role of occupational buffer. In addition, the urban-rural migration of elderly people [5] marks the household typology and the income sources. All this rises the question about how strong is the influence of macroeconomic changes on the rural regions, both during sustained growth and crisis periods.

The paper focuses on the impact of the national economy's evolution on the rural area during the period 2002-2010. The analysis considered two critical variables for the catching-up process of the rural areas in Romania: investment and household income. The research topic refers to the estimation of the influence of macroeconomic variables such as changes in GDP, investment and employment rate on the investment in agriculture and on the average income of rural households.

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## MATERIAL AND METHODS

The research method used is the multiple linear regression. The paper includes two applications of the regression model. The first model studies the relationship between changes of investment in agriculture as dependent variable and the dynamics of GDP, total national investment and total employment. The second model focuses on the changes of the average income of rural households as dependent variable again under the influence of the dynamics of GDP, total national investment and total employment.

The research of the crisis period makes sense if it is compared to the previous period. The relevant period chosen for the analysis is 2002-2010, which includes seven years of sustained economic growth (2002-2008) and two years of economic crisis (2009-2010). An important limitation of the time series is the availability of data. Beginning with 2002, the data about employment are not comparable with data series of previous years, because of revised definitions used.

The applications use the dynamic series of the indicators. The empirical analysis of the changes of GDP, investment and employment is based on data provided by the Romanian Statistical Yearbook, while the analysis of rural household income relies on data from the Household Budget Survey. The calculations of the regression involved the use of the package Eviews 4.1. We used a linear multifactorial model tested by means of the Durbin-Watson test [1] in order to verify the autocorrelation of residuals.

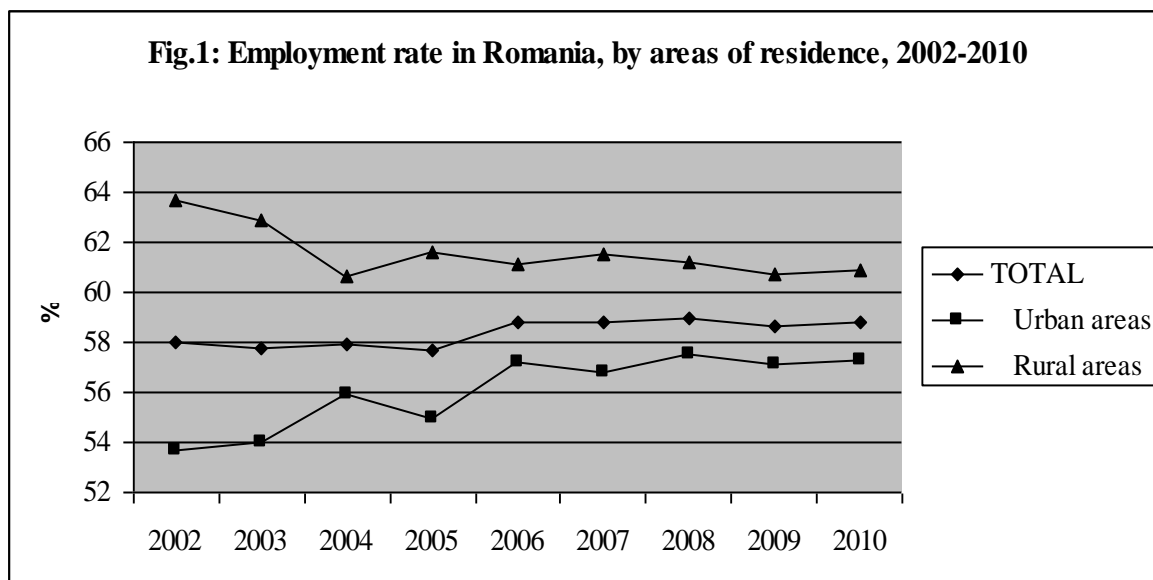
## RESULTS AND DISCUSSIONS

### **Growth, employment and investment**

The sustained economic growth in Romania during the period 2000-2008 produced changes in the level and structure of the economic activity in Romania. The changes occurred in employment and productivity and were accompanied by the improvement of the average real household income. Consumption was actually the engine of growth, but investment had also an upwards movement during this period. The crisis in 2009 and 2010 has abruptly inversed the trend, with major economic and social consequences. The shock of the economic crisis has influenced differently the urban and rural areas. In Romania the nominal change 2009/2008 of the GDP was only -4.9% in the predominantly rural areas compared to -6.0% at national level [4].

The employment rate in Romania has only slightly increased, from 58% in 2002 to 59% in 2008, as a cumulative result of structural changes in labour force. The employment rate had a positive trend in urban areas and a decline in rural areas (fig.1). Rural employment was strongly marked by the diminishing over-employment in the subsistence agriculture, while agriculture still is the main economic activity. However, in the context of the economic crisis that became visible in Romania in 2009, the trend of diminishing employment in agriculture was interrupted. In 2010 the 1.2 percentage point increase of employment in agriculture proves that this activity still plays the role of occupational buffer.

It is expected that, besides the reduction of employment in agriculture, the source of productivity in rural areas should be the investment in main rural activities. Since agriculture still dominates the rural economy, this paper focuses on investment in agriculture. The share of investment in agriculture in total national investment is significantly below the contribution of this branch to the GDP [10]. Moreover, the share of net investment in agriculture did not exceed 4% from the national net investment during 2002-2010, except 2002 (11.7%) and 2003 (5.9%) when it benefited from the pre-accession support, especially provided by the Special Accession Programme for Agriculture and Rural Development (SAPARD) [9]. The shock of the crisis reduced severely the investment in Romania, with a similar impact in agriculture.



\* employment rate calculated for the working age population (15-64 years)

Source: Romanian Statistical Yearbook Time series 1990-2009 and 2010, National Institute of Statistics

### Trends in rural household income

The rapid economic growth had a similar impact on the urban and rural population, by keeping the household income gap relatively unchanged. However, a reduction of this gap was visible during the crisis, since the rate between the total rural household income and the total national household income increased from 82.2% in 2008 to 82.9% in 2009 and 84.2% in 2010.

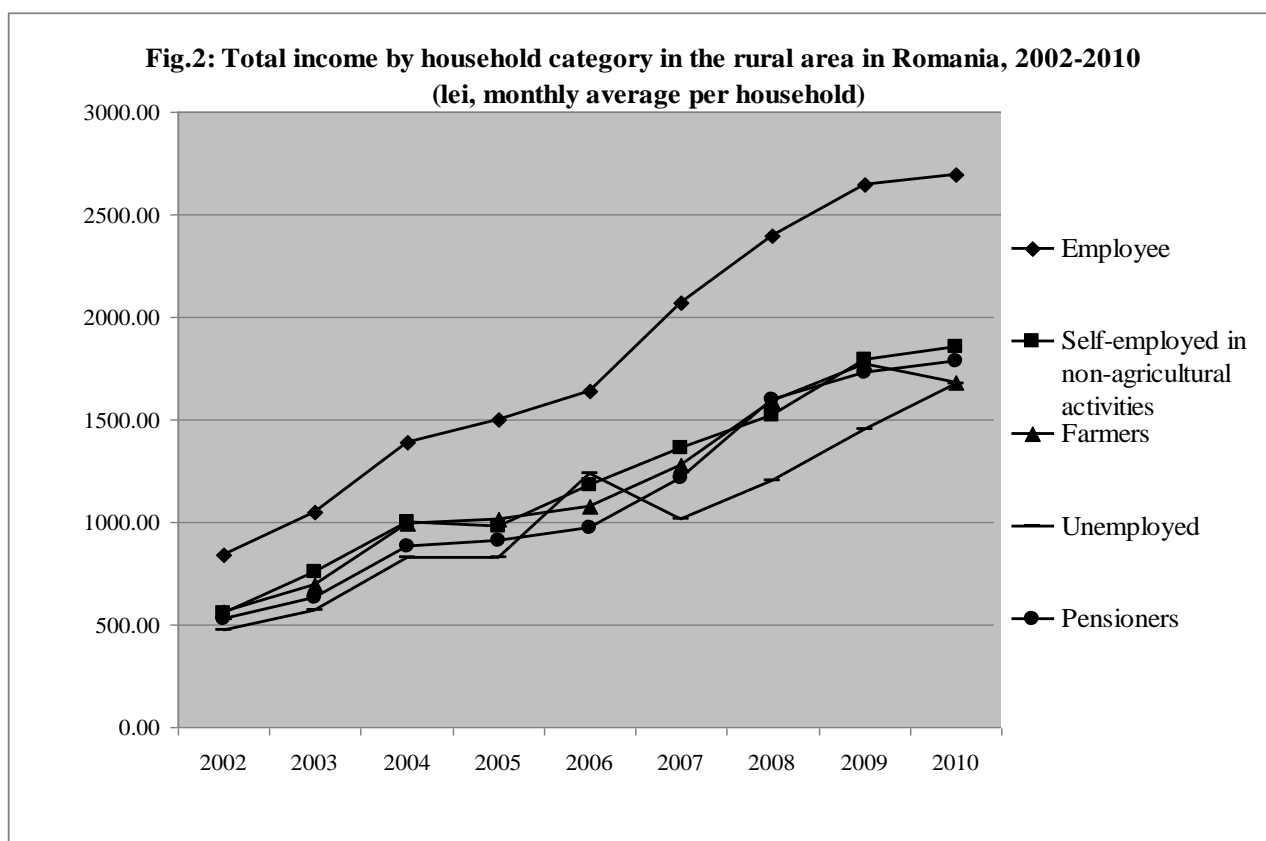
During the period 2002-2008 there was a pattern change in the household income structure in the rural area. Thus, the share of the equivalent value of consumption of agro-food products from own resources decreased gradually from 43% in 2002 to 28.5% 2008. At the same time, the share of gross salaries increased from 21% in 2002 to 29.5% in 2008, while the income from social provisions became also more important.

The employees households have the highest income level, while the unemployed the lowest. The nominal income levels presented in fig.2 reveal the increasing gap between employee households and all other households. However the share of employees is only 35.7% of total employment in rural area, most of them working in non-agricultural activities. In the last years the income of pensioner households of has increased, reaching in 2008 a higher level compared to the income of farmers.

The reduction of labour force participation due to the downturn of production in non-agricultural activities, as well as the austerity measures have reduced the level of the household money income. The inertia of income in kind helped the rural households to face a milder shock of the crisis compared to urban households. The narrowing of income inequality was expected in Romania, due to the fact that during the crisis top incomes have decreased and there is a strong social and political pressure to protect low incomes [6].

Considering the above mentioned trends, the research question is about the identification of the main variables which influence the rural household income during the economic crisis. Changes in a short run period cannot significantly influence the rural production and employment structures. However the downturn of GDP alongside with the reduction of demand for goods and services in rural areas affects directly the employees. The fall in GDP also reduces the financial support for investments in agriculture and induce a negative impact. The last factor to be considered is employment in agriculture, knowing that a shift towards agriculture still is a survival strategy for families.





\*Total income per household includes the income in kind  
Source: National Institute of Statistics, 2002-2010

### The econometric analysis

The econometric model is searching for the impact of the macroeconomic trends on the critical economic variables. i.e. investment in agriculture and rural household income, which are significant parameters for the progress of the rural area. In order to find the correlations during economic growth followed by the economic down-turn, we selected relevant indicators (table 1):

**Table 1: The economic variables (previous year = 100%)**

|      | GDP    | Net investments Total (Inv_tot) | Civil employment Total (Po_tot) | Net investments in agriculture, forestry and fishing (Inv_agr) | Employment in agriculture (Po_agr) | Total income per rural household – monthly average (Ven) |
|------|--------|---------------------------------|---------------------------------|--|------------------------------------|--|
| 2002 | 105.08 | 107.7                           | 97.26                           | 197.58   | 86.07                              | 101.13   |
| 2003 | 105.24 | 108.28                          | 99.72                           | 54.54  | 95.78                              | 106.81   |
| 2004 | 108.49 | 103.37                          | 99.18                           | 50.00  | 91.33                              | 125.33   |
| 2005 | 104.15 | 102.98                          | 101.84                          | 113.81   | 101.51                             | 95.22  |
| 2006 | 107.87 | 133.84                          | 100.94                          | 121.09   | 94.01                              | 103.20   |
| 2007 | 106.32 | 111.27                          | 103.03                          | 102.66   | 97.93                              | 117.31   |
| 2008 | 107.30 | 105.13                          | 100.24                          | 136.08   | 98.21                              | 115.85   |
| 2009 | 92.92  | 72.65                           | 96.15                           | 83.01  | 99.71                              | 103.84   |
| 2010 | 98.40  | 92.35                           | 99.52                           | 87.21  | 101.2                              | 95.20  |

Source: Own calculations based on data from the National Institute of Statistics.

### First regression model

The first correlation relies on the assumption that the variation of GDP, as well as the change in investment and employment, have an impact on the investment in agriculture. Generally, it is expected that a higher GDP, accompanied by higher investment and employment create favorable conditions and resources for the modernization of a traditional economic branch with high potential. However, the increase in employment is favorable only if labor productivity does not decrease. The model also uses the variable “employment in agriculture”.

The impact of GDP, investment and employment on the investment in agriculture (dependent variable) is reflected by the following model:

$$\text{LOG(INV\_AGR)} = C(1) + C(2) * \text{LOG(PIB)} + C(3) * \text{LOG(INV\_TOT)} + C(4) * \text{LOG(PO\_TOT)} + C(5) * \text{LOG(PO\_AGR)}$$

The regression equation for the data is therefore:

$$\text{INV\_AGR} = 21,82 + 6,74\text{PIB} + 1,65\text{INV\_TOT} + 4,76\text{PO\_TOT} - 3,40\text{PO\_AGR}$$

**Table 2: Results of the first model**

| Dependent Variable: LOG(INV_AGR)  |             |                       |             |          |
|---|-------------|-----------------------|-------------|----------|
| Method: Least Squares   |             |                       |             |          |
| Date: 09/03/12 Time: 14:22  |             |                       |             |          |
| Sample: 2002 2010   |             |                       |             |          |
| Included observations: 9  |             |                       |             |          |
| LOG(INV_AGR)=C(1)+C(2)*LOG(PIB)+C(3)*LOG(INV_TOT)+C(4)*LOG(PO_TOT)+C(5)*LOG(PO_AGR) |             |                       |             |          |
|   | Coefficient | Std. Error            | t-Statistic | Prob.    |
| C(1)  | 21.82624    | 63.11750              | 0.345803    | 0.7469   |
| C(2)  | 6.744004    | 10.25181              | -0.657836   | 0.5466   |
| C(3)  | 1.652241    | 3.027198              | 0.545799    | 0.6142   |
| C(4)  | 4.764303    | 25.70363              | 0.185355    | 0.8620   |
| C(5)  | -3.401038   | 8.923747              | -0.381122   | 0.7225   |
| R-squared   | 0.175808    | Mean dependent var    |             | 4.573346 |
| Adjusted R-squared  | -0.648385   | S.D. dependent var    |             | 0.433725 |
| S.E. of regression  | 0.556857    | Akaike info criterion |             | 1.967164 |
| Sum squared resid   | 1.240359    | Schwarz criterion     |             | 2.076734 |
| Log likelihood  | -3.852240   | Durbin-Watson stat    |             | 2.050151 |

The results show that an increase of GDP by 1% ceteris paribus determines an increase of investments in agriculture by 6.74%. An increase of employment at national level by 1% generates an increase of investment in agriculture but, on the other hand, an 1% increase of employment in agriculture determines a decrease of investment in agriculture by 3.4%. It seems that investment in agriculture is stimulated by higher income of persons employed in non-agricultural activities, which are able to finance agricultural projects. Higher employment in agriculture only substitutes the capital and discourages investments.

The positive value of the free term (21.82) shows that other variables not included in the model have a positive effect on the investment in agriculture. In table 2 the R-squared value indicates that only 17.58% variation of investment in agriculture can be explained by the five independent variables, while the rest of 82.42% of the total variation can be explained by other variables not included in the model.

The Durbin-Watson test provides the coefficient 2.05, which is near the value 2 and indicates that the residuals are not auto-correlated.

### Second regression model

The second correlation is based on the assumption that the variation of GDP, as well as the change in total investment and employment, have an impact on the household income in rural areas.

The impact of GDP, investment and employment on the rural household income (dependent variable) is reflected by the following model:

$$\text{LOG}(\text{VEN})=\text{C}(1)+\text{C}(2)*\text{LOG}(\text{PIB})+\text{C}(3)*\text{LOG}(\text{INV\_TOT})+\text{C}(4)*\text{LOG}(\text{PO\_TOT})+\text{C}(5)*\text{LOG}(\text{INV\_AGR})+\text{C}(6)*\text{LOG}(\text{PO\_AGR})$$

**Table 3: Results of the second model**

| Dependent Variable: LOG(VEN)  |             |                       |             |           |
|---|-------------|-----------------------|-------------|-----------|
| Method: Least Squares   |             |                       |             |           |
| Date: 09/03/12 Time: 14:33  |             |                       |             |           |
| Sample: 2002 2010   |             |                       |             |           |
| Included observations: 9  |             |                       |             |           |
| LOG(VEN)=C(1)+C(2)*LOG(PIB)+C(3)*LOG(INV_TOT)+C(4)*LOG(PO_TOT)+C(5)*LOG(INV_AGR)+C(6)*LOG(PO_AGR) |             |                       |             |           |
|   | Coefficient | Std. Error            | t-Statistic | Prob.     |
| C(1)  | 5.375068    | 10.73831              | -0.500551   | 0.6511    |
| C(2)  | 2.286868    | 1.809241              | 1.263993    | 0.2955    |
| C(3)  | -0.657860   | 0.526052              | -1.250561   | 0.2998    |
| C(4)  | -1.146293   | 4.327541              | 0.264883    | 0.8083    |
| C(5)  | 0.062030    | 0.083822              | -0.740015   | 0.5129    |
| C(6)  | 0.551252    | 1.522939              | -0.361966   | 0.7414    |
| R-squared   | 0.638594    | Mean dependent var    |             | 4.669691  |
| Adjusted R-squared  | 0.036250    | S.D. dependent var    |             | 0.095094  |
| S.E. of regression  | 0.093354    | Akaike info criterion |             | -1.670114 |
| Sum squared resid   | 0.026145    | Schwarz criterion     |             | -1.538630 |
| Log likelihood  | 13.51551    | Durbin-Watson stat    |             | 1.610183  |

The regression equation for the data is therefore:

$$\text{VEN}=5,37+2,28\text{PIB}-0,65\text{INV\_TOT}-1,14\text{PO\_TOT}+0,06\text{INV\_AGR}+0,55\text{PO\_AGR}$$

The increase of GDP, investment in agriculture and employment in agriculture has a positive impact on the household income. It is remarkable that 1% increase of investment in agriculture determines only 0.06% of income change, due to the fact that the agricultural income is only 6-7% of the total income per rural household. The rural households depend in a higher degree on the own produced agricultural products, but this part represents the subsistence sector with rather low investment. The household income has a much higher sensitivity to GDP changes which allow an increase in salaries and social provisions in rural areas.

An increase of 1% of employment in agriculture generates an increase of only 0.55% of the household income, since the marginal labor productivity is low. Usually this is a subsistence solution which occurred again in 2010.

In table 3 the R-squared value indicates that 63.85% variation of total income per rural household can be explained by the five independent variables. Regarding the Durbin-Watson test, the coefficient 1.61, which is near the value 2, indicates that the residuals are not auto-correlated.

### CONCLUSIONS

The rural area in Romania has specific characteristics determined by structural and traditional factors. The low household income level is closely connected to the low labor productivity in the main economic activities, while a significant share consists of the subsistence

economy. The sustained economic growth and Romania's adherence to the European Union have activated economic mechanisms for long term changes. Critical parameters for the modernization and catching-up of rural areas are the investments in agriculture and the increase in household money income.

The shock of the economic crisis affected differently the rural areas compared to the urban areas, since the decline of the GDP in predominantly rural areas was less severe. The paper focused on the estimation of the influence of macroeconomic variables such as changes in GDP, investment and employment rate on the investment in agriculture and on the average income of rural households.

The findings of the research reveal that investment in agriculture depends positively on the GDP and negatively on the employment in agriculture, but the cumulative impact of other factors not included in the list of variables is much higher. The household income has a high sensitivity to GDP variations which induce changes in salaries, social provisions and in the financial support for farmers. The relative slower reaction of the household income variable to the crisis proves that the subsistence role of the income in kind is still important and acts like an automatic stabilizer. The impact of investment in agriculture on household income is not significant. More important is the farmers' income directly influenced by the weather conditions and the by the financial support provided from public sources.

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# TERRITORIAL COMPETITIVENESS FOR RURAL DEVELOPMENT IN ROMANIA: ANALYSIS OF CRITICAL INFLUENTIAL FACTORS FROM WWP MODEL

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## Abstract

Romanian rural areas need revitalization and increasing territorial competitiveness. The "territorial projects" designed from the Local Action Groups, may become a new governance model for the search of regional competitiveness. The objective of this paper is to analyze the critical factors affecting territorial competitiveness in Romania and in the economic sustainability of rural areas. The competitiveness analysis is conducted in the context of the European Network for Rural Development. The methodology used for the analysis is based on the WWP model, which integrates elements of planning as social learning, economic sustainability and Networking Knowledge for Rural Development. The results show that the main limiting factors for regional competitiveness are focused on three dimensions or components: social-ethical, political-contextual and technical-entrepreneurial. Challenges and changes necessary for effective implementation of LEADER under conditions of global market relations are submitted.

**Keyword:** Territorial competitiveness; Rural Development; Romania; Working with People; Social Learning; Networking; Sustainable economies.

## INTRODUCTION

In terms of project management, the Romanian National Rural Development Network (NRDN) is a high social complexity rural development project. The NRDN general objective is to implement a new rural development management approach based on social learning to enhance the implementation of the National Rural Development Program (NRDP). The NRDN has to enlist the energy of all actors in the rural development process, and to promote an effective flow of information, exchange of ideas and good practices, and promote cooperation between all the organizations and institutions which are involved in rural development [17]. The NRDN is open to all rural development stakeholders—public authorities, Local Action Groups (LAG), universities and research institutes, professional associations, socioeconomic organizations, actors from agriculture, forestry and agribusiness and other relevant institutions and organizations who are active in rural areas—to improve the local governance in order to draw up and implement local development strategies for rural competitiveness. The Network Support Unit (NSU)—in connection with the European Network for Rural Development (ENRD) and other National Rural Networks (NRN) in the EU Member States—is the operative team charged on the NRDN implementation. Its task is to animate the efficient flow of information regarding the NRDP, to animate the exchange of ideas and good practices and cooperation between all the members of the Network who are beneficiaries of the NRDP and to grant specialized support for the NRDN members involved at the NRDP management (Managing Authority).

## MATERIALS AND METHODS

The research methodology incorporates different tools and information sources. First the collection and review of secondary sources on the concept described above. Moreover, the research methodology incorporates empirical information obtained from the Rumania NRDN, implemented following the principles of the planning model "Working With People, WWP", a conceptual

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proposal for rural development projects and territorial competitiveness, developed “by” people and not “for” people. This WWP has been applied in several experiences in rural development projects, especially in LEADER areas [4, 5, 6, 7, 9].

Currently the Romanian NRDN is integrated by 832 members. Amongst the activities implemented by NSU to dynamize the NRDN, the main tools for “working with people” and for the social learning processes are: «LEADER Working Group», the «Thematic Working Groups» and the «Experts Working Groups». For the collection and systematization of expert knowledge and experience about the territorial competitiveness in Romania, we used two participatory instruments that are complementary: focus group and empowerment assessment [12]. These activities were part of the NSU yearly working program. There were held six focus groups between March and July 2012. with a total of 20 stakeholders participating at each one. The NRDN members chosen to integrate each focus group were representative of the global NRDN members’ situation in terms of activity sectors, and institutional level: public authorities, universities and research institutes, local action groups, professional associations, socioeconomic organizations, actors from agriculture, forestry and agribusiness and other relevant institutions and organizations active in rural areas .Regarding their relevance for the study all members of the Competitiveness Thematic Working Group and all LAG at the Rumania regions were invited to participate.

As part of our larger WWP in the NRDN, the purpose of the FG was to address stakeholders’ assessment in territorial competitiveness. The FG designed according to international standards and considers the factors in the territorial competitiveness [3, 5, 9]. We used a systematic participatory process to prepare and analyze our data [12]: (a) sequencing the questions to allow the participants to clearly understand the purpose of the research and collect their thoughts, (b) recording each group with note-taking by an assistant moderator, (c) coding each theme with a label that is used each time it appears, (d) assessment of each answer using a participatory system (each research questions are assessed independently from the expertise, using a qualitative scale); (e) debriefing between the moderator and assistant moderator and (f) sharing findings among the research team. The findings may be transferrable to other similar environments. The themes, answer as they were coded, fit into clusters [12], according to the dimensions of WWP model –Ethical - social, Technical-entrepreneurial, Political-contextual [7]. Clustering helps to order the diverse themes offered by the participants by putting them into similar groupings, as is usual the overlapping of different participants’ contributions [14]. The richness of the descriptions of the experiences shared by the experts is one of the main advantages of focus group research. Opinions’ confidentiality is strictly assured for all the participants. The board at each FG approved the conclusions and each expert gave his consent form. In this article, we report common themes, derived from expert’s comments and their opinions. The purpose of this article is to report on common findings regarding territorial competitiveness for rural development in Romania, according to the WWP model dimensions.

## RESULTS AND DISCUSSION

Table n° 1 shows the limiting factors for rural territories in Romania sorted according to experts’ appraisal and also according to the three WWP competitiveness components. Results show that limitations are balanced at the three components of WWP model.

**Table 1 – Assessment of limiting factors on the territorial competitiveness for Rural Development in Romania: outcomes from the WWP model**

| Limiting factors for territorial competitiveness   | Ethical-social component | Technical-entrepreneurial component | Political-contextual component | Total general |
|--|--------------------------|-------------------------------------|--------------------------------|---------------|
| Human resources. Social Capital (lack of population, training and entrepreneurship competences). | 17,8%                    | 0,0%                                | 0,0%                           | 17,8%         |
| Difficulties for projects co-financing. Problems accessing financial resources                   | 0,0%                     | 0,0%                                | 13,7%                          | 13,7%         |

|  |              |              |              |               |
|--|--------------|--------------|--------------|---------------|
| Lack of technology and technology transfer   | 0,0%         | 13,7%        | 0,0%         | 13,7%         |
| High taxes (boureocracy)   | 0,0%         | 0,0%         | 9,6%         | 9,6%          |
| Productivity, Farms yield is low   | 0,0%         | 8,2%         | 0,0%         | 8,2%          |
| Professional Associations. Cooperation and integrated vision                         | 9,6%         | 0,0%         | 0,0%         | 9,6%          |
| Local product development (local marks and origin denominations)                     | 0,0%         | 5,5%         | 0,0%         | 5,5%          |
| Values. Responsibility. Fidelity. Ethics.  | 4,1%         | 0,0%         | 0,0%         | 4,1%          |
| Local development strategies do no include external relations promotion.             | 0,0%         | 0,0%         | 4,1%         | 4,1%          |
| Youth people migration. Local population aging.                                      | 4,1%         | 0,0%         | 0,0%         | 4,1%          |
| Absence of territorial approach on development policies.                             | 0,0%         | 0,0%         | 2,7%         | 2,7%          |
| Absence of public-private partenariates.   | 0,0%         | 2,7%         | 0,0%         | 2,7%          |
| Agricultural policies are almost only focused on traditional agricultural production | 0,0%         | 1,4%         | 0,0%         | 1,4%          |
| Information Access difficulties  | 0,0%         | 0,0%         | 1,4%         | 1,4%          |
| Development of cooperatives and other associative entities                           | 0,0%         | 1,4%         | 0,0%         | 1,4%          |
| <b>Total</b>   | <b>35,6%</b> | <b>32,9%</b> | <b>31,5%</b> | <b>100,0%</b> |

Source: USR, 2012

**Ethical-social component** covers the context of behavior, attitudes and values of people who interact to promote, manage or direct the territorial project [7]. Regarding this component — 35,6% of assessment— experts identified mainly those threats focused on improving training of human resources and local people and managers competences development –knowledge, attitudes and values– to make them able of managing a new local development planning approach that is based on local Action Groups (LAG). Regarding this Ethical-Social component several researches have made le linkage between rural education and competitiveness [21], creativity [11] and ethics [23].

**Technical-entrepreneurial** component integrates the key elements to achieve providing the WWP project as investment unit and technical tool capable of generating a flow of goods and services and to meet some targets, according to requirements and quality standards [7]. About this component - 33% of limitations - experts identify elements to improve projects quality, as “technical” instruments to bring goods and resources for population. Lack of technology and low productivity are restricting factors for private-entrepreneurial sector competitiveness. The low presence of public-private partnerships is also seen as a restriction. The influence of these technical-entrepreneurial elements on competitiveness has been studied from some different and complementary approaches like industry clusters [13, 19], the entrepreneurship and enterprises [1], the value chain of a particular product [2, 24] or the rural tourism [20].

**Political-contextual** component provide the territorial project with key elements to meet with the context the project is inserted. This area covers the ability of project to make relations with political organizations and with the different public-administrations [7]. In connection with this component —31.5% of the total assessment— experts identified some problems that had to be solved to improve the access to financial resources and promote projects co-financed by local actors through LAG management structure. Several studies have pointed that affects this territorial competitiveness component: Political factors [16, 18], urban-rural relationships [25], decentralization processes [26], spatial dispersion of the industry [27] and services [28], new conflicts and incompatibilities between uses [29, 30, 31]. The works in the context Romanian show the needs a revitalization of marketing on international markets by promoting the quality of the products [15].

Table 2 shows the results of the competence assessment process for the different acting contexts (Political and Public administration, Private and entrepreneurial fields, and non-economic Civil Society field) according to the WWP model for Romania.

**Table 2 – Influential skills and competences for territorial competitiveness in Romania: outcomes from the WWP model**

| <b>Competences</b>                 | <b>Political context</b><br><i>(Political and Public administration)</i> | <b>Technic-entrepreneurial context</b><br><i>(Private and entrepreneurial entities)</i> | <b>Ethic-Social context</b><br><i>(Non-economic civil society entities)</i> | <b>Total</b>  |
|------------------------------------|--|---|---|---------------|
| Team work                          | 0,0%   | 10,0%   | 2,5%  | 12,5%         |
| Negotiation                        | 4,7%   | 4,0%  | 2,5%  | 11,2%         |
| Finance                            | 8,3%   | 0,0%  | 0,0%  | 8,3%          |
| Program/projects implementation    | 5,8%   | 1,3%  | 0,0%  | 7,1%          |
| Leadership                         | 0,0%   | 2,2%  | 4,5%  | 6,7%          |
| Communication                      | 1,1%   | 1,1%  | 4,0%  | 6,3%          |
| Legal                              | 6,0%   | 0,0%  | 0,0%  | 6,0%          |
| Information and documentation      | 5,4%   | 0,4%  | 0,0%  | 5,8%          |
| Resources                          | 2,9%   | 2,5%  | 0,0%  | 5,4%          |
| Program orientation                | 3,3%   | 2,0%  | 0,0%  | 5,4%          |
| Permanent organization             | 2,7%   | 0,0%  | 2,7%  | 5,4%          |
| Efficiency                         | 0,0%   | 3,8%  | 0,0%  | 3,8%          |
| Interested parties                 | 0,0%   | 0,9%  | 2,2%  | 3,1%          |
| Systems, products and technologies | 2,7%   | 0,0%  | 0,0%  | 2,7%          |
| Creativity                         | 0,0%   | 0,4%  | 1,6%  | 2,0%          |
| Values appreciation                | 0,0%   | 0,0%  | 2,0%  | 2,0%          |
| Consultation                       | 0,0%   | 0,0%  | 1,6%  | 1,6%          |
| Ethics                             | 0,0%   | 0,0%  | 1,6%  | 1,6%          |
| Reliability                        | 0,0%   | 0,0%  | 1,6%  | 1,6%          |
| Openness                           | 0,0%   | 0,0%  | 1,1%  | 1,1%          |
| Efficacy                           | 0,0%   | 0,0%  | 0,4%  | 0,4%          |
| Engagement and motivation          | 0,0%   | 0,0%  | 0,2%  | 0,2%          |
| <b>Total per acting context</b>    | <b>42,9%</b>   | <b>28,8%</b>  | <b>28,3%</b>  | <b>100,0%</b> |

Source: USR, 2012

Main threats are to improve the *team work* (12,5%), *negotiation* processes (11,2%) and *financial resources* management (8,3%). A global appreciation of competences regarding the three WWP acting contexts, shows that the Political Context component is the main context that has to be improved (42,9%), followed by Ethic-Social domain (28%) and Technic-entrepreneurial (28%).

## CONCLUSIONS

Applying the WWP model to Romania is an Innovative process. It is focused on improving territorial competitiveness at global level from a new rural development governance dimension. Working with people from NSU as an active instrument into NRDN is helping to develop social learning processes between all the actors from the different rural development domains. According to the obtained results, actions to improve rural territories competitiveness in Romania should not be sectorial but –according to the WWP model– should be integrated into three global components –Ethic-Social, Technic-Entrepreneurial and Political– that interact transversally through social learning processes. This approach helps to understand and improve the social relations between



actors from all the social domains: political, public administrations, private enterprises and non-economic social organizations.

Regarding the limitations of traditional centralized competitiveness models, NSU works from WWP model proves the need of integrate into rural development projects management the behavior understanding and learning processes for t the involved actors and organizations. This approach allows developing and improving in them characteristics such as openness to questioning, dialogue, risk taking and experimentation based on new information, inclusiveness and empowerment, and flexibility within a sense of community. WWP model also emphasizes that cooperation and team working are the most suitable means to improve people abilities and create knowledge (Holden, 2008). There is also shown that it is important to integrate external knowledge and other external factors that influence projects planning and management. External knowledge acquisition is a basic resource to improve competitiveness. This approach enables organizations to benefit from external interpretation of what others think of them and to hear their ideas about how they might improve [10].

Experts and NRDN members appreciate this participatory activities promoted from NSU and that is needed “to have time to be with people” to integrate local population expertize knowledge with project managers expert knowledge, that is the base of social learning processes.

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# INSTALLATION OF YOUNG FARMERS IN THE CONTEXT OF RURAL DEVELOPMENT IN ROMANIA: IMPLEMENTATION OF ACTION FROM THE WWP APPROACH

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## Summary

*In the rural development context, the term “Working With People (WWP)” means a professional practice developed in cooperation that seeks to connect knowledge (expert and experienced) with actions by a common project. This professional practice includes the technical value of the production –goods and services generated– and incorporates the development of the actors who take part into the participatory activities. This communication illustrates the application from theUSR (Support Unit of the National Network for Rural Development of Romania) of the WWP approach to the planning of measures addressed to “Setting up of young farmers” included in the National Rural Development Programme of Romania. Instruments used and results from the participatory activities, with planners, managers and direct beneficiaries, carried on by theUSR are described. The results show the principal problems identified in Romania and the proposed improvements at the level of LAG, theUSR and the Ministry of Agriculture. Participatory processes based on WWP approach allow the actors to be more than simple information providers, by involving them actively in the search of proposals of improvement. The integration of expert and experienced knowledge enables them to manage the implementation of the proposed solutions.*

**Keywords.** *Working With People, young farmers, rural development,*

## INTRODUCTION

The agriculture reform carried out after 1991 caused the transformation of the agricultural property structure in Romania [18, 19, 20]. Agricultural and forestry land owned by the state was “re-transferred” to private owners [22, 8]. The result was an unbalanced agricultural system [15]: on one hand a large number of small holdings running a semi-subsistence system [8]; and on the other hand, a small number of large farms [22, 21].

Nowadays, these disadvantages have been intensified in rural areas by an unfavourable age structure [16]. Data from the last complete European Farm Structure Survey (FSS) show that in 2007 the farm holders aged 65 years or over were 44.2% in Romania, while in the EU they were 34.1%. Besides farm holders under 35 years old were 4.5% in Romania, while in the EU they were 17.3% [23]. Young farmers benefit from assistance schemes offered by the EU Common Agricultural Policy (CAP). Current National Rural Development Programme (NRDP) of Romanian cludes the measure 112 “Setting up of young farmers”.

From theUSR (Support Unit of the National Network for Rural Development of Romania) the WWP approach has been applied to reach the setting up of young farmers in rural Romania. WWP is “the professional team practice that seeks to connect knowledge and action by a common project, which besides the technical value of production-of goods and services- mainly incorporates the value of people who get involved, participate and are developed through the actions developed within the context of the project” [5]. Through WWP we got information about the effect of the measure 112 and identified the problems and the proposed improvements at the level of LAG, theUSR and the Ministry of Agriculture in relation to setting up of young farmers in Romania.

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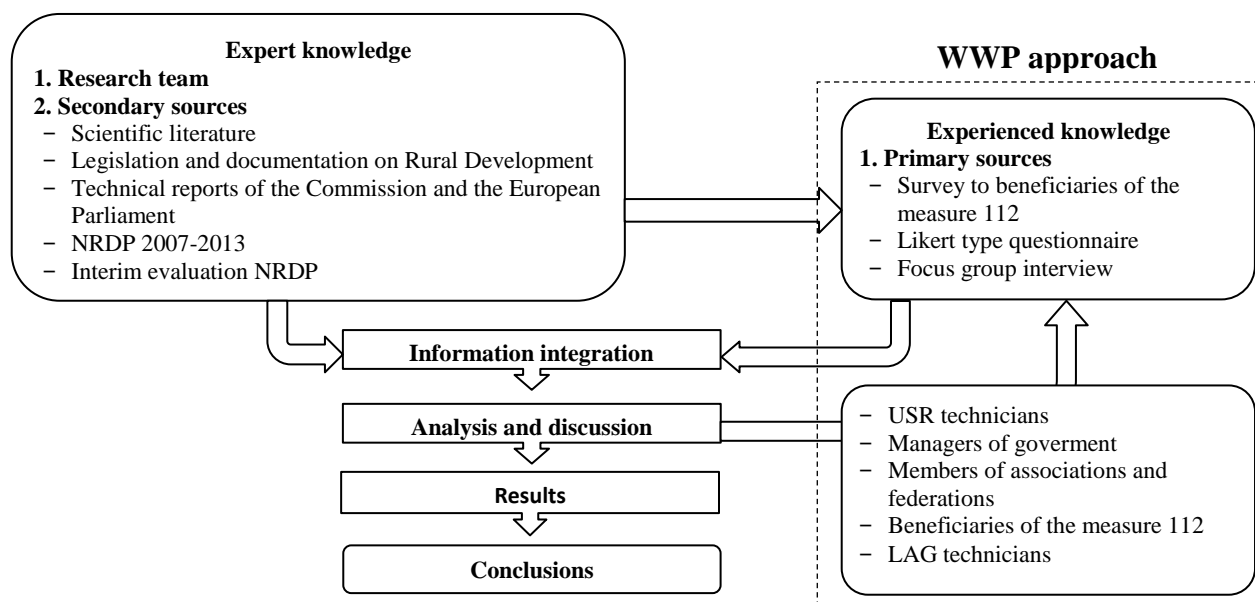
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## MATERIAL AND METHODS

The methodology used on the research follows WWP approach [4, 5], integrates expert knowledge, from the research team, and experienced knowledge from the different actors implicated in the context of NRDP of Romania 2007-2013 about setting up of young people measure, based on the following diagram:



We used secondary information sources to review current situation, problems and potential solutions about setting up of young farmers topic in the European Union and Romania. The sources include scientific literature, European legislation and documentation on Rural Development, technical reports of the Commission and the European Parliament, National Rural Development Programme of Romania 2007-2013, and interim evaluation of National Rural Development Programme.

In order to collect information from primary information sources we used three different tools combining quantitative and qualitative methods.

1) The quantitative study is based on a survey to beneficiaries of the measure 112 conducted in 2010 over the interim evaluation of NRDP 2007-2013. The survey was designed with a confidence level of 95% and an error of 5%, a total of 132 interviews over a total of 2784 beneficiaries. The goal was to learn from the experience the effects of the NRDP measure 112 “setting up of young farmers” in rural areas from 2007 to 2009 along the implementation of the NRDP.

Quantitative data were collected from a participative process during the third workshop of the ad-hoc seminar “Development in rural areas and business opportunities by young farmers and entrepreneurs oriented to non-agricultural activities“ in Alba-Iulia on June 15, 2012. The workshop was conducted by experts from the USR and the Technical University of Madrid (UPM) and carried on a Likert type questionnaire and a focus group interview. Participants include experts from different groups: USR technicians, managers of government and members of associations and federations of farmers, Local Action Groups (LAG) technicians, and beneficiaries of the measure 112.

2) 19 participants were asked to use a 5-point Likert type questionnaire. They rated problems (10 items) and solutions (9 items), identified in the bibliography review at European level as most important in Romania about setting up young people. Responses to the questions were measured on Likert scale: 1 = “very unimportant”; 5 = “very important”.

3) A focus group interview [17, 14] was carried out. The aim was to identify and assess the main problems for setting up of young farmers in Romania. 22 experts were divided in two groups,

each one was composed by a representative number of experts from each organization in order to increase the different points of view and enrich the discussion. Experts addressed four research questions about weaknesses and solutions related to professional skills of young people in rural areas. In addition to discussions for each question, the experts wrote on a form their opinions. Finally, the ideas proposed by the group were assessed for further discussion.

The application of WWP approach has been shown to be a useful methodology to improve policies and programs in rural development contexts. It has been applied in the EU [5] and in South American countries [4]. WWP approach shows the need to overcome the technical vision of the development programs, focusing on the behaviour of individuals and the context in which they work [12]. WWP is intended to improve human behaviour of the actors involved. Therefore, WWP project requires that planners, in addition to certain technical and contextual skills, have a special sensitivity to social [3] and sound ethical principles [11].

Following [4] the WWP approach may be summarized around four components: ethical-social, technical-entrepreneurial, political-contextual and social learning. i) The ethical-social component is aimed at improving the level of behaviours, attitudes and values of people who interact to promote, manage and direct their own development project. Try to improve moral behaviour of the people involved in a project in order that actors from public and private areas work together, with commitment, trust and personal freedom. The incorporation of ethics means that project developed under WWP approach is not "neutral", but is based on an ideal of service and is guided by values.

ii) The technical-entrepreneurial component integrates the elements to provide projects as investment unit and technical tools able to generate goods and services, to meet strategic objectives and business, in accordance with requirements and quality standards. The WWP approach adopts a "business function" -as mobilizing human, economical, public, private resources- leading to the arrangement and negotiation between various actors and involves a commitment to assume and manage risk. WWP approach serves not only to achieve "tangible" benefits, but to care about the "intangible" benefits in the form of expansion of knowledge, and social and cultural aspects.

iii) Political-contextual component provides the WWP approach the elements to meet with the rural development context. This area covers the ability of planners to make relations with political organizations and with the different public-administrations. The configuration of WWP approach must ensure that organizational change processes and structural processes are generated to allow adaptation to the priorities of involved people, also working with actors from the political and public administration fields. WWP organization has, therefore, an instrumental character, to serve the population, and it is flexible and changing according to the learning and the new information generated.

iv) Finally social learning component provides to the WWP approach an integrating component to ensure space and social learning processes [9, 1] among the different components, which lead to learn from the real agents of change. The social learning process runs with the main assumption that all effective learning comes from the experience of reality change. The process emphasizes on improving the linkage of knowledge, endogenous and exogenous, and practice planning. It mobilizes public and private resources in innovative solutions to the challenging problems of rural projects. In order to the population affected by the project actively participates in planning, with their own behaviours, attitudes and values -ethical-social component- to promote, manage and direct it.

## RESULTS AND DISCUSSIONS

### *Impact of the measure 112 in Romania*

The results of the survey to beneficiaries of the measure 112 presented in Table 1 show that half of those polled set as a new farmer (57.7%). Half of them, were already established in rural areas, before applying for measure 112, but NRDP funds help them to stay at the rural areas

(51.5%), and 28.5% were established as new rural inhabitants. Besides holdings have become more productive (73.3%) and the majority are optimistic about the future, they think that current farm activity will be profitable in the future (84.6%).

**Table 1. Effects of the NRDP measure 112 “setting up of young farmers”**

| Funding through NRDP measures has helped to   | %    |
|---|------|
| I set as a new farmer, because I was not  | 57.7 |
| I continue my farming activity, but I have improved it  | 90.8 |
| To initiate a complementary farming or forestry activity  | 10.8 |
| Total change of my activity   | 15.4 |
| Have you established in rural areas using NRDP funding?   | %    |
| Yes   | 28.5 |
| No  | 20   |
| I was already established, but NRDP funds helped me to remain                                     | 51.5 |
| Do you think your current farm activity will be profitable in the future?                         | %    |
| Yes   | 84.6 |
| No  | 10   |
| Ns / nc   | 5.4  |
| Do you think your farm is now more productive than before to receive NRDP funds? What percentage? | %    |
| Yes   | 73.8 |
| No  | 11.5 |
| Ns / nc   | 14.3 |
| Estimated Average% increase in productivity   | 27   |

*Perceptions of problems and solutions about setting up of young people*

Perceptions of the importance of problems and solutions identified in the bibliography about setting up of young people are showed in Table 2.

**Table 2. Importance of the problems and solutions identified in the bibliography review at European level more important in Romania**

| PROBLEMS   | N  | Mean | S.d  |
|--|----|------|------|
| Difficult to take possession of land and high cost to start in farming   | 17 | 4.48 | 0.87 |
| National legislation on succession   | 17 | 4.04 | 0.78 |
| Difficulty to access to credit   | 16 | 3.93 | 1.00 |
| Poor representation of young people in associations and cooperatives   | 17 | 3.78 | 0.86 |
| Insufficient and inadequate professional training  | 17 | 3.76 | 1.14 |
| Lack of basic infrastructure and social services   | 17 | 3.50 | 1.06 |
| Unemployment and poor access opportunities in the labour market  | 17 | 3.38 | 1.07 |
| Depopulation and loss of identity and traditions in rural areas  | 17 | 3.15 | 1.11 |
| Lack of activities for young women   | 17 | 2.33 | 1,67 |
| Negative image of farming way of live  | 17 | 1.93 | 1,45 |
| SOLUTIONS  | N  | Mean | S.d  |
| Facilitate holding transfer and reduce succession bureaucracy  | 19 | 4.63 | 0,67 |
| Develop training programs tailored to the real needs   | 19 | 4.37 | 0,84 |
| Encouraging the participation of young farmers in associations   | 18 | 4.21 | 0,75 |
| Promoting information and communication technologies   | 19 | 4.18 | 1,00 |
| Facilitate access to information about policies, programs and agriculture measures in EU                                   | 19 | 4.16 | 0,87 |
| Increase the involvement of young people in their community development processes, including participatory decision-making | 19 | 4.14 | 0,93 |
| Promote entrepreneurship for economic diversification  | 19 | 4.03 | 0,96 |
| Improving infrastructure and basic social services   | 19 | 4.03 | 0,96 |
| Facilitate hiring of support services during periods in wich farmers are unable to carry on the farm activity              | 18 | 3.86 | 1,16 |

Means were calculated based on a scale of 1= very unimportant 2 = unimportant; 3 = medium; 4 = important; and 5 = very important

Most important problems are related to access to land: difficulty to take possession of land and high cost to start in farming (mean = 4.48, s.d. = 0.95); legislation on succession (mean = 4.04, s.d. = 0.78); and difficulty to access to credit (mean = 3.93, s.d. = 1). The sale of holdings is made difficult by a market that is still emerging, has high transaction costs, and fragmentation of land [22]. The following problems are the poor representation of young people in associations and

cooperatives (mean = 3.78, s.d. = 0.86) and insufficient and inadequate professional training (mean = 3.76, s.d. = 1.14). A study on the impact of training activities conducted by Foundation for the Promotion of Agriculture and Regional Economy (FAER) and Land witchcraft Agriculture Mezoögazdaság (LAM) Foundation in Romania. The professional training, consulting services and exposure visits are necessary to meet the challenges of rural areas [16].

As in the case of the perceptions of the problems, the most important solution according to participants was: facilitate holding transfer and reduce succession bureaucracy (mean = 4.63, s.d. = 0.67). Second solution is developing training programs tailored to the real needs (mean = 4.37, s.d. = 0.84). Studies in rural areas show that individuals with more education have more participatory behaviours and attitudes of leadership in social, economic and cultural fields [13, 10]. This solution was followed by encouraging the participation of young farmers in associations (mean = 4.21, s.d. = 0.75). Fourth is to promote information and communication technologies (mean = 4.18, s.d. 1); and fifth is to facilitate access to information about policies, programs and agriculture measures in EU (mean = 4.16, s.d. = 0.87). Information is an essential tool in the development process in rural areas. The lack of meaningful information and clear and concrete proposals has become a major obstacle to decision making [7].

#### *Solutions proposed at different administrative level to Romania*

Problems indicated by experts who participated in the focus group, match the problems identified in the literature review at European level, but the order changes. First stands the lack of suitable professional training, followed by the poor living conditions and the lack of perspective in relation to a decent lifestyle in the rural areas. Third problem is the lack of information on legislation and rural development programs appropriate to the target groups, fourth, the lack of social infrastructure in rural communities, and fifth the lack of youth participation in decision-making.

First solution proposed at LAG level is to identify and promote training opportunities, although in principle the objectives of the LAG are not the organization of training activities in agricultural issues. Secondly is to provide suitable information on legislation and NRDP measures to target groups. And thirdly is to promote collaboration and team work between the LAGs.

Solutions proposed at USR level in collaboration with the National Rural Development Network (NRDN) of Romania focus on providing information on legislation, Common Agriculture Police (CAP) programs, guidance for applying to NRDP measures, best practices, etc. to potential beneficiaries, and to support, organize, identify and promote professional training opportunities for target groups (young farmers associations, etc.).

The MARD level solutions are much more varied, ranging from reducing bureaucracy and facilitate the procedures to request access to NRDP measures, promote legislation favourable to young people, or create professional training institutions specializing in agriculture in collaboration with the ministry of education.

## **CONCLUSIONS**

This paper has examined the application of WWP approach from USR to diagnose problems and suggest solutions to improve the setting up of young farmers in Romania. The WWP process allows the principal actors to be involved in promoting rural development and setting up of young people and to take part in the decision making process.

Success of WWP approach requires "social sensitivity" from planners and "stock assessment" to understand different perspectives and to be receptive to opinions, value judgments and ethical standards. Including key actors in participative processes to diagnose their problems provides specific data about the territory.

The implementation of the proposed solutions structured around the four components of WWP approach -ethical-social, technical-entrepreneurial, political-contextual and social learning-

will help rural communities to improve the establishment of young farmers, and to create improvement of innovation processes and development, while respecting their own culture, values and beliefs.

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# FARMERS PERSUASION REGARDING IMPLEMENTING OF THE METHODOLOGICAL SUPPORT FOR DETERMINING THE PERFORMANCE IN AGRICULTURAL EXPLOITATIONS

DOBRE IULIANA<sup>1</sup>

## Abstract

*This paper is a quantitative and qualitative approach of performance from Romanian agriculture exploitations,, focusing on the need to implement the methods to determining of it. Are references to the content of performance, to the variables that influence, to the assimilation of methodology for assessing of the its level by managers or producers. For this purpose, are created theoretical and methodological conditions which to provide information necessary for the understanding and acceptance of application of methods for determining the performance. For this, are used the statistics in this area by presenting some methods with large utilization in production activities and in marketing and illustration, by elaborate a questionnaire from producers, to convince them to implement methods and techniques as scientific base of decisions. Considering the multitude of factors which acting on achieving performance, the results show, undoubtedly, the need of minimum of economic and managerial knowledge which to put in value the potentialities of exploitations.*

**Keywords:** *performance, agricultural exploitations, methodological suport, persuasion, farmers*

## INTRODUCTION

The need of methods in agricultural exploitations is emphasized by the making of analysis with reference to economic and financial situation of the farm, to identification and interpretation of strengths and opportunities, but also to identify problems facing the unit, like the threats and dangers. Also, the need is felt in terms of: efficient use of inputs, given the substitutability of some (which would mean lower costs, with effect on performance), development of production programs (forecasting on short-term of activities, of expenses and profit, with inclusion in the program of problems regarding optimization of production structure), development of business plans

Methodological knowledge has a great importance. In their work, many producers acts in an empirical manner when estimates the activity, which can lead to errors in their decision-making process affecting the whole, with reference, in particular, to the decision. For example, the average production can be easily influenced if not call to the methods or if these not correspond to the series data. Similarly, the choice of crops structure without scientific foundation determine disaggregation at farm level, at least in terms of resource allocation and demand. Acquisition of fixed capital without knowing the methodology for calculating the investment can create strong financial imbalances. In like manner, can speak about establishing the necessary labor or investments in irrigation systems in livestock production (size and structure, determining forage requirements). Therefore, for the managers of agricultural exploitations is need to understanding and acceptance of methods and techniques utility, like support of their decisions, given that they are to ensure a certain level of economic performance.

## MATERIAL AND METHODS

Achievement of paper is based on a series of researches regarding functioning of agricultural exploitations ifrom Romania, practiced management, their level of economic efficiency. Was used studies from the literature on agricultural statistics, agricultural management from which we obtained results showed, also, exploitations situation, particularly with reference to the problems they face. Was described the methods and techniques needed to forecast agricultural activities, including the implementation of market studies, like support to connection of exploitations in the competitive environment.

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## RESULTS AND DISCUSSIONS

### *Why is it necessary to apply methods in farms activity? Motivation of farmers*

Orientation of farms, in generally of agriculture, at performance, either the economic or environmental, need to involve decision makers to approach beyond empiricism. It is known that such an approach can not be treated in an empirical manner, being to the significant allocation of working capital, which to find economic justification, for to achieve the desired results

The literature has, regarding performance, a variety of methods, models, techniques, all as a support of scientific substantiation decision, whatever their nature. When referring to the current decision, often required farmers activities (monthly maximum), made by decision makers are the hierarchical pyramid, things are more simplistic, because it no will introduce new elements to change the farms objectives. Intensity increases when the decision is tactical or strategic which aimed the overall activities of the farm, in order to find solutions to adapt to the economic environment, especially when it is changing with respect to various critical periods that may arise

High probability of occurrence of conflict situations on farms coming from the external environment (farms competing, market - demand, supply, prices, suppliers) are destabilizing elements that can lead to threath and dangers in farms (Bran, Mariana, 2012). Things can be amplified in the negative sense in the absence of tactical and strategic decisions (such as the recall), which emphasizes the necessity of predict economic phenomena and use of management and marketing practices to mitigate the manifestation of "lines" effects. Therefore, should be resorted to measures to persuade decision makers to use the methodological tools necessary to prevent such events.

In this sense, is make into account different situations that may arise in a farm and which require application of methods for substantiation. (Berevoianu, Rozi, Liliana, Dobre, Iuliana, Voicu, Radu, Bran, Mariana, Ivaşcu, Teodora, Buiga, Andrei, Trică, Carmen, Lenuţa, 2010).

#### Case 1: Farm establishment

- assessing the production potential of land, given by evaluation marks, to establish the favorability for different branches (culture);
- determining the optimal size;
- development of the production structure, crops to be applied, taking into account the natural characteristics and suitability of land for different crops, market demand (it is an economic decision to be based, using rigorous reasoning and methods of choosing the optimal of crops structure),
- land organization, focusing on possibilities for establishing and ensuring crop rotation, given their impact, particularly on the level of production per hectare and soil protection;
- estimation of total production and average production and they expect to get settled on the productive potential of land and production technologies to be used (with intermediate consumption higher or lower, which restores the level of intensity);
- estimation of technical means necessary to carry out production processes and ways to ensure their (purchase, call the service providers as agricultural work, etc..)
- providing other inputs (fertilizers, pesticides), human resource requirements, determined by technological requirements of the crop (the problem is particularly relevant if you work by hand);
- commercial relations will be established, stating the recipients of products from the set of crops for which we chose, that marketing plan: advertising, promotion, distribution, marketing, market research.

#### Case 2: Existing farm

- economic and financial analysis of farm (3 years): indicators of production (average yield, total production), changes in prices, production costs, the costs of production on cost elements (operational, financial, extraordinary), the income (operating, financial,

extraordinary), indicators of liquidity, solvency, indicators of resource consumption, gross margin (often used in farms in the European Union)

- altering the structure of production - production development programs: forecasting (estimating) average production level, streamlining production, estimating demand for chemical fertilizers or organic crop and total, to the identification of origin, changes in human resources - determining labor requirements due to new production structures,
- design revenue and expenditure budget
- economic efficiency,
- sensitivity and risk analysis (under the influence of climate, change of price, technology improvement, etc.).

The following refers to farmers to play results (operating income, operating expenses, the operating result, total revenues, total expenses, gross profit, net profit, rate of return), which requires a degree of economic training, capacity of synthesis and interpretation.

In any of the following situations may occur a number of issues that are necessary elements of economic knowledge (calculation of investment indicators), namely:

- investment in the purchase of technical equipment (tractors, agricultural machinery, etc..)
- investments, purchase of vehicles for plant products;
- planning an irrigation system;
- construction of silos for storage of plant products;
- other storage buildings (cold storage, warehouses, cellars) along access roads;
- availability of technological lines for sorting, grading, packaging in case of vegetable products.

Such activities involve rigorous calculations regarding investment efficiency: specific investment, payback period, profit from recovered, total profit, profit end economic return on investment. In the absence of these elements can create dysfunction at farm level, with impact on the distortion degree of efficiency.

Not omitted any concerns environmental practices. Farmers are applying in their activities unconventional technologies, which requires the presence of solid elements of knowledge, both technical and economic. Allocation and adventitious organic fertilizers can adversely affect product quality. In addition, should know that organic farming produces high costs per unit area, is needed a control in terms of achieving their for to obtain performance. Also, it put an increasing emphasis on environmental performance, which requires the use of knowledge and application of good practices. Also, conducting of agricultural activities aimed at making products from biologically clean and maintain a healthy environment involve high risks from farmers, requiring more support than in conventional agriculture. There are studies describing the development of this type of agriculture, farmers and expectations in their relationship with the promotion of this agriculture. Society's expectations of farmers in relation to their environmental performance are ever increasing, in general terms and in response to regional challenges. One tool for achieving environmental improvements in agriculture is the design and promotion of region-specific best management practices' (BMPs). BMPs are conservation practices aimed at reducing diffuse source pollution from agricultural lands and thus improving end-of-catchment water quality (Greiner, Romy, Patterson, Louisa, Miller, Owen, 2009). Is need to understanding of farmers' motivations and risk attitudes for improvements in the environmental performance of agriculture.

Some methods in production of exploitations

Production activity. Substantiation methods are numerous and could be considered: methods for the estimate of average production, optimization of production structure (linear programming, partial budget, the gain matrix, the method variants (Voicu, R., Dobre, Iuliana, 2003).

*Estimate of average production* Methods - trend extrapolation, using statistical and analytical methods. mobile mean method, the arithmetic mean, mechanical methods

- *Average increase method (mean absolute change)*:  $y_i = y_1 + t_i \cdot \bar{\Delta}$ ;  $i = 1, 2, \dots, n$ , when:

$y_i$  = adjusted level of production with average growth

$y_1$  = production in  $t_1$ ;  
 $t_i$  =time variable..

$$\bar{\Delta} = \frac{y_n - y_1}{n - 1}$$

*Increase average index method*

Average growth index method is recommended to use if the terms of the series tend to increase as a

geometric progression:  $\bar{I} = \sqrt[n-1]{\frac{y_n}{y_1}}$  ,  $y_i = y_1 \cdot \bar{I}^{t_i}$  .

- Increase average rythm method  $\bar{R} = 100 - \bar{I}$

*Arithmetic mean*

The arithmetic mean is used only if the series is stationary (production is constant, regardless of the period for which is calculated). It will be added to increase the production (s) determined by the improvements to technology, the quantities of inputs allocated.

$$\bar{X}' = \bar{X} + s.$$

Moving average method is used when the average production of time series shows an oscillating evolution. In this case, are calculated moving averages of a number of years. This number can be established: either by successive attempts, stopping us at the number of terms for the series average production of the calculation shows a continuous evolution, increasing or decreasing; either by counting periods of time between two points of maximum or minimum, resulting in a dynamic chart of the average series. In this case, add a production increase, according to conditions such as those mentioned in the arithmetic mean.

Extrapolation from analitical methods

- liniar  $y = a + bx$ ;
- parabolic  $y = a + bx + cx^2$ ;
- exponențială  $y = a \cdot b^i$ , unde  $i = \text{timpul}$ .

Optimization of production structure

The linear programming method, using an appropriate mathematical model, allows obtaining, from the multitude of possible variants, the optimum solution. The objective function of the model will be the maxim profits, and the variables will be possibilities to practice different branches, in the conditions and according to various requirements mentioned. Linear programming model has the following general form:

$$\text{max. } f(x) = \sum p_j \cdot x_j$$

General restrictions are the following

$$1. \sum_{j=1}^n a_{ij} \cdot x_j \leq b_i \quad i=1,2, \dots, n \quad 2. x_j \geq 0$$

The meanings of symbols are:  $x_j$  – the area that will hold the branch  $j$ ;  $p_j$  – the profits of branch  $j$ ;  $a_{ij}$  –the resource consumption per unit area of branch  $j$ ;  $b_i$  - the volume of resources;  $j$  - set of branches;  $b_i$  – volume of resources  $i$ ;  $i$  –volume of branches.

What was presented is related to farm managers, and therefore theirs collective responsibility in accepting and using of methodologies, whether are be these, respectively from management or marketing. It needs the persuasion of farmers for using, in their business, the methodology with scientific substantiation, in terms of performance increase.

Farmers persuasion – questionnaire

Research goal is to promote "product" methodology, which belongs to marketing communications, and convinced of farmers for usefulness in their production activity and aconomic activity.

Elements of "input":

- The choice of the target group (farmers)
- Message (which is to be provided)

- Establish means of communication (direct channel of communication - discussion with farmers, or indirect - e-mail).

#### Stages

##### Stage 1 About farmers and their activities

###### a. Knowing the target group – farmers (based on questionnaire):

- age; level of general knowledge; level of economic knowledge; level of managerial training.

###### b. Farms knowledge (data and general information):

- location: area, degree of favorability for different branches; type and form of legal status; field of activity (eg production and marketing of cereals); size;
- production system practiced (intensive, semi-intensive, extensive, based on monoculture or polyculture, in the open or in an artificial environment (for vegetables), conventional or organic, traditional and industrial (in animals);

###### c. Knowledge of economic and financial situation of the farms:

- production structure (what is cultivated or what is grow and how much of each); the level of production indicators (average production, total production)
- economic results (revenues, expenditures, proffit, proffit rate); SWOT analysis; market analysis.

Stage 2. Presentation methodology farmers (message) - Some methods used in production and marketing activities of producers: content; advantages to implementing; practical example (information necessary and effective way of computing); any costs involved in providing information in the application of the methodology.

##### Stage 3. Interpretation of answers

##### Structure of questionnaire

To achieve the questionnaire was left: identification of decisional problem; establishment of objectives; establishment of hypothesis, establishment of research variables. Schematically, the relation between them is shown below:

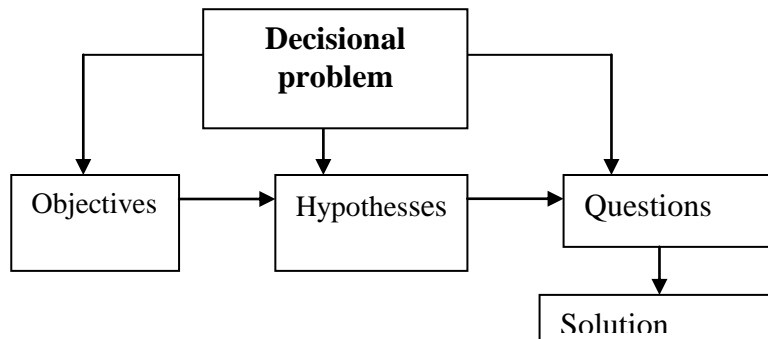


Fig.1 Structure of marketing research

Decisional problem: *Farmers persuasion regarding implementing of the methodological support for determining the economic and ecological performance in agricultural exploitations*

Hypotheses:  $H_1 \dots H_n$

Objectives:  $O_1 \dots O_n$

Questions:  $Q_1 \dots Q_n$

##### Questionnaire

H1 It is a correlation between type of management and farmers education and their willingness to implement methodologies

O1 Identifying factors that influence farmer's willingness to implement methodologies

Q1 What is your education level?

Q2 What kind of management do you practice?

Q3 What is the farm area?

Q4 What is the used agricultural area?

Q5 Which is the production structure?

Q6 Is an activity based on profit?

If Q6 is No, then stop the H1, result activity noncommercial, small size.

If Q6 is Yes, then follow:

Q7 Do you use the methods in planning activities?

H2 Farmers use methods of improving on performance considering the type of exploitations, area, structure of production, system of production, level of education and age.

O2 Determining the methodological support used in farms.

Q1 Do you practice a large production structure or specialized?

Q2 Who are your customers?

Q3 What methods do you use in production activities?

Q4 What methods do you use for estimation of indicators?

Q5 Do you want to extend your market?

Q6 What methods will be used for determining the study of market?

H3 Farmers are interested in applying new methods.

O1 Determining farmers' interests in applying immediately new methods of improving performance

Q1 Do you recognize the role of application a new methods in your farm activities?

Q2 Your performance is due to scientific substantiation decision?

Q3 Are willing to improve your economic and management training?

## CONCLUSIONS

- The production activity of agricultural exploitations is influenced by a variety of factors;
- Is need to knowledge for making the decisions in agricultural exploitations;
- Obtain of performance require the scientific analysis of exploitations, inclusive market research;
- The literature has a multitude of methods for the estimate the future results, as support to achievement of performance;
- The results of this questionnaire show :the knowledge degree concerning scientific methods; the capacity of farmers to understanding the importance of methods for functionality of their business; the acceptability degree for methods and the proportion for using; the major importance of methods in obtain the performance and competitive advantages; the managerial training of farmers, respectively the level of education; the relation of farmers with market; the degree of opening farmers for new and formation of new farmer; the economic development level of farms and, through extension, the level of agriculture.

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# MITIGATION SCENARIOS INEQUALITIES IN RURAL WEST REGION OF ROMANIA

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## Abstract

*In this paper we present two scenarios to mitigate inequalities in rural Western region of Romania. The two scenarios are: a) Scenario "Convergence and Territorial Cohesion – CCT" Which assumes that the dependence decreases as circumstantial situations, the degree of homogeneity of economic performance and social and economic plans and social complementarity increases, the greater the impact of rural inequality combat scenarios. b) Scenario "Competitiveness and social efficiency - CES" Assumes that achieving economic growth and mitigates default does social inequality. Reducing inequalities requires specific growth factors inter-conditionality equipping and specific material wealth. Also, the higher the quality of demographic processes is greatly increased chance of reducing inequalities. In addition, reducing inequalities can be done by increasing the sustainability of investments.*

**Key words:** scenario, competitiveness, convergence

## INTRODUCTION

West Development Region is located in the western part of Romania's border with Hungary and Serbia, consisting of territorial administrative point of view of four counties: Arad, Caras-Severin, Hunedoara and Timis. The region has an area of 32 034 km<sup>2</sup>, accounting for 13.4% of the country and is comparable with Moldova and Belgium.

West Region includes all forms of relief its territory of Romania, which gives different living conditions and life for residents of the region, especially in rural areas. In rural West Region lives about 36% of the total population of the region. The rural population is facing a demographic aging due to massive migration of young people from villages to cities, which took place during the period 1960-1985 forced industrialization and the low birth rate recorded in recent years. However, the rural population of the West Region recorded increases, the largest migratory balance being Timis, Arad followed.

## MATERIALS AND METHODS

Economic activities taking place in rural areas are very poorly diversified economic life of the village in the West Region is dominated by agriculture. Industry sector is economically less developed rural areas. Thus, recently, an alternative source of income to obtain employment and represent rural tourism and agro tourism.

Also, rural entrepreneurship is little developed. Fields of business, mainly micro-enterprises, are restricted main economic activity which is carried out by trade. Also, bear in mind that the development of industrial and service activities in rural areas requires prior development of access infrastructure and utilities necessary for both economic activities and to provide a comfortable living population in these areas.

## RESULTS AND DISCUSSIONS

Scenario CES is based on strategic choices:

**A. economic development** increasing competitiveness;

**B. social development through** social welfare growth;

**C. development of utilities by** increasing material wealth.

The indicators selected to influence these options are:

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### 1. Indicators for "competitiveness"

- number of employees / 1000 inhabitants
- average number of accommodation / accommodation

### 2. Indicators for Social Development

- number of dwellings completed in 2008/1000 existing housing
- Residence/1000 balance changes people.
- enrolled students / teacher
- population / physician

### 3. Development Indicators of utilities

- amount of drinking water supplied to domestic consumers
- Length of sewerage network

Mitigation strategy for inequalities in rural Western region was based on an extensive analysis of indicators needed to achieve this. Following this analysis was performed and framing rural localities in clusters.

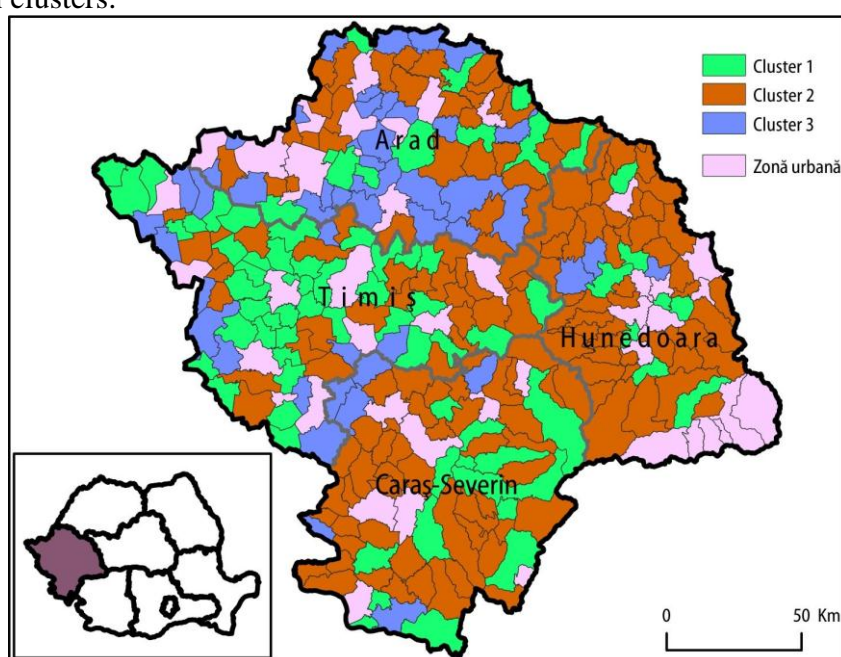


Figure 1 – Cluster classification in Western Region

Table 1 - Average values indicators and clusters

|           | No. salariați/1000 people | No. environment places / accommodation | No. localities |
|-----------|---------------------------|--|----------------|
| Cluster 1 | 159.4                     | 15.0                                   | 78             |
| Cluster 2 | 85.0                      | 1.2                                    | 156            |
| Cluster 3 | 94.9                      | 3.6                                    | 45             |

Analysis of the number of local clusters, shows that, out of 279 villages in the region, 78 are found in cluster 1 (28%), 156 localities in cluster 2 (56%) and 45 towns in cluster 3 (16%).

#### 1. Economic development - indicators:

- a) Number of inhabitants salariați/1000
- b) Average number of accommodation / accommodation

#### a) Number of inhabitants salariați/1000

In 2008, the number of employees in the Western region was 105.7 inhabitants salariați/1000, 34.8 (49%) employed more than the national. However, this indicator is very low, indicating high unemployment, and a large number of people with social income, or income from



agriculture (subsistence), with serious implications for living standards and purchasing power of the rural population. It is however noted that the analysis region have resulted in 2008 localities with zero value of this indicator. The highest value was found in the town Buchin, Caras Severin, with 931.5 salariați/1000 inhabitants, while the minimum value is found in the town Luncavita, also Caras Severin and 18.6 salariați/1000 people.

**b) Average number of accommodation / accommodation**

Tourism capacity region is given by the average number of indicator analysis places / accommodation, which is very close to the national value respectively to 5.1 and 5.3 to the national average regional average. Analyzing more detail this indicator, it was found that the total number of 279 cities, 230 of them have tourist accommodation units, which is approximately 82%. Percentage is quite high, given that there is huge tourism potential in the region, the potential is not exploited and that could improve the incomes and therefore the purchasing power of the rural population and the manner and quality of life.

**Specific objective - development of economic activities in rural areas**

**Priority** - *Superior capitalization of tourism potential of rural areas and support rural entrepreneurship*

Development and diversification of economic activities in rural areas and increasing employment through enterprise development and job creation is the key to maintaining and rural welfare.

One of the fundamental problems facing the rural economy is the impact of the restructuring of agriculture and the need to diversify default and rural economic growth in non-agricultural sector. Farm diversification and local economic orientation towards non-agricultural sector is not only a logical response to market demand, which is changing, but will also help to absorb surplus labor released from economic sectors become inactive (eg mining) or returned labor resources in rural areas.

Supporting entrepreneurship in rural areas will aim high and balanced exploitation of tourism potential through service professionalization and development especially the types of tourism in the area considered, namely agro-tourism, mountain tourism, cultural tourism and historic etc. and all their components. Tourism is an important economic sector in rural areas, the complexity and the potential to support other economic sectors and local culture by making specific local products and services and promoting opportunities for rural areas.

**Table 2 - Average values indicators and clusters**

|           | <b>Balance changes of residence / 1000 inhabitants</b> | <b>Houses completed in 2008 / 1000 existing housing</b> | <b>No. localities</b> |
|-----------|--|---|-----------------------|
| Cluster 1 | 23.2   | 12.7  | 78                    |
| Cluster 2 | 8.3  | 1.6   | 156                   |
| Cluster 3 | 8.5  | 1.6   | 45                    |

**2. Development social - indicators:**

- Number of dwellings completed in 2008/1000 existing housing
- Balance changes domiciliu/1000 people

- **Number of dwellings completed in 2008/1000 existing housing**

Number of dwellings completed in 2008 was 4.6 residential /1000 existing housing with 2 existing dwellings locuințe/1000 less than the national value. Of intra-regional analysis revealed that a number of 131 municipalities (47%) did not complete any home in 2008, the remaining localities ranging from 1 to 182, resulting in a series of differences from one place to another, in the same county as well as the total region.

- **Balance changes domiciliu/1000 people**

Changes in socio-economic structure of Romania led to an intense territorial mobility of population, with direct consequences in changing the number and socio-demographic structure of

the population in territorial. Regarding changes balance domiciliu/1000 people in the western region it is found that their number is nearly 2.7 times higher than the national average, with a figure of 12.3 ‰. On the segment of the population that is willing to change his domicile, there is a young population migration to areas with higher potential, especially in terms of the labor market. This phenomenon is due to factors such as greater labor market opportunities in other areas (especially urban) attractive salary level, schools etc concentration.

**Specific objective - sustainable rural development by improving social and infrastructure development**

**Priority - *Creating new housing, to improve the quality of life of rural population***

The measures will focus on creating new housing, to increase the comfort of living of the rural population, which, in conjunction with other actions in the economic development and create new jobs, will decrease the migration of the rural population.

**Table 3 - Average values indicators and clusters**

|           | <b>Enrolled students / teacher</b> | <b>No. population / 1 doctor</b> | <b>No. localities</b> |
|-----------|------------------------------------|----------------------------------|-----------------------|
| Cluster 1 | 9.4                                | 1237.7                           | 78                    |
| Cluster 2 | 8.2                                | 1323.3                           | 156                   |
| Cluster 3 | 10.2                               | 1493.9                           | 45                    |

**3. Social efficiency**

• **Students enrolled /teacher**

The analysis of this indicator quite important, given that it is one of the indicators of system resources for education and vocational training shows that the regional average is lower than the national one, which is not a bad thing, but rather , given the fact that the higher this value is lower, the more increase the quality of education. Regarding the distribution of rural communities as number of students enrolled / teacher, they note that the total of 279 communities, only 3 of them are equipped with schools, or about 1%, these being found in counties Hunedoara (2 locations) and Caras Severin (one location), and the maximum value is 18.36, the common Biled, Timis County.

• **Number of inhabitants / doctor**

National average for the number of inhabitants is 1947 inhabitants doctor / physician, while the regional average is 1,313 inhabitants / doctor, with 634 less. In 80% of the total common people per one physician exceeds the national average is 18% of the joint is below the regional average. Extremely disadvantaged communes are grouped in Caras-Severin, Hunedoara and the eastern counties of Timis and Arad. Number of locations that do not have hospitals is 42, or about 15%, and valaorea highest is found in town Satchinez, in Timis County with 4751 inhabitants / doctor 2.4 times higher than the national average and 3.6 times higher than the regional average.

**Specific Objective - Improve the quality of life in rural areas through targeted assistance**

**Priority - *Provision of access to rural health services and education level of the urban***

**Measures:**

- Provision of access to health services through the creation and modernization of rural clinics and providing medical facilities;
- Provision of access to education services

**Table 4 - Average values indicators and clusters**

|           | <b>Quantity of drinking water delivered to consumers household mc / place</b> | <b>Long of simple distribution drinking water network - km</b> | <b>No. localities</b> |
|-----------|---|--|-----------------------|
| Cluster 1 | 37.2  | 19.3   | 78                    |
| Cluster 2 | 11.3  | 8.6  | 156                   |
| Cluster 3 | 8.8   | 7.3  | 45                    |

#### 4. Development of utilities

- **The amount of household drinking water supplied to consumers (m<sup>3</sup> / capita)**

In terms of access to the water for domestic, rural population of western region has benefited from a better supply, the average amount of water being supplied to consumers in 2008 of 17.7 m<sup>3</sup> / capita in this region compared to only 14.8 m<sup>3</sup> / capita at the national rural assembly. Although the whole Western region, the amount of drinking water supplied to households is higher than the national level, however, only 34.8% of the communes have managed to achieve an overall water supply above the national average. Housing facilities with plumbing is relevant in assessing their comfort level, the existence of these facilities allowing civilized lifestyle that offers a quality guarantee proper water and the possibility of modern spatial dependencies (bathroom, toilet, kitchen with water current). Problem running water for rural communities is not only a comfort factor but also a safety factor of health. Whose rural public water networks fail to provide the highest level of water supply to residents are: Zerind (140.3 m<sup>3</sup> / capita), Ghioroc (90.1 m<sup>3</sup> / capita), Brebu New (263, 1 m<sup>3</sup> / capita) Santamaria Orlea (42.4 m<sup>3</sup> / capita) and is located in Arad, Caras-Severin and Hunedoara. Highest risk of access to sources of drinking water household is recorded in Teregova communes, Sopotu New Vermes (located in Caras-Severin) the amount of drinking water supplied is very small or lacking supply drinking water.

- **Length of the drinking water distribution network - km**

In Romania mains drinking water in rural areas is much less extensive. The data analysis revealed that the vast majority of the rural population is supplied with water from individual sources (wells and groundwater wells), which in most cases is not adequate water quality with high concentrations of nitrates and organic matter, well above the norms for drinking. Length of the drinking water distribution network in the Western region is located above the average national level, ie 12.3 km. Following this analysis, it was found that about 56% of the total of 279 municipalities analyzed in the West do not have drinking water distribution network, which adversely affect quality of life in rural areas. Thus, Arad County, in 2008 there were a total of 12 communes, in Caras-Severin 35 common 29-common in Florida and in Timis County, a total of 83 communes not connected to the water supply network.

#### **Specific objective - rehabilitation and development of rural basic public**

**Priority - Modernization, expansion or establishment of public utility networks basic physical infrastructure of public services and cultural infrastructure**

Modernization and expansion of basic rural physical infrastructure directly affects the development of the social, cultural and economic and thus creating employment opportunities. Existence and good technical condition of road infrastructure are essential for socio-economic development of rural areas. They can decisively influence the development of new investment and local economic development.

It also provides municipal infrastructure, in addition to more attractive economic environment, a high quality of living in rural areas.

Will develop drinking water distribution networks will be rehabilitated and / or resize water production facilities will extend public sewer network will be built wastewater treatment plants, will expand natural gas distribution network and so on

By developing cultural infrastructure creates the potential development of the tourism sector, improves natural and anthropogenic landscapes and contribute to an overall picture of the countryside attractive for potential investors and young people.

#### **Scenario 2 CCT**

Scenario CCT is based on the following policy options:

**A. Territorial convergence** - to reduce gaps and discrepancies preventing intraregional.

**B. Territorial Cohesion** - to ensure equal opportunities, ensuring polycentric development and the emergence of secondary poles, ensuring balanced and sustainable development of rural areas with different characteristics and specificities, allowing their diversity conservation.

The indicators selected to influence these options are:

**1. Territorial convergence indicators:**

- salariați/1000 number of inhabitants
- % Area covered by vineyards and orchards in the total agricultural area
- PC/1000 inhabitants

**2. Indicators for Territorial Cohesion:**

- residence/1000 balance changes people
- migration balance externe/1000 people

**1. Territorial convergence**

**Table 6 - Average values indicators and clusters**

|           | PC/1000 place. | No. employees / 1000 inhabitants | % Area vineyards and orchards in total agricultural area | No. localities |
|-----------|----------------|----------------------------------|--|----------------|
| Cluster 1 | 8.1            | 159.4                            | 1.9  | 78             |
| Cluster 2 | 8.7            | 85.0                             | 1.6  | 156            |
| Cluster 3 | 7.8            | 94.9                             | 1.7  | 45             |

• **PC/1000 inhabitants**

Because rural areas, population density is low, the cost of information infrastructure is high and purchasing power is very low, the number PC/1000 inhabitants is relatively low, only 8.3 Western region, with approximately 5 % higher than the national average. However, only 18 of rural Western region do not have any PC (2 locations in Caras Severin, 4 cities in Arad, 5 cities in 7 localities in Timis and Hunedoara). The highest value of this indicator can be found in town Gurahonț, Arad County, 27 PC/1000 capita (3.4 times higher than the national average)

• **Number of inhabitants salariați/1000**

In 2008, the number of employees in the Western region was 105.7 inhabitants salariați/1000, 34.8 (49%) employed more than the national

However, this indicator is very low, indicating high unemployment, and a large number of people with social income, or income from agriculture (subsistence), with serious implications for living standards and purchasing power rural population. Note, however, that the analysis region have resulted in 2008 localities with zero value of this indicator. The highest value was found in the town Buchin, Caras Severin, with 931.5 salariați/1000 inhabitants, while the minimum value is found in the town Luncavita, also Caras Severin and 18.6 salariați/1000 people

• **Percentage of area occupied by vineyards and orchards in the total agricultural area**

As expected, and this indicator is closely related to the percentage of arable farmland in the region, following the same path, meaning that the regional average is less than the national average of 1.7% respectively compared to 3 4%. In the distribution of rural communities as percentage of area occupied by vineyards and orchards, only 27.2% of them are found above the regional average and 81% below the national average.

There are a total of 85 municipalities that have no areas with vineyards and orchards, most of them being found in Hunedoara County (37 locations), followed by Arad (29 cities), Timis (10 localities) and Caras Severin (9 locations).

**Specific objective - economic potential by improving the business environment and develop a sustainable agriculture based on modern technology**

**Priority - Business development and agriculture**

- support existing operators and attract new investors;
- Development of services;

- Computerization of local public services in order to increase the efficiency of the administrative and create complete database, which will be made available to potential investors;
- Encouraging farmers to form association of medium-sized agricultural associations, in order to increase the efficiency of agricultural activity;
- Supporting local producers who want founded agricultural products processing units.

## 2. Territorial cohesion

**Table 7 - Average values indicators and clusters**

|           | <b>Balance changes of residence<br/>/ 1000 inhabitants</b> | <b>Balance change of residence<br/>/ 1000 inhabitants</b> | <b>No. localities</b> |
|-----------|--|---|-----------------------|
| Cluster 1 | 23.2   | 7.0   | 78                    |
| Cluster 2 | 8.3  | -1.8  | 156                   |
| Cluster 3 | 8.5  | -0.7  | 45                    |

- **Balance changes domiciliu/1000 people**

Changes in socio-economic structure of Romania led to an intense territorial mobility of population, with direct consequences in changing the number and socio-demographic structure of the population in territorial. Regarding changes balance domiciliu/1000 people in the western region it is found that their number is nearly 2.7 times higher than the national average, with a figure of 12.3 ‰. On the segment of the population that is willing to change his domicile, there is a young population migration to areas with higher potential, especially in terms of the labor market. This phenomenon is due to factors such as greater labor market opportunities in other areas (especially urban) attractive salary level, schools etc concentration. Analyzing the data by county is found that the maximum value was reached in 2008 in Timis county, city Secas, with 220 inhabitants domiciliu/1000 changes and the number of localities where there were no changes of residence was only 7 localities (one in Timis county, one-Severin county cars, one in four localities in the county of Arad and Hunedoara).

- **Reședință/1000 changes balance inhabitants**

Changes of residence in the West have a positive balance of 0.7 ‰., Approximately 5 times higher than the national average, negative otherwise. Analyzing in detail the indicator stem a series of intra-regional disparities, with large differences between maximum and minimum limits. Thus, the minimum value of this indicator is -31.02 ‰ in town Sopotu New Caras Severin county, while the maximum value is 247.3 ‰ and is found in the same county, New Brebu town. In the entire region, only six municipalities have a balance of zero change of residence.

### **Specific objective - development of human resources**

**Priority** - Supporting the adaptability of the workforce to current demands of the rural economy

Need training activities occur in the context of related products and increasing competitiveness and diversifying economic activities in rural areas, agriculture, restructuring and modernization of the agricultural sector of the processing and marketing of agricultural products by encouraging market-oriented business, the requirements for a wide range of economic and management skills, as well as achieving the objective of sustainable land management and environmental protection, the application of environmentally friendly technologies and practices and the use of renewable energy.

Therefore, it is necessary that training activities, information and diffusion of knowledge to be extended to adults who are involved in areas related to agriculture and food industry. Training activities, information and diffusion of knowledge are also needed in disadvantaged areas naturally, where continued agricultural activity contributes significantly to maintaining the viability of rural areas.

Labor resources made available from other economic restructuring, are a special case, and their adjustment problems need to be addressed specifically and with priority.

## CONCLUSIONS

After analyzing indicators presented have synthesized several conclusions:

**a) in terms of territorial equipment:**

- In the region of the comfort of living is higher, the higher regional average of 2.9 m / capita compared to the national average;
- Houses constructed from durable materials with adequate facilities are above the national average;
- The relatively small number of localities that have drinking water and natural gas;
- Inadequate water treatment systems, collection and recycling of waste;
- Inadequacy of utility infrastructure needs and standards required by the population

**b) In terms of economic size:**

- Region has four airports, two of which are international
- Railway density is higher, the region being second in the country after Bucharest - Ilfov, being crossed by three international railway lines;
- The existence of five European roads of strategic importance
- Areas with high tourism potential (especially in mountain areas), the region accounting for a high proportion of business tourism market and transit;
- Various forms of relief, allowing practicing all forms of economic activity;
- Farming tradition;
- Good quality land in the lowlands;

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# DETERMINATION OF RESTRICTIVE ECONOMIC FUNCTIONS AND EVOLUTION TENDENCIES OF TECHNICAL INDICATORS FROM AGRICULTURE IN THE NORTH-WEST REGION

DRAGOMIR VILI<sup>1</sup>, DRAGOMIR NELA<sup>2</sup>

## Abstract

*In the knowledge process we have a variety of methods, ways, means enabling the identification, scientific determination of the phenomena from nature and society. A current widely used model is modeling the investigated phenomena. Research methods used in order to elucidate economic processes and evolution trends of plant and animal systems in territorial profile were: **regression function method** - which statistically expresses how characteristic result  $y$  changes due to changes of characteristic  $x$  factor for in the case that the variance of  $y$  would only be based on the variation of  $x$ ; **the method of least squares** - through which is obtained a solution of an over determined system of equations, which has more equations than unknowns. The least square means that the obtained solution minimizes the sum of squares of deviations from the values equations. Indicators calculated very useful in assessing the development prospects of the North-West region, were based on two assumptions: a) the development trend will remain the same, in this case putting only the problem is if development rate of the phenomena will be the same or changes to the new conditions; b) assumes that changes the trend and development rate*

**Key words:** modeling, assumptions, data series

## INTRODUCTION

In statistics theory and practice more frequently appear the question of using statistical data series to determine the trend of development of phenomena and phases that follows. In the social and economic phenomena usually act statistical laws, which manifest as a trend that can be observed only for a big period of time. This means that the development trend of the phenomenon within certain limits of probability can be known and be used in future calculations.

To highlight the law which is manifested in the relationship between phenomena is necessary for it to be expressed as an analytical function corresponding to the relation between factorial and the results characteristics. This function is known as regression function and its graphic representation is done by regression line (curve). The correct choice of regression function that expresses the best the relationship between the two characteristics is crucial for determining the statistical correlation indicators.

Regression function expresses statistically the way that the results characteristic  $y$  changes due to changes characteristic factor  $x$  in the case that  $y$  variation would be only based on the variation of  $x$ . For this, it's necessary the other characteristic to be considered as not essential and with constant action on all units on which it's measures the ratio of interdependence and whose influence to be summed up in a single average value character.

Regression equation, represent the trend of achieving the correlation between the two variables  $x$  and  $y$ . the values of regression equations are calculated for all units observed on individual value of the variable  $x$ . So in this interdependence report is considered that the variation of characteristic  $y$  is only for varying  $x$  factor; other factors being considered with constant action and expressed as average size through parameters  $a$  and  $b$ .

In order to determine the values of regression equations it's necessary to establish the values of the two parameters  $a$  and  $b$  which expresses the relationship between the two variables. In the case that the values of characteristic  $y$  depend into a greater degree of individual values of the variable  $x$ , then between empirical values of  $y$  obtained by observation and  $Y$  values are obtained

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very small deviations. In this way the regression equations calculated are becoming a way of assessing the achievement of connections between the two variables. If deviations between empirical  $y$  values and the values of regression equations  $Y$  - theoretical values - are minimal, then means that the variation of characteristic  $y$  depends to a high degree of variation of chosen factorial characteristic. As these deviations may occur in one way or another, they are squared and because of this, the method of verifying this condition is also called the method of small squares.

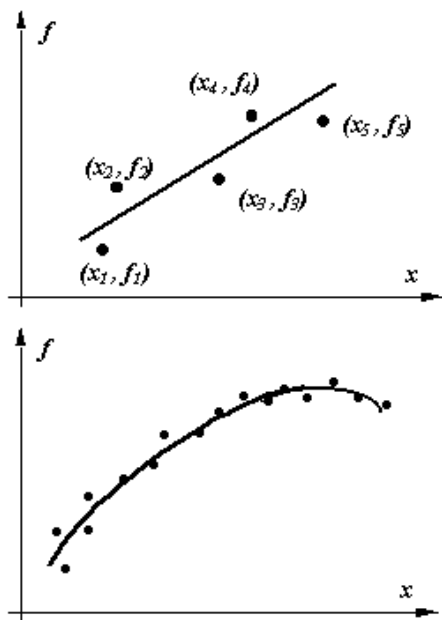
## MATERIAL AND METHODS

The purpose of this paper is the applying of the method of small squares approximation of a data series, calculating in this way the regression equation for a period of  $n$  years.

Most general formulation of the approximation problem requires that, starting from a function  $f(x)$  defined on a domain, to determine another function  $F(x)$ , with a more simple form, which to approximate as well the function  $f(x)$  over the entire domain of definition.

Method of approximation by interpolation determines approximate the function  $F(x)$  imposing the condition that to coincides with the approximated function  $f(x)$  in all nodes of interpolation. Thus, the curve associated to function  $F(x)$  is forced to follow a trajectory imposed by the position of interpolation nodes.

But this criteria is hardly effective in the case of a large number of nodes of interpolation, because the determination of polynomial coefficient approximation require a large amount of calculation and there is the risk of oscillations appearing between nodes. In addition, if the values shown itself to function  $f(x)$  are not accurate, resulting e.g. from measurements with errors, it makes no sense to impose their replication by function approximation. In these situations it is convenient to apply a method to determine the "best" function to minimize the standard deviation between  $f(x)$  and  $F(x)$  in all points of the original function value is known.



Approximate by the criteria of small squares determines a function  $F(x)$  which didn't pass through the points of definition, but between them, so that the sum of squares of deviations between the function  $F(x)$  and  $f(x)$  in these points is minimized.

To formulate this criteria, is considered the function in s table form, with  $n$  measurements  $(x_1, x_2, x_3, x_n)$  affected by inherent errors and aims to determine an approximation function  $F(x)$ , defined such as that the sum of squared deviations in points to be minimal:



$$\sum (x_i - \bar{x})^2 = \text{Minim}$$

### Work assumptions

For extrapolation of statistical data for the next stage can be used independent statistical series whose interpretation is based on time and interdependent statistical series whose development trend in the next stage of evolution depends on the factorial characteristic.

In the second case assumptions that are put into establishing the foresight calculations have in sight in the first way the knowing the development trend of phenomena and of the form in which the dynamic correlation links are made.

So, in the first assumption we can appreciate that the development trend will remain the same in this case is just a question if keeps the same development rate or it's changing to the new conditions.

A second hypothesis assumed that would change the evolution trend but also the development rate. Obviously in this case it must still exist in the statistical series - during the period which expired - a trend change of the form of evolution of phenomena that suggest the changing of development trend.

In the predicting model that we will present it is necessary to consider the solving of the following problems:

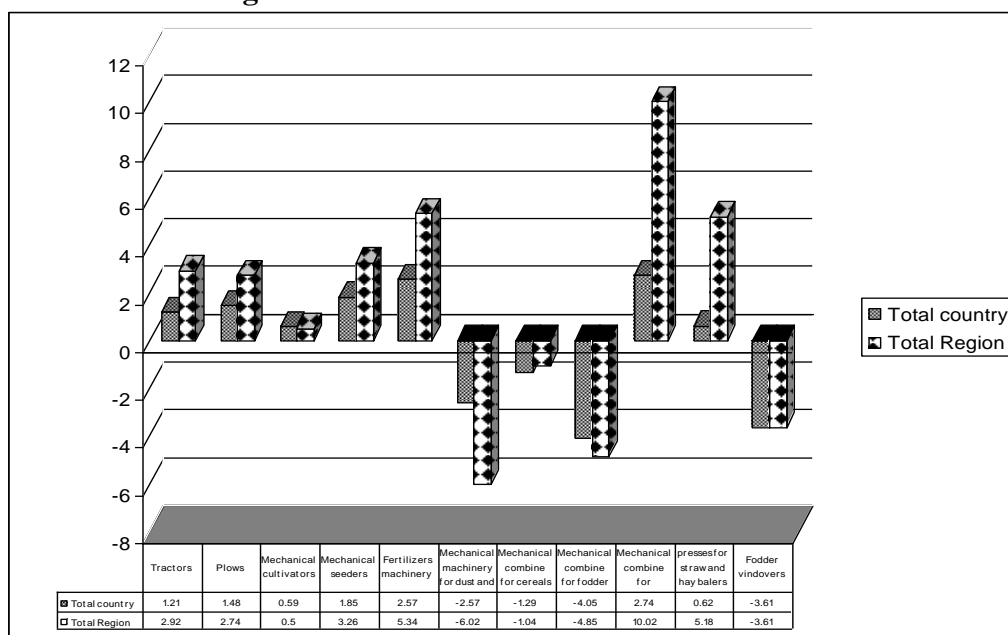
- checking the shape and direction of a relationship between factorial variable (t) and resulted variable f (t);
- Finding the theoretical values of characteristic (t) during the period in which the extrapolation is made. For this it is necessary to analyze the characteristic (t) independent from characteristic f(t);
- Finding theoretical values of resulted characteristic f(t) according to the new values of the factorial characteristic t.

Knowing the average growth rates can be calculated some very useful indicators in assessing the prospects of developing regions.

## RESULTS AND DISCUSSIONS

Here are some data regarding the annual growth rate and the trend for some of the technical agricultural indicators over a period of 11 years.

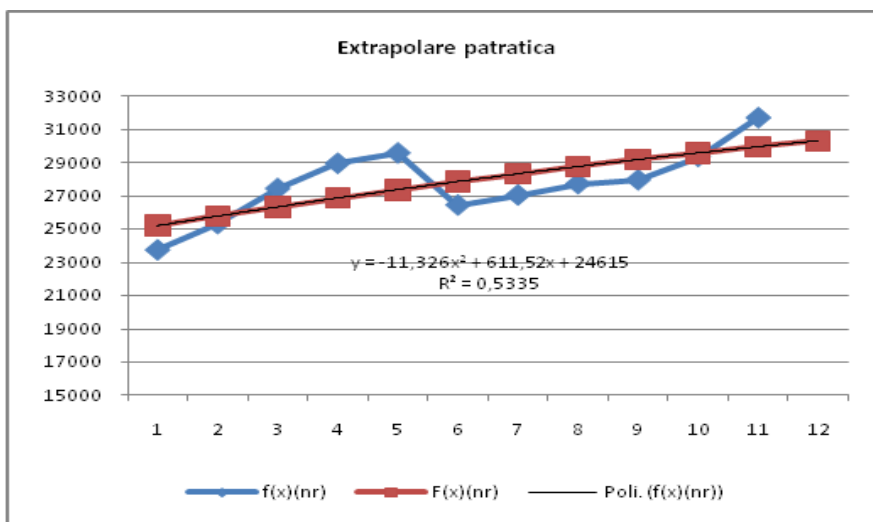
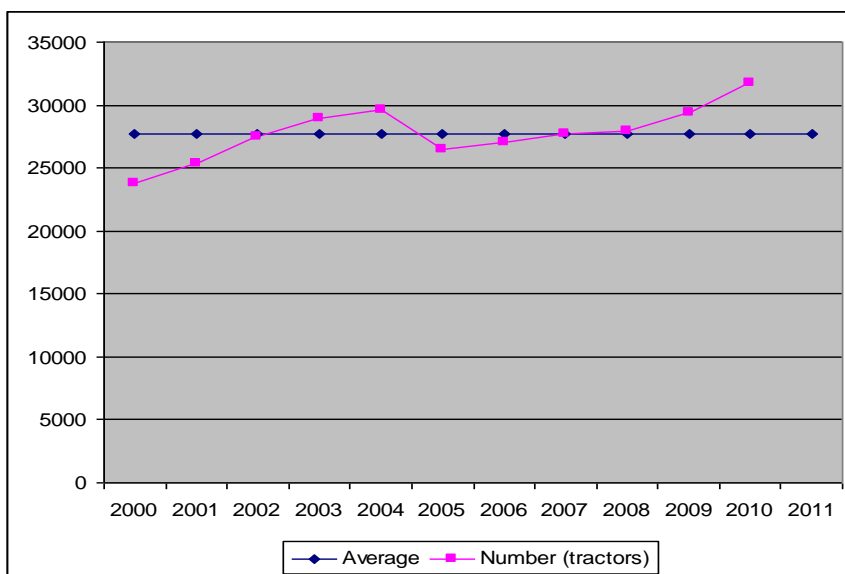
### 1. Endowment of agriculture



Dynamic of tractors number and adjustment of the dynamic series by linear regression

A. Purpose: The method of small squares of approximation the data series aiming the number of tractors for the period 2000-2010.

B. The statement: is calculated the regression equation for a period of 11 years.



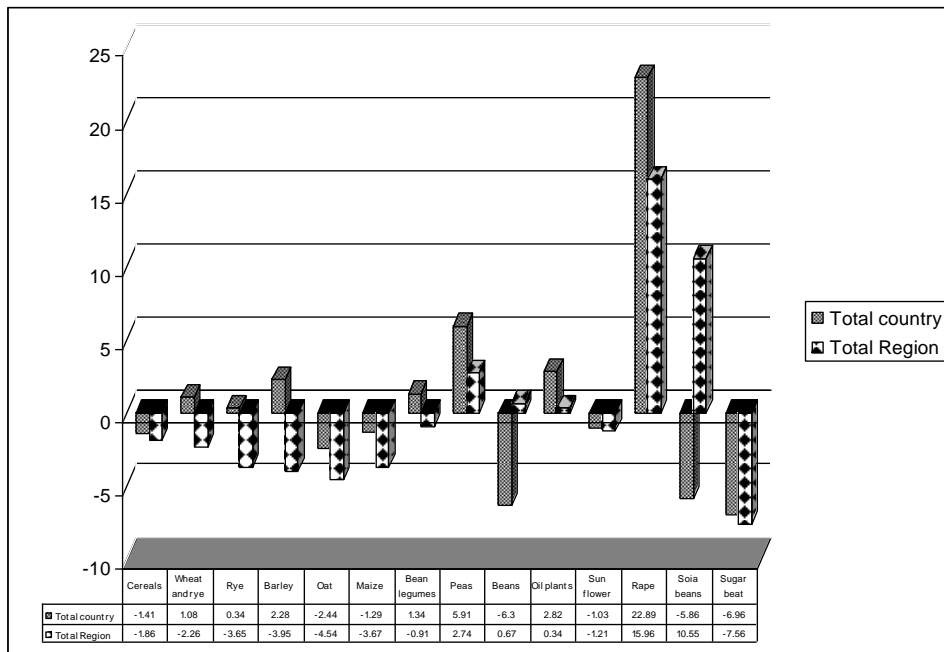
|                              |                            |                          |
|------------------------------|----------------------------|--------------------------|
| North-West region – tractors | Average growth rate 102,8% | Annual growth rate 2,92% |
|------------------------------|----------------------------|--------------------------|

**Table 1 Adjustment of dynamic series regarding the number of tractors series between 2000-2010 and 2011-2021 in North West Region**

| Adjustment of tractors number between 2000-2010 |       |  |  | Extrapolated values for tractors number between 2011-2021          |       |  |   |       |  |
|---|-------|--|--|--|-------|--|---|-------|--|
|   |       |  |  | a) I fit keeps the same trend and the same development coefficient |       |  | b) If it keeps the same development trend but it changing the growth rate of the tractors number by 1,5 times |       |  |
| t=T-1999  | Years | Tractors numbers (f <sub>t</sub> )(nr) | F*(Y <sub>t</sub> ) = a+bt+ct <sup>2</sup> | t=T-2010   | Years | F*(Y <sub>t</sub> ) = a+bt+ct <sup>2</sup> | t=T-2010  | Years | F*(Y <sub>t</sub> ) = a+bt+ct <sup>2</sup> |
| 0   | 1     | 2                                      | 3  | 4  | 5     | 6  | 7   | 8     | 9  |
| 1   | 2000  | 23770                                  | 25215                                      | 1  | 2011  | 33139                                      | 1   | 2011  | 37391                                      |
| 2   | 2001  | 25348                                  | 25793                                      | 2  | 2012  | 33717                                      | 2   | 2012  | 38247                                      |
| 3   | 2002  | 27450                                  | 26348                                      | 3  | 2013  | 34272                                      | 3   | 2013  | 39070                                      |
| 4   | 2003  | 28956                                  | 26880                                      | 4  | 2014  | 34804                                      | 4   | 2014  | 39860                                      |
| 5   | 2004  | 29577                                  | 27389                                      | 5  | 2015  | 35313                                      | 5   | 2015  | 40615                                      |
| 6   | 2005  | 26464                                  | 27876                                      | 6  | 2016  | 35800                                      | 6   | 2016  | 41337                                      |
| 7   | 2006  | 27061                                  | 28341                                      | 7  | 2017  | 36265                                      | 7   | 2017  | 42026                                      |
| 8   | 2007  | 27739                                  | 28782                                      | 8  | 2018  | 36706                                      | 8   | 2018  | 42681                                      |

|    |      |       |       |    |      |       |    |      |       |
|----|------|-------|-------|----|------|-------|----|------|-------|
| 9  | 2008 | 27972 | 29201 | 9  | 2019 | 37125 | 9  | 2019 | 43302 |
| 10 | 2009 | 29368 | 29598 | 10 | 2020 | 37522 | 10 | 2020 | 43890 |
| 11 | 2010 | 31694 | 29971 | 11 | 2021 | 37895 | 11 | 2021 | 44444 |
| 12 | 2011 |       | 30322 | 12 | 2022 | 38246 | 12 | 2022 | 44964 |

## 2. Cultivated area with the main crops between 2000-2010 in North West region



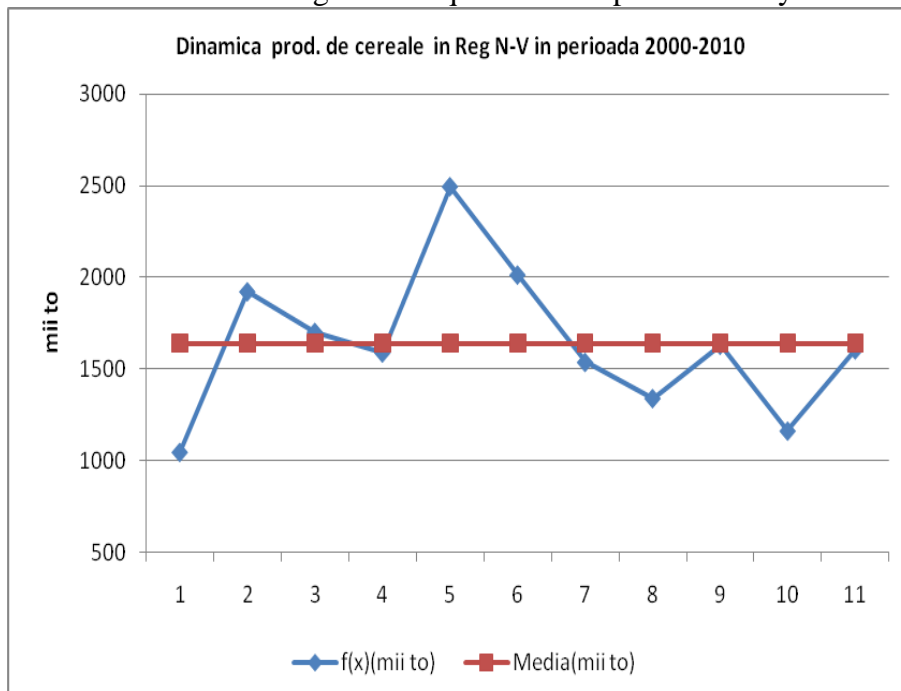
In the North-West region, in the analyzed period have been reduced the area with cereals for the legumes beans with 1,34% / year (pea bean 2.74% / year, beans 0.67% / year) and oil plants by 0.34% / year (rape 15.96% /year, soy bean 10.55% / year).

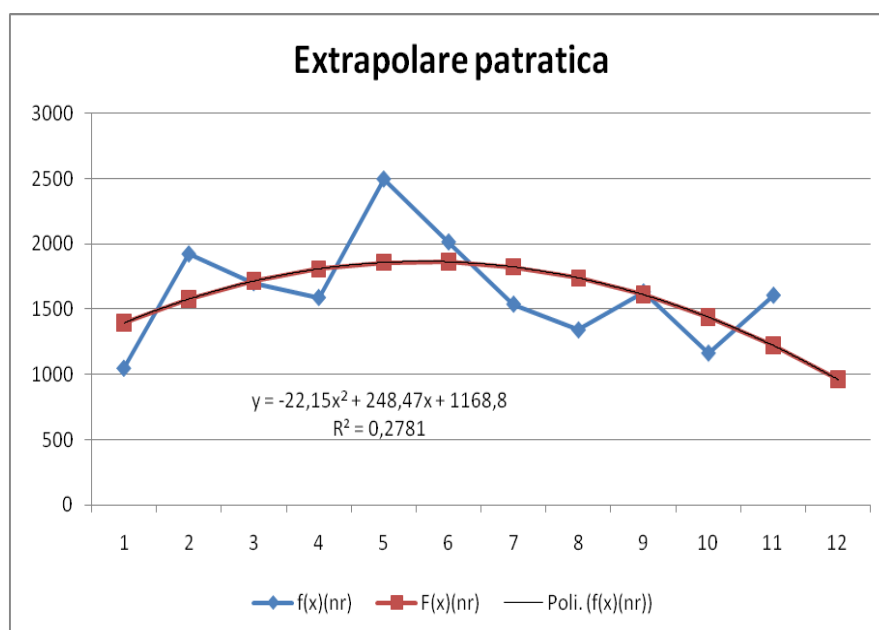
## 3. Total production for the main crops in North-West region between 2000-2010

Cereals production dynamic in the North-West region during 2000-2010 and dynamic series adjusting by quadratic regression.

A. Purpose: Applying the small squares method of data series approximation aimed at the production of cereals in the North-West region during 2000-2010.

B States: it's calculated the regression equation for a period of 11 years.





**Table 2 Dynamic series adjustment regarding the cereal production between 2000-2010 and 2011-2021, in North-West region**

| Adjustment of cereal production between 2000-2010 |       |  |  | Extrapolated values for cereal production between 2011-2021            |       |  |          |  |  |      |  |
|---|-------|--|--|--|-------|--|----------|--|--|------|--|
|   |       |  |  | a) If it keeps the same trend and the same development coefficient (b) |       |  |          | b) If it keeps the same development trend but it changing the growth rate of the total production by 1,5 times |  |      |  |
| t=T-1999  | Years | Cereal production (f <sub>t</sub> )(thou to) | F*(Y <sub>t</sub> ) = a+bt+ct <sup>2</sup> | t=T-2010   | Years | F*(Y <sub>t</sub> ) = a+bt+ct <sup>2</sup> | t=T-2010 | Years  | F*(Y <sub>t</sub> ) = a+bt+ct <sup>2</sup> |      |  |
| 0   | 1     | 2  | 3  | 4  | 5     | 6  | 7        | 8  | 9  |      |  |
| 1   | 1     | 2000   | 1048                                       | 1  | 1     | 2011                                       | 1        | 1  | 2011                                       | 2394 |  |
| 2   | 4     | 2001   | 1922                                       | 2  | 4     | 2012                                       | 2        | 4  | 2012                                       | 2707 |  |
| 3   | 9     | 2002   | 1702                                       | 3  | 9     | 2013                                       | 3        | 9  | 2013                                       | 2943 |  |
| 4   | 16    | 2003   | 1589                                       | 4  | 16    | 2014                                       | 4        | 16   | 2014                                       | 3103 |  |
| 5   | 25    | 2004   | 2494                                       | 5  | 25    | 2015                                       | 5        | 25   | 2015                                       | 3188 |  |
| 6   | 36    | 2005   | 2013                                       | 6  | 36    | 2016                                       | 6        | 36   | 2016                                       | 3196 |  |
| 7   | 49    | 2006   | 1538                                       | 7  | 49    | 2017                                       | 7        | 49   | 2017                                       | 3128 |  |
| 8   | 68    | 2007   | 1341                                       | 8  | 68    | 2018                                       | 8        | 68   | 2018                                       | 2984 |  |
| 9   | 81    | 2008   | 1631                                       | 9  | 81    | 2019                                       | 9        | 81   | 2019                                       | 2764 |  |
| 10  | 100   | 2009   | 1164                                       | 10   | 100   | 2020                                       | 10       | 100  | 2020                                       | 2469 |  |
| 11  | 110   | 2010   | 1606                                       | 11   | 110   | 2021                                       | 11       | 110  | 2021                                       | 2097 |  |
| 12  | 144   | 2011   | 961  | 12   | 144   | 2022                                       | 12       | 144  | 2022                                       | 1649 |  |

$$F^*(Y_{2000-2010}) = 1168,8 + 248,47t - 22,15t^2$$

$$F^*(Y_{2011-2020}) \text{ a} = 1168,8 + (1606 - 1048) = 1727; F(Y_{2011-2020}) = 1727 + 248,47t - 22,15t^2$$

$$F^*(Y_{2011-2020}) \text{ a}' = 1168,8 + (1606 - 1048) * 1,5 = 2055,8 + 248,47 * 1,72t - 22,15 * 1,72t^2; F(Y_{2011-2020}) = 2055,8 + 426,4t - 38,0t^2$$

**Cereal production between 2000-2010 and 2011-2020 in North-West region**

| Years                            | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|----------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Cereal cultivated area (thou ha) | 554  | 604  | 559  | 559  | 633  | 593  | 490  | 541  | 462  | 430  | 459  |
| Total production (thou to)       | 1048 | 1922 | 1702 | 1589 | 2494 | 2013 | 1538 | 1341 | 1631 | 1164 | 1606 |
| Cereals yields (kg/ha)           | 1892 | 3184 | 3047 | 2842 | 3943 | 3397 | 3139 | 2480 | 3529 | 2704 | 3498 |
| Years                            | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| Cereal cultivated area (thou ha) | 554  | 604  | 559  | 559  | 633  | 593  | 490  | 541  | 462  | 430  | 459  |
| Total production (thou to)       | 2394 | 2707 | 2943 | 3103 | 3188 | 3196 | 3128 | 2984 | 2764 | 2469 | 2097 |
| Cereals yields (kg/ha)           | 4323 | 4483 | 5268 | 5551 | 5040 | 5394 | 6383 | 5519 | 5981 | 5735 | 4568 |

## CONCLUSIONS

Extrapolating data from the period 2000-2010 was conducted on two assumptions:

- a) If it keeps the same trend and the same growth coefficient;
- b) If they keep the same development trend but changes the growth rate by 1, 5 times.

The number of tractors analyzed during 2000-2011 grew compared to 2000 range between 7% and 33%. Extrapolated value in 2000 is 26% higher compared with 2011, ie 7924 units in the first case, and 17%, ie 6718 units in the case of the second hypotheses.

Regarding the cereals production, during the same period, 2000-2011 it varied greatly from year to year, being influenced by two aspects: one climatic and other financial. However, in dynamic from the year 2000, production showed higher values that ranged between 11% and 138%, the highest value was recorded in 2004.

Extrapolated values in the two hypotheses are 44% higher for the first hypotheses and by 57% in the case of the two hypotheses.

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# SELLING WAYS OF LOCAL TRADITIONAL PRODUCTS AND THEIR INFLUENCE IN SUSTAINABLE RURAL DEVELOPMENT

DRAGOMIR NELA<sup>1</sup>, DRAGOMIR VILI<sup>2</sup>

## Abstract

*In Romania, some traditional foods present risk of disappearing due to altered lifestyle. In this paper we address the concept of sustainable which referring to time, a long time. Sustainable process must be converted to sustainable human development, oriented mainly towards quality of life and environment in special for obtain traditional products "local", by creating ethical relations between consumers and producers, in an era of globalization, industrialization and products standardized. The conservation and valorization of local/traditional products could increase the adoption of more sustainable agricultural systems together with the adoption of practices more restrictive regarding of environment and the natural habitats. So, biodiversity in the food systems is absolutely crucial for both a sustainable food production and food security. Diets based on different food species promote health by addressing the problem of micronutrient and vitamin deficiencies. Therefore, it seems that the transition towards sustainable forms of agriculture cannot be deferred further.*

**Key words:** *sustainable, local, trade, tradition*

## INTRODUCTION

In this paper we tackle the sustainable concept, referring to time, a long time. Sustainable process must be converted to sustainable human development, oriented mainly towards to quality of life and environment to "local" traditional products, which plays an important role in ethical relations establishment between consumers and producers, in an era of globalization, industrialization and standardized products [2, 3]. With the spread of globalization, local concept also revised and localization has become a slogan. Local products are very important for nature conservation and are an important element in the local economy. However, the concept of local, when is viewed as a counter to global initiatives may involve closing the geographically distances, they become "close" under new kinds of interconnected relationships between producers and consumers [12, 10, 5].

## MATERIALS AND METHODS

For a better analysis of the influence on traditional products obtaining on sustainable development of rural areas we have left from the targets set by the Brundtland report: ensuring economic growth with respect for natural resources conservation, eradication of poverty and ensuring people's needs, increase quality of life, conservation and enhancement of natural resources, monitoring of environmental economic development impact, restructuring of production technologies and the keeping under control of the risks, ensuring an integrated approach to decisions on economic growth, the environment and energy resources.

For this reason, a traditional local product is very important for nature conservation and sustainable development being that product which helps:

- Conservation of biodiversity, rural areas, habitats, rural landscapes and natural resource;
- Local economy development, supporting semi-subsistence farmers, by maintaining the agricultural activities in the system farm / household;
- Cultural heritage preservation and perpetuation of traditions in these rural areas.

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## RESULTS AND DISCUSSIONS

A negative characteristic of classic economic growth was massive exodus of population from rural to city, exodus that has had its logic, related to circumstances such as: accelerating industrialization and rural disadvantage in terms of public and private investment but also social, cultural, civic, where a force of feedback rejection and village equated with misery and ignorance.

To prevent this continues migration must take into account a number of measures that should be implemented as soon as possible, but not without regard to fighting the main reason which lead to this phenomenon.

We can not talk about economic development of rural areas without putting in the forefront the level of those area resources (livestock, processing, handicraft, tourism and so on). It must be studied this very well before making a sustainable development strategy. One of the major challenges of sustainable development is to find ways to encourage environmentally friendly economic activities and to discourage activities that cause damage to the environment (air, water and soil, subsoil respectively) [9].

In terms of local traditional products and their promotion and trading have been elaborated many an initiative thru which manufacturer is put into a relationship with consumer. Depending on the case, this relationship is more intimate and accurate, to impersonal.

Another concept, eco-economy becomes increasingly more important role in sustainable development, where more often is discussed the need to ensure equity between generations, but also within them. According to eco-economy paradigm, a sustainable economy respects the "offer" of ecosystems being dependent upon all its resources, such as fisheries, forest resources, pastures and meadows, arable land, etc. As long as demand does not exceed sustainable yields can be sustained accepted limits of natural systems. Economies based on wrong signals received from the markets on demand, will lead to irrational decisions increase the supply of products (mainly agricultural) decisions are "recipe" best for the destruction of natural systems [4].

The most practiced initiatives include: Fair Trade, Slow Food concept, commerce and community supported agriculture (CCSA), sustainable consumption and sustainable tourism.

Fair Trade is a type of trade that aims to propel small producers, disadvantaged or workers in disadvantages positions from rural areas by providing support and assistance, creating relationships with customers, and, if necessary, paying above-market prices. Shortening the distance between producers and consumers is one of the main strategies of the Fair Trade movement. There where is present the employer - employee relationship, fair trade movement aims to maintain the same standards of work, as is customary in ethical trade. There are often confusion between fair trade and ethical trade. This contributes to sustainable development by offering better trading conditions marginalized producers and workers. Through fair trade, producers have more control over his work and life [5].

Fair trade is a trading partnership, based on dialogue, transparency and respect that seek to protect the environment, biodiversity, and economic growth without harming the environment area (eco-economy).

Organizations that produce in this fair trade system maximizes the use of raw materials from sustainably managed sources, purchased locally whenever is possible. They use production technologies aimed at reducing energy consumption and where is possible the use of renewable energy technologies that minimize emissions of greenhouse gases, minimizing the environmental impact of waste products

Agricultural producers minimize their environmental impact by using organic pesticides or light pesticide whenever is possible [10].

Those who purchase and import Fair Trade products give priority to products made from raw materials from sustainably managed sources and have the lowest environmental impact possible.

All organizations are using recycled or easily biodegradable materials for packing and goods are dispatched by sea wherever is possible.

**SLOWFOOD campaign** is an international movement that advocates to food pleasure, but protects biodiversity, spread taste education, link "green" producers with consumers and believes that gastronomy intersects with policy, agriculture and ecology. Slow Food is an eco-gastronomy nonprofit organization that was founded as a response to fast-food, consumed in speed from contemporary life, the disappearance of local food traditions and people's declining interest in food.

The founder of manifesto Slow Food with other organizations that activate in the organic movement promotes and supports projects that protect agricultural biodiversity and gastronomic traditions respecting local cultural identity, respect for the earth, sustainable animal husbandry and health of end users [8].

A related movement with the concept of the Slow Food which defends fair trade is Terra Madre, a network of small-scale producers, scattered around the world that have as main objective to conserve biodiversity and support local community through labor relations, legal, simple dialogue between manufacturers. This initiative has a positive impact on promoting and marketing scale of Romanian traditional products, especially as Romania is one of the countries where this movement has been very active in recent years.

**Electronic trade** refers to specific business activities (transactions) in an integrated automated environment for the exchange of information using electronic (computer networking) [1].

The basic idea is that e-commerce can be achieved exchange of ideas, goods, knowledge in addition to simple sale / purchase of goods and services.

Electronic trade technologies can be used to run a business communication using the Internet, Intranet or other computer networks. In recent years the Internet has become increasingly used for e-commerce. The Internet has a global reach and is in excellent decentralized [1,7].

Electronic commerce has been a real springboard for small producers of traditional products from Maramures area, Sibiu, Bucovina, Danube Delta, because they have managed to sell a lot of products made in their own households and to promote tourist area of origin.

**Direct selling** is that business practice thru which products or services are sold opened directly to consumers outside the retail areas through direct sellers who offer products and services for sale. It is systems that interact with people and gain new knowledge and the obtained profit is direct proportionally with the effort. This system is practiced generally in fairs, markets, leaflets, exhibitions etc.

**Agriculture Supported by the Community (ASC)** is a socio-economic model of food production and distribution. The term comes from English more exactly Community-supported agriculture how is called in the USA and in Canada can be found under the name of Community Shared Agriculture. A A.S.C. is composed by a group of individuals who provide support to a firm (or a manufacturer), where clients and farmers share the risks and benefits of the entire process by which food is produced. This system consists of weekly delivery or personal lifting a basket of local traditional products, fruit and vegetables. Such customer groups and farmers can form cooperative partnerships to finance sustainable and organic agriculture.

It is an agricultural trading system that helps small farmers in rural areas who want to practice sustainable agriculture. They may enter into a direct partnership with many consumers who want to be sure that they consume agricultural products healthy and fresh. Thus, the farmer delivers consumer, by subscription, a weekly basket comprising the various crops. Consumers are required to pay the price basket negotiated agreement early and the farmer is not left with unsold merchandise. Through this system of commerce, neither side has not lost [3,6].

Although had successful in many countries, this system is at the beginning in Romania and have it exclusively only large restaurants and people with a budget higher than average and who want organic products obtained by traditional methods.



**Sustainable consumption:** refers to a fundamental change in consumer behavior by addressing a sustainable lifestyle, changing the way of thinking and acting. You must cultivate your family first consumption of local traditional events associated with social, cultural and religious community obtained. It is the only way of ensuring sustainable consumption [11].

Should not be overlooked contribution of local authorities which can achieve by geographic area or county level, maps of farms producing traditional products and authorized to sell local contacts and auto routes or railroads.

## CONCLUSIONS

In conclusion, to help an area to develop quickly we can use *local* or *traditional* word that brings to mind such *return among nature*, and this must be speculated and profited especially among traditional local producers. But to realize this so quickly is necessary the involvement of competent state bodies to provide advice to small producers of traditional products, and producer associations, companies on ways parents to make their products and their market, eco-economic development of the area and preserve agricultural and livestock biodiversity.

Marketing initiatives presented in this paper are a starting point for this target group. In Romania, it is known that the best catches are direct sales, e-commerce, fair trade and then fair trade and ASC. However should also focus on sustainable consumption to justify the investment in the area's economic rise and also sustainable tourism. Must at the county level, regional, geographically traditional products small producers to become more visible by making guides, maps with auto routes, train or tours that offer products to show local traditional specific area and contacts and events that occur during the year.

Traditional direct sales of these products in markets, exhibitions from big cities do not help small manufacturers of traditional producers and even the consumer will not always have "real" products because this counterfeit products on the market that sell eco logo or traditional.

We believe that Romanian producers are open to new ideas and be better informed and helped on their way to promote local products, the birthplace of economic development, to raise the standard of living in less favored areas of origin.

## ACKNOWLEDGEMENT

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# COMPARATIVE ANALYSIS OF NUTRITIONAL QUALITY AND FUNCTIONAL EFFECTS OF SOME FUNCTIONAL BAKERY PRODUCTS FROM ROMANIAN MARKET

EFTIMIE MARIANA<sup>1</sup>, PETRESCU VIOREL<sup>2</sup>, CONSTANDACHE MIHAELA<sup>3</sup>

## Abstract

*One solution to improve the nutritional level of the population, especially in disadvantaged areas, is the enrichment and fortifying consumer foods. This study aims at analyzing the possible beneficial effects of bread fortified with various micronutrients that gives product functionality. The aim of research is a comparative analysis of nutritional quality and functional effects of bakery products of three major producers in Romania, respectively SC DobrogeaGrup S.A. Constanta, Smart Food Solutions Company and the VelPitar Group. We could identify thus the most efficient bakery product from the nutritional perspective as well as from the functional one. Thus, Whole Wheat bread is an important source of dietary fiber which can reduce blood cholesterol levels thereby decreasing the risk of heart disease, can promote proper digestion, can regulate blood glucose, thereby preventing type 2 diabetes and can provide a quick sensation of satiety helping to maintain body weight. Sana Bongrana Ultrafibre is rich in fiber and may reduce risk of diabetes It can also lower blood cholesterol levels, being a functional product recommended for health of cerebral, cardiovascular and digestive systems. BenecolDobrogea product is a threefold functional bread that, in addition to the lowering cholesterol effect, has a high content of fiber, which helps regulate bowel movements and at the same time, a low-carbohydrate, which recommends it to the people with diabetes. Sana BongranaBenexia bread has a remarkable nutritional value and its content of Benexia sage seeds brings an important contribution to the body of  $\omega$ 3 and  $\omega$ 6 fatty acids, with beneficial effects on the functioning of the cardiovascular and immune systems.*

**Key words:** *nutritional intervention, functional effects, functional foods, nutritional quality, synthetic indicator of quality*

## INTRODUCTION

An important issue in the development of nutritional intervention programs is the counteraction of resistance factors of the population in terms of changing consumer habits. Lack of time or knowledge regarding healthy eating, family preferences for consumption of fatty foods or those which contain significant amounts of salt, sensory motivations (taste, smell), psychological ones (lack of will) and also economic constraints are the main barriers in an attempt of changing dietary habits. Prescriptions based on scientific legitimacy may be rejected as well as those based on ideological reasons, so a key role in defining nutritional policies is to obtain population's acceptability about the intended changes.

A solution to avoid these barriers is the introduction of functional foods in the diet in order to achieve certain long term health benefits, thus reducing the risk of chronic diseases among the population.

Assuming that one of the solutions for improving the nutritional level of the population, especially in disadvantaged areas, is the enrichment and fortification of consumer foods [1, 2, 3], this study aims to examine possible beneficial effects of bread fortified with various micronutrients that give functionality to the product.

Bread can be considered a food vector because it is a stable product consumed by the entire population, also because in many cases the culinary practices may introduce significant losses of nutrients compromising the success of the enrichment program. Bread is the food of greater use in the daily diet of Romanians and therefore it can be used for efficient leading of a supplementary

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feeding program with a number of biologically active substances that give the finished product functionality.

## **MATERIAL AND METHODS**

To assess the quality of functional bakery products we will calculate the synthetic indicators of quality products as a quantitative expression of key quality characteristics to identify the most effective solution in terms of energy and nutrients to ensure the health of the population through the consumption of functional bakery products. The methodology of implementing the quality synthetic indicator involved the following steps:

- Selection of functional bakery products offered by three competing companies such as SC DobrogeaGrup S.A. Constanta, Smart Food Solution Company and the VelPitar Group, that have the same basic feature;
- Selection of key quality characteristics specific to the analyzed functional products, extracted from standards, technical standards, analysis bulletins;
- Characteristics' classification according to the specific of the product in energy, nutritional and economic characteristics;
- Grouping selected characteristics, according to their importance in determining the quality of the consumer's point of view in main, secondary and minor features;
- Turning of attributive judgments in points or notes;
- Providing the share of characteristics through quadratic matrix method;
- Calculate of the complex index of quality;
- Hierarchy of functional products in descending order of values of the complex indicator of quality [5].

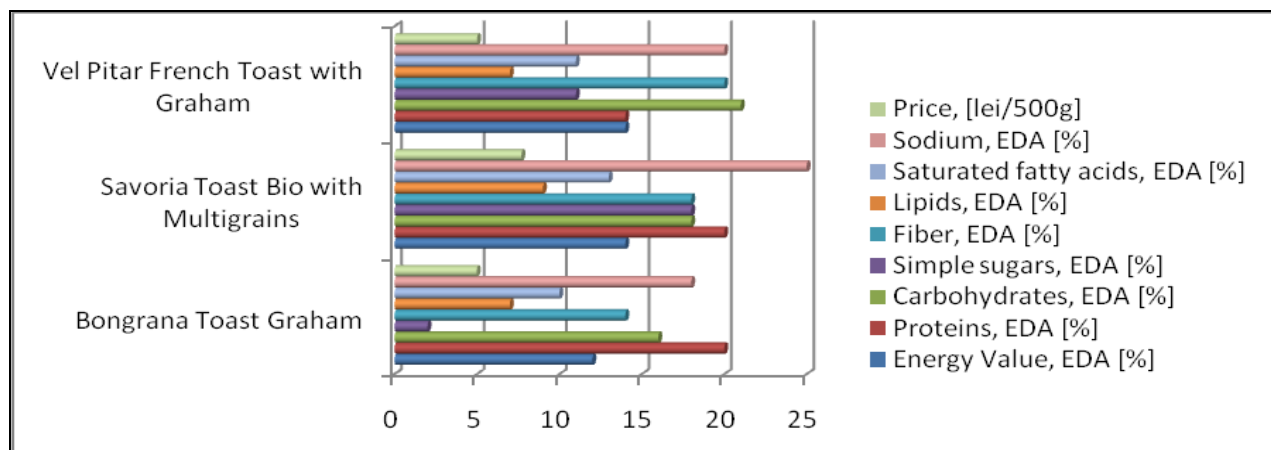
## **RESULTS AND DISCUSSIONS**

Many local bakery manufacturers have launched on the market in recent years, a number of functional products that are designed both for the consumers that have different affections and for the consumers showing a major interest in healthy eating to reduce the risk of certain chronic diseases. Next, we will make a comparative analysis of the nutritional quality and functional effects of three major bakery product manufacturers in Romania such as SC DobrogeaGrup S.A. Constanta, Smart Food Solution Company and the VelPitar Group.

Figure 1 comparatively shows the energetic, nutritive and economic efficiency of Graham Toast bakery products of most representative three producers in Romania. The most efficient in terms of energy and nutrients is considered the product with the lowest energy value, the higher content of protein and dietary fiber and the lower content of carbohydrates, simple sugars, saturates fatty acids and sodium. Based on economic reasons, the most efficient product is considered the lowest priced one which is more accessible to the consumers. As it can be seen in figure 1 an intake of 100 g BongranaToast Graham provides 20% of the body's daily requirement of protein, a sufficient intake of dietary fiber (14% EDA) under the conditions of a low intake of carbohydrates (16% EDA), simple sugars (2% EDA), lipids (7% EDA) and respectively saturated fatty acids (10% EDA) and sodium (18% EDA). From an economic perspective, the product Bongrana Toast Graham is the most accessible for population compared with other homologue products of their competitors. The product Savoria Toast Bio with Multigrains have the same protein value (20% EDA), a higher fiber content than BongranaToast Graham product (18% EDA compared with 14% EDA), but in terms of carbohydrates, simple sugars, lipids, saturated fatty acids and sodium intake, these are higher than homologue products of the competition. Economically speaking, Savoria Toast Bio with Multigrains is the least accessible to the public, however it should be kept in mind that it is a Bio product obtained by a careful monitoring of raw materials and related processes, which explains the higher price.

In order to form a clearer picture of the quality of Toast Graham bakery products of the three manufacturers we will make a comparative analysis by calculating synthetic indicators of quality. Quality characteristics used in the analysis were:

- C<sub>1</sub> – energy intake by eating 100 g product, EDA [%];
- C<sub>2</sub> – protein intake by eating 100 g product, EDA [%];
- C<sub>3</sub> – carbohydrates intake by eating 100 g product, EDA [%];
- C<sub>4</sub> – simple sugars intake by eating 100 g product, EDA [%];
- C<sub>5</sub> – fiber intake by eating 100 g product, EDA [%];
- C<sub>6</sub> – lipids intake by eating 100 g product, EDA [%];
- C<sub>7</sub> – saturated fatty acids intake by eating 100 g product, EDA [%];
- C<sub>8</sub> – sodium intake by eating 100 g product, EDA [%].



**Figure1. Energetically, nutritive and economic efficiency of Toast Graham bakery products of some representatives Romanian manufacturers**

EDA – Estimated daily amount for a person weighing 70 kg (adult), a normal level of physical activity and a caloric need of 2000 kcal/day

Taking into consideration the nutritional recommendations, we are considering that the values of C<sub>2</sub> and C<sub>5</sub> characteristics have a directly proportional influence on the quality of the functional product while the influence of C<sub>1</sub>, C<sub>3</sub>, C<sub>4</sub>, C<sub>6</sub>, C<sub>7</sub> and C<sub>8</sub> is quite the opposite. To calculate the complex quality indicator we will calculate the shares of the characteristics by quadratic matrix method (Table 1). Quality characteristics and their shares for Graham Toast bread products and product prices are shown in Table 2. These data will be used to calculate the complex indicator of quality.

The synthetic indicator of Toast Graham bakery products quality will be:

$$I_q \text{ BTG/R} = \frac{12}{12} \times 0,056 + \frac{20}{20} \times 0,194 + \frac{16}{16} \times 0,056 + \frac{2}{2} \times 0,111 + \frac{14}{20} \times 0,194 + \frac{7}{7} \times 0,139 + \frac{10}{10} \times 0,194 + \frac{18}{18} \times 0,056 = 0,942$$

$$I_q \text{ STBM/R} = \frac{12}{14} \times 0,056 + \frac{20}{20} \times 0,194 + \frac{16}{18} \times 0,056 + \frac{2}{18} \times 0,111 + \frac{18}{20} \times 0,194 + \frac{7}{9} \times 0,139 + \frac{10}{13} \times 0,194 + \frac{18}{25} \times 0,056 = 0,736$$

$$I_q \text{ VPFTG/R} = \frac{12}{14} \times 0,056 + \frac{14}{20} \times 0,194 + \frac{16}{21} \times 0,056 + \frac{2}{11} \times 0,111 + \frac{20}{20} \times 0,194 + \frac{7}{7} \times 0,139 + \frac{10}{11} \times 0,194 + \frac{18}{20} \times 0,056 = 0,806$$

The synthetic indicator of the quality / price ratio of Toast Graham bakery products will be:

$$I_{q/p} \text{ BTG/R} = \frac{4,99}{4,99} \times 0,942 = 0,942$$

$$I_{q/p} \text{ STBM/R} = \frac{4,99}{7,7} \times 0,736 = 0,477$$

$$I_{q/p} \text{ VPFTG/R} = \frac{4,99}{5,01} \times 0,806 = 0,803$$

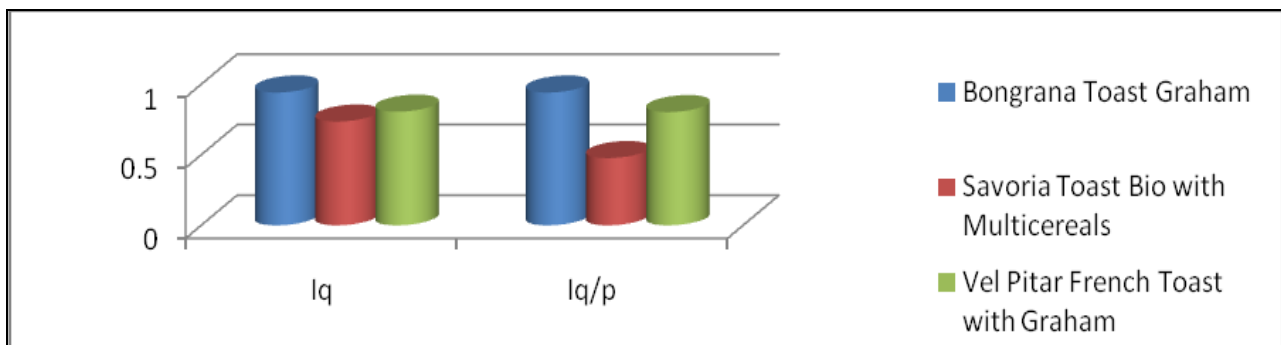
**Table 1 Share of the quality characteristics of Toast Graham bakery product of the most representative Romanian producers, obtained by quadratic matrix method**

|                | C <sub>1</sub> | C <sub>2</sub> | C <sub>3</sub> | C <sub>4</sub> | C <sub>5</sub> | C <sub>6</sub> | C <sub>7</sub> | C <sub>8</sub> | Total C <sub>i</sub> | C <sub>i</sub> /total | p <sub>i</sub>         |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------------|-----------------------|------------------------|
| C <sub>1</sub> | 1              | 0              | 1              | 0              | 0              | 0              | 0              | 0              | 2                    | 2/36                  | 0,056                  |
| C <sub>2</sub> | 1              | 1              | 1              | 1              | 0              | 1              | 1              | 1              | 7                    | 7/36                  | 0,194                  |
| C <sub>3</sub> | 0              | 0              | 1              | 0              | 0              | 0              | 0              | 1              | 2                    | 2/36                  | 0,056                  |
| C <sub>4</sub> | 1              | 0              | 1              | 1              | 0              | 0              | 0              | 1              | 4                    | 4/36                  | 0,111                  |
| C <sub>5</sub> | 1              | 1              | 1              | 1              | 1              | 1              | 0              | 1              | 7                    | 7/36                  | 0,194                  |
| C <sub>6</sub> | 1              | 0              | 1              | 1              | 0              | 1              | 0              | 1              | 5                    | 5/36                  | 0,139                  |
| C <sub>7</sub> | 1              | 0              | 1              | 1              | 1              | 1              | 1              | 1              | 7                    | 7/36                  | 0,194                  |
| C <sub>8</sub> | 1              | 0              | 0              | 0              | 0              | 0              | 0              | 1              | 2                    | 2/36                  | 0,056                  |
| Total          |                |                |                |                |                |                |                |                | 36                   |                       | $\sum_{i=1}^8 p_i = 1$ |

**Table 2 Quality characteristics, their weight sand prices of Graham Toast bakery products of the most representative producers in Romania**

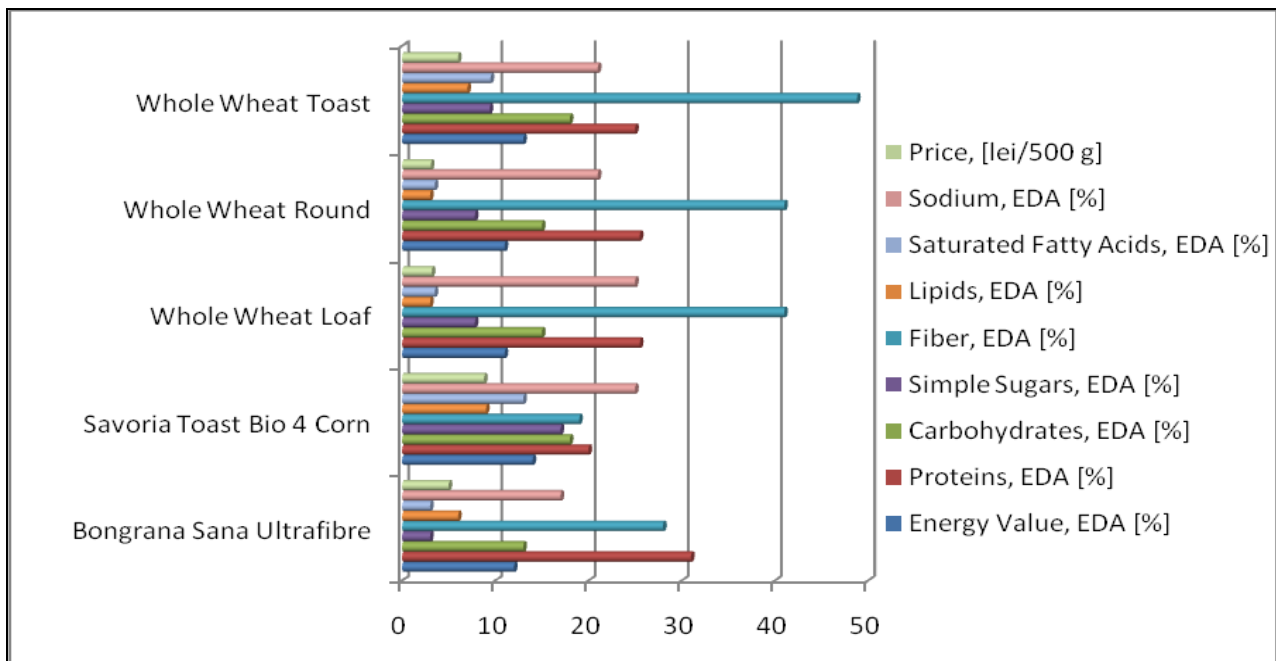
| Characteristics<br>Products                           | Proportional Characteristics |                | Inversely Characteristics |                |                |                |                |                | Price, [lei] |
|---|------------------------------|----------------|---------------------------|----------------|----------------|----------------|----------------|----------------|--------------|
|   | C <sub>2</sub>               | C <sub>5</sub> | C <sub>1</sub>            | C <sub>3</sub> | C <sub>4</sub> | C <sub>6</sub> | C <sub>7</sub> | C <sub>8</sub> |              |
| P <sub>DG</sub> , Bongrana Toast Graham               | 20                           | 14             | 12                        | 16             | 2              | 7              | 10             | 18             | 4,99         |
| P <sub>SFS</sub> , Savoria Toast Bio with Multigrains | 20                           | 18             | 14                        | 18             | 18             | 9              | 13             | 25             | 7,70         |
| P <sub>VP</sub> , Vel Pitar French Toast with Graham  | 14                           | 20             | 14                        | 21             | 11             | 7              | 11             | 20             | 5,01         |
| Reference product                                     | 20                           | 20             | 12                        | 16             | 2              | 7              | 10             | 18             | 4,99         |
| Weights   | 0,194                        | 0,194          | 0,056                     | 0,056          | 0,111          | 0,139          | 0,194          | 0,056          |              |

Graham Toast bakery products hierarchy given that the synthetic indicator of quality and respectively the synthetic indicator of quality / price ratio are presented in Figure 2. It can be seen that both in terms of energy and nutrients efficiency, and in terms of economic efficiency, the most valuable product is Bongrana Toast Graham, followed by VelPitar French Toast with Graham and Savoria Toast Bio with Multigrains. Due to economic reasons Savoria Toast Bio with Multigrains is the least accessible to the public, but it should be kept in mind that it is a Bio product obtained by careful monitoring of raw materials and related processes, which explains the higher price.



**Figure 2. Graham Toast bakery products hierarchy of the most representative producers in Romania, by synthetic indicators of quality**

Figure 3 presents energy, nutritive and economic efficiency of high fiber bakery products promoted on the Romanian market of most representative domestic producers. The most effective products both economically and in terms of nutritional products are Whole Wheat Round and Whole Wheat Loaf. Thus, under the conditions of low energy values, covering 11% of daily energy needs, consumption of 100 g Whole Wheat Loaf provides 25.5% of the daily protein requirement, 41% of the fiber, due to a low intake carbohydrate (15% EDA), simple sugars (7.8% EDA), lipids (3% EDA) and saturated fatty acids (3.5% EDA). It is also very important the potassium intake (22% RDA), magnesium (40% RDA) and folic acid (31% RDA), mineral bioactive compounds that multiplies the product functionality. Nutritionally valuable, Bongrana Sana Ultrafibre ensures a high protein intake (31% EDA) and dietary fiber (28% EDA) under a moderate intake of carbohydrates (13% EDA) and simple sugars (3% EDA), but it has a reduced accessibility due to its higher price. Savoria Toast 4 Corn Bio is a Bio product with considerable nutritional value, but with a much higher price compared to other products.



**Figure 3 Energy, nutritive and economic efficiency of bakery products rich in fiber of the most representative producers in Romania**

In order to form a clearer picture of the quality of bakery products with high fiber content of the three manufacturers we will comparatively analyze their quality by calculating the synthetic indicators of quality, using the same quality features as in the previous case. Quality characteristics and their weights for bakery products rich in fiber, calculated by quadratic matrix method and product prices are shown in Table 3. These data will be used to calculate complex indicator of quality.

The synthetic indicator of quality of bakery products rich in fiber will be:

$$I_q = \frac{11}{12} \times 0,056 + \frac{31}{31} \times 0,194 + \frac{13}{13} \times 0,056 + \frac{3}{3} \times 0,111 + \frac{28}{48,8} \times 0,194 + \frac{3}{6} \times 0,139 + \frac{3}{3} \times 0,194 + \frac{17}{17} \times 0,056 = 0,843$$

$$I_q = \frac{11}{14} \times 0,056 + \frac{20}{31} \times 0,194 + \frac{13}{18} \times 0,056 + \frac{3}{17} \times 0,111 + \frac{19}{48,8} \times 0,194 + \frac{3}{9} \times 0,139 + \frac{3}{13} \times 0,194 + \frac{17}{25} \times 0,056 = 0,434$$

$$I_q = \frac{11}{11} \times 0,056 + \frac{25,5}{31} \times 0,194 + \frac{13}{15} \times 0,056 + \frac{3}{7,8} \times 0,111 + \frac{41}{48,8} \times 0,194 + \frac{3}{3} \times 0,139 + \frac{3}{3,5} \times 0,194 + \frac{17}{25} \times 0,056 = 0,814$$

$$I_q = \frac{11}{11} \times 0,056 + \frac{25,5}{31} \times 0,194 + \frac{13}{15} \times 0,056 + \frac{3}{7,8} \times 0,111 + \frac{41}{48,8} \times 0,194 + \frac{3}{3} \times 0,139 + \frac{3}{3,5} \times 0,194 + \frac{17}{21} \times 0,056 = 0,821$$

$$I_q = \frac{11}{13} \times 0,056 + \frac{25}{31} \times 0,194 + \frac{13}{18} \times 0,056 + \frac{3}{9,4} \times 0,111 + \frac{48,8}{48,8} \times 0,194 + \frac{3}{7} \times 0,139 + \frac{3}{9,5} \times 0,194 + \frac{17}{21} \times 0,056 = 0,638$$

The synthetic indicator of the quality / price ratio for bakery products with high fiber content is:

$$I_{q/p \text{ BSU/R}} = \frac{3,08}{4,99} \times 0,843 = 0,520$$

$$I_{q/p \text{ STBC/R}} = \frac{3,08}{8,79} \times 0,434 = 0,152$$

$$I_{q/p \text{ WWL/R}} = \frac{3,08}{3,19} \times 0,814 = 0,786$$

$$I_{q/p \text{ WWR/R}} = \frac{3,08}{3,08} \times 0,821 = 0,821$$

$$I_{q/p \text{ WWT/R}} = \frac{3,08}{5,99} \times 0,638 = 0,328$$

**Table 3. Quality characteristics, their weights and prices of high fiber bakery products of the most representative producers in Romania**

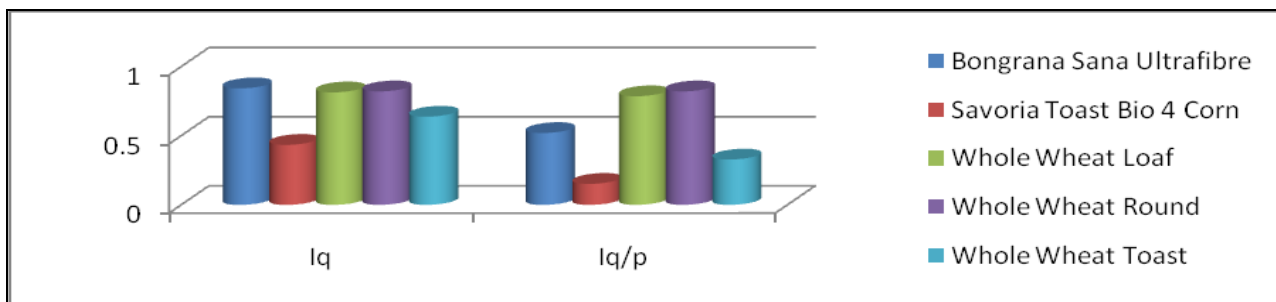
| Characteristics<br>Products                  | Proportional<br>Characteristics |                | Inversely Characteristics |                |                |                |                |                | Price,<br>[lei] |
|--|---------------------------------|----------------|---------------------------|----------------|----------------|----------------|----------------|----------------|-----------------|
|  | C <sub>2</sub>                  | C <sub>5</sub> | C <sub>1</sub>            | C <sub>3</sub> | C <sub>4</sub> | C <sub>6</sub> | C <sub>7</sub> | C <sub>8</sub> |                 |
| P <sub>BSU</sub> , Bongrana Sana Ultrafibre  | 31                              | 28             | 12                        | 13             | 3              | 6              | 3              | 17             | 4,99            |
| P <sub>STBC</sub> , Savoria Toast Bio 4 Corn | 20                              | 19             | 14                        | 18             | 17             | 9              | 13             | 25             | 8,79            |
| P <sub>GfR</sub> , Whole Wheat Loaf          | 25,5                            | 41             | 11                        | 15             | 7,8            | 3              | 3,5            | 25             | 3,19            |
| P <sub>GfR</sub> , Whole Wheat Round         | 25,5                            | 41             | 11                        | 15             | 7,8            | 3              | 3,5            | 21             | 3,08            |
| P <sub>GfR</sub> , Whole Wheat Toast         | 25                              | 48,8           | 13                        | 18             | 9,4            | 7              | 9,5            | 21             | 5,99            |
| Reference product                            | 31                              | 48,8           | 11                        | 13             | 3              | 3              | 3              | 17             | 3,08            |
| Weights                                      | 0,194                           | 0,194          | 0,056                     | 0,056          | 0,111          | 0,139          | 0,194          | 0,056          |                 |

It can be seen that in terms of energy and nutritive efficiency the most valuable product is Bongrana Sana Ultrafibre, closely followed by Whole Wheat Round and Whole Wheat Loaf and then by Whole Wheat Toast and Savoria Toast Bio 4 Corn and according to quality / price ratio most valuable product is Whole Wheat Round followed by Whole Wheat Loaf, Bongrana Sana Ultrafibre, Whole Wheat Toast and Savoria Toast Bio 4 Corn (Figure 4). Should be kept in mind that Savoria Toast Bio 4 Corn is a Bio product obtained by a careful monitoring of raw materials and related processes, which explains the higher price.

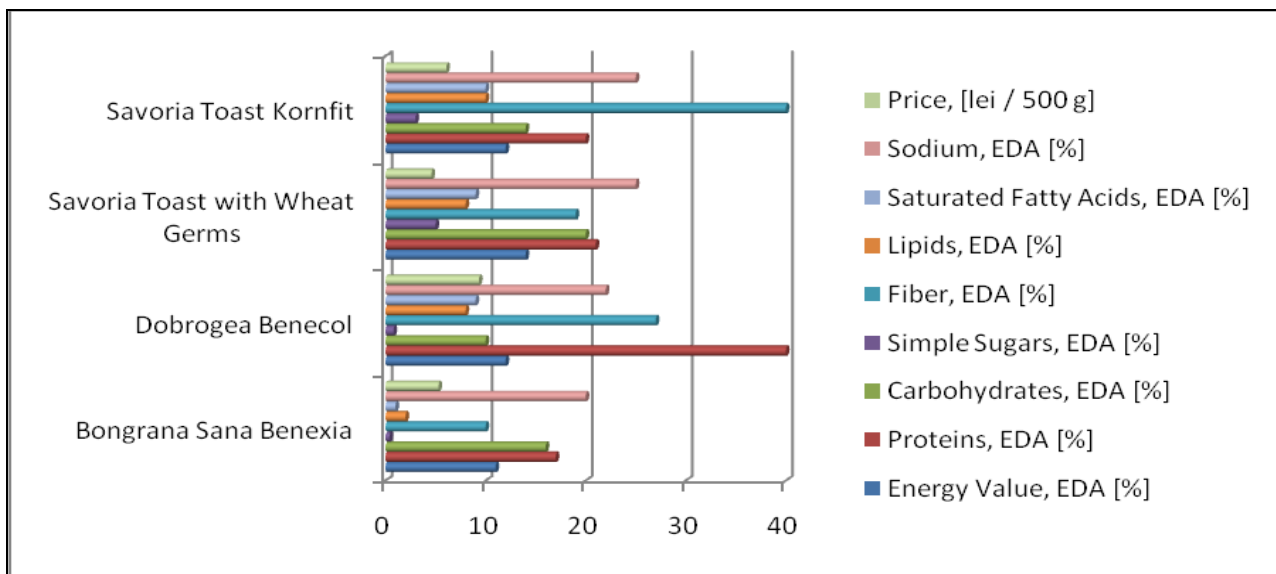
Figure 5 comparatively presents the energy, nutritive and economic efficiency of some products with special functionality of the main bakery producers in Romania. Comparing Bongrana Sana Benexia with Savoria Toast Kornfit, both enriched with vegetable sources of  $\omega_3$  and  $\omega_6$ , it can be seen that, in nutritive terms, Savoria Toast Kornfit is more efficient, but because of its higher price it has a lower accessibility among consumers. Thus, in nutritive terms, in terms of a lower energy values covering 12% of daily energy requirements (compared to 11% for the competing product) and a moderate intake of carbohydrates (14% EDA versus 16% EDA properly Bongrana Sana Benexia) Savoria Kornfit Toast is a great source of protein (20% EDA compared with 17%



EDA corresponding Bongrana Sana Benexia), dietary fiber (40% compared with only 10% EDA properly Bongrana Sana Benexia) and polyunsaturated fatty acids type  $\omega_3$  (6.5% RDA compared to 34% RDA, according Bongrana Sana Benexia) and  $\omega_6$  (39% RDA compared to 2.4% RDA corresponding Bongrana Sana Benexia). It should be noted that the ratio of polyunsaturated fatty acids  $\omega_3 / \omega_6$  is optimal for the body needs for Savoria Toast Kornfit and it is unbalanced for the Bongrana Sana Benexia product. It is also remarkable the intake of micronutrients and vitamins brought by consumption of 100 g Bongrana Sana Benexia: iron (5.8% RDA), magnesium (4% RDA), calcium (3.3% RDA), potassium (4.3% RDA) and vitamin A (0.06% RDA), compared to bring micronutrients intake by eating 100 g Savoria Toast Kornfit: magnesium (1.5% RDA), potassium (4.3% RDA) and phosphorus (40% RDA). Despite the more balanced intake of  $\omega_3$  and  $\omega_6$  polyunsaturated fatty acids of the product Savoria Toast Kornfit due to lower prices, Bongrana Sana Benexia enjoy greater accessibility to consumers, being at the same time, a valuable source of bioactive elements with functionality for the body.



**Figure4. Ranking the high fiber bakery products of the most representative producer in Romania, by synthetic indicators of quality**



**Figure5. Energy, nutritive and economic efficiency of products with special functionality of the most representative bakery producers in Romania**

The comparative analysis of energy, nutritive and economic efficiency of other two products with special functionality that addresses the same segment of the population, DobrogeaBenecol and Savoria Toast with Wheat Germs (Figure 5), reveals a special nutritive intake, superior of the DobrogeaBenecol product, coupled with a better efficiency of its functionality, proven clinically to reduce blood cholesterol levels, but the level of their accessibility is diminished by its relatively high price. Thus, under a low energy value (12% EDA), a daily consumption of 100 g DobrogeaBenecol provides, in addition to a 10% reduction in blood cholesterol levels, a substantial contribution of protein (40% EDA) and dietary fiber (27% EDA),

much higher than the protein intake (21% EDA) and of dietary fiber (19% EDA) provided by consumption of 100 g Savoria Toast with Wheat Germs. It is also remarkable the micronutrient intake of Savoria Toast with Wheat Germs such as: magnesium (15% RDA) and phosphorus (43% RDA). Under these conditions, due to the more affordable price and considerable nutritional value, Savoria Toast with Wheat Germs remains a more economical alternative for consumers.

## CONCLUSIONS

With multiple health benefits, the introduction of functional foods in the diet may reduce the risk of chronic diseases and provide health insurance for population on long term. Bakery products can be successfully used in nutritional intervention programs because bread is a stable food, the most used in Romanian daily diet and as a result it can be achieved through its consumption an efficient mastering of a supplementary feeding program with a number of biologically active substances that give the finished product functionality.

The analysis made in this study allowed the identification of several bakery products with special functional effects and important benefits for health consumers.

Whole Wheat bread is an important source of dietary fiber that reduces blood cholesterol levels and the risk of cardiovascular diseases. It also promotes proper digestion and regulates blood glucose, thereby preventing type 2 diabetes. Moreover, it provides a quick feeling of satiety helping to maintain a proper weight body.

Sana Bongrana Ultrafibre is rich in fiber and may reduce the risk of diabetes and also the cholesterol levels in blood, being a functional product recommended for the health of cerebral, cardiovascular and digestive systems.

Dobrogea Benecol product is a threefold functional bread that, in addition to its cholesterol lowering effect, it has a high content of fibers, which helps regulate bowel movements and provides at the same time a low content in carbohydrates, being suitable for people with diabetes. A Benecol daily consumption reduces the total cholesterol by 10%, reduce the LDL-cholesterol by up to 15% and lowers blood triglyceride levels and these remain low for a period of 12 months, which ensures the prevention or slowing the development of coronary heart disease and atherosclerosis.

Sana Bongrana Benexia bread has a remarkable nutritional value and its content of 25g sage seeds Benexia (non-marine richest source of  $\omega_3$  fatty acids) makes an important contribution to the body of  $\omega_3$  and  $\omega_6$  fatty acids, with beneficial effects to the functioning of the cardiovascular and immune systems and are also needed in normal growth and development of the child.

However, the list of functional bakery products on the Romanian market is a much larger one. A deeper analysis could provide the identification of most valuable bakery products with functional effects, which consumption could lead to improving the health of consumers.

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# NEW DIMENSIONS OF FOOD SECURITY IN ROMANIA FROM THE EUROPEAN PERSPECTIVE

ENE CORINA<sup>1</sup>, MATEI MIRELA<sup>2</sup>

## **Abstract:**

*Article outlines the key coordinates of food security at global, regional and national level, highlighting and analyzing requirements, transformations, limits and opportunities facing our country at this level, in the context of EU integration.*

**Key words:** *food security, sustainable development, social responsibility*

## INTRODUCTION

Despite efforts at global, regional or national level, the economic development and food security issues are in a permanent increase. The direct dependence of food security for the economic development and the possibilities of providing necessary material means to achieve this goal are obvious. In addition, more dynamic disturbances due to pollution and destruction of the environment which enhances balance and diversifies dependency system are pressing on economic and social phenomena and have an increasing impact on the overall economic development and food security.

The food security issues are very complex and strictly dependent on country-specific economic development and environmental aspects, on the way they that are designed social policies [4], on the ability to produce food, stocks, and on the demand for food correlated with demographic and purchasing power of the population.

International common sense defines food security as a concept that encompasses all the measures to ensure access for all people at all times to enough food to enable an active life and good health.

We can say, however, that food security include aliments security issues, but not limited to them, it goes beyond the strict scope of consumption, with broad implications across the economic (production, transfer, distribution etc.), demographic, social, cultural and political and involving state institutions at the highest level by developing particularly complex pricing, social protection, foreign trade, economic development policies.

## RESULTS AND DISCUSSIONS

### **The food security policies**

The food security policies developed at the national level must be thoroughly defined by reference to the real possibilities and urgent needs arising from the current food insecurity and the goals of sustainable development.

The causes of food insecurity are diverse [3]:

- lack of investment in agriculture in developing countries and the decline of official development assistance (ODA) in the agricultural field;
- low efficiency or lack of public programs to support agriculture;
- international trade liberalization that has also affected trade of agricultural products created by small farmers;

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- the existence of small farms under 2 hectares, which are not characterized by high efficiency (of the 525 million farms in the world, 404 million farms have an area under 2 ha, of which 87% are located in Asia)<sup>3</sup>;
- maintenance of restrictions on imports of agricultural products by certain countries such as India or Ukraine in order to protect domestic producers;
- rapid population growth in developing countries;
- poor harvests due to climate change;
- use of agricultural raw materials for production of biofuels.

Food security with two components: ensuring food availability per capita (calories and proteins) and purchasing power is achieved by linking food policies to nutrition policies. Food policy aims to provide the necessary quantity and quality of food for the entire population, at affordable prices.

The experience of industrialized countries is useful, but we should not lose from sight the differences in circumstances of their abundance of food and malnutrition or the malnutrition existing in other parts of the world. The gradual elimination or reduction of food insecurity is imperative in order to stop the dramatic degradation of health, which has long-term implications even on the chances of survival of a state.

The food safety policy in the European Union (EU) considers the whole chain of food intended for consumption by animals or humans. This includes stringent regulations and emphasizes extended producer and providers' responsibility regarding their participation in quality assurance food supply.

At European level, the quality and food safety is based on the efforts of all those involved in the complex chain that includes the agricultural production, processing, transportation and consumption. According to the European Union and the World Health Organization –thee food safety is everyone's responsibility, from their origin to the time they reach the table. To maintain food quality and safety throughout the this chain, the specific procedures are necessary in order to ensure that foods are upright and monitoring procedures must be implemented to ensure the smooth completion of all operations.

To provide a transparent and scientific character for food regulation, there was a review of the food safety framework in the EU since the late 1990s, by creating new Scientific Committees and the European Food Safety Authority - EFSA as an independent organization that works closely with various scientific agencies and institutions from EU countries, providing independent scientific advice on all matters with direct or indirect impact on food safety. It covers all stages of food production and supply, making risk assessments in the food chain and scientific assessment on any matter that has a direct or indirect impact on food supply security, including health and good treatment of animal and plant health.

### **The relation between food security and food safety**

The foods produced in European Union countries are considered, at present, among the safest in the world. The Community experience has shown that the market economy has led to the production of food at and above the quantitative needs of populations in members' countries.

Although this created very large export availabilities, this development, covering food safety aspect has not solved the problem of food security [5]. The proof is the recent food crises in the EU, such as the bovine spongiform encephalopathy crisis - 1986-2000, crisis swine - 1997, dioxin crisis - 1999, FMD crisis - 2001, avian flu crisis - 2002.

To address these issues at EU level there have been several legislative and administrative restructuring measures [5], which culminated in the adoption of Regulation No. 178/2002 - "Food Safety Law" and the new package on hygiene - H1-H5 - published in 2004.

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<sup>3</sup> IASSTD, *Food Security in a Volatile World*, p. 3

### **The food safety – the Romanian perspective**

In Romania, for managing food safety issue the following institutions cooperate: Ministry of Agriculture and Rural Development (MARD), the Ministry of Public Health (MPH), the National Authority for Consumer Protection (NACP) and the National Sanitary Veterinary and Food Safety Authority (NSVFSA).

EU urged Romania, since 2002, the modernization and the restructuring of the food industry. The monitoring of food units, the establishment of the programs of modernization and restructuring to align with European requirements, debuted with the opening of EU accession negotiations and was intensified during the period 2003 to 2004.

Moreover, the food security was one of the most significant issues on the European Commission report of September 26, 2006, report that ratified the accession to the European Union. Thus, traders operating in the food industry and distribution must reorganize their activities in order to raise the standards.

Prior to accession to the European Union, in the matters of food safety, the following objectives were proposed [6]:

- an effective implementation of evaluation, management and risk communication systems;
- the oversight of agricultural markets and imports;
- the delineation and strengthening of control systems;
- imposing safeguards measures to protect the country's security against major diseases in of animals;
- the identification, assess and monitor of livestock and food industry units, in order to be the restructured and modernized;
- the completion of strategy for border inspection posts (eastern border of Romania, the European Union Border);
- the prompt and transparent information of consumers;
- the identification and registration of all animal species;
- the identification and registration of all farms and processing units;
- the complete computerization of veterinary and food safety systems.

In Romania, the main institution governing the work in the field is NSVFSA that acting on the basis of functional autonomy and decision-making. In 2003, following the recommendations of the EU institutions and its support through PHARE RO 0006.09 - "Strengthening quality control systems for agri-food products", the Romanian Food Safety Agency was established by Ordinance 90/08.2003[10]. It later merged with the National Sanitary Veterinary Agency and becomes Veterinary and Food Safety Agency. Organization and operation was carried out by HG 308/11.03.2004 and with the advent Law 215/24.05.2004 approving GO 42/01.2004, it was transformed into the National Sanitary Veterinary and Food Safety Authority (NSVFSA).

The Agency is empowered to develop and promote, in cooperation with other authorities involved, the legal framework for safety and food quality. It also participates in standardization, grading and classification of food products in accordance with European quality standards, the Agency is responsible contact point and structure for Codex Alimentarius in our country. The Agency's strategy [11] is based on the principle that health surveillance of animals, sanitation of animal products and quality of these foods is a guarantee of safety throughout the food chain.

One of the most important European concepts, which are intended to be implemented in our country, is the **food traceability**. Applying this concept implies that all stages of the food chain elements can be tracked from origin to destination. The starting point is the action of identification and registration of animals. Through this, you can learn about all the steps that a food has traveled [12, 13] (*from stables to tables*).

Only gradually control may reduce the alimentary risk for the population, with all the benefits of its implementation. At all stages of the chain, the legal responsibility to achieve food security belongs to food operator, and role of the Agency is to monitor and control the compliance

of requirements and regulations. Therefore, this institution initiated, together with associations from the food industry, the establishment of requirements on codes of good practice and training needs for staff involved in food safety field.

Under the current legislation, the agency has the following powers in matters of food safety:

- coordinating the development and implementation of policy and legislation on food safety field;
- developing food safety standards for areas of competence required for all individuals and businesses;
- promotes and coordinates the implementation methodologies of risk assessment;
- assesses risk and recommends authorities the necessary measures when there is a major problem that can endanger human health;
- coordinates the development of codes of good practice, and supervision and control of food safety, from production of raw materials to the distribution of food to the consumer;
- implements government policies on food safety field;
- coordinates the activities regarding standards, food brands and licenses;
- coordinates the training of personnel involved in carrying out the activities regarding the supervision and control of food safety;
- provides scientific advice and technical assistance in cases provided by national and Community legislation;
- elaborates, upon request, national food safety programs with other institutions, and draft legislation to achieve specific tasks;
- coordinates at the national level the Rapid Alert System - RAS and is the national contact point;
- organizes state veterinary services and establish their financing needs and the tasks and responsibilities;
- issues scientific opinions on products other than food and feed, even those derived from genetically modified organisms as defined by Government Ordinance no. 49/2000 on the regime for obtaining, testing, operation and marketing of genetically modified organisms through modern biotechnology and products derived ;
- participates in standardization, grading and classification of food products in accordance with European quality standards.

In 2006 [7], the Food Safety General Directorate acted to further the commitments and recommendations made by representatives of the European Commission about the need for appropriate legislation and administrative capacity building in food safety.

In the medium and long term strategy, there have been set and achieved goals as: strengthening the institutional framework specifically improving methods for food control throughout the food chain, information campaigns, strengthening cooperation with associations and operators and improving the food consumers` confidence in the work of the Agency.

In the context of EU integration, one major priority was the implementation of food safety management using the system Hazard Analysis and Critical Control Point (HACCP - risk analysis and critical control points) in the food industry units. This system identifies, evaluates and controls the food safety risks.

The food safety management system is described in ISO 22000 [9], an international standard that specifies requirements for a food safety management system in a food chain, where an organization:

- must demonstrate the ability to control food safety hazards in order to provide safe end products that meet the food safety requirements appeal to customers and regulatory authority;
- aims to meet customers` satisfaction through effective control of food safety hazards, including processes to update the system.

The International Standard ISO 22000 specifies requirements to enable an organization to:

- plans, designs, implements, lead, maintain and update a food safety management system;
- evaluates and assess customer requirements and demonstrate compliance with mutually agreed customer requirements in relation to food safety;
- demonstrates effective communication with customers and other stakeholders along the food chain;
- demonstrates compliance with the applicable requirements of the regulatory authority in terms of food safety;
- ensures that they meet established food safety policies;
- shows this conformity to other stakeholders;
- requires certification or registration of safety management system powered by an external organization.

The International Standard ISO 22000 takes into account only the concerns about food safety issues but it does not discourage the integration of other aspects of management system elements such as quality (SR EN ISO 9001: 2001) and / or environmental protection (SR EN ISO 14001:2005).

Decisiveness of quality raw materials, unprocessed, for safety and quality of finished product required a systematic approach of the entire food trail to avoid cross contamination and identify potential risks. The phase transport in the food chain has a demanding legislation on standards of quality, including:

- EU legislation on hygiene and food safety on the mode of transport and storage;
- the rules of the International Organization for Standardization (ISO) contain a chapter on food storage and delivery;
- Codex Alimentarius, established in 1962 by the World Health Organization - (WHO) and the Food and Agriculture Organization (FAO) that have preoccupations on the transport and storage of the foods.

The food processing stage is based on modern quality management systems to ensure product quality and safety for consumers. The three main systems in use are:

- Good Manufacturing Practices (GMP). They require processing conditions and processes - based on long experience - who have demonstrated the ability to ensure consistent quality and food safety.
- Hazard Analysis and Critical Control Points (HACCP). While traditional surveillance programs focused on food safety to identify problems in the finished product, HACCP, as a proactive technique, focuses on identifying potential risks and their control over the production process.
- Quality Assurance Standards. The adherence to standards established by the International Organization for Standardization - International Standards Organization (ISO 9000) and European Standards (ES 29000) ensure that food processing, catering and other food-related industries comply with the procedures prescribed a priori. Effectiveness of these programs is regularly assessed by independent experts.

These quality management systems used by food processors, includes the relationship with suppliers (farmers and wholesalers of raw materials), packaging and transport agents, vendors' products wholesale and retail to ensure procedures quality assurance at every level.

## CONCLUSIONS

Outside food business operators responsibilities, the role of consumer (regarded as the end point of the food chain) regarding the food safety practices remain highly relevant and can be successfully exercised only through awareness of rights and interests, and through education and adequate information on the requirements in the field of purchase, transport, storage and food preparation.

The current stage of development of the food industry, on the one hand, and the impossibility of complete elimination of risk - on the other - always bring to the attention new challenges to food safety. Issues such as contaminants and pollutants of food, extensive use of pesticides, food additives, genetically modified organisms, food irradiation are current challenges that require ongoing reassessments and improvements.

Existence of weaknesses, such as insufficient level of investment in the sector during the pre-accession, mismatch of the control activities, insufficient training of professionals, lack the capability of economic operators to be consistent with the new requirements, lack of communication between institutions that adequate coordination surveillance programs in food safety, the insufficient education and information raises difficulties in achieving national food security goal.

Moreover, the food security is not limited to safety component, but includes elements of availability, access and use of food, which highlights the multivalent necessary interventions and approaches.

Beyond the general framework outlined in the context of European integration, the nature of regulatory requirements of the *acquis* communautaire, our country is characterized by specific economic and cultural features which cannot be canceled or uniformed.

Ensuring appropriate national average consumption, both quantitatively and qualitatively, depends - in essence –on the improvement of the purchasing power of consumer, of the information and education of consumers, on the access to food resources and technologies for optimization of production, on increasing employment and social policies adopted.

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# EVALUATING THE ATTRACTIVENESS OF SERBIAN AGRIBUSINESS FOR FDI<sup>1</sup>

FILIPOVIC SANJA<sup>2</sup>, ZUBOVIC JOVAN<sup>3</sup>

## Summary

*The aim of this paper is to research potentials for attraction of foreign direct investment (FDI) into agricultural and food processing sector of Serbia. After reviewing the statistical data on agribusiness in Serbia and the framework for FDI, we have designed a special methodology for the purpose of this research. The methodology was based on integrated vertical and horizontal approach, which provides analysis of agricultural and food processing sector up to the sub-sector level. The survey was carried out on the sample of 100 companies per set of criteria which are defined as important for foreign investors. The paper consists of four sections and concluding remarks. At the beginning we have presented the methodology used in the research. The second section emphasizes the importance of agriculture and food processing sector for national economy. The third section provides a picture of national comparative advantages for attraction of FDI into agriculture and food processing industry. The fourth and most important section presents the results of empirical research where we have found that the subsector of fruit and vegetable processing is most interesting for FDI. Finally, the last section summarizes key conclusions from the research undertaken in agribusiness sector of Serbia.*

**Key word:** Agribusiness, FDI, Serbia, Sub-sectors evaluation

## INTRODUCTION

Prices of agricultural products are steadily rising [4]. Such trends in prices of agricultural products have attracted new private investors in all stages of the value chain in agriculture. In addition, there is significantly intensified stock of purchases of agricultural products, with a proliferation of speculative investors eager to cash in on the sale of the brokerage. Since the crisis in Serbia and the liquidity problems have diminished the capacity of local investors, foreign investment should be able to fill the investment gap. As Furtan and Holzman note FDI bring positive results to the whole of the economy [10]. Moreover Marchant, Cornell, and Koo had developed a model by which they proved that there is a positive correlation between a countries export and the level of FDI in agribusiness [14]. The world's FDI inflow to agriculture sector in recent years has been increasing gradually [21, 22]. In 1990s, FDI capital in the world's agriculture reached nearly USD 1 billion a year while in 2005-2007 the figure climbed to USD 3 billion/year. Despite the significant impact of the global financial crisis on all sectors of the economy, agriculture is expected to be relatively better off, as a result of relatively higher income in recent period and income-inelastic demand for food [9].

The aim of this paper is to research potentials for attracting foreign direct investment into agribusiness (agriculture and food processing industry) in Serbia. Paper is divided in five sections. At the beginning we are presenting the methodology of the research used in the paper. Further on we give a brief review of the agricultural sector in Serbia. In the next section we present the most important aspects of the FDI in Serbian agribusiness. The fourth section of the paper is devoted to findings from the empirical research in Serbia. Finally we close our paper with conclusions from the research on the attractiveness of Serbia for FDI in agribusiness.

## THE METODOLOGY OF RESEARCH

The theoretical section of the paper presents the review of agriculture in Serbia and the importance of FDI for its current and future growth. Having understood why agriculture and agribusiness have an important role in Serbian economy and why the FDI are important, we have in the

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<sup>1</sup> Preliminary version of this paper was presented on a conference „Economic Changes in a time of Crisis and Opportunities“ at the Faculty of Economics University of Coimbra, Portugal.

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empirical section defined a special methodology, which provides analysis of agricultural and food processing sector on seven sub-sector levels (wheat processing, industrial plant processing, confectionary sector, fodder, fruit and vegetables processing, production of wine and distillates, and processing of products of animal origin) per defined set of criteria which are highly important for foreign investors: availability of raw material base, competition on the market, production facilities, property transformation, availability of staff. Herewith we intended to evaluate which of the subsectors in Serbian agribusiness is most attractive for foreign investors.

Moreover the evaluation of competition was made based on attitudes of the surveyed companies within the sector in relation to: quality, assortment, prices, production and sales trends, market research and marketing activities. Analysis was made especially for each sector: logistic processes, purchase market and sales market, restrictions and branding. With the aim of collecting as much representative data as possible based on which realistic image about condition in each sector can be gained, we have created a questionnaire which served as the basis for making survey in the sample of 100 companies [3]. The survey was based on: i) structured written questionnaire and ii) unstructured phone interviews with the management and experts from leading producers in this sector. The survey was filled in by representatives of company management, mostly with university education, with considerable years of service and experience in their job.

## **DYNAMICS OF AGRICULTURE IN SERBIA**

At the beginning of the 1980s, Serbia had achieved impressive growth in agricultural production (3.5% - 4% annually), which stagnated in the late 1980s and rapidly decreased during the 1990s. However, the decrease in agricultural production was much smaller compared to the rest of the economy. During the 2000s, agricultural production has continued to record very high annual fluctuations. The fluctuations were a consequence of low investment, reduced agricultural techniques, excessive share of farming in primary agricultural production (especially wheat), as well as the adverse impact of weather conditions. The price shock of 2006–08 had a significant impact [5]. Moreover, different net trade positions and different policy responses to changing price and income shocks held the key to the range of outcomes [1]. In the period 2005-2011, agro-industrial sector recorded average annual growth in production of about 1.1%, while the overall industrial production had an average growth of 0.4% per year [19].

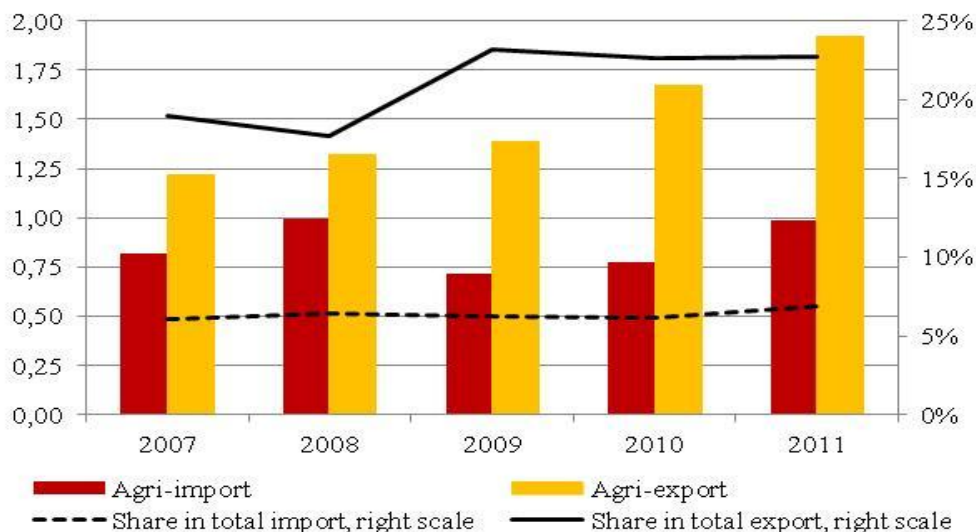
Therefore the agriculture has a very high importance for national economy and social stability in Serbia. The main reason is slow restructuring of the rest of the economy, low investment activity and reduced employment opportunities in other sectors of the economy [2]. Even though the share of agriculture in GDP in 2010 declined to about 9.1%, the importance of agriculture in Serbia is similar or higher than in other countries in the region that have significant agricultural production - e.g. Turkey 9.5%, Bulgaria 5.4%, Ukraine 8.2%, B&H 7.6%, Romania 7.1%, Croatia 5.5%, Hungary 3.5%, etc. [23].

Besides primary agricultural production, agribusiness sector also includes agro - industry. Agro-industrial sector consists of production of food and beverage, tobacco products, fertilizers and production of agricultural machinery. In total industrial production of Serbia the agro-industry have a share of 26.7%. The production of food and beverage generate 87.1% of total agro-industry production, while the production of machinery for agriculture and the chemical account for just about 2%.

Agriculture is the only sector in Serbia with a positive foreign trade balance. Agriculture plays a significant part in the overall foreign trade, with 22.7% share in total exports and 6.4% share in imports. However, raw materials have the highest share in export, while the share of high final processing products is modest. Four products make more than two fifths of the total export of agribusiness sector: corn, fruit and fruit products that do not include fruit juices, sugar and vegetable fat and oil. On the regional level, the concentration is even more expressed – almost half of the total exports of agro-business sector of Vojvodina are generated by three products: corn, sugar and alcoholic beverages [7, 8]. On the import side, fertilizers dominate with 15% of total import (mainly from the Russian Federation). The import of fertilizers has been increasing in recent

years partly as a consequence of the complete disappearance of the domestic production of agro chemicals.

**Figure 1 – Foreign trade and share of agribusiness in foreign trade, bill. EUR**



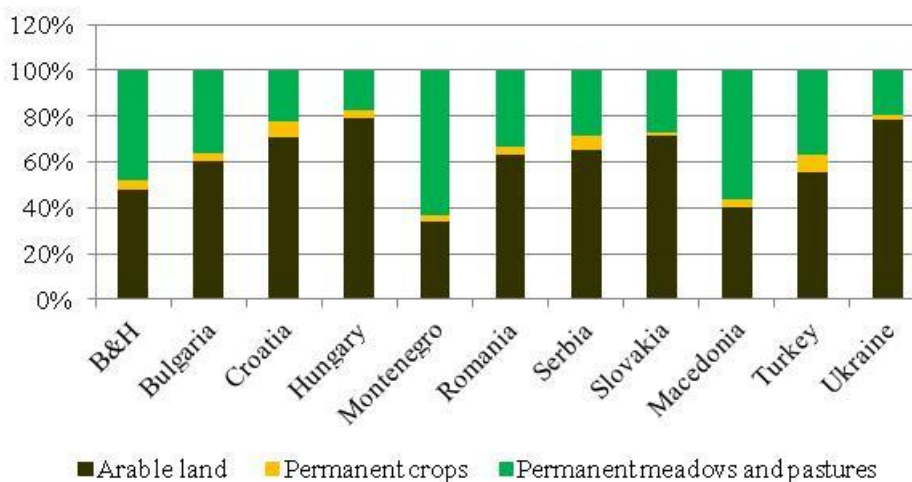
Source: <http://www.trademap.orfg>

Foreign trade in agricultural and fishery products of the Republic of Serbia is constantly rising. The highest value of trade, in the amount of about EUR 3 billion, was reached in 2011, where the surplus realised was about EUR 1 billion, more than imports value for the same year (Figure 1).

### ATTRACTIVENESS FOR FDI

Serbia has 5.093 million ha of agricultural land, which is more than 65% of the total territory. The agricultural land is mostly fields and gardens with 64.8%, followed by pastures 16.4%, meadows 12.2%, orchards 4.7% and vineyards 1.1%. Arable land and permanent crops cover over 70% of agricultural land, which is higher than in the most countries in the region [3]. Comparison of Serbia with other countries in the region is presented in Figure 2.

**Figure 2 - Structure of agricultural land**

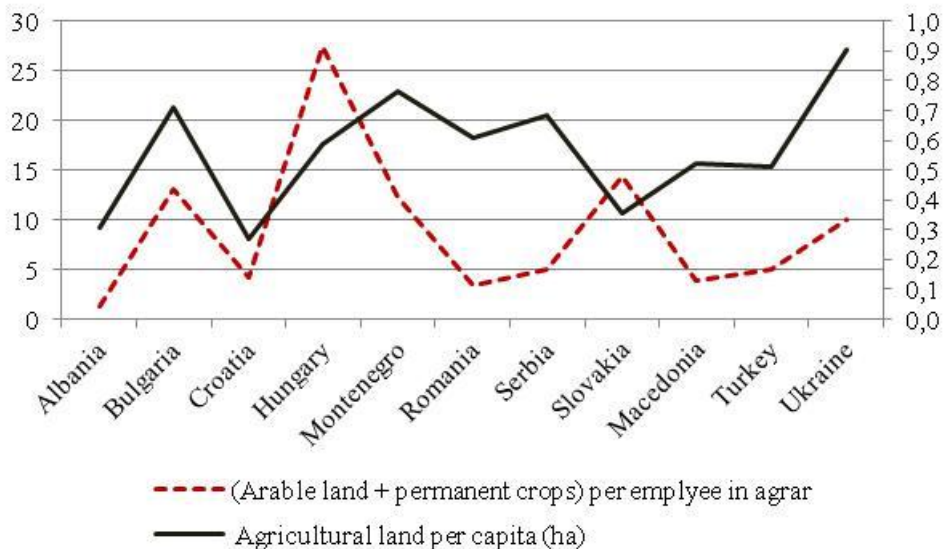


Source: FAO data base <http://faostat.fao.org>

Available agricultural land per capita in Serbia amounts to 0.68 ha, which is more than in most countries in Central and South-eastern Europe [9]. High availability of agricultural land per

capita is particularly pronounced in the northern region of Vojvodina, where the level of 0.86 ha is significantly above the EU average and it is an important comparative advantage (figure 3). Regarding the relationship between farmland and the employed in agriculture, Serbia is in line with the average for this part of Europe (5.08 ha per employee).

**Figure 3 - Available land resources**

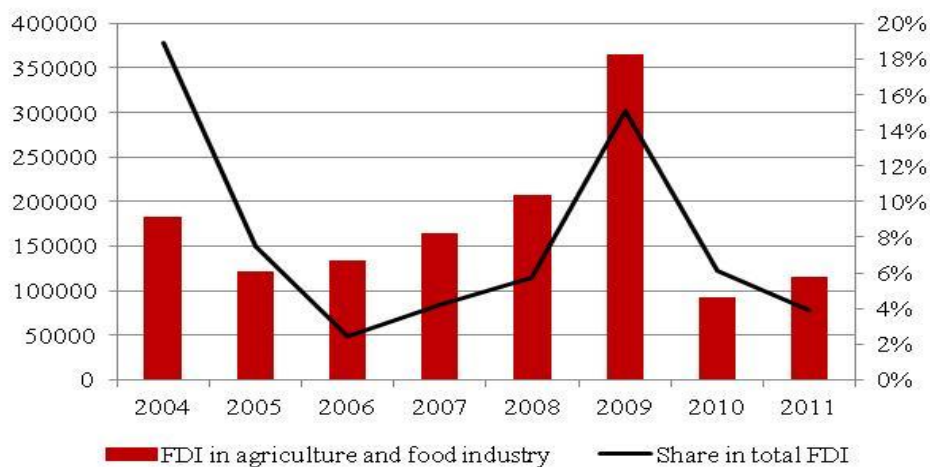


Source: FAO data base <http://faostat.fao.org>

A good business climate and opportunities for investment are assisted in particular through state subsidy programs for foreign direct investment. In financial terms, grants are offered for both green-field and brown-field projects in agricultural and food sector production activities, and in research and development.

The total amount of foreign investment into Serbian agricultural and food sector in the period 2004-2011 reached USD 1.4 billion. The highest amount of foreign investment in agribusiness was in 2009. The amount of USD 366 million was about 15% of total foreign investments into the Republic of Serbia. In the last two years the amount of investments in this sector was modest – only USD 93 mil. and USD 116 mil. respectively.

**Figure 4 – FDI in Serbian agriculture and food processing industry, mil. USD**



Source: NBS database <http://www.nbs.org>

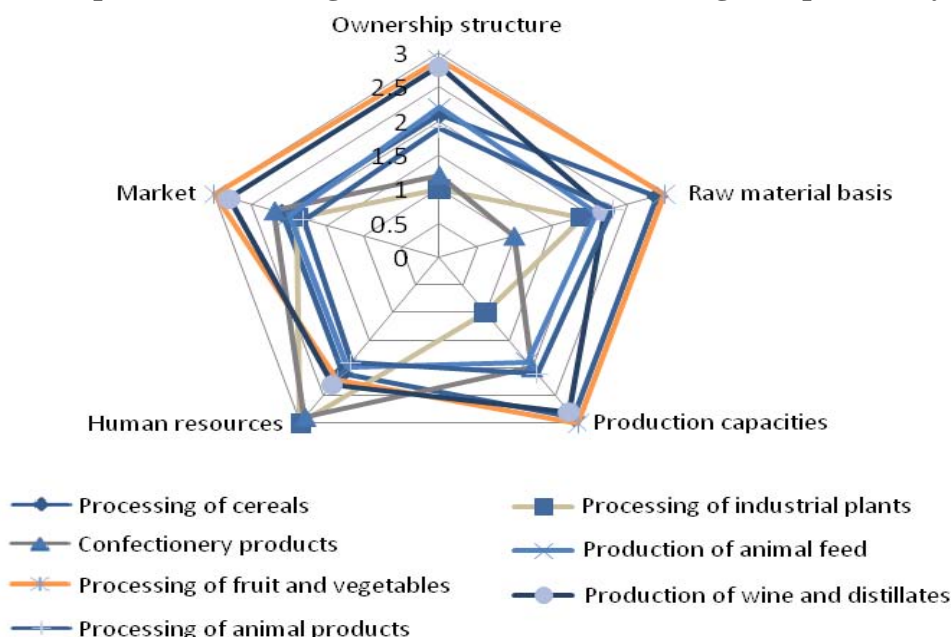
The investments in Serbian agriculture have been realized through privatisation of former state-owned companies [12]. State-owned agricultural companies and cooperatives were bought mostly

by large domestic private investors. Foreign investors and companies participated in this process either directly through privatisation or indirectly through resale of privatised companies [13]. Largest volume of investments is registered in beer, tobacco, confectionary and sugar industries. As noted above, FDI are important source for investments in agribusiness. Therefore we wanted to research on which of the subsectors might be interesting for future foreign investors.

## RESEARCH RESULTS AND DISCUSSION

Based on comparative analysis of all seven surveyed sub-sectors per set criteria, we have found that the sub-sector of fruit and vegetable processing has the highest potential for investment in food processing industry. The results of research are presented in figure 5.

**Figure 5 - Comparative advantage of sub-sector for attracting FDI per surveyed factors**



In the sector of fruit and vegetable processing, there are high possibilities for direct foreign investment into production, warehousing, primary production and higher stages of processing of standard and differentiated products intended for foreign markets. In the sector of fruit and vegetable processing, possibilities for direct foreign investments are seen in the following areas:

- classification and standardization of fruit and vegetables for use in fresh state for export;
- production of standardized high-quality and safe dried, frozen or lyophilized products;
- development of top quality product lines for consumers with higher purchasing capacity and for foreign market;
- production and processing of organic products.

Intensive agricultural production with use of plant protection chemicals – which is especially characteristic in fruit and vegetable growing, with accelerated adjustment to international quality and environmental sustainability standards, impose need for more significant and urgent investment into construction of facilities for safe destruction of packaging material for plant protection chemicals (pesticides, herbicides, etc.).

Apart from fruit and vegetable sector, there are other sectors which might become interesting for FDI. In production of wine and distillates, possibilities for direct foreign investments are in extension, arrangement and improvement of vineyards and wine cellars, direct marketing and production and positioning of top quality wines and wines made of autochthonous grape sorts. There are investment potentials in the segment of production, branding and marketing of top quality

wines and wines with geographical origin, but also in branding of traditional alcoholic drinks. In processing of wheat and flour, there are special fields and possibilities for direct foreign investments, both into modernization and enlargement of plants, and into distribution network and production of differentiated product assortment.

Possibilities for direct foreign investments into production of industrial plants are relatively low, as market and production are kept by large multinational companies. Investment potentials are plants for production of bio-fuel and processing of waste and secondary raw materials from agricultural production and food production.

## ACKNOWLEDGMENT

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## CONCLUSION

Serbian agriculture and food processing industry have a important comparative advantages which might arise interest for foreign investment. The most significant comparative advantage of Serbia is an excellent raw material base for the development of food industry.

Despite the good raw material base for development of national food processing industry, raw materials have the largest share in the structure of agro-food export, while the share of high final processing products is low. In the export structure by product, four products make more than two fifths of the total export of agriculture and food sector (corn, raspberries, sugar and vegetable fats). With exports of 1.6 million tons of corn in 2009, Serbia was within top ten largest world exporter of corn. Being so important factor in Serbian economy, it is expected that there is a need for future high investments in agribusiness. Since domestic sources are very limited the other possibility is to attract foreign investors.

The results of research based on comparative analysis of all seven surveyed sub-sectors per set criteria, showed that the sector of fruit and vegetable processing has the highest potential for foreign investments in food processing industry. Summary result indicates that in terms of all said performances for development of agricultural and food processing industry, region of Vojvodina is the most suitable region for potential investors not only in the Republic of Serbia, but also in comparison to all other regions in the neighbouring countries of South-Eastern Europe.

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**THE RESEARCH INSTITUTE FOR AGRICULTURAL  
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# SCENARIOS OF INCREASING AGRICULTURAL PRODUCTION OF ANIMAL ORIGIN TO COVER THE GAPS BETWEEN PRODUCTION AND DOMESTIC AVAILABILITIES OF CONSUMPTION, IN ROMANIA

ION RALUCA ANDREEA<sup>1</sup>

## Abstract

*The purpose of this study is to identify solutions for increasing agricultural production of animal origin, with the aim of decreasing the share of imports in total supply of the market and ensuring, accordingly, a high level of food self-sufficiency. The overarching research question is: Which is the agricultural area needed to be cultivated in order to increase production to the upper limit of domestic consumption? Usually, the gap between domestic production and consumer availability is covered by imports of agricultural products and foodstuffs. Because of its negative effect upon trade balance, imports should reduce as total value and as share in total supply. This is the reason why, we suggest covering the gaps between domestic production and demand by growing the level of agricultural output, as result of increasing the area cultivated with different crops. Statistical data about structural components of food supply and demand are analysed and the area needed to obtain a higher level of production of animal origin is projected, considering the vegetable products equivalent to a physical unit of animal product. Results show that, to cover the gap between domestic consumption and production of food products of animal origin, an area of 514,339 ha of barley, oats and corn should be cultivated.*

**Key words:** *domestic availabilities of consumption, agricultural production, animal origin, imports, trade balance*

## INTRODUCTION

The present study proposes solutions for restructuring the agro-food system in Romania, considering the demand for food, with the aim of ensuring food self-sufficiency. We try to answer the questions: Does the level of domestic production cover the market demand for food? Which is the agricultural area (and its structure) needed to be cultivated in order to increase production to the upper limit of domestic consumption and which are the revenues and expenses?

In pursuing these questions, statistical data from the Statistical Yearbook of Romania, other publications of the National Institute of Statistic and results of previous studies have been analysed. The methodology of research consists in data analysis, critical analysis, and literature review in various fields of agro-food economy.

The objectives of the research consist in elaborating scenarios of restructuring the Romanian agro-food system, considering food demand, so that the share of domestic production in total supply to increase and the share of imports in total supply to decrease.

In the first part of the study, gaps between domestic production and internal availabilities for consumption are identified for the main agro-food products of animal origin: milk and milk products, eggs, pork meat and poultry meat. In the second part of the paper, the area needed to be cultivated in order to increase the production level is estimated.

The outcomes of the research are relevant for macroeconomical policies' orientation in direction of increasing production of agro-food products and decreasing the share of imports in total supply.

In Romania, the agricultural area is 14,685,000 ha, of which the agricultural area utilized is 13,753,000 ha [10]. It results a difference of 932,000 ha that can be drawn in culture in order to obtain high agricultural outputs. If domestic production satisfies the main part of the demand, the imports would decrease.

Typically, reducing the gap between domestic production and consumer availability is achieved by importing agricultural products and foodstuffs. The deficit of food trade in 2011 was 376 mill. Euro, dropping 48.5% compared to 2010 [11]. The shrinking trade deficit was possible

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due to strong growth in exports of agricultural products. In 2011, the food exports were 3,912.2 mill. Euro, with 851.8 mill. Euro more than in 2010. Maize accounted for the main share in total food export (14.8%), followed by sunflower seeds, with 13%, and tobacco with 11.6%. The exports of wheat reduced in 2011 with 36.7% compared to the previous year. In 2011, the foodstuffs imports value 4288.2 mill. Euro, the main products imported being sugar, pork meat and food preparation.

In this context, reducing the negative gap between domestic consumption and availability should be done by increasing the level of production and not on account of imports; situation that results in trade imbalance. Domestic production can grow in two ways: extensive and intensive. Extensive path involves increasing the cultivated area. For this, uncultivated agricultural areas can be attracted in culture. Intensive way means to increase yields, considering the same farmland cultivation; if yields increase, the total production grows. In this paper, In order to cover the gaps between production and consumption, we suggest to increase the level of total production extensively, by growing the area cultivated with different crops.

## MATERIALS AND METHODS

The projection of the area needed to increase the production of animal origin is made starting from vegetable products equivalent to a physical unit of animal product. In Table 1, recommended consumption of food and animal products and equivalent in products of plant origin are given.

**Table1: Recommended consumption of animal origin food and its equivalent in products of plant origin [3]**

| (kg/cap/year, kg)   |                         |  |
|---|-------------------------|--|
| Product   | Recommended consumption | Equivalent in products of plant origin |
| Meat*   | 62.1                    | 155.25 kg corn (2.5 x 62.1)            |
| Milk** and dairy  | 219                     | 109.5 kg barley (0.5 x 219)            |
| Eggs***   | 204                     | 63.24 kg corn (0.31 x 204)             |
| * Pork meat (3.5 kg NC/kg gain in weight; 69% corn/100 kg NC => 2.5 kg corn/kg gain in weight) [12] |                         |  |
| ** Cow milk (5 kg barley + 4 kg bran/30 l milk of 4% fat) [13]                                      |                         |  |
| *** Eggs (150-180 g NC/ hen/day => 310 g corn/egg) [14]   |                         |  |

Source: Bran Mariana, 2012

According to previous research, to obtain one kilogram of meat, 2.5 kg of corn are required and for a kilogram of milk 0.5 kg barley are needed. To obtain one egg, 0.31 kg of corn is required [1].

## RESULTS AND DISCUSSIONS

In Table 2, the negative differences between production and domestic availability of consumption and specific consumption are presented. Levels of plant origin production, yields and, ultimately, agricultural area needed to generate animal production are estimated.

The difference between domestic production and consumer availability is -344,100 tons of milk and milk products. To make one litter of milk, 0.5 kg of barley is consumed, which means that to cover the gap referred to 688,200 tons of barley production is required. To obtain this amount, an area of 275,280 ha of barley must be cultivated, to a yield of 2.5 t / ha.

Egg consumption exceeds domestic production by 188 million pieces. To get 100 pieces of eggs, 31 kg of corn must be consumed, which means that the difference between consumption and production are covered by obtaining a production of 58,280 tons of corn. To obtain this quantity, assuming a maize yield of 3.5 t / ha, an area of 16,651 ha should be cultivated.

**Table 2: Designing the area required to obtain agricultural production of animal origin needed to cover the gaps between production and domestic availability of consumption**

| Product                                | Gaps between production and domestic availability of consumption (tones) | Specific consumption |                             |       | The needed production of vegetal origin (tones) | Yield (t/ha) | Agricultural area (ha) |
|--|--|----------------------|-----------------------------|-------|---|--------------|------------------------|
|  |  | Product              | MU                          | Value |   |              |                        |
| Milk and dairy                         | 344,100  | Barley               | kg barley / 1 kg milk       | 0.5   | 688,200   | 2.5          | 275,280                |
| Eggs*                                  | 188,000,000  | Corn                 | kg corn / 1 egg             | 0.31  | 58,280  | 3.5          | 16,651                 |
| Pork meat and pork meat products       | 231,378  | Corn                 | kg corn / 1 kg pork meat    | 2.5   | 578,445   | 3.5          | 165,270                |
| Poultry meat and poultry meat products | 34,283   | Oats                 | kg oats / 1 kg poultry meat | 2.5   | 85,707.5  | 1.5          | 57,138                 |

\*pieces

In pork, the difference between consumption and production is 231,378 t. To obtain a kilogram of pork, 2.5 kg of corn are consumed, which means that to cover the gap referred to, a production of 578,445 t corn is required. To obtain this quantity, an area of 165,270 ha must be cultivated with corn, assuming a yield of 3.5 t / ha.

Poultry consumption exceeded domestic production by 34,283 t. To obtain one kilogram of chicken meat, 2.5 kg of oats are consumed, and to satisfy the recall is necessary, therefore, a production of 85,707.5 tons of oats. At a yield of 1.5 t / ha, it means that, to get that quantity, an area of 57,138 ha with oats should be cultivated.

In total, to cover the gap between domestic consumption and food production of animal origin, an area of 514,339 ha of barley, oats and corn should be cultivated.

As mentioned before, in Romania, 932,000 hectares may be drawn into the culture to achieve higher agricultural production and to meet so domestic consumption. In our estimation, agricultural surface needed to cover the difference between agricultural production of animal origin and domestic availability of consumption is 514,339 ha.

Further, the estimated revenues and expenses related to areas designed are estimated in table 3. They have been calculated by multiplying the income and expenditure per hectare, for each crop separately, with the areas projected.

**Table 3: Estimating economic efficiency\***

| Crop   | Agricultural area (ha) | Revenues per hectare (lei/ha) | Expenses per hectare (lei/ha) | Total revenues (lei) | Total expenses (lei) | Profit (lei) | Profit rate (%) |
|--------|------------------------|-------------------------------|-------------------------------|----------------------|----------------------|--------------|-----------------|
| Barley | 275280                 | 3031                          | 2597                          | 834373680            | 714902160            | 119471520    | 16.7            |
| Corn   | 181921                 | 3254                          | 2630                          | 591970934            | 478452230            | 113518704    | 23.7            |
| Oats   | 57138                  | 2600                          | 2350                          | 148558800            | 134274300            | 14284500     | 10.6            |
| Total  | 514339                 | -                             | -                             | 1574903414           | 1327628690           | 247274724    | -               |

\* obtained as a result of projected area

Source: own calculations after Dobre, Iuliana, 2012

The results show a high profitability for corn, and lower efficiency recorded for oats.

## CONCLUSIONS

This study examined the current status of supply and demand for food products of animal origin in Romania, reflecting imbalances between their components. Domestic production is supplemented by imports in order to meet consumers' needs.

But imports lead to disequilibrium in foreign trade with agro-food products. We suggested increasing the level of production in order to cover the gaps between production and internal availabilities for consumption.

Designing the cultivated area to cover the gap between production and consumption has been achieved taking into account the average yields per hectare and food consumption of cereals required to obtain a unit of production of animal origin.

Results show that, to cover the gap between domestic consumption and production of food products of animal origin, an area of 514,339 ha of barley, oats and corn should be cultivated.

To exploit the surface projected, the estimated revenues are 1,574,903,414 lei; the estimated expenses are 1,327,628,690 lei, obtaining a profit of 247,274,724 lei.

At least two limits of the research can be taken into account. The first relates to production. Even if it grows, this does not mean that all is delivered to market, because the main problem of the food system in Romania, for many branches, is collecting the agricultural outputs from producers. An important role would play the marketing of food products with its specific operations of collecting, sorting, packing, storage, transport, in order to achieve continuous flow of food supply.

The second limit is the fact that in many cases, the prices of imported food are lower than their counterparts in Romania, which means that the market will continue to absorb food imports until, at a certain level of economic efficiency of domestic production; Romanian products will have lower prices than imported ones.

## ACKNOWLEDGEMENT

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# THE DYNAMICS OF TECHNICAL ECONOMIC INDICATORS OF CROP AND ANIMAL PRODUCTION IN SOUTH -EAST REGION

IURCHEVICI LIDIA<sup>1</sup>, CHETROIU RODICA<sup>2</sup>

## Abstract

*The South-East Region represents the joining place of Moldova, Muntenia and Dobrogea, situated, thus, at the confluence of the history and national culture. The administrative structure of the region includes six counties: Constanta, Tulcea, Braila, Galati, Vrancea and Buzau. Being the second largest in the 8 regions of Romania, covers 35,762 km<sup>2</sup>, ie 15% of total national area. Agriculture holds an important share in the region economy, 40.4% of the population of region being occupied in this sector. The work studies the evolution, during 2000 - 2010, of the following technical and economic indicators specific to agriculture in South-East: the land fund, material and technical basis of agriculture, agricultural crop area and production, average production for the main crops, livestock and animal production, the number of animals per 100 ha, value of agricultural production, agricultural production indices. It shows that the total agricultural area of South-East Region met an upward curve in the first three years of the interval, decreasing slightly from the base year. Of total cultivated areas, cereals represented in 2010, 62.6% and 99.8% of the surface cultivated with cereals in 2000. The surfaces of the private sector, cultivated with cereals, increased in 2010 by 18.4% compared to 2000. Of the total cereals, wheat and corn represent over 90%, the rest being represented by other straw cereals. Among animal products, a positive dynamic in the analyzed period, have registered the pork meat, the sheep and goat's milk, wool, eggs and honey. The value of agricultural production in 2009 was 140% higher than the initial.*

**Keywords:** *land fund, agricultural area, production, cereals, dynamic*

## INTRODUCTION

The South - East Region is the only region of Romania where all forms of relief blend harmoniously, so that, from the Black Sea shore, passes by Dobrogea Plateau, bordered to the north of the Macin Mountains, for then to cross the Danube valley in the plain Baragan and Covurlui and reach the Curvature Sub-Carpathians and Curvature Carpathians. The east of the region is surrounded by the Danube Delta, unique in Europe, and nature has given the privilege Danube to cross the region and to spill directly by Delta in the Black Sea.

All of these are crowned with the rich fruit of plains land, from the Danube valley, or hills and plateaus of the region. These places, especially Baragan Plain, have always been considered "granary of Europe". In this paper, is performed a multi-annual analysis of technical economic indicators of plant and animal production, at the territorial level.

## MATERIAL AND METHOD

The paper studies the evolution, during 2000 - 2010, of following technical and economic indicators specific to agriculture in South-East Region, using official statistical data series of N.I.S.:

- land fund;
- technical and material basis of agriculture;
- crop area and production;
- average production for main crops;
- livestock and animal production;
- number of animals per 100 ha;
- value of agricultural production;
- agricultural production indexes.

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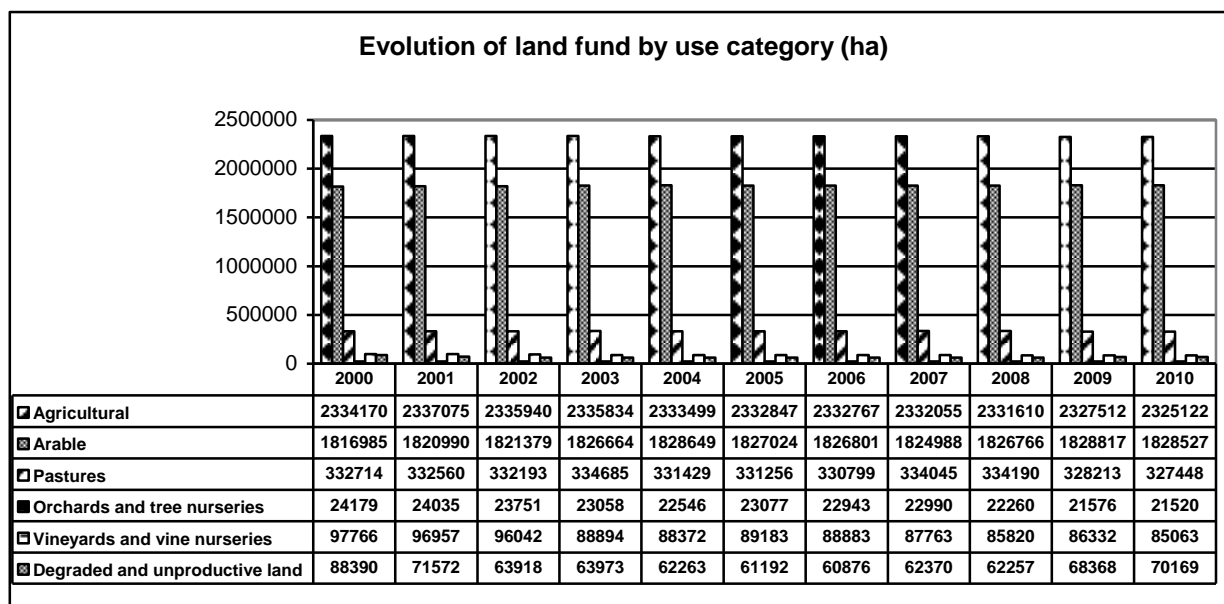
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## RESULTS AND DISCUSSION

### 1. Land fund

Chart 1

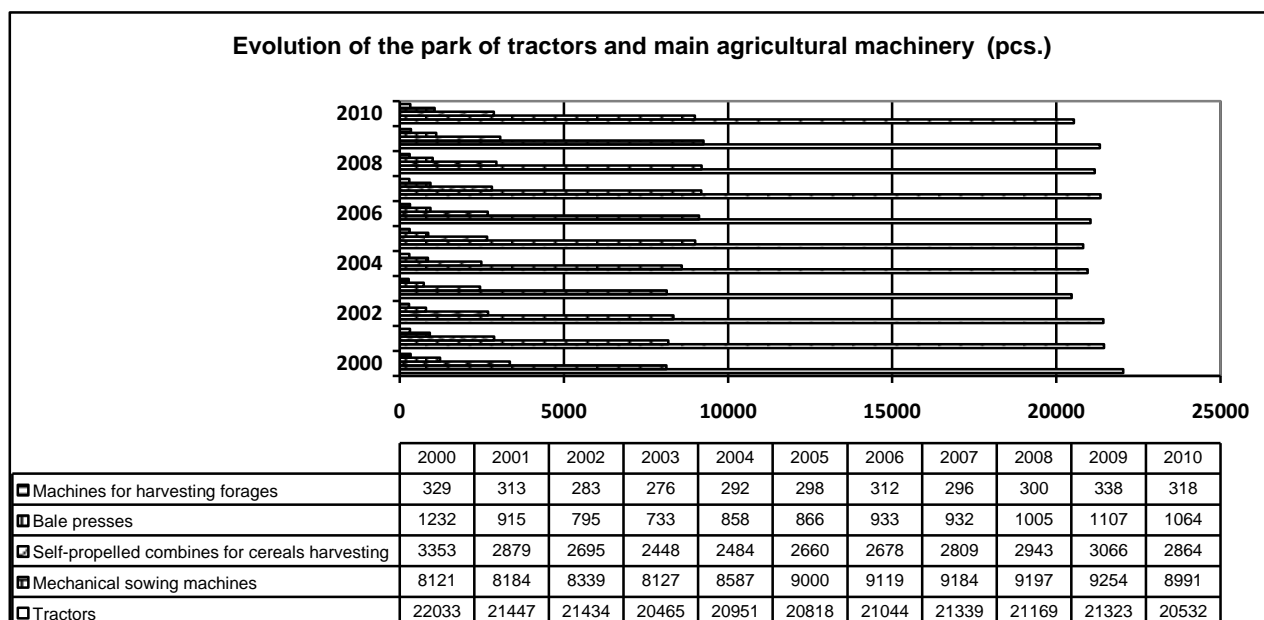


Source: N.S.I

Analyzing the evolution of land fund in the period 2000-2010, it shows that total agricultural area of South-East Region has seen a trend ascending in the first three years of interval, decreasing slightly to 99.6%, compared to base year. At the same time, the arable land has increased by 0.6 percent in 2010 compared to 2000. In contrast, the areas under vineyards and wine nurseries decrease by 13%. The same descending evolution is noticed for areas under orchards, they decrease by 11% at the end of the range. Fortunately, the fact that degraded and unproductive lands in South-East Region decreased by 20.6% in the period analyzed, showing how attention is given to improving the use and quality of land.

### 2. Technical and material basis of agriculture

Chart 2



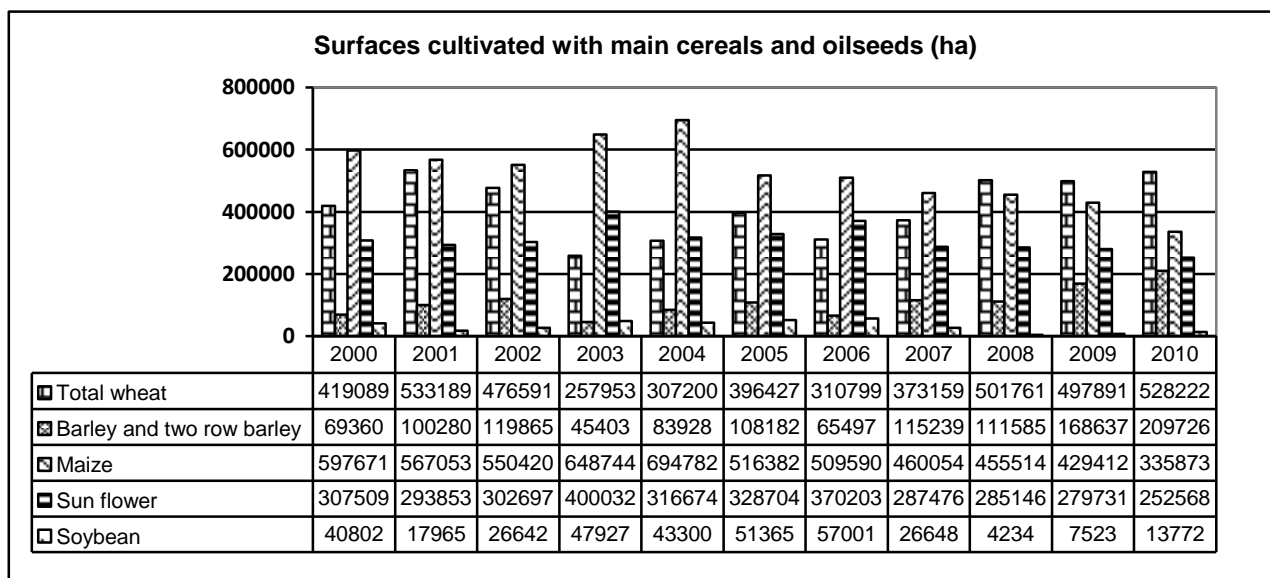
Source: N.S.I

It finds that the largest number is of agricultural tractors, which, having a sinuous dynamic, decrease by 6.8% from 22033 in 2000 to 20532 pieces in 2010. The current park of agricultural machinery is broadly outdated, and this leads to big losses of harvest and not solve the problem of long campaigns. The numerical hierarchy, follows mechanical sowers, which, however, have an increase of 10.7% at the end of the period under review. In terms of combines for cereals harvesting, they decrease by 14.6%, something not encouraging, given the fact that, in the increasing of cereals production conditions, the existing material and technical basis is poor, leading to delays in production harvesting and losses.

### 3. Crop area and production

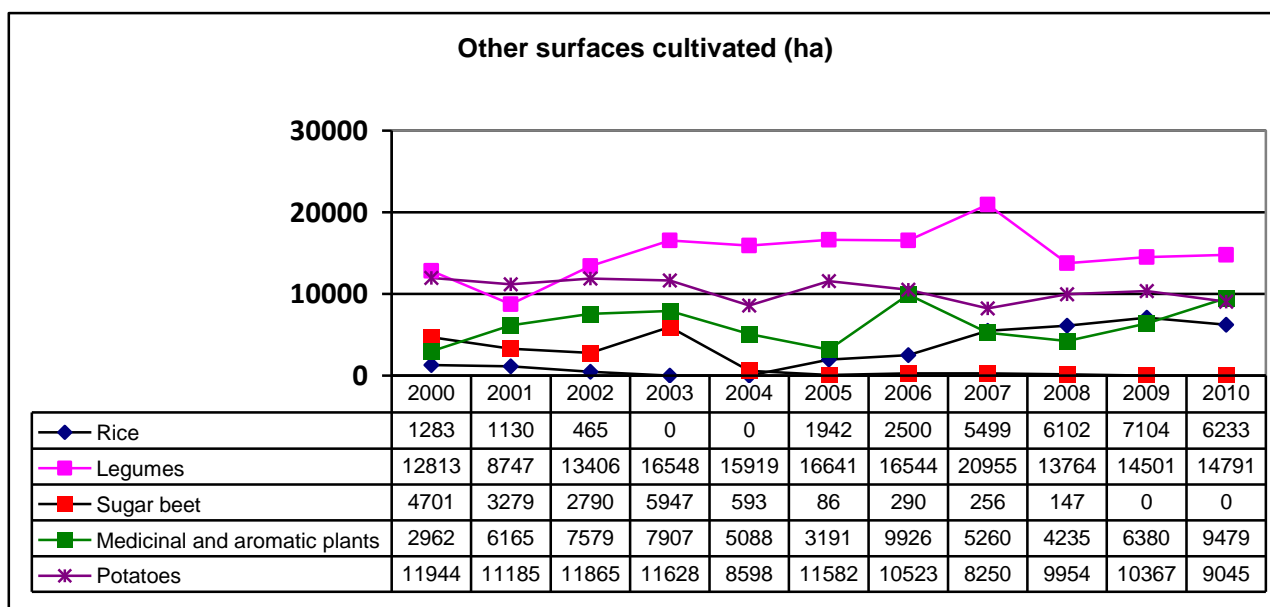
According to data from 2010, agricultural land in the South - East of the country is 2.32 million hectares, ie 15.9% of the total country land for agricultural activities. Agricultural land has 65% of the total region. The private sector holds the largest share of agricultural land (90.5%) and also produces the major part of agricultural production (96.1% in 2009).

Chart 3



Source: N.I.S.

Chart 4

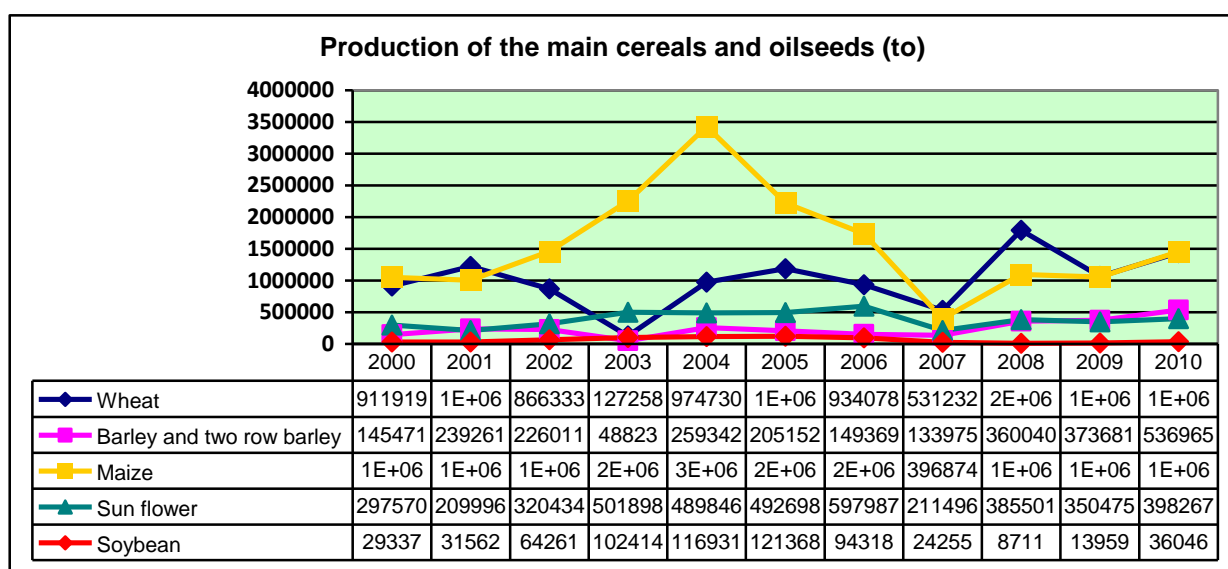


Source: N.I.S.

Thus, of total area cultivated cereals were, in 2010, 62.6% and 99.8% of the cereals surface of 2000. In 2010, the total area cultivated with wheat represented 47.8% of the total cereals surface, with an increase of 26% compared to 2000. Areas cultivated with barley and two row barley have tripled in 2010 compared to 2000, 99% being in the private sector, and oats increases in size by almost 4%. Area occupied by corn represented, in 2010, only 56.2% of the year 2000, after having peaked at 694782 ha in 2004. For almost five times greater is surface area of rice in 2010, it reached 6233 ha and legumes occupy an area greater by 15% than in 2000.

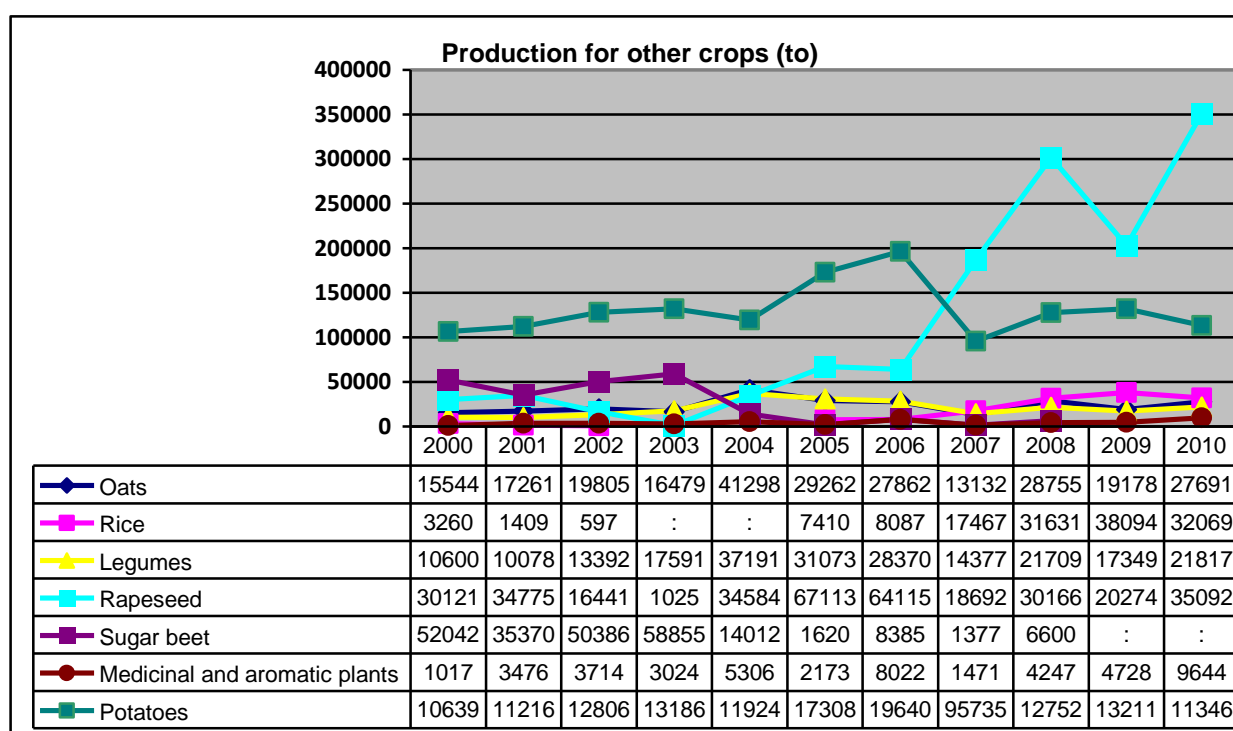
Sunflower was cultivated in 2010 on an area by 17.9% lower than in 2000, and soybean represented only 33.8% of the abovementioned year surface. Starting with 2009, in the statistics do not appear areas under sugar beet, although in 2000 there were still 4701 hectares. Medicinal plants were cultivated in 2010 on an area by 3.2 times higher than in 2000, and the potatoes are decreasing by 24.3%.

Chart 5



Source: N.I.S.

Chart 6



Source: N.I.S.

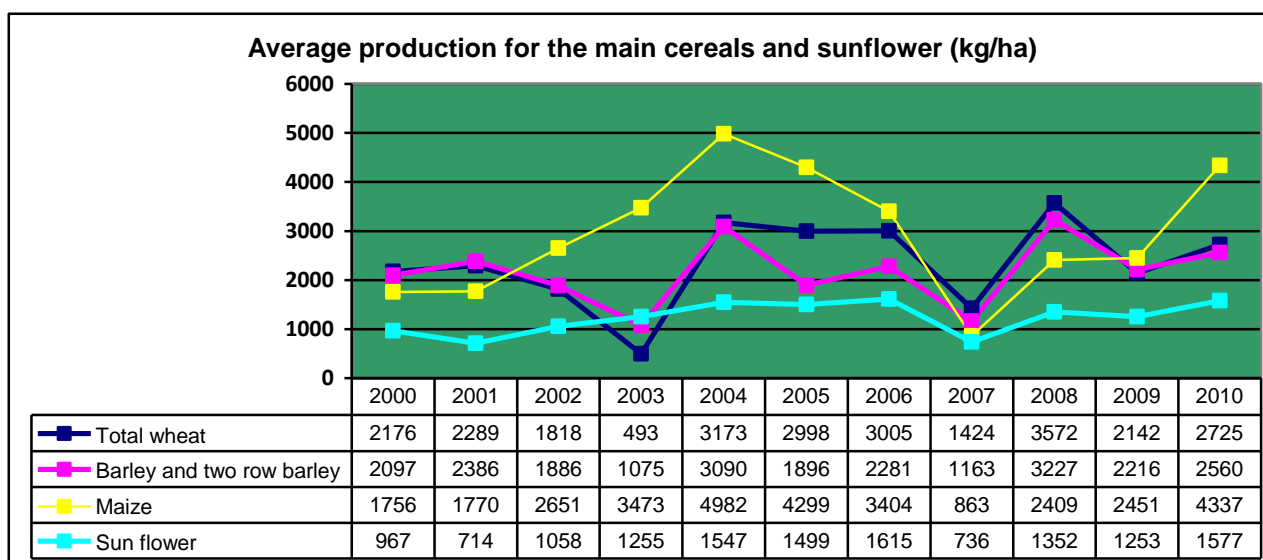


In terms of agricultural production for the main crops, cereals production had an irregular evolution over the period analyzed, climatic conditions, germinating material quality and compliance with technologies culture having a decisive influence. Thus, the minimum was recorded in 2007, when production fell by over 1 million tons compared to 2000 and maximum in 2004, over 2.5 million tons. Also, the year 2010 recorded an increase over 60% compared to 2000. Of all cereals, wheat and corn is over 90%, the rest being represented by barley, two row barley, rye, oats, rice. At legumes, peas grew substantially, by more than 3 times in 2010 compared to 2000, while the beans, production remained constant. And oil plants recorded increases in 2010, with over 45% compared to 2000.

#### 4. Average production for main crops

The evolutions of average production for the main crops in the period 2000-2010 have ranged depending on the varieties of cultures: in cereal grains, maize recorded the highest increase of over 240%, ranging from 1756 kg / ha to 4337 kg / ha, and in the oil plants, soya bean average production increased of 4 times at the end of the interval.

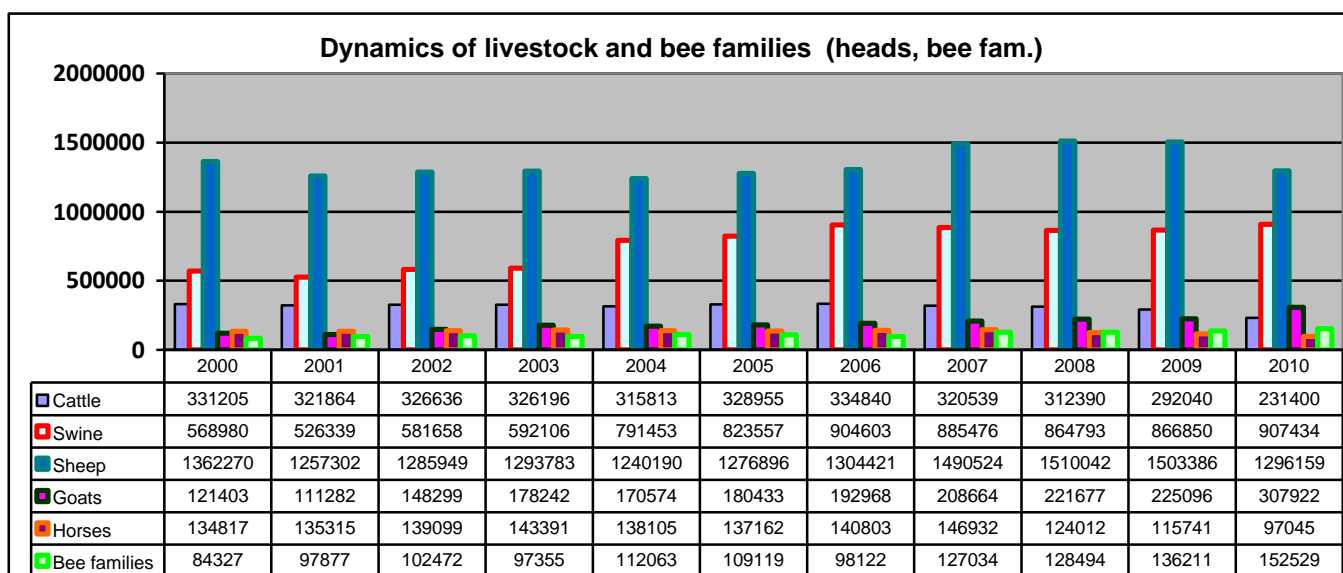
Chart 7



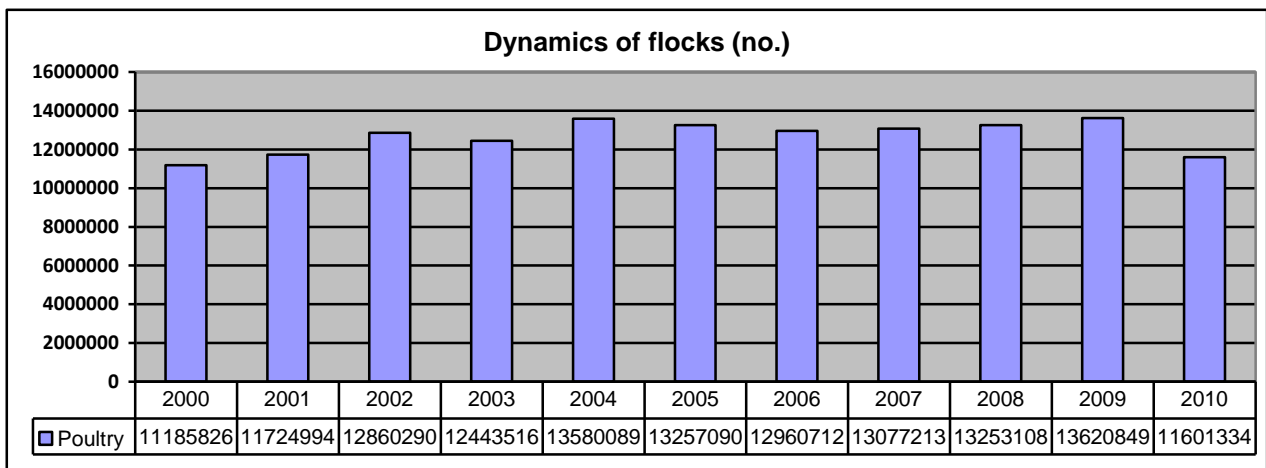
Source: NIS

#### 5. Livestock and animal production

Chart 8

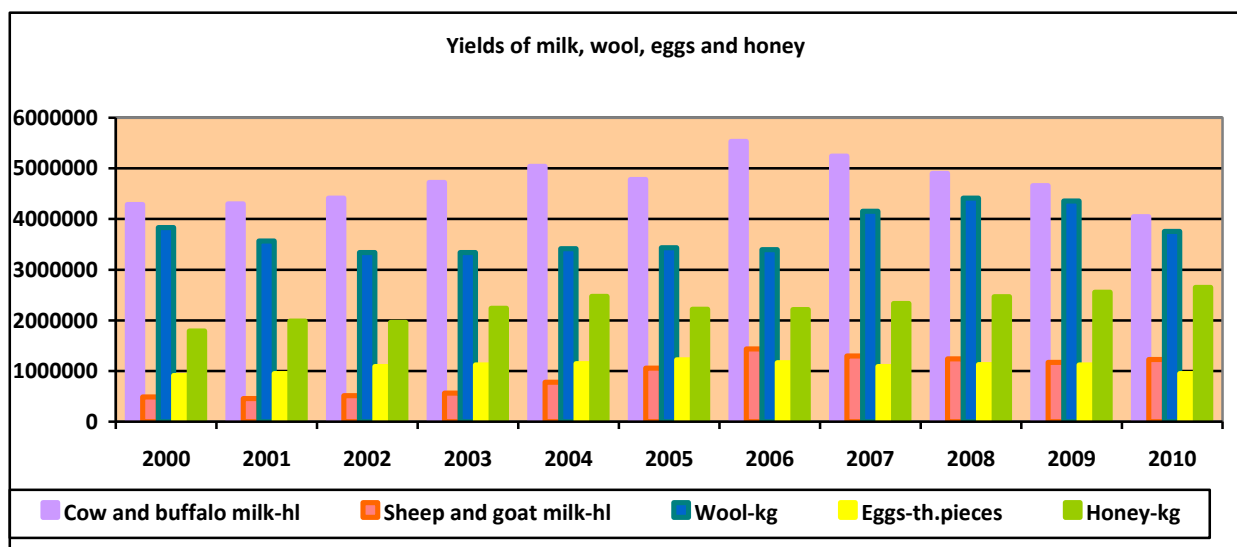


Source: NIS



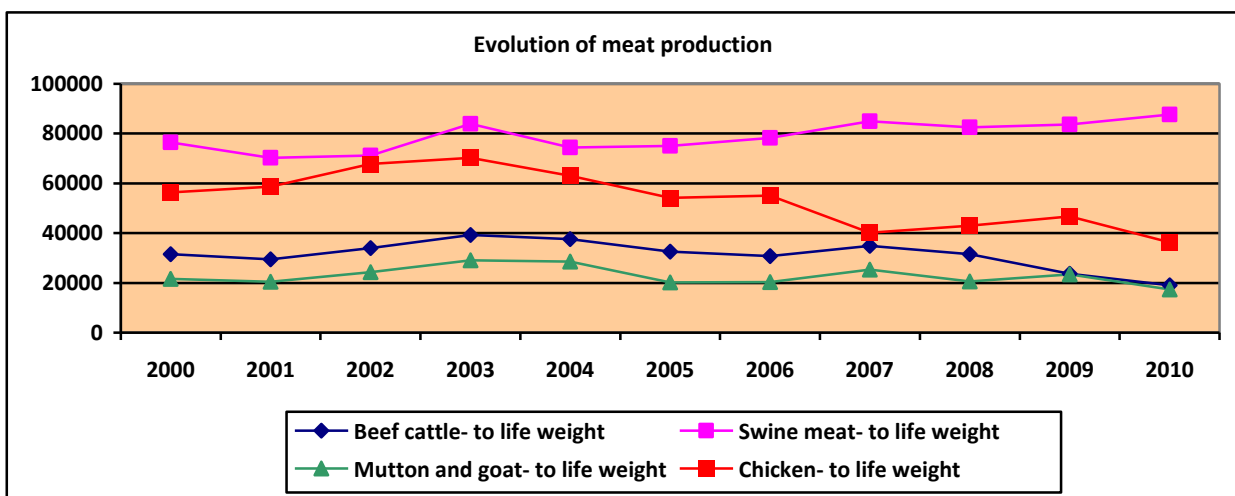
Source: NIS

Chart 9



Source: NIS

Chart 10



Regarding the evolution of meat production, overall, it was declining in 2010 compared to 2000, with 14%. Per species, situation is as follows: the beef fell by 39.8%, in the sheep and goats by 19.5% and 35.7% in poultry. In contrast, a slight increase in pork meat by 14.6% was registered. (Chart 10). Cow and buffalo milk decrease as production, by 5.6% in 2010 compared to 2000, and

milk of sheep and goats increase by over 152%, consecutive to livestock growth. Wool production overall decreases slightly by 2%.

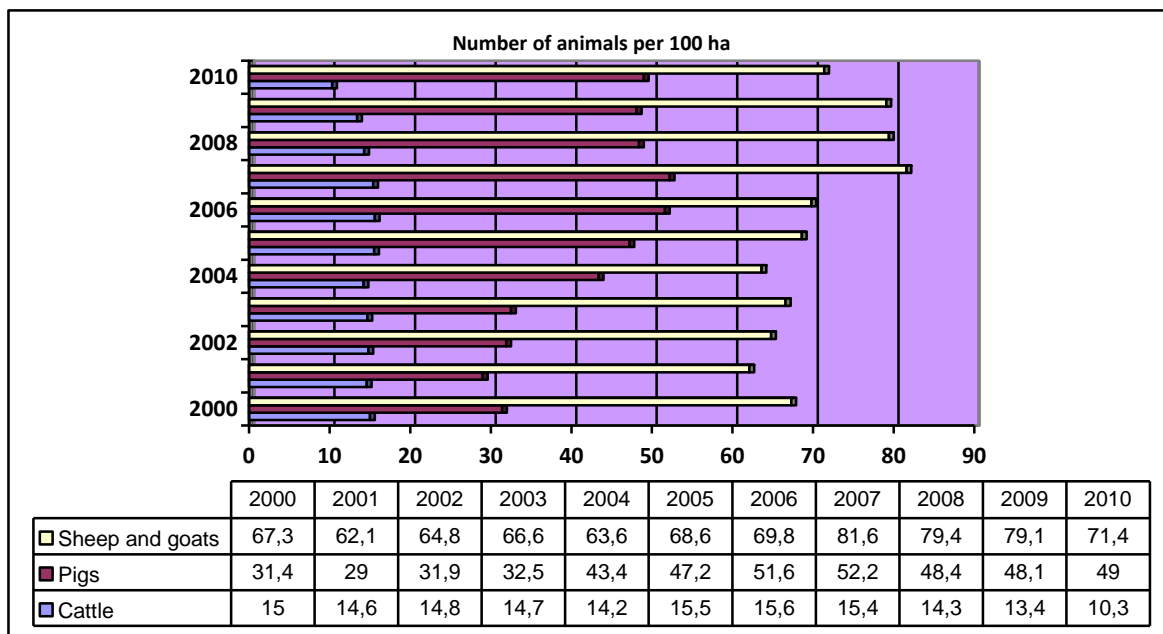
In terms of egg production, this registered an ascending trend, by 3.9% in 2010 compared to 2000. Also, honey production has increased by 48.2%.

### 6. Number of animals per 100 ha

In the case of bovine population, it is an indicator of a sinus evolution, in the period analyzed, with a maximum in 2006 of 104% and a minimum in 2010, 68.7%.

In pigs, the year 2010 shows an increase of 56.1% compared to 2000, consecutive to livestock increases and in sheep and goats of 6.1%.

Chart 11

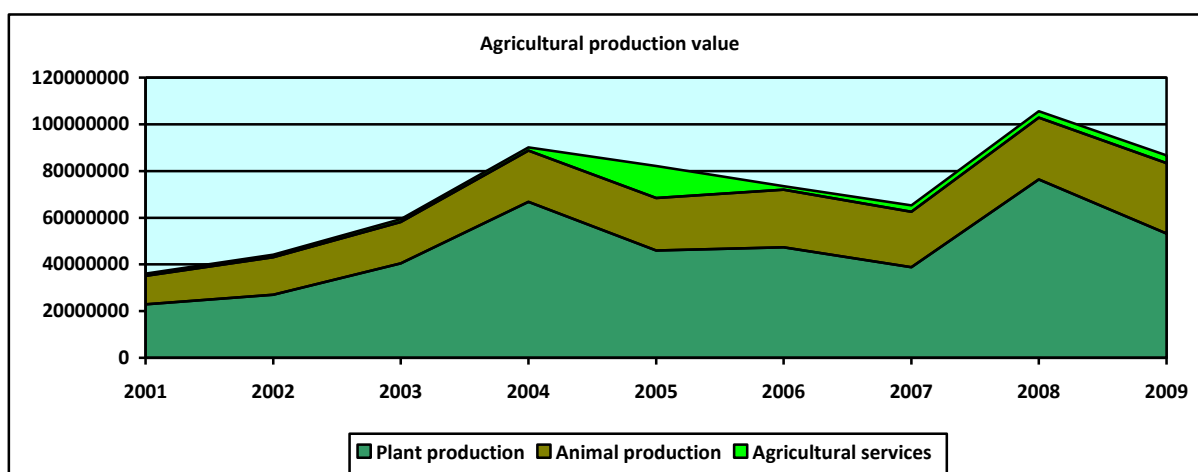


Source:NIS

### 7. Value of agricultural production

Value of agricultural production in 2009 was 140% higher than in 2001, but the maximum was reached in 2008. (Chart 12). In 2009, of total agricultural production, 61.3% is represented by plant production, animal production 34.9% and 3.8% of agricultural services. The main supplier of agricultural production value is the private sector (96.1%) and in particular the production plant. Thus, 96.9% of this is carried out in the private sector.

Chart 12

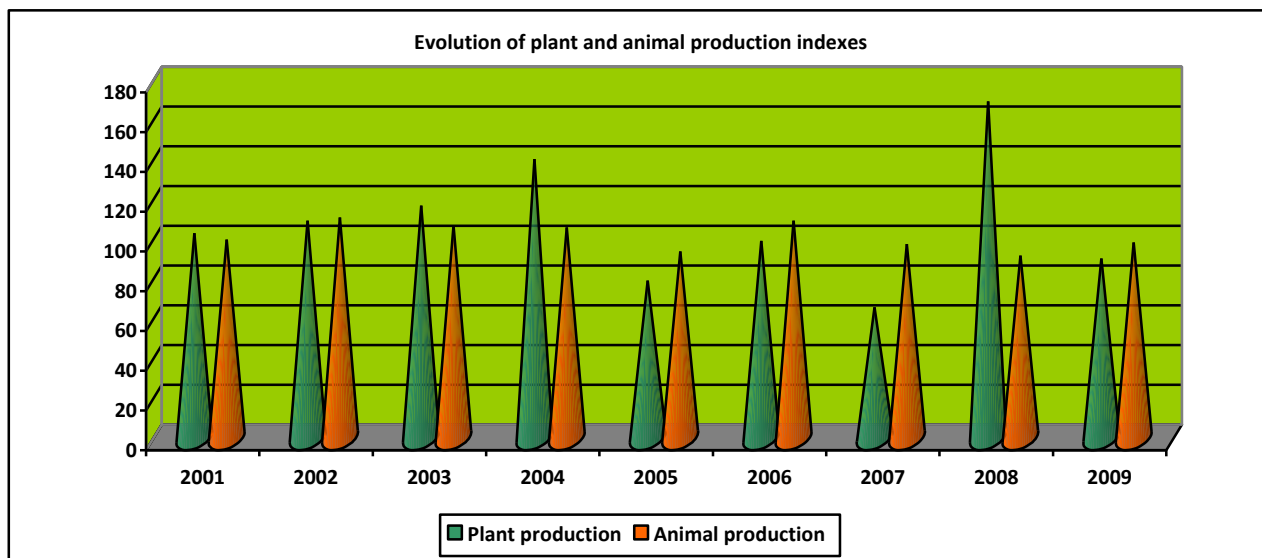


Source:NIS

## 8. Agricultural production indexes

They reflect the dynamics of agricultural production value and, as noted above, in the analyzed interval, maximum is reached in 2008 by the crop production index (169), followed by the same of 2004 (140). In 2009, there is a regression of indexes, with a slight advance of animal production compared to crop production.

Chart 13



Source:NIS

## CONCLUSIONS

In conclusion, it points out that:

- land fund dynamic knew no significant variations during the 10 years analyzed;
- total agricultural area of South-East Region had an slight ascending curve in the first three years of interval, decreasing slightly compared to the base year;
- in the conditions of growing cereals production, the existing material and technical basis is poor, leading to delays in harvesting production and losses;
- of total area cultivated, cereals were, in 2010, 62.6% and 99.8% of the cereals surface of the year 2000;
- of all cereals, wheat and maize occupies over 90%, the rest being represented by other cereal straw;
- among animal productions, a positive trend in the analyzed period have registered the pork meat, sheep and goat's milk, wool, eggs and honey;
- of total agricultural production, over 60% is represented by plant production, animal production about 35% and the remaining agricultural services.

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# COMPARATIVE ANALYSIS OF BROILERS GROWING IN DIFFERENT MAINTENANCE SYSTEMS

IURCHEVICI LIDIA<sup>1</sup>

## Abstract

*In Romania it is necessary to pay special attention to adapt the broilers growing and exploitation systems to the European Union requirements. At the same time, it is necessary to protect and stimulate those characteristics of chickens growing and exploitation that have competitive advantages concerning the obtained products quality and the minimum environmental impact technologies. An especially important desideratum is to promote and implement the environmentally friendly production systems. It is important that technological solutions adopted in the growth and exploitation of poultry to meet all environmental requirements, for the conservation of natural area of Romania. The main objective of this work is to provide a technical economic solution for broilers growing both in intensive and in household or ecological system. Our researches reveal that the intensive - industrial system of broilers growing remains the main source to satisfy the global and the national consumption. The alternative technologies of chicken growing, in particular the ecological system, take place on the domestic poultry market, but it is necessary to create slow-growing biological material, fodder with components allowed by this technology, certified organic slaughterhouses and should develop a specific market segment. Farmer's yard chicken will still remain in the Romanian countryside. Householders must change their mentality and approach the peasant poultry farming from more economic positions.*

**Keywords:** chicken, growth, production, intensive, ecological

## INTRODUCTION

Poultry meat is on preferences top of consumers everywhere. The scientific research has made farmers available to new genotypes of great value, with advanced precocity and high growth speed, to harness upper the fodder, resulting in high production economy. All this is done in conditions of an artificial growing environmental and in the presence of a "food doping."

Inevitably, the reverse of the medal occurred: quantitative exhausting productions continuously prove qualitative depreciation, on lower comfort and well-being of the poultry.

In case of poultry meat industry produced, consumers complain vehemently depreciation of taste and cooking qualities, so they are turning their attention to poultry products obtained in smaller farms, in conditions of birds access to fresh air and grassy land, bred semi-intensive or extensive, without dietary forcing, with slow growth and slaughter later.

## MATERIAL AND METHOD

This paper is based on a comparative study on raising broilers in intensive - industrial and extensive – ecological type. The methodology for determining the production costs of the two types of growth is based on a series of technological features that are found in the table below. (Table 1)

**Table 1 Essential differences between intensive - industrial and extensive - ecological systems**

| Specification                               | Intensive – industrial system   | Extensive - ecological system   |
|---|---|---|
| Age at slaughter (days)                     | 39-45   | 81-90   |
| Average daily gain (gr./day)                | 45-55   | 22-25   |
| Specific consumption of fodder (kg/kg gain) | 1,7-2   | 4,6   |
| Characteristic food                         | Combined fodder, recipes for growing phases with antibiotics, acids, amino acids and enzymes of synthesis, antifungal GMO, animal meal, dietary forcing | Ration from cereals, oilseeds, protein, minerals, all certified as organic. Are prohibited antibiotics, drugs, stimulants of synthesis, amino acids, enzymes, GMOs. Mandatory grassy field. |

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| Specification      | Intensive – industrial system  | Extensive - ecological system   |
|--------------------|--|---|
| Growing conditions | Industrial, artificial environment, 10,000 to 20,000 chicken / hall, 20 chicken/m <sup>2</sup> , very early biological material with high intensity of growth. | Shelter up to 500 chickens, 10 chickens / m <sup>2</sup> , access to grassy land, 4m <sup>2</sup> , conditions of exceptional wealth, slow-growing chicken. |

## RESULTS AND DISCUSSION

The production costs were determined based on production technologies, each item of expense being based on gain, specific consumption, exploitation period, in the two farming systems. (Table 2)

**Table 2 Main economic indicators**

| Specification                    | M.U.   | Industrial system | Ecologic system |
|----------------------------------|--------|-------------------|-----------------|
| Variable costs                   | lei/kg | 5.232             | 10.504          |
| Fixed costs                      | lei/kg | 0.550             | 1.178           |
| Total costs (cost of production) | lei/kg | 5.782             | 11.682          |
| Acquisition price                | lei/kg | 6.700             | 14.000          |
| Profit rate                      | %      | 15.87             | 11.6            |

Following table with the main economic indicators can see big differences between the two exploitation systems. Thus, ecological systems, costs are twice higher than the industrial system.

**Table 3 Estimate technology for poultry meat**

| Average production 50 g/day                   |                       |                                      |                            |
|---|-----------------------|--------------------------------------|----------------------------|
| SPECIFICATION                                 | Quantity<br>kg fodder | Unitary<br>price<br>lei/kg<br>fodder | Value<br>lei/100 kg fodder |
| Maize   | 65                    | 0.95                                 | 61.750                     |
| Barley  | 7                     | 0.80                                 | 5.600                      |
| Soybean cake                                  | 25                    | 2.50                                 | 62.500                     |
| Zoofort                                       | 1                     | 7.50                                 | 7.500                      |
| Premix  | 2                     | 12.00                                | 24.000                     |
| Total fodder                                  | 100                   |                                      | 161.350                    |
| Specific consumption kg fodder/kg gain (1.87) |                       |                                      | 3.017                      |
| SPECIFICATION                                 | QUANTITY              |                                      | EXPENDITURES               |
|   | M.U.                  | M.U./head                            | Lei/kg life weight         |
|   |                       | Quantity                             | Price lei/M.U.             |
| <b>1.Feed costs</b>                           |                       |                                      | 3.017                      |
| <b>2.Biologic material</b>                    | kg                    |                                      | 1.200                      |
| <b>3.Energy and fuels</b>                     | kW/year               | 0.390                                | 0.600                      |
| <b>4. Drugs and sanitary material</b>         | lei                   |                                      | 0.370                      |
| <b>5.Other material expenses</b>              | lei                   |                                      | 0.200                      |
| <b>6. Share of supply</b>                     | lei                   |                                      | 0.115                      |
| <b>7. Insurance</b>                           | lei                   |                                      | 0.096                      |
| <b>TOTAL VARIABLE COSTS</b>                   | lei                   |                                      | 5.232                      |
| <b>8. Labor costs</b>                         | lei                   |                                      | 0.160                      |
| <b>9. General expenditures</b>                | lei                   |                                      | 0.100                      |
| <b>10. Interest on loans</b>                  | lei                   |                                      | 0.170                      |
| <b>11. Depreciation</b>                       | lei                   |                                      | 0.120                      |
| <b>TOTAL FIXED COSTS</b>                      | lei                   |                                      | 0.550                      |
| <b>TOTAL COSTS</b>                            | lei                   |                                      | 5.782                      |

**Table 4 Budget for poultry meat**

| INDICATORS                                  | Average production<br>50 g/day |
|---|--------------------------------|
|   | Lei/kg                         |
| <b>A. VALUE OF PRODUCTION</b>               | 6.700                          |
| A <sub>1</sub> Of which main production     | 6.700                          |
| <b>B. SUBSIDIES</b>                         | 1.080                          |
| <b>C. RAW PRODUCT</b>                       | 7.780                          |
| <b>D. TOTAL COSTS</b>                       | 5.782                          |
| D <sub>1</sub> Of which for main production | 5.782                          |
| <b>I. VARIABLE COSTS</b>                    | <b>5.232</b>                   |
| <b>1.Feed costs</b>                         | 3.017                          |
| 2.Biologic material                         | 1.200                          |
| 3.Energy and fuels                          | 0.234                          |
| 4. Drugs and sanitary material              | 0.370                          |
| 5.Other material + water                    | 0.200                          |
| 6. Share of supply                          | 0.115                          |
| 7. Insurance                                | 0.096                          |
| <b>II. FIXED COSTS</b>                      | <b>0.550</b>                   |
| - Labor costs                               | 0.160                          |
| - General expenditures                      | 0.100                          |
| - Interest on loans                         | 0.170                          |
| - Depreciation                              | 0.120                          |
| <b>E. TAXABLE INCOME</b>                    | 0.918                          |
| Taxes and duties                            | 0.000                          |
| <b>F. NET INCOME + subsidies</b>            | 1.998                          |
| <b>G. TAXABLE INCOME RATE (%)</b>           | 15.870                         |
| <b>H. NET INCOME RATE + subsidies (%)</b>   | 34.547                         |
| <b>COST OF PRODUCTION</b>                   | 5.782                          |
| <b>INTERNAL PREDICTABLE MARKET PRICE</b>    | 6.700                          |

**Table 5 Estimate technology for poultry meat**

| Average production 22 g/day                  |                       |                                |                            |
|--|-----------------------|--------------------------------|----------------------------|
| SPECIFICATION                                | Quantity<br>kg fodder | Unitary price<br>lei/kg fodder | Value<br>lei/100 kg fodder |
| Maize  | 70                    | 0.95                           | 66.500                     |
| Wheat  | 3                     | 0.80                           | 2.400                      |
| Oilseed cakes                                | 22                    | 2.50                           | 55.000                     |
| Other seeds of cereals                       | 5                     | 7.50                           | 37.500                     |
| Total fodder                                 | 100                   |                                | 161.400                    |
| Specific consumption kg fodder/kg gain (4,6) |                       |                                | 7.424                      |
| SPECIFICATION                                | QUANTITY              |                                | EXPENDITURES               |
|  | M.U.                  | M.U./head                      | Lei/kg life weight         |
|  |                       | Quantity                       | Price<br>lei/M.U.          |
| <b>1.Feed costs</b>                          |                       |                                | 7.424                      |
| <b>2.Biologic material</b>                   | kg                    |                                | 1.500                      |
| <b>3.Energy and fuels</b>                    | kW/year               | 0.600                          | 0.600                      |
| <b>4. Drugs and sanitary material</b>        | lei                   |                                | 0.000                      |
| <b>5.Other material expenses</b>             | lei                   |                                | 0.600                      |
| <b>6. Share of supply</b>                    | lei                   |                                | 0.500                      |
| <b>7. Insurance</b>                          | lei                   |                                | 0.120                      |
| <b>TOTAL VARIABLE COSTS</b>                  | lei                   |                                | <b>10.504</b>              |
| <b>8. Labor costs</b>                        | lei                   |                                | 0.500                      |
| <b>9. General expenditures</b>               | lei                   |                                | 0.198                      |
| <b>10. Interest on loans</b>                 | lei                   |                                | 0.300                      |
| <b>11. Depreciation</b>                      | lei                   |                                | 0.180                      |
| <b>TOTAL FIXED COSTS</b>                     | lei                   |                                | <b>1.178</b>               |
| <b>TOTAL COSTS</b>                           | lei                   |                                | <b>11.682</b>              |

**Table 6 Budget for poultry meat**

| Average production 22g/day                  |               |
|---|---------------|
| INDICATORS                                  | Lei/kg        |
| <b>A. VALUE OF PRODUCTION</b>               | 14.000        |
| A <sub>1</sub> . Of which main production   | 14.000        |
| <b>B. SUBSIDIES</b>                         | 2.000         |
| <b>C. RAW PRODUCT</b>                       | 16.000        |
| <b>D. TOTAL COSTS</b>                       | 11.682        |
| D <sub>1</sub> Of which for main production | 11.682        |
| <b>I. VARIABLE COSTS</b>                    | <b>10.504</b> |
| <b>1.Feed costs</b>                         | 7.424         |
| 2.Biologic material                         | 1.500         |
| 3.Energy and fuels                          | 0.360         |
| 4. Drugs and sanitary material              | 0.000         |
| 5.Other material + water                    | 0.600         |
| 6. Share of supply                          | 0.500         |
| 7. Insurance                                | 0.120         |
| <b>II. FIXED COSTS</b>                      | <b>1.178</b>  |
| - Labor costs                               | 0.500         |
| - General expenditures                      | 0.198         |
| - Interest on loans                         | 0.300         |
| - Depreciation                              | 0.180         |
| <b>E. TAXABLE INCOME</b>                    | 2.318         |
| Taxes and duties                            | 0.000         |
| <b>F. NET INCOME + subsidies</b>            | 4.318         |
| <b>G. TAXABLE INCOME RATE (%)</b>           | 19.842        |
| <b>H. NET INCOME RATE + subsidies (%)</b>   | 36.962        |
| <b>COST OF PRODUCTION</b>                   | 11.682        |
| <b>INTERNAL PREDICTABLE MARKET PRICE</b>    | 14.000        |

## CONCLUSIONS

The researches point out that the intensive - industrial raising of broilers remains the main source for satisfying global and national consumption.

To obtain competitive results, should ensure feeding to chickens, in accordance with needs and with the genetic potential of biological material in use, optimum microclimate throughout the period of growth, welfare conditions, in particular by complying the recommended maximum density and avoid possible stress.

The alternative technologies for raising chickens, particularly ecological system, takes place on the domestic market, but is necessary to create a slow-growing biological material, mixed fodder with components allowed by this technology, certified organic slaughterhouses and to create a specific market segment. Organic farming is better for the environmental protection. Farmers must change their mentality and approach the ecological poultry farming on more economical positions.

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# THE DIRECT PAYMENT LEGISLATION, PROPOSED BY THE EUROPEAN COMMISSION AND THE IMPACT OF ITS APPLICATION IN ROMANIA

IVASCU TEODORA<sup>1</sup>

## Abstract:

*Romania has gone through, in the last 20 years, an ample and complex process of systematic transformation, of reconstruction of the legal, institutional and organizational medium, having as objective the implementation of a democratic system and the transition to market economy. The promotion of public politics, based on anterior research, represents an essential element in providing quality results with a positive impact over the life of the citizens and capable of providing the desired changes in the real world. Following the situation of the Romanian agriculture in the present, for the advantageous integration in the UE, a specific approach is needed for the CAP measures that assure the reduction of economic delays compared to member states. The European Commission proposals for the political measures for rural development after 2013 are a mix of what was and what will be. So, a series of measures, that proved their worth in current times, have been updated. The declared purpose was to update these measures and make them more effective, so that they better reflect the political priorities for rural development.*

**Key words:** direct payment, European Commission, Common Agricultural Policy..

## INTRODUCTION

The increase of the EU member states to 27, in 2007, has modified the European agricultural reality, which now includes a diversity of types of agriculture, with big development delays in rural areas.

In Romania, a bipolar agrarian structure is maintained, formed on one side by small farms, with extensive production systems and on the other side formed by very large farms, that apply intensive and modern production systems. In the last 20 years, this structure has not suffered major modifications, both types of farms having their own important role in the exploitation of the terrain and having their own economic, social role and a specific potential for development.

Also, Romania's rurality degree is similar to the UE27 average, also the details of the social rural environment. Keeping in mind these aspects as well as the necessities of competitively growth, it is important that all available possibilities are used, provided through the rural and agricultural policy, proposed by the Commission, to support both types of agriculture so that they respond to the needs and niches of their development.

## MATERIAL AND METHOD

The evaluation starts from the hypothesis of applying the law proposals for direct payments, estimating their impact and the application conditions in the form presented by the Commission. It is proposed that the distribution of assistance between member states should be more equitable so that in the case of member states in which the value of direct payments is smaller than 90% of the EU average, they are covered gradually by a third of this delay, by gradual reduction of country ceilings of countries that go over the EU27 average with over 190%.

Starting with the year 2014 the farmers will have access to two schemes of support (direct payments): one enforced and one optional.

The enforced scheme will be composed of:

- Base payment that will replace the two current schemes (the unique payment scheme and the unique payment scheme by surface). This scheme will function based on

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payment rights allocated at national (or regional) levels of all farmers, depending on the number of eligible ha in the first year of application.

- One payment for the farmers that apply agricultural practices that benefit the climate and environment (30% of the national annual ceiling)

The optional scheme:

- A payment for farmers in the areas with natural constraints (up to 5% of the national annual ceiling)
- A payment for young farmers that are starting their agricultural activity (up to 2% of the national annual ceiling)
- A coupled support scheme (up to 5% of the national annual ceiling) for certain types of agricultural activities or for certain agricultural systems that are difficult but important;
- A specific payment for the cotton cultures;
- A simplified annual scheme for the small farmers (up to 10% of the national annual ceiling).

According to present legislation (R73/2009), the eligible surface for SAPS in Romania is that of 8.716.320, 00 ha (until 2013). In conformity with the active European laws in the direct payment domain, in Romania direct payments are introduced gradually in conformity with the calendar for their growth by percentage, which is: 35% in 2009, 40% in 2010, 50% in 2011, 60% in 2012, 70% in 2013, 80% in 2014, 90% in 2015 and 100% starting with 2016.

## RESULTS AND DISCUSSIONS

The Commission proposal stipulates that the surface upon which it will make all assessments for all countries will be one in 2009 (COM 12734/2011) and for Romania this means 9,720,864 ha, thus 11.5% higher than in current legislation.

Direct payments in the Commission proposal are broken down into dynamic national ceilings for each country and stated that the reference surface is taken into account in each country (2009).

For Romania, the total national ceilings for the period 2014-2020 amounts to EUR 12.816.958 thousand euros, theoretically 60% more than during 2007-2013, according to current legislation (R 73/2009) the amount rises to 5.578.490 thousand euros.[2]

If we consider it's different reference surfaces, of proposal COM is higher than 11.5% of the current regulations, a brief analysis we can say that the support per hectare by pillar 1 of the proposal COM, so as presented, does not support equality between farmers, even if national ceilings provide for an increase, this increase is less than the losses per hectare.

The proposal for a regulation COM are also indications concerning the estimation of the average payment per ha in EU-27, which is calculated by dividing total national ceilings to the total reference area (42.780.279 thousand euros/161.066.872 ha) with an average of 266 EUR / ha.[3]

To assess the amounts needed to pay for agricultural practices beneficial for the climate and environment make the following assumptions:

- Because this payment is not subject to the cap, it is estimated that all farmers will be interested to apply;
- It is assumed that all farms over 3 hectares for cultivation will be required at least 3 different cultures (466 000 firm-as APIA 2010), will be eligible for this payment;
- In the first version (V1) payment per hectare was estimated at 30% of the payment per hectare as proposed by the Commission;
- In the second version (V2) payment per hectare was estimated at 25% of EU-27 average payment for natural resources are the same for all Member States it must be kept in harmony throughout the EU.

In version V1, the maximum annual value for this payment, in the case that all farmers that have exploitations over 3 ha, utilize one of the eco-friendly practices, will be situated ascending between 26% of the annual cap for 2014 and 30.5% of the annual cap for 2020, the total value for the budgetary period being that of 3.527.659 thousand euros, which represent 28% of the total cap.

In version 2, the maximum annual value of these payments would be higher for 2014 and 2015 (38% and 33% of the annual ceiling) but for the next period would fit the maximum amount of 30% of the annual ceiling. Even total value for 2014-2020, 3.903.250 thousand euros, it will represent 30% of Romania's total budget ceiling.

To assess the impact of the proposed cap on farm support were used APIA data for the year 2009 on the farms of over 2000 ha, those that would be practically affected by this measure. Thus, for 200 farms with a total of 816 738 ha (9% of the eligible in 2009), it was estimated that the value loss due to capping / modulation (money available for rural development). It was also made a comparison between the current legislative provisions, a variant as proposed COM cap and pay 30% of average pay per ha (V1) and a version with cap and average pay 25% of the EU average (V2) for the years 2014 and 2020.

Capping losses on farm payments, amounts will be transferred to rural development are not as spectacular as we expected. For example, as proposed in COM (V1), in 2014 they amounted to 33.959 thousand euros, which represents 2% of the national ceiling. In 2020, the loss is estimated at 55.401 thousand euros, representing 3% of the national ceiling in 2020.

If we look at version 2 (V2), in which considered a payment for practices beneficial for the climate and environment, uniform EU, namely 25% of the EU27 average, the losses are lower, namely 23 096 thousand euros in 2014 and 51 100 thousand euros in 2020, representing less than 2% of the national ceiling in 2014 and 3% of the national ceiling in 2020.[4]

A detailed assessment of the impact of capping value on the 200 farms over 2 000 hectares, which basically are among the most competitive and who would be affected by this measure is presented in the following table

**Table 1 Impact of capping value on certain categories of farms in V1 and V2 compared to the current state of legislation**

| Type of farm  | Number     | surface 2009 ha | % of eligible surface | The value of direct payment in the current legislation 2011 euro | Value of direct payment after modulation. 2014(V1) euro | Value cap loss (V1) euro | Value of direct payments in current legislation 2020 euro | Value of direct payment after modulation 2014(V2) euro | Value cap loss (V2) euro |
|---------------|------------|-----------------|-----------------------|--|---|--------------------------|---|--|--------------------------|
| Over 20000 ha | 4          | 126 061         | 1,4                   | 13047306   | 6926723   | 12162354                 | 25603241  | 8763656  | 16448530                 |
| Over 10000 ha | 4          | 45 164          | 0,5                   | 4674516  | 3251739   | 3587390                  | 9172987   | 3909865  | 5123017                  |
| 5000-10000 ha | 23         | 177 846         | 1,0                   | 18407112   | 14979249  | 11951580                 | 36120998  | 17570789   | 17998509                 |
| 3000-5000 ha  | 52         | 192 885         | 2,2                   | 19963600   | 24362422  | 4845652                  | 39175355  | 27173101   | 11403903                 |
| 2000-3000 ha  | 117        | 274 781         | 9,4                   | 28439845   | 40196984  | 1412401                  | 55808624  | 50528843   | 4427379                  |
| <b>Total</b>  | <b>200</b> | <b>816 738</b>  | <b>9,4</b>            | <b>84532379</b>  | <b>89717116</b>   | <b>33959376</b>          | <b>165881205</b>  | <b>107946254</b>                                       | <b>55401338</b>          |

Source: Romania European Institute – Politics and strategies studies SPOS 2011, own evaluations on APIA dates, 2009

In the first version (V1) will lose substantially in 2014 values between 5,6 and 2 million euros, 4 farms with area over 20 000 ha representing 1.4% of the area eligible for direct payments. These farms will receive payments / farm between 2,8 and 1,2 million, the amount can be higher if they would take into account labor costs. Also 4 farms with an area of over 10 000 ha will receive pay / farm between 0,9 and 0,8 million. Losses due to a ceiling value if these farms will range between 0,7 to 1,0 million euros per farm. 23 farms with areas ranging from 5000 to 10 000 ha will

receive 0,5 to 0,75 million / farm losses from capping being 0,2 to 0,7 million per farm depending on the surface.

It was also estimated for each type of farm, based on the previously processed data, the average payment per farm in V1 and V2 versions and average losses / farm payments due capping versus medium / firm received in 2011, situation presented in table 2.

**Table 2 Payments medium / firm and capping losses compared with average payments received in 2011 for categories of farms over 2,000 hectares**

| Farm type            | The average value per farm in current legislation | The value of average payment per farm (V1) euro | Loss value per farm (V1) euro | The value of average pay per farm (V2) euro | Loss value per farm (V2) euro |
|----------------------|---|---|-------------------------------|---|-------------------------------|
| <b>Over 20000 ha</b> | 3 261 827   | 1 731 681                                       | 3 040 588                     | 2 190 914                                   | 4 112 133                     |
| <b>Over 10000 ha</b> | 1 168 629   | 812 935   | 896 847                       | 977 466                                     | 1 280 754                     |
| <b>5000-10000 ha</b> | 800 309   | 651 272   | 519 634                       | 763 947                                     | 782 544                       |
| <b>3000-5000 ha</b>  | 383 915   | 468 508   | 93 186                        | 522 560                                     | 219 306                       |
| <b>2000-3000 ha</b>  | 243 076   | 343 564   | 12 072                        | 431 870                                     | 37 841                        |

Source: Agricultural Common Policies reform in the context of budget perspective post 2013, own evaluations on APIA dates, 2009

And from this analysis it can be seen that the cap substantially affected farms in both those in the first 3 categories (over 5000 ha) both in 2014 and in the year 2020. In the case of category between 2000-5000 ha farm loss is so consistent in 2014, amounts medium / firm that may be collected by farmers are higher than those received in 2011 under current law, which is not true for the first three categories of farms (which represents 4% of the eligible for direct payments).[4]

In the last years the subject of the „small farm” keeps coming up, and the law proposal targets a scheme to support small farms. This proposal aims at replacing payment per hectare with an annual amount per farm and also simplify compliance with conditionality on good agricultural practices for the implementation of CAP direct payments in the future. The main provisions of the proposal for small farm refers to the amount of the payment, namely:

- The amount should not exceed 15% of the average value per farm payments nationally or amount must correspond to direct payment per hectare multiplied by the number of hectares that can be up to 3 ha;
- Payment amount can not be less than 500 euros per farm and can not exceed 1000 euros per farm.

Amount designed for small farms will be deducted from the total ceiling for direct payments allocated to each Member State. The total amount that can be spent on the scheme for small farms should not exceed 10% of the national ceiling for direct payments, but there are reports that this percentage could rise if countries that have a large number of small farms, such as Romania.

If we consider the first criterion for membership of the scheme (15% of the national average per farm), we see that in our country, in 2017, average payments per farm, nationwide, such as those presented in Table. 3.

According to the Commission, the average payment per farm in Romania was in 2009, the lowest level of EU-27 countries namely 493 euro / farm. In 2017, when the ceiling of payment for Romania is 1 939 357 thousand euros per farm payment would be about 1739 euros and 15% of this amount is approximately 260,7 euro / farm, so less than 500 euro / farm that is minimum amount stipulated by the scheme.

**Table 3 Possible payments per hectare and per farm in Romania in 2017**

|                                   | UM             | Current legislation | COM, 2017 proposals |
|-----------------------------------|----------------|---------------------|---------------------|
| <b>Eligible surface 2010</b>      | ha             | 9611790             | 9611790             |
| <b>Farm numbers 2010</b>          |                | 1115756             | 1115756             |
| <b>National cap</b>               | thousand euros | 1780410             | 1939357             |
| <b>Euro/ha</b>                    |                | 185,2               | 201,8               |
| <b>Euro/farm</b>                  |                | 1595,7              | 1739,2              |
| <b>15% of the surface payment</b> |                | 239,4               | 260,7               |

Source: after European Parliament and Council of regulation proposal Annex II National levels on article 6 and Regulation 73/2009

According to the proposal, however, the minimum single farm payment should not be less than 500 euro / farm. The question which category of farms could join the scheme and, sensibly, is supposed to be the ones who, after options for payment to 500 euro / farm would receive more than if they receive direct payment per ha.

It is therefore considered that the second criterion would be beneficial for our country, namely an award of at least 500 euro / farm for farms with an area of 1 to 3 hectares. According to the 2010 APIA in this category would be about 650 000 farms and exploited area they would be 1.198 million ha.[4]

## CONCLUSIONS

Shaping the future of the European Agricultural Policy in 2020 was and is a complicated and sensitive issue both because global context but very changeable and unstable growth and diversity of agriculture European countries following the enlargement to Central and Eastern European former communist . The main conclusions drawn from this are:

- States with a competitive agriculture, with large farms and effective, the workforce employed in agriculture is relatively low, are dominated by concerns about the environment, landscape preservation, balanced development of rural areas;
- Less developed States with numerous small farms and especially with a significant population employed in agriculture must maintain a policy to subsidize agriculture in one form or another farm to cope with market competition Agricultural Community ;
- For Romania, direct payments support from the European Union will be supplemented by payments from the national budget;
- Reference surface for direct payments in Romania will be 9 720 864 ha so 11.5% higher than current legislation;
- Total national ceilings for 2014-2020 amounted to 12 816 958 thousand euros, 130% higher than the 2007-2013 period;
- To finance payment for agricultural practices beneficial for the climate and environment, use 30% of the annual national ceiling;
- Capping losses on farm payments, amounts will be transferred to rural development are not as spectacular as expected;
- Small farms would receive the most money in case the segment 1 to 2.5 ha would opt for single farm payment (500 euros) and class 2.5 to 3 ha farm payment per hectare.

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# DYNAMICS OF AGRICULTURAL LAND, THE PARK OF TRACTORS AND AGRICULTURAL MACHINERY AND THE TOTAL PRODUCTION OBTAINED SOUTH OF ROMANIA DURING 2005-2010

IVASCU TEODORA<sup>1</sup>

## **Abstract:**

*The present situation of Romanian agriculture is characterized by many socio-economic problems, low yields and competitive, driven mainly by incomplete use of material resources, financial and human. Farms in Romania are extremely numerous and varied, and their physical size does not allow the application of appropriate technologies. Although some progress has been made to maintain an excessive number of individual farms, small and very small, inefficient, as a small number of large and very large units whose activity was not restructured to become compliant with the requirements of the single market.*

**Keywords:** *agricultural holdings, agricultural land, agricultural land use, agricultural production.*

## INTRODUCTION

Romanian agriculture is heterogeneous in terms of mining structures and their dual nature is emphasized to the vast majority of Member States of the European Union. During 2005-2010, the operating structures of Romanian agriculture had some developments, but poor in adapting to community needs and the superior resources that Romania has.

Agricultural potential of the South is generally very high compared to other agricultural regions of Romania. In terms of territorial agrozone plain is located in the counties of south, southeast and southwest and Bucharest-Ilfov area. This area has the highest percentage of arable land (40%) and includes the following counties: Braila, Constanta, Calarasi, Giurgiu, Ialomita, Teleorman, Dolj, Olt, Arad, Timis, Ilfov, including Bucharest.

## MATERIAL AND METHOD

As shown in Farm Structure Survey in 2005 and 2007 and provisional data of the General Agricultural Census 2010 data published in June 2011, on the size and number of farms can list some relevant data. Also, the analysis presented in the Statistical Yearbook of Romania in 2011, data on the provision of agricultural machinery and equipment and total production obtained in the period 2005-2010 were obtained important information for the years studied.

Despite the high agricultural potential, agricultural products processing capacity is low due to outdated technology. Fragmentation of arable land in small portions is another obstacle to agricultural development. Low economic potential of small farms and poor management of agricultural enterprises caused underdevelopment agro-processing sector.

Agriculture is not adjusted to specific regional planning and financial crisis does not contribute to its development. Structure of a highly fragmented agricultural area is an obstacle in attracting new investment and low investment rates have increased vulnerability to weather conditions the Romanian agriculture and this sector induced highly volatile behavior.

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## RESULTS AND DISCUSSION

Distribution of total area and the utilized agricultural area of farms, as the legal status of farms, the total country and the south of Romania (Bucharest Ilfov + South Muntenia + South East + South West Oltenia), is as follows:

**Table 1: Total area of farms, as the legal status of farms, the total development region South and country, in 2005, 2007, 2010**  
(Thousands of hectares)

| Regions                               | Individual farms |             |             | Holdings with legal |             |             | Total        |              |              |
|---------------------------------------|------------------|-------------|-------------|---------------------|-------------|-------------|--------------|--------------|--------------|
|                                       | 2005             | 2007        | 2010        | 2005                | 2007        | 2010        | 2005         | 2007         | 2010         |
| South - East                          | 1354             | 1316        | 1043        | 1125                | 934         | 1292        | 2237         | 2250         | 2387         |
| Bucharest - Ilfov                     | 74               | 65          | 29          | 113                 | 131         | 46          | 187          | 196          | 76           |
| South - Muntenia                      | 1311             | 1299        | 1076        | 1125                | 1299        | 1338        | 2436         | 2417         | 2536         |
| South - West Oltenia                  | 1530             | 1400        | 1301        | 455                 | 432         | 720         | 1986         | 1832         | 2043         |
| <b>Total Development Region South</b> | <b>4270</b>      | <b>4081</b> | <b>3450</b> | <b>2820</b>         | <b>2798</b> | <b>3397</b> | <b>6847</b>  | <b>6698</b>  | <b>7044</b>  |
| <b>Total Romania</b>                  | <b>9886</b>      | <b>9590</b> | <b>8193</b> | <b>5556</b>         | <b>5673</b> | <b>7378</b> | <b>15442</b> | <b>15263</b> | <b>15866</b> |
| <b>Total Romania - %</b>              | 100.0            | 100.0       | 100.0       | 100.0               | 100.0       | 100.0       | 100.0        | 100.0        | 100.0        |
| <b>Total South - %</b>                | 43.2             | 42.5        | 42.1        | 50.7                | 49.3        | 46.0        | 44.3         | 43.8         | 44.3         |

Source: Farm Structure Survey, 2007 General Agricultural Census 2010

**Table 2: Agricultural surface used by the legal status of farms, the total development region South and country, in 2005, 2007, 2010**  
(Thousands of hectares)

| Regions                               | Individual farms |             |             | Holdings with legal |             |             | Total        |              |              |
|---------------------------------------|------------------|-------------|-------------|---------------------|-------------|-------------|--------------|--------------|--------------|
|                                       | 2005             | 2007        | 2010        | 2005                | 2007        | 2010        | 2005         | 2007         | 2010         |
| South - East                          | 1303             | 1263        | 1012        | 848                 | 924         | 1180        | 2151         | 2187         | 2193         |
| Bucharest - Ilfov                     | 68               | 61          | 23          | 109                 | 126         | 39          | 177          | 187          | 62           |
| South - Muntenia                      | 1232             | 1218        | 1069        | 1093                | 1037        | 1264        | 2325         | 2255         | 2333         |
| South - West Oltenia                  | 1397             | 1292        | 1105        | 384                 | 337         | 503         | 1782         | 1629         | 1608         |
| <b>Total Development Region South</b> | <b>4000</b>      | <b>3834</b> | <b>3209</b> | <b>2434</b>         | <b>2424</b> | <b>2986</b> | <b>6435</b>  | <b>6258</b>  | <b>6196</b>  |
| <b>Total Romania</b>                  | <b>9102</b>      | <b>8966</b> | <b>7445</b> | <b>4804</b>         | <b>4786</b> | <b>5852</b> | <b>13906</b> | <b>13753</b> | <b>13298</b> |
| <b>Total Romania - %</b>              | 100.0            | 100.0       | 100.0       | 100.0               | 100.0       | 100.0       | 100.0        | 100.0        | 100.0        |
| <b>Total South - %</b>                | 43.9             | 42.7        | 43.1        | 50.6                | 50.6        | 51.0        | 46.2         | 45.5         | 46.5         |

Source: Farm Structure Survey, 2007 General Agricultural Census 2010

The analysis of data presented in the tables above it can be seen that the development region of Romania South focus and the total area utilized agricultural area of farms, almost half of the total farms nationwide. This shows that agriculture plays an important role in the study subject.

Total utilized agricultural area in the country, the agricultural year 2009-2010, was 13.298 million ha, of which 7.445 million ha (55.9%) fall on individual farms and 5.852 million ha (44.1%) farms with legal personality. South development across the region, we find that the same crop year UAA was 6.196 million ha, of which 3.209 million ha (51.8%) upon individual holdings and 2.986 million ha (48.2%), agricultural holdings legal personality.

**Table 3: The utilized agricultural area by type of use, the total development region South and country, in 2005, 2007, 2010**  
(hectares)

| UAA                | South Development Region |                   |                  |                      | Total development area | Total Romania     |
|--------------------|--------------------------|-------------------|------------------|----------------------|------------------------|-------------------|
|                    | South - East             | Bucharest - Ilfov | South - Muntenia | South - West Oltenia |                        |                   |
| <b>Arable land</b> |                          |                   |                  |                      |                        |                   |
| <b>2005</b>        | 1665591,63               | 167221,06         | 1849490,0        | 1277350,48           | <b>4959653.17</b>      | <b>8866591,66</b> |
| <b>2007</b>        | 1671745,87               | 178546,29         | 1785603,13       | 1161421,28           | <b>4797316.57</b>      | <b>8691343,47</b> |
| <b>2010</b>        | 1717010,87               | 57411,56          | 1858329,61       | 1153681,50           | <b>4786433.54</b>      | <b>8305473,64</b> |
| <b>Gardens</b>     |                          |                   |                  |                      |                        |                   |



| UAA                       | South Development Region |                   |                  |                      | Total development area | Total Romania      |
|---------------------------|--------------------------|-------------------|------------------|----------------------|------------------------|--------------------|
|                           | South - East             | Bucharest - Ilfov | South - Muntenia | South - West Oltenia |                        |                    |
| <b>2005</b>               | 22179,12                 | 2634,79           | 30110,67         | 15965,81             | <b>70890.39</b>        | <b>170612,12</b>   |
| <b>2007</b>               | 25579,15                 | 2671,84           | 27436,66         | 15822,97             | <b>71510.62</b>        | <b>177944,58</b>   |
| <b>2010</b>               | 25024,34                 | 1805,51           | 31119,50         | 17946,52             | <b>75895.87</b>        | <b>181568,90</b>   |
| <b>Pasture and meadow</b> |                          |                   |                  |                      |                        |                    |
| <b>2005</b>               | 374770,46                | 4614,26           | 374338,58        | 425967,61            | <b>1179690.91</b>      | <b>4530298,46</b>  |
| <b>2007</b>               | 399745,16                | 4247,01           | 370114,21        | 395411,41            | <b>1169517.79</b>      | <b>4540135,09</b>  |
| <b>2010</b>               | 370475,45                | 1865,66           | 380747,61        | 383003,81            | <b>1136092.53</b>      | <b>4493902,47</b>  |
| <b>Permanent crops</b>    |                          |                   |                  |                      |                        |                    |
| <b>2005</b>               | 88666,91                 | 3354,09           | 71821,27         | 63315,79             | <b>227158.06</b>       | <b>339199,04</b>   |
| <b>2007</b>               | 90916,77                 | 2231,25           | 72375,50         | 56837,28             | <b>222360.80</b>       | <b>343623,35</b>   |
| <b>2010</b>               | 80499,07                 | 1305,17           | 63099,28         | 53120,83             | <b>198024.35</b>       | <b>317245,88</b>   |
| <b>TOTAL</b>              |                          |                   |                  |                      |                        |                    |
| <b>2005</b>               | 2151208,12               | 177824,20         | 2325760,52       | 1782599,69           | <b>6437392.53</b>      | <b>13906701,28</b> |
| <b>2007</b>               | 2187986,95               | 187696,39         | 2255529,50       | 1629492,94           | <b>6260705.78</b>      | <b>13753046,49</b> |
| <b>2010</b>               | 2193009,73               | 63287,90          | 2333296,0        | 1607752,66           | <b>6197346.29</b>      | <b>13298190,89</b> |

Source: Farm Structure Survey, 2007 General Agricultural Census 2010

The analysis of data presented in Table 3 shows that most farms in Romania used as agricultural area, arable land, followed by those who use agricultural land and grassland pastures, permanent crops and the last, gardens.

On agricultural land use development in the region South of the farm structure survey data in 2005 and 2007 and the General Agricultural Census 2010 data reveals that farmland tops in the use of agricultural land, followed by pasture / hay, then permanent crops last, gardens.

**Table 4: Agricultural holdings, agricultural area (UAA) UAA and the average returns on a farm after farm legal status of the total development area country and South in 2010**

|                                       | Total farms    |              | Individual farms |              | Holdings with legal |              | Utilized agricultural area (UAA) per average (ha) |                       |                                  |
|---------------------------------------|----------------|--------------|------------------|--------------|---------------------|--------------|---|-----------------------|----------------------------------|
|                                       | number         | SAU -mii ha- | number           | SAU -mii ha- | number              | SAU -mii ha- | On a farm   | On an individual farm | On a farm with legal personality |
| <b>South - East</b>                   | 459691         | 2193         | 455233           | 1012         | 3938                | 1180         |   |                       |                                  |
| <b>Bucharest - Ilfov</b>              | 33047          | 62           | 32828            | 23           | 218                 | 39           |   |                       |                                  |
| <b>South - Muntenia</b>               | 800269         | 2333         | 793718           | 1069         | 5536                | 1264         |   |                       |                                  |
| <b>South - West Oltenia</b>           | 576590         | 1608         | 573768           | 1105         | 2638                | 503          |   |                       |                                  |
| <b>Total Development Region South</b> | <b>1869597</b> | <b>6196</b>  | <b>1855547</b>   | <b>3209</b>  | <b>12330</b>        | <b>2986</b>  | <b>3.3</b>  | <b>1.7</b>            | <b>242</b>                       |
| <b>Total Romania</b>                  | <b>3856245</b> | <b>13298</b> | <b>3820393</b>   | <b>7445</b>  | <b>30669</b>        | <b>5852</b>  | <b>3.4</b>  | <b>1.9</b>            | <b>190</b>                       |

Source: General Agricultural Census 2010

UAA that is, on average, on a nationwide farm is 3.4 ha. Individual farms lies, on average, 1.9 ha and farms 190 hectares legal personality.

Development in the region South UAA which is, on average, on a farm is 3.3 ha. Individual farm development in the South region lies, on average, 1.7 ha and farms 242 hectares with legal personality.

Investments in tractors and agricultural machines provide increasing levels of mechanization of agriculture. Mechanization is manifested as the main factor increasing agricultural production,

mechanization is provided decisive capitalization of other factors of production that enhances agricultural production (fertilizers, irrigation, agrobiological progress, etc.).

In terms of technical-material base in South Development Region may notice a slight increase in the number of basic equipment such as tractors, seeders, grain harvesters, representing an improvement of agricultural mechanization. By analyzing the table below notes that in the south is the number of tractors in the year 2010, 43% of the total number of tractors in the country. The level of endowment cultivators, seeders, harvesters is quite high in this area. Thus, the number of drills used in the South in 2010 is 35 763 which is 51.6% of the total number of seeders. Grain harvester combine totals in the South of the country, 12 243 which is 48.4% of total combined (25 285).

**Table 5: Provision of agricultural machines and South development area compared to Romania**

| Categories of tractors and agricultural machinery | TOTAL South region (number) |       |       | TOTAL Romania (number) |        |        | Southern regions (%) |      |       |
|---|-----------------------------|-------|-------|------------------------|--------|--------|----------------------|------|-------|
|   | 2005                        | 2007  | 2010  | 2005                   | 2007   | 2010   | 2005                 | 2007 | 2010  |
| Tractors physical                                 | 76687                       | 77006 | 77528 | 173043                 | 174003 | 180433 | 44.3                 | 44.3 | 43.0  |
| Plows for tractors                                | 62917                       | 63267 | 62514 | 137018                 | 139782 | 142671 | 45.9                 | 45.3 | 43.8  |
| Mechanical cultivators                            | 13930                       | 13884 | 14138 | 27143                  | 27262  | 27795  | 51.3                 | 50.9 | 50.9  |
| mechanical drills                                 | 34874                       | 35073 | 35763 | 66732                  | 67674  | 69337  | 52.3                 | 51.8 | 51.6  |
| Car spray and dust with mechanical traction       | 3591                        | 3545  | 3776  | 5679                   | 5876   | 5680   | 63.2                 | 60.3 | 66.5  |
| For self-propelled combine. harvested grain       | 12052                       | 12036 | 12243 | 25055                  | 24656  | 25285  | 48.1                 | 48.8 | 48.4  |
| For self-propelled combine. forage harvester      | 295                         | 296   | 263   | 724                    | 761    | 797    | 40.7                 | 38.9 | 33.0  |
| Presses for. straw and hay balers                 | 2144                        | 2276  | 2886  | 5028                   | 5399   | 7181   | 42.6                 | 42.2 | 42.6  |
| Vindrovere feed                                   | 771                         | 794   | 804   | 1224                   | 1269   | 1233   | 63.0                 | 62.6 | 65.21 |

Source: Calculations based on data from the Statistical Yearbook of Romania 2005-2010

Total production of main crops produced in the South was quite large oscillations. In 2007 there were small productions compared to the years 2005 and 2010. For example, cereal grains, in 2007 we obtained a total production 30% lower than in 2005 and 31% lower than in 2010, in the southeast region. Such small productions in 2007 were obtained and other cultures, such as: sunflower, soybean. Rape culture in the south-west is an increase in total production in 2007 by 40% compared to 2005. Rape culture in the south-west is an increase in total production in 2007 by 40% compared to 2005.

In terms of share of total production obtained in South Development Region productions obtained from nationwide to find that it is quite high. Thus, in 2010, obtained from cereal grains production share in total production in Romania is 59.3%. Moreover 78% of sunflower production in Romania was obtained in South Development Region.

**Table 6: Dynamics of production of main crops in 2005-2010**

| The main crops | South East<br>(thousands to) |      |      | South Muntenia<br>(thousands to) |      |      | Bucharest-Ilfov<br>Region (thousands to) |      |      | South West<br>(thousands to) |      |      |
|----------------|------------------------------|------|------|----------------------------------|------|------|--|------|------|------------------------------|------|------|
|                | 2005                         | 2007 | 2010 | 2005                             | 2007 | 2010 | 2005                                     | 2007 | 2010 | 2005                         | 2007 | 2010 |
| Grains         | 3653                         | 1096 | 3507 | 4115                             | 1307 | 3878 | 217                                      | 47   | 117  | 3228                         | 668  | 2348 |
| Wheat          | 1188                         | 532  | 1439 | 1997                             | 702  | 1648 | 80                                       | 19   | 52   | 1557                         | 311  | 1000 |
| Barley         | 205                          | 134  | 537  | 226                              | 89   | 366  | 21                                       | 8,3  | 12   | 105                          | 18   | 89   |
| Maize          | 2220                         | 397  | 1457 | 1841                             | 439  | 1795 | 113                                      | 14   | 50   | 1519                         | 315  | 1189 |
| Sunflower      | 493                          | 212  | 398  | 350                              | 101  | 402  | 13                                       | 3    | 13   | 109                          | 27   | 161  |
| Soy            | 121                          | 24   | 36   | 124                              | 29   | 33   | 4  | 7    | 4    | 3,5                          | 0,22 | 0,23 |
| Rape           | -                            | -    | -    | -                                | -    | -    | 2  | 3    | 3    | 7,3                          | 18   | 11   |
| Potatoes       | 173                          | 96   | 113  | 282                              | 305  | 331  | 12                                       | 6    | 10   | 187                          | 91   | 252  |

Source: Calculations based on data from Statistical Yearbook of Romania 2005-2010

**Table 7: Total production obtained in the south compared to yields obtained in Romania**

| The main crops | TOTAL South region<br>(thousand tons) |       |       | TOTAL Romania<br>(thousand tons) |        |        | Southern regions<br>(%) |      |      |
|----------------|---------------------------------------|-------|-------|----------------------------------|--------|--------|-------------------------|------|------|
|                | 2005                                  | 2007  | 2010  | 2005                             | 2007   | 2010   | 2005                    | 2007 | 2010 |
| Grains         | 11213                                 | 3118  | 9850  | 19345                            | 7815   | 16592  | 57,9                    | 39,9 | 59,3 |
| Wheat          | 4822                                  | 1564  | 4139  | 7341                             | 3045   | 5753   | 65,7                    | 51,3 | 71,9 |
| Barley         | 557                                   | 249,3 | 1004  | 1079                             | 531,4  | 1300,8 | 51,6                    | 46,9 | 77,1 |
| Maize          | 5693                                  | 1165  | 4491  | 10388                            | 3854   | 8998   | 54,8                    | 30,2 | 49,9 |
| Sunflower      | 965                                   | 343   | 974   | 1341                             | 547    | 1248   | 71,9                    | 62,7 | 78,0 |
| Soy            | 252,5                                 | 60,22 | 73,23 | 312,8                            | 136,1  | 148    | 80,7                    | 44,2 | 49,4 |
| Rape           | 9,3                                   | 21    | 14    | 147,6                            | 361,5  | 925,9  | 6,3                     | 5,8  | 1,5  |
| Potatoes       | 654                                   | 498   | 706   | 3738,6                           | 3712,4 | 3276,5 | 17,5                    | 13,4 | 21,5 |

Source: Calculations based on data from Statistical Yearbook of Romania 2005-2010

## CONCLUSIONS

- South Development Region of Romania focuses as total area and utilized agricultural area of farms, almost half of the total national farm;
- Most farms in Romania used as agricultural area, arable land;
- The utilized agricultural area which is, on average, on a farm at the country level is 3.4 ha and the development region South UAA that is, on average, on a farm is 3.3 ha;
- Provision of tractors and agricultural machinery is relatively good in this area, they yet are low tech degree, feeling lack of investment, the purchase of new equipment with high performance.
- The main internal factors that affected and affects the production and marketing of agricultural products, causing agricultural balance of trade deficit are fragmented structure of farms and production uncertainty distribution and marketing integrated systems, oscillating volume production from year to year dismantled strategies export, a good example of this is the production of cereals. Also contributing to this lack of market information to the producers regarding especially quality standards.

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# ORGANIC PRODUCTION IN PROTECTED AREAS OF THE UPPER DANUBEREGION<sup>1</sup>

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## Summary

*Organic production requires strictly controlled conditions for the implementation on specific locality. Fulfillment of conditions of reduced use of chemicals, the use of unpolluted water, creating a protective belt around the farms and fields, preventing pollution, we get the basis for the development of this method of production with environmental protection and good quality of final products. Organic products have a major role in the strengthening of the local environment; it provides certified production provides a stable economic niche to sell in the domestic and foreign markets. The advantages of the area of the Upper Danube region lies in the fact that the spreads in the part of Serbia known for intensive organic agriculture in the AP Vojvodina. This paper will present recent results in organic production in the Republic of Serbia, with emphasis on the territory of the Upper Danube, as well as opportunities for future development of organic farming in the territory of the protected area of the Upper Danube municipal administration. Closeness of the Danube River opens new possibilities for connecting local markets.*

**Key words:** organic production, local environment, Upper Danube region

## INTRODUCTION

Organic production represents complete production process of agricultural products of plants or animal origin, which are sustainably exploit natural resources, with particular emphasis on preservation of the environment from pollution from agriculture. In AP Vojvodina, agricultural activity has a long history and in the last three decades, the area under organic farming is increasing. Features that make this method of agriculture could be used to revitalize municipalities located along the Danube and the whole region of the Upper Danube. Region encompasses the municipalities of Sombor, Apatin, Bač and Bačka Palanka municipality and they all gravitate towards the river Danube and are characterized by specific endemic and species of animals and plants, and many protected areas.

Applying the methods of organic agriculture is possible in the territory of protected areas, given the current economic potentials and orientation municipalities to crop production. In this way, biodiversity will be preserved, reduce the pollution of natural resources, primarily agricultural land. The region Upper Danube is suitable for this type of production, and because of the proximity of the Danube River, which opens the door to easier connecting farmers, both locally and from producers in neighboring countries, to the formation of the optimal product prices and transport costs are less. This is significant because in the European Union consumption of organic produce is more intense than what can be produced. This would mean that for the Upper Danube region a production opportunity, which could animate a considerable number of human strength and attraction of foreign investments in this segment of agricultural production.

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## MATERIAL AND METHODS

Knowledge in the characteristics of the Upper Danube and the traditional orientation towards agriculture and food production, a precondition for the improvement and innovation of the manufacturing process, thus the final products can later find an adequate market. According to statistical data, public institutions, forecast of the Ministry of Agriculture, Trade, Forestry and Water Management of the Republic of Serbia, as well as a number of strategies that have been conducted by eminent institutions will conduct research on the possibilities of applying the methods of organic agriculture in the territory of the Upper Danube. The collected data will be analyzed using the analytical methods.

## RESULTS AND DISCUSSION

Upper Danube region, known as a special nature reserve stretches on the left bank of the Danube River, and the flow of 1367 km to 1433 km overall flow. Represents a large part of the complex that spans two countries (Hungary and Croatia). Its natural features have represents an area of great importance for the development of the entire region. When viewed in the broader context of the administrative area includes the following municipalities: Sombor, Apatin, Bač and Bačka Palanka.

The whole area is characterized by still underutilized regional values, and the part that goes in the Republic of Serbia is the area of the Upper Danube, which causes the whole area to the cross border cooperation, as a condition for international competitiveness. Geographical position and strategic priorities of municipalities that fall within the region of the Upper Danube provides the opportunity to prepare policy documents and international cross-border type, ensure grant funds intended for the implementation of cross-border projects with Croatia.

Possibilities for development of agricultural activity lies in understanding characteristics of natural resources, the current state of their utilization, and the measures envisaged in order to improve production and environmental protection.

Upper Danube is characterized by flat and slightly hilly relief with the presence of erosive and accumulative forms: meanders, backwaters, old river courses, river islands and beams. Continuity of micro-and macro-relief causes major changes in vegetation composition and spatial distribution of plant associations. Climate of Upper Danube is beneficial for the development of agricultural crops, it is supported that the average long-term values of air temperature between 13 ° C in January to 10 ° C in July, with an average rainfall during the growing season, which is 360,6 mm of rainfall. The study area is characterized by the presence of different types of soil of which are the most dominant: chernozem soils, meadow soils, salt marshes and alluvial soils, which are dominated by the arable fields. Hydrography of the Upper Danube is very suitable, where the Danube River is the main watercourse of all municipalities in the 66 km long. For some municipalities represents natural border with the Republic of Croatia (Bač), while other municipalities located on the shore of the border village of great importance. Together with the rivers Mostonga, Žica, Berava, Vajiš, channel Karavukovo– Bački Petrovac (part of hydrosystem Danube - Tisa-Danube) and numerous artificial lakes, complete with a water potential of the entire area.

As one of the potential of this area is the fact that this region represents special nature reserve, which extends over 19.500 ha, of which 9.996 ha is on our side and is one of the largest protected natural areas in Europe. It consists of: Apatinski marsh, Monoštorski marsh, Štrpca, Kozara and Karapanda. It is known as a whole floodplain forest, numerous tributaries and canals, and ponds and meadows. Fauna present include: marsh deer, roe deer, wild boar, fox, otter, etc. Characterized by the presence of rare plant species, such as white water lily, yellow water lilies, winterling, *Hottonia palustris*, blue iris., Buttercup the barreland Black hawthorn, as well. As a signatory to the Ramsar Convention on Wetlands SNP Upper Danube are characterized by specific needs in the direction of preserving natural beauty, genetic resources and the expansion of surfaces

of the areas will be represented by a model of agricultural production, which will satisfy the principles of conservation of natural resources.

Organic farming is a model of conservation, protection and improvement of the existing agriculture. Promotes and enhances biodiversity, protect the environment and introduces the highest standards of animal and plant health. Taking advantage of the optimum quantity of natural resources, maintain and increase soil fertility, prevents erosion, reduce pollution from agriculture and eventually results in the production of food with high nutritional value. Upper Danube region has based export-oriented organic production of vegetables and field crops.

Using the provisions of Agenda 21 document, in which attention is focused on sustainable development, with a focus on making decisions that strengthen agriculture and enhances the environmental awareness of the people. With this decision was made that greater attention to the organic production method, and that the new regulations on the management of resources with respect to the adopted standards for this type of production. In the region of the Upper Danube is one of the five centers for organic production in Serbia. The center is housed in Selenča, Bač.

The need for a transition from the conventional methods of production of agricultural products to the organic production method, supported by the fact that the entire region of the Upper Danube dealing with the potential for agricultural production, both in the production of vegetable crops, and future orientation towards organic livestock production. The basis for the development of organic farming and organic products getting late, have knowledge of the potential of areas in which it is planning a future production. According to official statistical data on the territories of the Upper Danubian organization in agricultural land, most of the surface are the fields and gardens, observed in all four municipalities. In Table 1 presents will be used for agricultural lands, in 2010. year.

**Table 1. Utilised agricultural area, 2010., in ha**

|              | Agricultural area | Arable land and gardens | Participation of arable land and gardens in the agricultural area (%) |
|--------------|-------------------|-------------------------|---|
| Sombor       | 101612            | 92849                   | 91  |
| Apatin       | 24479             | 20784                   | 85  |
| Bač          | 26899             | 23971                   | 89  |
| BačkaPalanka | 48281             | 45145                   | 93  |

Source: Municipalities and regions in R. Serbia, 2011, Statistical Office of the Republic of Serbia

Based on disclosed information, on the territory of the Upper Danube region there is a clear orientation towards agriculture to production, and almost the whole of the agricultural production in the area organize the arable land and gardens. The range of participation fields and gardens in agricultural surface ranges from 85% of the territory of Apatin, and to 93% in the municipality Bačka Palanka.

**Table 2. The structure of sown arable area, 2010. years., (%)**

|              | Cereals | Industrial crops | Vegetables |
|--------------|---------|------------------|------------|
| Sombor       | 60      | 27               | 2          |
| Apatin       | 57      | 18               | 6          |
| Bač          | 29      | 58               | 1          |
| BačkaPalanka | 51      | 33               | 6          |

Source: Municipalities and regions in R. Serbia, 2011, Statistical Office of the Republic of Serbia

In structure of total area planted, the highest incidence of the cereals, in the range of 29 - 60%, with the largest quantities of cereals products in the municipality of Sombor (60%), while the lowest are in the presence of crop structure in the municipality of Bač (29%). Production orientation towards the production of industrial crops has Bač, where the percentage of industrial plants in the crop structure 58%, while in other municipalities to participate significantly lower (18% Apatin, BačkaPalanka and Sombor, 33% to 27%). The lowest participation in crop structure has vegetables and the territory of the four municipalities observed.

Resources in fruit production and vineyard are limited to the territory of the municipalities surveyed. The largest share of the total orchard agricultural area compared to all observed Municipality is the municipality BačkaPalanka, a minimum area under orchards has Bač. With the shift from manufacturing aspect of winemaking, the territory of the municipalities surveyed, the largest share of the total agricultural area is the municipality Apatin (0.4%), while the other three municipalities have a share of 0.2%. (Table 3).

**Table 3. Areas under the orchards and vineyards. 2010. year**

|              | Orchards , ha | Orchards in agricultural land (%) | Vineyards, ha | Vineyards in agricultural land (%) |
|--------------|---------------|-----------------------------------|---------------|------------------------------------|
| Sombor       | 628           | 0,6                               | 214           | 0,2                                |
| Apatin       | 124           | 0,5                               | 102           | 0,4                                |
| Bač          | 75            | 0,3                               | 65            | 0,2                                |
| BačkaPalanka | 490           | 1,0                               | 113           | 0,2                                |

Source: Municipalities and regions in R. Serbia, 2011, Statistical Office of the Republic of Serbia

What may appear as an obstacle to the development of organic farming in a wide range, is poorly developed livestock production. Livestock production devastation caused by poor investment projects for the whole of the Republic, as well as the lack of a secure market for the purchase of the obtained meat and meat products. Decline in livestock production are recorded in all livestock sectors, with particular emphasis on the pig. Although there are exceptional natural conditions for reorientation towards organic production of all types and breeds of livestock, was observed insufficient use of natural resources.

According to data from the Statistical Office of the meadows and pastures in the territories of the municipalities surveyed in the territory of Sombor (meadows - 3.6% of the total agricultural area in the municipality), while the largest following box pastures are located in the municipality of Bač (8%) and in the territory Apatin (7.8% of the total agricultural area of Apatin).

In observed municipalities there is a potential for the production of power plants, but also inadequate utilization for the production of biomass, biogas and bioethanol. Settling for the production of power plants will cause the autonomy of individual holdings in energy supply and a shift to the use of alternative forms of energy. Plants raised in such a way (canola, corn, etc.), may leave enough nutrients in the soil, which later can be a good basis for starting organic production.

Production of organic products will influence the positioning of the region, both from an economic standpoint, but also from the aspect of sustainable modes of production and environmental protection. This will pull together all of the postulates provided numerous collaborations at local and international level.

The European market has great needs for organic products, consumers are willing to set aside large sums of money for purchase of such products and that is the potential for anyone to organic production should be the main form of production in this region. Due to its geographical position, the Upper Danube region has the potential to create local and cross-border partnerships with neighboring countries maximize profits, and using organic production methods that protect the environment from pollution from agriculture, with optimum utilization of natural resources. In *Table 4* presents the categories of organic products in raw and processed form may be of interest to consumers.

**Table 4. Organic products from the region of the Upper Danube region with significant market potential in the EU**

| Category    | Products                              | Use                                      |
|-------------|---------------------------------------|--|
| Cereals     | Corn/wheat/barley/oat                 | Nutrition                                |
| Root plants | Potato                                | Food                                     |
| Vegetable   | Onions, beans, garlic, peppers, etc.. | Market for fresh vegetables              |
| Fruit       | Apples, grapes, etc.                  | Processing market and fresh fruit market |

Source: GIZ, 2011.

In order to achieve this kind of growth in agricultural production, it is necessary to follow and respect the framework conditions and trends. Compared with European countries, where the production of organic products has a long history, the total value of organic products from 11 billion euros in 2003. year, increased to 18 billion euros in 2009. year, which justifies the cost of this kind of production. As organic consumption to the EU grew faster than production, disproportionately increased imports from third countries. Retail sales of organic food reaches the value of 0.5 billion euros, as is the case in Austria, the Netherlands, Belgium, Spain and Denmark, 3 to 4 billion euros in Germany, Switzerland, France and the UK, so the market does not show signs of saturation, which may be the impetus for the expansion of organic farming in this region.

A special advantage that contributes to the development of organic production are local and cross-border cooperation of the Republic of Serbia and neighboring countries. Agreement on the establishment of cross-border reserve UNESCO biosphere and to protect the biosphere, nature, flora and fauna long river Mura, Drava and Danube, is one of the most important projects that will preserve the genetic basis and natural resources. Then the realization of cross-border cooperation between Serbia and Croatia - IPA (CBC Croatia-Serbia, 2007-2013.) and the between Hungary and Serbia (IPA project - Hungary-Serbia, 2007-2013), which aimed to increase cross-border exchange of goods, to develop labor market mobility, research, development, investment, preserving natural resources and the development of border regions of good relations between communities on both sides. In this way we'll get to linking markets in the region, which will be facilitated transport of organic products and as well as other products from the region. *"Adjoining municipality that has proximity and the easy access to potentially pan-European corridors X and the Vc and Corridor VII-Danube, is very attractive for investment, both large and the small producers. A good network of regional routes to all major sales centers and the processing further facilitate the distribution of manufactured products of primary production."* [7].

## CONCLUSION

Organic farming is a sure way to improve existing production potential in the municipalities of the Upper Danube. Based on these results, the Upper Danube region has a predisposition to become the region with the organic production of plants and animals of different species and races, become a driving force of development. Favorable characteristics of relief and climate factors are the basis for the development and improvement of agricultural production. A special advantage is the proximity of the river Danube, which makes this region the local community (municipality of Sombor, Apatin, Bač and Bačka Palanka), are strategically positioned, which can create benefits for the establishment of cross-border cooperation with local communities in Croatia and Hungary. Combining the advantages of introducing organic production methods with the possibility that the end products are sold to the international market, which will cause the development of the entire region. Implementing the principles of organic production, will help preserve the environment, so it will be a reduction in pollution from agricultural waste (primarily pollution caused by nitrates and nitrites), it will cause the rational use of natural resources and biodiversity of plants and animals. Upper Danube Region is a special reserve of the first kind with a rich heritage of flora and fauna, which must be preserved. This is another reason why you should take organic agriculture as the basis for future development.



In all the municipalities of the Upper Danube there is widespread farming. The structure of the utilized agricultural land indicates that all observed municipalities, agricultural production is the highest percentage of organizing the fields and gardens. The most common crop structure is the production of grains (wheat, corn, barley), while production plants for industrial use is most developed in the municipality of Bač (58% of arable land). Vegetable production is least prevalent, regardless of the existence of water potential. Resources in fruit production and vineyards are limited to the territory of the municipalities surveyed. Investing in livestock production is very low, regardless of the livestock industry.

Advantageous geographical position of municipalities that develop along the Danube River, can potentiate the development of organic agriculture. Agreements that exist, aiming to link the cross-border community and to thereby establish a permanent exchange of goods and upgrade existing development. Recognizing the potential of local communities, the emphasis on food safety of organic origin, and may result in increasing the number of employees in the sector primary agricultural production and increase the availability of products in the markets of Western Europe. Agreements relating to the protection of the environment also can promote the sustainable development of the whole region, and organic agriculture can be more effective link between the protection of resources of the Upper Danube.

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# THE FUNCTIONS OF LAND IN IRRIGATION IN SERBIA<sup>1</sup>

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## Summary

*Land represents one of the key factors limiting crop production due to the simultaneous action of two processes as demand for food increasing, on the one hand, and reducing the area of agricultural land, on the other. Production capacity of the land reduces the continuous processes and damages toward agricultural areas. Of the total available land of approximately 8.8 million ha, agricultural land in the Republic of Serbia covers 5.9 million ha, of which 4.7 million ha represents arable land, and 3.7 million hectares are fields. Since not all arable land is suitable for irrigation, 3.6 million ha are of that kind. So, Serbia has around 0.4 ha of arable land per capita and the land fund is constantly decreasing. This small area should provide enough food for the population. Accordingly, this paper shows the structure of agricultural land, irrigated area in ha and their percentages, area under different irrigation systems (surface, spraying, dripping) and area of arable land covered with gardens, orchards, vineyards and meadows, in the period 2000-2010. At the end of the paper tables are given showing areas where irrigation is applied under different crops in 2010.*

**Keywords:** rural development, land use, irrigation, protection.

## INTRODUCTION

Land as a gift of nature has no value, but from the moment of its use in the production process, it becomes a product of human labor, which can be sold and purchased at a specified price, as a function of potential for the production of goods and services. For this reason, almost all states initiate and implement concrete measures in practice in terms of land use, preservation of fertility, protection of property rights and ecological system [7].

Rural development involves the integrated management of natural resources in a sustainable manner (harmonization of economic, social and environmental principles) in the rural community. Rural Development is a program of activities geared towards the needs of rural communities. It is also a response to the pressure that accompanies the modernization of European agriculture and reconstructs the disturbed economic base of rural economy and farm businesses. Agriculture and forestry are the main land users and play a key role in managing natural resources in rural areas. The latest rural development policy provides a smooth and balanced development in all rural areas in the EU. All activities of rural development and forestry are defined by agricultural policies.

Land and climate conditions are very favorable for Serbian development of agricultural production. Flat regions, according to its natural characteristics, are favorable for crop and vegetable production, while higher elevations areas are favorable for fruit growing, wine-growing and cattle breeding.

General picture of development of agriculture in Serbia is almost impossible to give. The degree of development is determined by areas and regions. The most fertile, lowland areas, although not at a high level, has agricultural production much developed than in mountainous areas. We can conclude that in addition to the large number of people engaged in agriculture, few of them are ready and able to apply modern methods and introduce innovations in their production. Average yields of most agricultural products are far below the European and world average. Agricultural land is an important natural advantage in Serbia relating to many European countries,

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due to its total volume and its regional distribution. Agricultural land, coupled with other favorable natural conditions (altitude, climate parameters, relief), in our region is very suitable for the development of diversified agricultural production.

## RESULTS AN DISCUSSIONS

### Structure of agricultural land

Based on the data of the Republic Statistical Office in Serbia 67.3% of the total area (88,361 km<sup>2</sup>) is agricultural land of different solvency classes. The remaining 27.5% consists of forests and forest lands, and 5.2% is non-productive land.

From the point of organizing a modern market production, current state of the spatial arrangement of farmlands is unsustainable. Factors reducing and degrading agricultural land in Serbia are: the expansion of settlements, industrial, mining, energy and transportation facilities, water erosion, wind erosion, soil salinity, nutrient loss, chemical pollution of bio - industrial sources, mechanical compaction of soil in the processing of heavy machinery, water logging land, flood, etc.).

Land use in Serbia is followed by a number of different issues such as land fragmentation, the extensiveness of use, inadequate intake of organic matter degradation processes caused by the action of nature and man. The solution is in the intensive land use, enlargement of holdings, greater intake of organic matter and reducing the degradation process.

In the structure of agricultural land, by categories of use a high share of arable land (83%) is evident. Observed by average for the period 2000-2010 of the total area of arable land, which amounts 5.086 million ha, 65.5% represents arable land, 4.8% are orchards, 1.4% vineyards, 12.0% meadows and pastures 16.3% (Table 1).

**Table 1 Agricultural land use by category (period 1999-2010) (000 ha)**

| Year                      | Total | Arable land |                    |          |           |         | Pastures | Marshes, ponds and swamps |
|---------------------------|-------|-------------|--------------------|----------|-----------|---------|----------|---------------------------|
|                           |       | sum         | Fields and gardens | Orchards | Vineyards | Meadows |          |                           |
| <b>Republic of Serbia</b> |       |             |                    |          |           |         |          |                           |
| 1999                      | 5119  | 4252        | 3352               | 245      | 72        | 583     | 835      | 32                        |
| 2000                      | 5109  | 4259        | 3356               | 245      | 71        | 587     | 815      | 35                        |
| 2001                      | 5112  | 4256        | 3355               | 244      | 69        | 588     | 821      | 35                        |
| 2002                      | 5107  | 4255        | 3351               | 245      | 69        | 590     | 817      | 36                        |
| 2003                      | 5115  | 4253        | 3345               | 246      | 67        | 594     | 826      | 36                        |
| 2004                      | 5075  | 4252        | 3344               | 244      | 66        | 598     | 823      | -                         |
| 2005                      | 5074  | 4242        | 3330               | 239      | 64        | 609     | 832      | -                         |
| 2006                      | 5066  | 4228        | 3318               | 238      | 62        | 610     | 838      | -                         |
| 2007                      | 5053  | 4218        | 3299               | 240      | 59        | 620     | 835      | -                         |
| 2008                      | 5093  | 4260        | 3302               | 242      | 58        | 621     | 833      | -                         |
| 2009                      | 5058  | 4224        | 3301               | 240      | 58        | 625     | 834      | -                         |
| 2010                      | 5052  | 4216        | 3295               | 240      | 57        | 624     | 836      | -                         |
| <b>Central Serbia</b>     |       |             |                    |          |           |         |          |                           |
| 1999                      | 3329  | 2605        | 1768               | 228      | 60        | 549     | 720      | 5                         |
| 2000                      | 3322  | 2614        | 1776               | 227      | 59        | 552     | 703      | 5                         |
| 2001                      | 3324  | 2611        | 1775               | 226      | 57        | 552     | 708      | 5                         |
| 2002                      | 3325  | 2608        | 1771               | 227      | 57        | 554     | 711      | 6                         |
| 2003                      | 3322  | 2602        | 1762               | 228      | 56        | 557     | 713      | 6                         |
| 2004                      | 3315  | 2604        | 1762               | 226      | 55        | 561     | 711      | -                         |
| 2005                      | 3316  | 2593        | 1748               | 221      | 53        | 571     | 723      | -                         |
| 2006                      | 3318  | 2587        | 1744               | 220      | 52        | 571     | 731      | -                         |
| 2007                      | 3305  | 2576        | 1727               | 222      | 49        | 578     | 729      | -                         |
| 2008                      | 3312  | 2585        | 1728               | 223      | 48        | 580     | 727      | -                         |
| 2009                      | 3312  | 2580        | 1723               | 222      | 48        | 584     | 732      | -                         |
| 2010                      | 3301  | 2568        | 1717               | 222      | 48        | 581     | 733      | -                         |
| <b>AP Vojvodina</b>       |       |             |                    |          |           |         |          |                           |

| Year | Total | Arable land |                    |          |           |         | Pastures | Marshes, ponds and swamps |
|------|-------|-------------|--------------------|----------|-----------|---------|----------|---------------------------|
|      |       | sum         | Fields and gardens | Orchards | Vineyards | Meadows |          |                           |
| 1999 | 1789  | 1647        | 1584               | 17       | 12        | 33      | 115      | 28                        |
| 2000 | 1787  | 1645        | 1581               | 17       | 12        | 35      | 112      | 30                        |
| 2001 | 1788  | 1645        | 1580               | 18       | 12        | 35      | 113      | 29                        |
| 2002 | 1783  | 1647        | 1581               | 18       | 12        | 36      | 106      | 30                        |
| 2003 | 1794  | 1651        | 1583               | 18       | 11        | 38      | 113      | 30                        |
| 2004 | 1760  | 1648        | 1582               | 18       | 11        | 37      | 112      | -                         |
| 2005 | 1758  | 1649        | 1582               | 18       | 11        | 38      | 109      | -                         |
| 2006 | 1748  | 1641        | 1574               | 18       | 11        | 38      | 107      | -                         |
| 2007 | 1748  | 1642        | 1572               | 18       | 10        | 42      | 106      | -                         |
| 2008 | 1781  | 1675        | 1574               | 19       | 10        | 41      | 106      | -                         |
| 2009 | 1747  | 1646        | 1578               | 18       | 10        | 41      | 101      | -                         |
| 2010 | 1750  | 1648        | 1578               | 18       | 10        | 42      | 102      | -                         |

Source: Statistically Yearbook of Serbia, 2004, 2009.

Irrigation provides a multifaceted contribution to the improvement and intensification of agricultural production. By providing irrigation the change of agricultural production structure is carried out, along with deadlines and standards of planting, cultivation methods; plant nutrition also contributes to the irrigation by obtaining higher yields and intensification of livestock production. As a result of irrigation direct engagement of the food industry processing capacities in price of final products reducing occurs. [2, 3, 4, 5].

Irrigation in the global context is applied to more than 1/6 of arable land. The main factor in the spread of irrigation are rainfall, or lack thereof, because 55% of the land surface is placed in the areas of arid and semiarid climate, and therefore there is the need for irrigation. On the other hand, an unfavorable distribution of rainfall, both during the year and during the growing season, and frequent drought periods shift this limit to 75% of areas in need of permanent or temporary irrigation system.

In general one could say that the spread of irrigation globally is directly proportional to air temperature and evapotranspiration, and inversely proportional to the quantity and distribution of rainfall during the growing season.

The level of irrigation development reached in Serbia does not satisfy the needs of a stable and efficient agricultural production. Irrigation has not found its rightful place in our agriculture because each fertile year places it into the background. According to the percentage of irrigated area to total area of land suitable for irrigation, our country lags far behind all the neighboring countries and is on almost the last place among the countries of Europe. In Serbia there are about 180,000 ha under irrigation system, but the extent of their use is of 50-60%. It is estimated that currently in operation is approximate 30,000 ha [1].

The most common reasons for low use of existing irrigation systems are the disadvantage of agriculture, insufficient equipment of farms that have irrigation equipment for the production of additional resources, and general lack of financial resources for equipment maintenance and operation of irrigation systems.

For the period 2000-2010., the average irrigated area was 0.54% of total agricultural land used in the Republic of Serbia. Central Serbia for the same period irrigated 0.14% and AP Vojvodina 1.47% from used agricultural land.

In the past 11 years an average of 27 550 ha, which represents only 0.54%, of total arable land in the Republic of Serbia (5.086 million ha) was irrigated. Surface irrigation method is applied to a surface of 3939 ha, spraying to the 22 850 ha, and drop by drop to 438.5 ha. Most of the irrigated land are fields and gardens (an area of 26 034 ha or 94%), orchards (1323 ha or 0.03%), vineyards (an area of 169 ha or 0.4%) and finally the meadows (on the surface of 37.4 ha or 0.1%). In Central Serbia 4611 ha are irrigated, which makes 0.15% of total arable land in Central Serbia, while in Vojvodina 22 939 ha is irrigated which represents 0.01% of total arable land of Vojvodina. Surface irrigation is actually a 429 ha in Central Serbia, and the 3390 ha in Vojvodina, while the

spraying is applied to 3807 ha in Central Serbia and 19 043 hectares in Vojvodina. Most of the irrigated areas are fields and gardens (3 549 ha are in Central Serbia and 22 484 ha in Vojvodina ), followed by orchards (436 ha in Central Serbia, 1151. ha in Vojvodina), vineyards (61 ha in central Serbia and in Vojvodina 119 ha) and meadows (32 ha in central Serbia and 13 ha in Vojvodina).

**Table 2 Area under irrigation in R. Serbia in the period 2000-2010**

| Years                                 | 2000   | 2001   | 2002   | 2003   | 2004   | 2005   | 2006   | 2007   | 2008   | 2009   | 2010   |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Republic of Serbia                    |        |        |        |        |        |        |        |        |        |        |        |
| Used agricultural land (thousands ha) | 5.109  | 5.112  | 5.107  | 5.115  | 5.113  | 5.074  | 5.066  | 5.053  | 5.055  | 5.058  | 5.091  |
| Irrigated area (ha)                   | 26.845 | 29.688 | 37.017 | 28.072 | 21.287 | 26.845 | 25.566 | 25.763 | 26.260 | 30.576 | 25.128 |
| Irrigated area ( % )                  | 0,52   | 0,58   | 0,72   | 0,55   | 0,42   | 0,53   | 0,50   | 0,51   | 0,52   | 0,60   | 0,49   |
| <i>Surface</i>                        | 4.828  | 5.384  | 5.940  | 4.916  | 4.596  | 4.828  | 5.437  | 3.067  | 1.571  | 1.506  | 1.261  |
| <i>Sprinkling</i>                     | 20.964 | 23.614 | 30.220 | 22.439 | 16.243 | 20.964 | 19.647 | 22.061 | 24.172 | 28.585 | 22.442 |
| <i>Drip</i>                           | 1.053  | 690    | 857    | 717    | 438    | 1.053  | 482    | 635    | 517    | 484    | 1.425  |
| Fields and gardens                    | 24.054 | 27.852 | 35.111 | 26.250 | 19.836 | 24.054 | 24.025 | 24.339 | 25.035 | 29.781 | -      |
| Orchards                              | 2.593  | 1.730  | 1.883  | 1.550  | 1.451  | 2.593  | 1.521  | 1.204  | 924    | 728    | -      |
| Vineyards                             | 178    | 79     | -      | 212    | -      | 178    | -      | -      | 302    | 67     | -      |
| Meadows                               | 20     | 27     | 60     | 60     | -      | 20     | -      | -      | -      | -      | -      |
| Central Serbia                        |        |        |        |        |        |        |        |        |        |        |        |
| Used agricultural land (thousands ha) | 3.322  | 3.324  | 3.325  | 3.322  | 3.321  | 3.316  | 3.318  | 3.305  | 3.306  | 3.311  | 3.502  |
| Irrigated area (ha)                   | 5.557  | 3.746  | 4.208  | 3.014  | 3.114  | 5.557  | 3.698  | 3.675  | 4.130  | 3.863  | 10.156 |
| Irrigated area ( % )                  | 0,17   | 0,11   | 0,13   | 0,09   | 0,09   | 0,17   | 0,11   | 0,11   | 0,12   | 0,12   | 0,20   |
| <i>Surface</i>                        | 1.326  | 873    | 232    | 434    | 342    | 1.326  | 324    | 96     | 201    | 76     | 810    |
| <i>Sprinkling</i>                     | 3.901  | 2.660  | 3.775  | 2.496  | 2.762  | 3.901  | 3.357  | 3.398  | 3.752  | 3.589  | 8.288  |
| <i>Drip</i>                           | 330    | 213    | 201    | 84     | 10     | 330    | 17     | 181    | 177    | 197    | 1.058  |
| Fields and gardens                    | 4.345  | 3.070  | 3.782  | 2.750  | 3.040  | 4.345  | 3.524  | 3.258  | 3.784  | 3.595  | -      |
| Orchards                              | 1.145  | 649    | 366    | 144    | 74     | 1.145  | 154    | 197    | 263    | 227    | -      |
| Vineyards                             | 60     | -      | -      | 60     | -      | 60     | -      | -      | 84     | 41     | -      |
| meadows                               | 7      | 27     | 60     | 60     | -      | 7      | -      | -      | -      | -      | -      |
| AP Vojvodina                          |        |        |        |        |        |        |        |        |        |        |        |
| Used agricultural land (thousands ha) | 1.787  | 1.788  | 1.783  | 1.794  | 1.792  | 1.758  | 1.748  | 1.748  | 1.749  | 1.747  | 1.589  |
| Irrigated area (ha)                   | 21.288 | 25.942 | 32.809 | 25.058 | 18.173 | 21.288 | 21.868 | 22.088 | 22.130 | 26.713 | 14.972 |
| Irrigated area ( % )                  | 1,19   | 1,45   | 1,84   | 1,40   | 1,01   | 1,21   | 1,25   | 1,26   | 1,27   | 1,53   | 2,94   |
| <i>Surfaces</i>                       | 3.502  | 4.511  | 5.708  | 4.482  | 4.254  | 3.502  | 5.113  | 2.971  | 1.370  | 1.430  | 451    |
| <i>sparkling</i>                      | 17.063 | 20.954 | 26.445 | 19.943 | 13.481 | 17.063 | 16.290 | 18.663 | 20.420 | 24.996 | 14.154 |
| <i>Dripping</i>                       | 723    | 477    | 656    | 633    | 438    | 723    | 465    | 454    | 340    | 287    | 367    |
| Fields and gardens                    | 19.709 | 24.782 | 31.329 | 23.500 | 16.796 | 19.709 | 20.501 | 21.081 | 21.251 | 26.186 | -      |
| Orchards                              | 1.448  | 1.081  | 1.517  | 1.406  | 1.377  | 1.448  | 1.367  | 1.007  | 661    | 201    | -      |
| Vineyards                             | 118    | 79     | -      | 152    | -      | 118    | -      | -      | 218    | 26     | -      |
| Medows                                | 13     | -      | -      | -      | -      | 13     | -      | -      | -      | -      | -      |

Source: Calculation based on data of the Statistical Office of Serbia, Statistical Yearbooks 2001. - 2011.

The data regarding irrigated areas covered by specific crops and the overall yield in the terms of irrigation is very difficult to obtain because the reporting units registered in Address Book Group for Environmental Statistics of the Statistical Office, collect data annually with the response of 75%. Many of the reports are often empty or incomplete, and some of the notes include an explanation of the reason for unfilled questionnaires (the company in bankruptcy, disabled or defective irrigation systems, etc), according to this only approximately 45% of questionnaires have operational data. In particular, the data on the quantities of water for irrigation, as well as irrigated

areas per crop are unreliable because in most cases an assessment is necessary (especially for data on the quantities of water for irrigation).

During 2010, in the Republic of Serbia 25 128 ha (of which in central Serbia on 10 156 ha in Vojvodina on 14 972 ha).was irrigated.

**Table 3 Irrigated area in the Republic by the cultures (ha)**

| Crop plants <sup>5</sup>                       | 2010         |                |              |
|--|--------------|----------------|--------------|
|  | R. of Serbia | Central Serbia | AP Vojvodina |
| Total irrigated area of biotech crops (ha)     | 25.128       | 10.156         | 14.972       |
| Cereals for grain production, but corn         | 1.694        | 10             | 1.684        |
| Corn grain and silage                          | 6.289        | 2.398          | 3.891        |
| Pulses   | 2830         | 232            | 2598         |
| Sugar beet                                     | 1.682        | 450            | 1.232        |
| Sunflower                                      | 49           | 0              | 49           |
| Oilseed rape and fodder beet                   | 445          | 0              | 445          |
| Plants for the production of textile fibers    | 70           | 70             | 0            |
| Mixture of grasses                             | 674          | 662            | 12           |
| Potatoes (including early)                     | 1.878        | 1.406          | 472          |
| Vegetables, strawberries and watermelon (open) | 6.351        | 3.130          | 3.221        |
| Other crops on arable land and gardens         | 1.141        | 620            | 521          |
| Meadows and Pastures                           | 69           | 44             | 25           |
| Orchards                                       | 1.264        | 826            | 438          |
| Vineyards                                      | 1            | 1              | 0            |
| Other permanent crops                          | 691          | 307            | 384          |

Source: National Statistical Office, the Group for Environmental Protection

According to this wheat for grain production (corn) cover to 1694 ha (in central Serbia, 10 ha, 1684 ha in Vojvodina), corn for grain and silage on 6289 ha (in 2398 ha Central Serbia, Vojvodina in 3891 ha), pulses 2830 ha (in central Serbia, 232 ha, 2598 ha in Vojvodina), 1682 ha of sugar beet (in central Serbia, 450 ha, 1232 ha in Vojvodina), sunflower 49 ha (in central Serbia 0 ha, 49 ha in Vojvodina), oilseed rape and fodder tail 445 ha (in central Serbia 0 ha, 445 ha in Vojvodina), plants for production of textile fibers 70 ha (in central Serbia, 70 ha in Vojvodina 0 ha), a mixture of grass 674 ha (in central Serbia, 662 ha in Vojvodina 12 ha), potatoes (including early) 1878 ha (in 1406 ha Central Serbia, Vojvodina 472 ha), vegetables, strawberries and watermelon 6351 ha (in 3130 ha Central Serbia, Vojvodina in 3221 ha), and other crops on arable land and gardens 1141 ha (in central Serbia, 620 ha, 521 ha in Vojvodina), meadows and pastures of 69 ha (in central Serbia, 44 ha, 25 ha in Vojvodina), 1264 ha of orchards (in central Serbia, 826 ha, 438 ha in Vojvodina), vineyards 1 ha (in central Serbia 1 ha 0 ha in Vojvodina), other permanent crops 691 ha (in central Serbia, 307 ha, 384 ha in Vojvodina).

## CONCLUSION

Common Future for agriculture in Serbia and in the EU has to be an efficient, market-oriented production, one in which issues such as food safety and environmental protection contribute to the overall development of rural society. Serbia can produce more food (safe and of high quality) attractive to consumers at home and abroad, can impact on the environment, submit the changes that are needed to enable this state to join the EU. The future must be based on the production that is more specialized and focused on market requirements.

"The strategic goals of sustainable land use to be implemented should be directed to:

<sup>5</sup> List of agricultural crops has been made on the basis of a list of irrigated crops in the current Census of Agriculture questionnaire

- the harmonization of legislation concerning the use and protection of land with EU legislation;
- prevention of further loss of land and the preservation and improvement of its quality, especially for industrial, mining, energy, transportation and other activities;
- protection against degradation, changing the use and regulation of agricultural land. To achieve these objectives it is necessary to: harmonize existing legislation with EU and UN on land use and environmental protection; identify and select groups of soil quality parameters that will be applied in monitoring and control of fertility; create fertility control networks to strengthen its land to be deal with the protection, development and use of agricultural land, and establish a laboratory at the national level to deal with land and mineral resources. It is necessary to establish a database on land " [5]..

Strategic starting point for irrigation in Serbia lies in the fact that it should not be treated only as a measure of the fight against drought and further measure to stabilize agricultural production in its present structure has to be applied. Construction of irrigation systems is expected to create economic and organizational framework to overall agricultural production, with all related sectors (farming, processing, purchase, transport, etc.) and to transform in accordance with primary production through irrigation. The whole structure of the food industry, to the highest level of finalization, should be transformed and developed keeping in mind a whole new resource, economic and manufacturing base that performs in terms of agriculture with irrigation.

The real development of irrigation implies providing technical, economic and social conditions. "The main factors of irrigation development in terms of its impact on the development of agro-industrial complex are:

- Restructuring primary agricultural production and increasing yields of irrigated crops, which will help to increase the efficiency of irrigation;
- Mechanization in agriculture, where irrigation development will cause the increase of technical equipment, the purchase of specialized machinery and greater degree of readiness;
- The labor force, where irrigation contributes to increased employment, both in primary and in secondary production;
- The market, where irrigation development has an impact on better supply of the domestic market and for placement on the international market;
- Protecting the water, where the area of water use should choose the appropriate transformation model of water management;
- Looking at the structure of land ownership, particularly in some regional hydro systems, the private sector should be included in irrigation. Based on experiences from other countries is necessary to choose ways of including these factors in our country " [6].

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# RE-EVALUATION OF THE POTENTIAL OF SOUTH MUNTENIA REGION FOR THE IMPROVEMENT OF THE RURAL DEVELOPMENT STRATEGIES

LASCĂR ELENA<sup>1</sup>, DRĂGHICI MANEA<sup>2</sup>

## **Abstract**

*The integrated sustainable development strategy of South Muntenia Region presented within the work, constitutes a projection for the very immediate period, respectively year 2015, of the rural area development in a balanced manner and it is to be proposed to the authorities involved at regional level The South Muntenia Regional Development Board (1) and a county level (The County Councils) (2) in the implementation of the development policies. The strategy aims a wide range of economic, social and environment issues of the communities that are relevant in order to define the objectives needed to obtain the sustainable development and the increase of the economic and social cohesion in the region. Following the analysis of the funding programs for the rural area development projects, with social and economic impact, we found out that for South Muntenia Region, the rural development strategy must contain measures and indicators of the development at an integrated level, relating to the following constitutive elements : the area infrastructure development strategy, the strategy for SMEs development in South Muntenia Region, the strategy for environment protection in South Muntenia Region; the strategy and programs for the increase of nutritional level (qualitative and quantitative) of the rural population in South Muntenia Region.*

**Key words:** strategy, analysis, program, rural, development

## INTRODUCTION

South Muntenia Region, with a surface of 34,453 square kilometers, representing 14.45 % of Romania surface, is situated in the South-South-East part of it, bordering to the North with the Center Region, to the East with South-East Region, to the South with Bulgaria, the limit being given by the natural border – The Danube River and to the West with South-West Region.

The presence in the South of the region of the Danube River gives it the possibility to have communications with the 8 river countries, and by means of the Danube –Black Sea channel to reach to the Black Sea and thus to have access to Constanta Harbour – the main maritime gate of the country.

The existence in the center of the region but not being part of it of the country capital, București, component part of București-Ilfov Region, constitutes by the existing institutional and social infrastructure and by Otopeni international airport, a real advantage.

Not being an administrative structure, South Muntenia Region is formed by 7 counties (Argeș, Călărași, Dâmbovița, Ialomița, Giurgiu, Prahova and Teleorman), 15 municipalities, 28 towns și 481 communes with 1552 villages.

The Region relief characterised by variety and amphitheater arrangement contains three major forms of relief : mountains 9.5 %, hill 19.8%, field and meadow 70.7%.

If for the 4 counties in the South (Ialomița, Călărași, Giurgiu, Teleorman) the characteristic form of relief is the field the others 3 counties in the North (Argeș, Dâmbovița, Prahova) contain both the field and the hills and mountains.

The hidrographic network quite rich is dominated by the Danube River in which the main rivers of the region flow (Olt, Arges, Dâmbovița, Ialomița and Prahova). This is completed by a series of natural and anthropic lakes with complex use [4].

The climate taken as a whole is moderate temperate-continental, with annual average temperatures between 10<sup>0</sup>-12<sup>0</sup> C in the South part and 2<sup>0</sup>-6<sup>0</sup> C in the North part and with an

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atmosphere precipitations regime characterised by the following annual average quantities: 504 mm-600 mm in the field area and 1000 mm-1300 mm in the mountains area.

Their variety of the forms of relief and the geological complexity make the natural resources of the region to be quite diversified.

The mountains and hill area concentrates the natural resources of the subsoil (petroleum, natural gas, coal, radioactive and metal ores, salt, calcareous marls, sulphur, gypsum accumulations and mineral springs) important for the chemical, energetic and construction materials industry.

Besides the subsoil resources, of a remarkable importance and with direct influences in the development of some economic sectors there are the soil resources.

The share of the arable surface in the agricultural surface being of 80.6 %, that allows to practice the agriculture to a large scale.

The region possesses rich and water important resources (3.4% of the region surface), that, by using them in different sectors, have a remarkable role in the economic development of the region.

## **MATERIAL AND METHOD**

Starting from the identification of the most important strategic directions and priorities, we used SWOT analysis in the context of the re-evaluation of the potential of South Muntenia Region, as basic instrument in the elaboration of the Integrated Sustainable Development Strategy of the region.

In SWOT analysis we used the socio-economic comparative research data, of re-evaluation of the region potential, as well information provided by the experts within South Muntenia Regional Development Agency, APIA (Agency for payment and Intervention in Agriculture) and MADR that supported the elaboration of this paper, to which the results provided by the questionnaire added, they having the aim to identify some specific issues with influences on the local economic performances and strategic directions of rural development in the region.

## **RESULTS AND DISCUSSIONS**

Based on the conclusions of the socio-economic analysis and SWOT analysis, on the comparative advantages of the regions, on its strengths and opportunities, the strategy, by its structure and contents, aims the balanced and economic development of the region, together with the development of its capacity to adapt and to respond to the main key economic changes [2].

The background and development process of the strategy is based on taking into consideration of the following specific and important aspects of the region:

- The existence of some areas characterised by an adequate environment, that contributes to its attractiveness for the residents and tourists and to its competitiveness considering the business location;
- The nature and the varied character of the region that need specific measures and activities;
- The existence of some polycentric settlements, including important increase poles that provide good conditions for the productive investments concentration;
- That fact that a significant percent of the population lives in small towns, communes and villages, characterised by a modest development and that needs interventions that aim to support the economic development and diversification;
- The predominant agricultural character of the south area and the problems generated by this aspect;
- The inadequate road networks for the public and goods transport.

Starting from the identification of the most important strategic directions and priorities, we used SWOT analysis in the context of the re-evaluation of the potential of South Muntenia Region, as basic instrument in the elaboration of the Integrated Sustainable Development Strategy of the region.

### **SWOT Analysis – the rural area in South Muntenia Region**

#### **Strengths:**

- Natural conditions favourable for the economic development
- High percent of the non agricultural activities in the North of the region
- Long time traditions in all agriculture sectors
- Existence of some agro tourism structures under development
- Non polluting life environment
- Rich cultural and historical patrimony
- Original historical and cultural traditions
- High level of electrification of the households
- Qualified work force

#### **Weaknesses:**

- Inadequate technical conditions of the commune roads network
- Low level of development of the social infrastructure, of services and public utilities
- Low number of SMEs
- Lack of employment opportunities
- Low percent of non agricultural activities in the South of the region
- Lack of specialised labour force in non agricultural sectors
- Low level of education and living conditions
- Low productivity and profitability
- Low financial power of the rural population

#### **Opportunities:**

- Revitalization of the rural communities
- Development of SME sector in the rural area
- Facilities for the agricultural activities
- Development of agro tourism, preservation of the historical and cultural traditions
- Investments for the environment protection Increase of the ecological products volume
- Increase of the non agricultural activities
- Diversification of the non agricultural activities
- Increase of the population incomes in the rural area
- Existence of the financial Structural Instruments for the development of the rural area

#### **Threats:**

- Under-estimation of the rural area in the region development
- Lack of capital to support the investments
- Insufficient use of the existent potential
- Slow development of the rural economy
- Increase of the disparities between the rural communities
- Migration of the young persons to the urban areas
- Intensification of the disparities between the rural communities and their excessive depopulation

The re-evaluation of the socio-economic potential of South Muntenia Region is highlighted by the aspects presented in the *strengths and weaknesses*. The elements regarding the

*weaknesses and threats*, indicating the restrictions that the strategic development directions and objectives in the analysed sectors will be corrected by the implementation of some measures and activities under the form of implementation/achievement indicators, result and impact [1].

Based on the re-evaluated socio-economic characteristics of the region, including the relevant discrepancies and disparities within the region and the questionnaire, we made the SWOT analyses that led to the elaboration of the component elements of the integrates sustainable development strategy of the region, of the medium and long term systemic framework, that includes the rural development.

The strategy aim is to obtain the positive economic and social effects for the benefit of the entire region, presenting in an integrated approach the strategic directions, the objectives and activities needed to accomplish them. For long term, the main strategic aim for the development of South Muntenia Region is: „to increase the region capacity for the sustainable and balanced economic and social development of the region, that lead to the decrease of the disparities and increase of the social and economic cohesion, the increase of welfare and living standards of the inhabitants in the region”

The integrated sustainable development strategy of the region aims itself to achieve the development plan, by accomplishing 3 global strategic objectives, developed on vertical and 5 horizontal (transversal) objectives interdependent, that will be applied to all individual priorities and measures, that will ensure the revitalization and competitiveness of the region. In the future phases for the implementation of the Strategic Plan for Regional Development, the horizontal objectives will be taken into consideration, totally by an integrated approach..

The strategic development objectives that reflect the correlation of the social, economic, and environment forecasting of the region, are included in a strategic development such as:

Objective 1 – Development of the region competitiveness and attractiveness

Objective 2 – Development of competitiveness and innovative capacity of the business sector in the region

Objective 3 – Sustainable economic, social and cultural development of the communities in the rural area and it aims the development of an attractive and prosper rural area, by an integrated and balanced approach as regards the development of the communities and of the rural economy, favouring its positive contribution to the regional prosperity. This wish for the rural area development can be obtained by: the development of a diversified, competitive and powerful rural economy in agriculture, by the modernisation of the production and processing systems; providing alternative sources of incomes for the farmers; improve the local networks of transport and TIC; improve the services infrastructure; improve the access of the rural communities to the education, training, employment and counselling services; preservation of the natural and cultural heritage of the rural communities; promotion of the rural development using the local work force, materials, methods and traditional crafts.

Horizontal objectives – Environment protection; Equal opportunities; Innovation; Information Society and Human Resources Development.

The main aim of the strategy is to support the regional infrastructure strategy that represents one of the factors needed to increase the region competitiveness. In order to reduce the regional disparities, the infrastructure issues must be solved, that limit the accessibility, the business development and the employment level. In the wide context of the development strategy of the area infrastructure, the specific objectives of the strategy are: the improvement of the road access within the region, by the modernization of the commune and county roads, including the increase of the territorial density; orienting the investments to less developed areas; increase the life quality especially in the areas with social and economic problems by connecting them to the regional and national infrastructure; elimination of the problems generated by the traffic conditions at the community level; elimination of the factors that restrict the development potential of the region; cease the migration of the active population from the rural communities.

These objectives will be achieved by : the modernisation of the transport infrastructure in order to facilitate the access to the national roads network, jobs, social opportunities, markets

also in the areas with development potential of SMEs; the modernisation of the communication and information infrastructure concomitantly with establishing a performing services system in the information sector; improve the quality of the environment, social, cultural and pleasure infrastructure in order to increase the level of attractiveness of the region.

He measures to achieve the development strategy of the area infrastructure, elaborated within the paper, aim the improve of the development strategy of the regional infrastructure, with impact on the rural area development.

An important measure for our study is *Measure 3.2. Development of the non agricultural rural economy and stimulation of its competitiveness*

*Objectives:* increase of the rural areas contribution to the regional economy; extension of the range of the economic activities that are developed; contribution to the creation of alternative sources of incomes; facilitation of the access to services for the farmers; contribution to the increase of the production rentability and agricultural companies services; increase of the alternative incomes and of the employment opportunities for the young persons and women in the rural area; support the projects initiated by the young persons and by the women for the activities developed in the rural area; support the activities specific to the rural tourism, forest tourism and eco-tourism.

*Indicative activities:* the promotion of the alternative specific products based on the superior use of the local resources; suport provided for the development of the activites of the rural area; development of the craftsmen industries; improve the performing production activites; investments for aquaculture; investments for sericulture; investments for beekeeping; investments for mashrooms harvesting and processing .

*Covering area:* South Muntenia Region

*Impact:* the increase of the population incomes in the rural area; increase of the number of jobs for the rural population; reduce the number of unemployed persons; increase the added value for the activities in the rural area [3].

## CONCLUSIONS

The complex development of the rural area is an objective of national importance considering the conditions provided by the access to the European Union, situation that determined the intensification of the theoretical and practical concern in this sector. Many of the traditional approaches are not adequate anymore to the market economy and especially, to the rural area, being needed new requirements. This requires a modern approach, taking into consideration that the rural area possesses a high variety of local resources that can be used highly based on the sustainability, in order to develop the rural area.

For the achievement of the Convergence objectives six Sector Operational Programs and one Regional Operational Program were elaborated covering the period of the current budget exercise of the European Union (2007-2013) in the priority sectors: transports, environment, economic competitiveness increase, regions development, human resources development, administrative capacity development, technical assistance.

The rural area possesses the potential in order to increase the live quality of the entire society, by the existence of a healthy and secure environment, with a high level of social integrity and security, contributing this way to the social and economic cohesion.

The rural settlements that provide the needed infrastructure, the pleasure facilities and adequate spaces, constitute necessarily the premises for the development if multiple sectors. The protection of the cultural heritage by the restoration of the cultural buildings, of the monuments or creating museums, allow cultural and social activities, contribute to preserve and improve the areas identity, to increase their attractiveness level and not least encourage the tourism.

In many rural areas, the previous development of the specific agro-systems contributed to a much richer biodiversity than the present one on the old arid lands.

The agriculture contributed also to the decrease of the air quality, to the soil pollution, surface and deep waters pollution, as well of different lands. The production of food, the processing of the raw materials do not comply always with the environment and many times are in conflict with the society wish to protect the environment.

The rural area will transform itself in order to respond to the demand for an attractive pleasure and living area.

The rural area provides an important potential for the pleasure activities, but this must be maintained and sometimes improved. On the other hand, the rural area preservation for its beauty, historical and cultural importance is not comparable with the economic development. On the contrary, such protection can support the development – by tourism – of other investments as well. But the natural patrimony needs a careful management, adapted to the local conditions. Usually, this management develops closely related to the agriculture, because the workers in agriculture have a central role in the management of the rural areas.

The actions that will be taken will relate to the global investments, aiming to maintain the traditional image of the villages, the local architecture and the rural heritage, at the same time the measures being perfectly compatible with the objectives of the local development. These integrated actions can aim the renovation of the traditional elements of the houses, the protection and maintenance of the traditional elements of the rural heritage, such as water mills, wind mills, bridges, as well preserving the customs and the rural traditional life.

The sustainability must be always taken into consideration in the sense that the tourism development must be planned carefully, so that to exist a balance between the economic, social and environment impact [3].

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# LAND RESOURCES MANAGEMENT AND SOIL DEGRADATION FACTORS IN THE REPUBLIC OF MOLDOVA

LEAH TAMARA<sup>1</sup>

## Abstract

*Land resource management includes three interrelated levels: national, district and commune. The purpose and basic objectives are: state land policy implementation, legislation and regulations in force, effective implementation of measures to protect soil cover, to maintain ecological balance and biological diversity in ecosystems of the Republic of Moldova. The soil cover quality on the most agricultural land is unfavorable, and on some land - critical. Continue to expand the area affected by erosion and landslides, dehumification processes, damage of structure and compaction, sodium enrichment, salinization and soil swampy, drought intensified. Land management in the Republic of Moldova should be a process of development and implementation system of organizational, economic and administrative levers. They would allow regulation and development the forecast of quality land status; develop recommendations on the rational use of land, combating soil degradation processes and long-term preservation of agricultural production capacity. Basic information for proper management of land resources must become computerized information system of the state of soil quality.*

**Key words:** agriculture, land recourses, soil cover, soil degradation, soil evaluation

## INTRODUCTION

Soil is a natural body with a organo-mineral complex composition and properties that provides the necessary conditions of plant growth. Thus said, soil holds fertility - the ability to produce agricultural production. As support and living environment for humans, plants and soil animals is an inestimable wealth of all people, irrespective of ownership, must be used according to the interests of national economic development, in accordance with applicable law. Proper management of soil fertility resources is a primary social problem for Republic of Moldova.

Soil resources and use them in agriculture have their ecological and economical aspects. Republic of Moldova is characterized by very complexicity of soil cover. The soil variability and zonality of the territory are caused by climate change, topography and vegetation, from North to South of Moldova. Depending on climate and soil zonality in Moldova are highlighted three agropedoclimatic areas: North, Centre and South, which is divided into subareas [3, 4].

Main soils in Moldova are chernozems, area of 2 million 510 thousand hectares or 70% of the land. Under the forest steppe and steppe vegetation formed several subtypes of chernozems area: luvic or podzolic (3.5%), cambic or leachates (11.7%), typical (8.3%), ordinary (18.8% ), carbonate (19.9%), southern (0.1%) of land surface and intrazonale subtypes (7.3%).

Under recent and previous forest vegetation (altitude 200-300 m) have evolved the zonal soils: grey (9.8%), brown (0.8%); xero-forestry chernozem (0.5%) of land area.

Brown and Gry soils, cambic chernozems of Central Moldova were formed as a result of vertical zonality and differ from similar soils in Northern Moldova with a more favorable temperature regime (sum  $t^{\circ} > 10^{\circ} = 3000-3150^{\circ}$ ). Areas of these soils are extremely favorable ecological niches for placing precious vineyards with varieties of fine quality wine production. An important group of soils, as its use in agriculture (can be easily irrigated) and the ecological niche for the conservation of biodiversity, are hydromorphic soils (300 thousand ha or 8.4% of the total land).

Basic characteristic of the soil, which largely depends on favorability and their suitability for crops, is texture. In Moldova the most widespread are clayey-loamy and loamy textured soils (62.1%). These soils are characterized by high productivity if the content of humus in the arable layer is greater than 3.0%. Less favorable soils are loamy-clay (8.5%). Fine clay soils (41 thousand

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ha or 1.2%) are unfavorable for use in agriculture, their use is recommended for grasslands and forests [2, 3].

## RESULTS AND DISCUSSIONS

The land fund of the Republic of Moldova at 01.01.2012 is 3384.6 thousand ha, agricultural land occupies 2498.3 thousand ha (73.8%), including arable land – 1.812.7 thousand ha (53.6%), perennial plantations – 299 thousand ha (12%), meadows and pastures – 353 thousand ha (14%), fallow land - 34 thousand ha (1.4%). Is only 0.5 hectares per capita of arable land and perennial plantings, including 0.4 hectares of arable soils. Exceedingly high rate of agricultural land in the composition range leads to the manifestation of processes of soil degradation and land desertification [5].

Land reform in Moldova, as a result of unadequat strategy has not created conditions for increasing the soil fertility, sustainable land use, increasing agricultural production, exerting therefore a negative impact on national economy. Privately owned land area – 1882 thousand ha (55.6%), number of land owners increased from 1845 owners in 1990-1991 to 2366 thousand owners today. During the 20 years of reform have been deforestation and irreversibly lost more than 150 thousand ha of perennial plantations [5]. The main problem imposed by consequences of land reform is need for further consolidation of agricultural land. Land reform has resulted in massive acceleration of soil degradation processes and substantially reduces their fertility. In condition of subsistence agriculture, created as a result of land reform, Moldova risks losing the greatest wealth of the country – chernozem's fertility. Rational distribution of land in the national economy and sustainable use of soil resources should be based on two basic principles:

- Produce the necessary volume of agricultural production to meet population needs and export;
- Organization of agriculture in a way that the agricultural production to protect soil and enhances fertility.

### *Soil degradation and the factors responsible for degradation*

The quality of the soil cover of Moldova on most agricultural land is unsatisfactory, and on some land - critical. Continue to expand the area affected by erosion and landslides, dehumification processes, damage to structure and compaction, compactation, sodium enrichment, salinization and swampy, acute drought are intensified. These processes lead to disruption of biological cycles, balance of nutrients and humus in the soil, deterioration of soil and decrease their fertility. It creates the situation in which any social problem can be solved only by maintaining the ecological balance, environment and soil protection.

In the early of '70 the weighted average rating note of agricultural land was equal to 70 points. According to the Land Cadastre (2012) the average rating note of agricultural land now is equal to 63 points; fell in this period by 7 points [5]. The price of 1 point/ha per year is equal about 47 lei. Annual losses as a result of decreasing soil reliability note, measured by loss of agricultural production is 330 MDL per ha and 83 million MDL for the whole area of agricultural land (tab.1). The main factors of soil degradation are presented in tab.2.

According to soil surveys, soil eroded area increased over 40 years with 284 thousand ha (594 thousand ha in 1965 and now 878 thousand ha), increasing annually by 7.1 thousand hectares. Eroded soil fertility decreases in the following: weakly eroded - 20%, moderately eroded - 20-40% highly eroded - 40-60; very highly eroded - 60-80%. Along with surface water erosion, is widespread the deep-water erosion. Gullies on agricultural land area increased from 8.8 thousand ha in 1999 to 11.9 thousand ha in 2012. Rational management in agriculture in recent years generates decrease of number and ravenes surface.

Damage caused by erosion to national economy is tremendous. The annual loss of fertile soil is 26 million tons which is equivalent to the destruction of 2000 hectares of black earth with the whole profile evaluation to 100 notes. The amount of fertile soil contains: humus - 700 thousand tons, nitrogen – 50 thousand tons, phosphorus - 34 thousand tons, potassium - 597 thousand tons.



The cost of washing soil to the cost of legal land (1 ha – 926.496 lei), is about 1.850 million lei. Agricultural production is not obtained due to soil erosion, consists 525 thousand tons of nutrient units on the arable land and 57 thousand tons of fruit and grape on the perennial plantations lands. Given the price of 1.5 lei per nutritive unit and 1 kg of fruit and grape harvest, cost is lost yields due to erosion is 873 million lei. Indirectly, the damage caused by erosion extends to other spheres of human activity: bogging up of ponds and other water bodies, pollution of depressions soil, surface and groundwater with pesticides and chemical fertilizers washed from the slopes, destruction of communication, hydro and social construction, etc. [1-4].

**Table 1. Quality statuses (soil rating) of the soil cover of agricultural land**

| Soil rating clas | Soil rating, points | % from agricultural land surface | Surface, thousand ha | Winter wheat crop, q/ha |
|------------------|---------------------|----------------------------------|----------------------|-------------------------|
| I                | 81-100              | 27                               | 680                  | 32-40                   |
| II               | 61-80               | 36                               | 907                  | 24-32                   |
| IV               | 41-60               | 24                               | 604                  | 16-24                   |
| VI               | 21-40               | 6                                | 153                  | 8-16                    |
| VII              | <20                 | 7                                | 178                  | 0-8                     |
| Average          | 63                  | 100                              | 2518                 | 25                      |

**Table 2. Soil degradation factors of agricultural land**

| Soil degradation factors   | Surface, ha |
|--|-------------|
| Water erosion  | 839,7       |
| Landslides   | 81,0        |
| Damage to soil as a result of landslides   | 24,6        |
| Ravines damage soils   | 8,8         |
| Soil damage by excavating  | 5,0         |
| Overburden soils on artificial terraces, recently abandoned                              | 5,0         |
| Unclogging soils   | 546,4       |
| Reducing production capacity of unclogging soils as a result of their use in field crops | 175,7       |
| Clogging soils with low humifere deposits  | 119,0       |
| Secondary compaction of soils as a result of their intensive use                         | 2183,0      |
| Primary compaction (slitization) of vertic soils   | 60,0        |
| Excessive soil moisture on the slopes and valleys  | 49,6        |
| Excessive humidity of alluvial soils   | 259,0       |
| Salinisation and alkalization of soil on the slopes and valleys                          | 20,0        |
| Salinisation and alkalization of aluvil soils  | 99,0        |
| Solonezization of authomorth soils   | 25,0        |
| Dehumification, small (<3.0%) and very low (<2.0%) reserves of humus                     | 1037,0      |
| Ensuring unsufficient land with mobile forms of phosphorus                               | 785,0       |
| Soil degradation as a result of irrigation   | 12,8        |
| Drought and other natural disasters  | 256,0       |
| Land allocation for social needs   | 120,0       |
| Total damage of soil cover on land allocated for social needs                            | 40,9        |

A great economic and ecological damage on the land and the national economy in general is caused by landslides. Land area damaged by landslides is 24.6 thousand hectares and increase annually by about 100-300 ha.

Dehumification, structure deterioration and secondary compaction of soils are interdependent factors of soil degradation. Research has found that arable chernozems, compared with fallow, have lost about 2.5 to 3.0% of humus from 0-30 cm layer. Deterioration of structure and dehumificatiot of arable layer as a result of the existing agricultural activity led to compaction of arable layer of chernozems and grey soil with negative consequences for the physical condition of soils.

Periodic excess of soil moisture and appearance swampy processes, salinity and sodium enrichment is widespread in the Prut, Dniester, small rivers valley and on the slopes.

In recent years, with the increase of cattle numbers and excessive grazing in countryside, the the ecological situation of pastures suddenly has worsened. As a result of worsening occurred initially, and then total degradation of these lands. Because of the high concentration of livestock in rural area the environmental situation of health of rural space has worsened.

Reducing the amount of organic and mineral fertilizers by 20-30 times and failure of agricultural technologies and crop rotations have led to an uneven balance of humus and nutrients in soils and decrease crop yields by 20-30% [1,3].

#### ***Necessary measures to improve farmers' agricultural practices***

Rational land management means the combining technologies and activities in such way as are done concomitantly: bioproductivity, food security, protection of soil quality, economic viability and social acceptability. This can be done if it acts primarily on the main objective - protection of soil quality. Maintaining long-term productive capacity of the soil, increasing its fertility, is the primary strategic goals of farmers. The attitude toward on the soils is depends the country's economic situation. Therefore, every citizen, first, every farmer, land owner and economic agent, should be informed about the status of soil quality and to participate actively in the implementation of necessary measures to protect and enhance fertility. With the intensification of agriculture is creating new opportunities and positive anthropogenic influence on soil productivity. These possibilities can be achieved through improving the system of territorial organization of the land based on the ecological princes of maximum evidence of all natural landscape features.

Most measures to combat degradation processes of the soil cover are aimed at eliminating these processes, but not the causes that generate them. It is now evidence that such an approach to the problem will not result in its settlement. Removing of this shortcoming is possible by transferring socio-economic problems in the center of analytical and practical activity and addressing these questions with the same attention is given physical, chemical and biological forms of soil cover degradation.

#### ***General measures:***

- Improving national pedological and agrochemical soil research, creating a computerized information system for soil quality (soil quality monitoring status) for the management and proper use of the land at plot, agricultural, common, district and country level;
- Development of standards, technical reglamentation, general aspects, norms of agricultural land;
- Improve land law, solving problems of calculating land tax, land price, the rent, tax on land transactions, collected and use the funds in the form of land payments;
- Specifying form and limits the performance of state supervision of land transactions, contractual relations and policy responsibility for these relationships;
- Consolidation of land holdings in profitable optimal size, which would allow implementation of crop rotation and technologies, develop a system of sustainable use of soil resources;
- Creating a economic mechanism that would ensure sustainable improvement of price and tax credit policy, which would provide special-purpose programs in agro-industrial complex, especially in the protection, improvement and rational use of the land;
- Creating in different climatic areas the model of specialized farming households, high-yield and optimal sizes, determining the optimal size of farms of different specialties, taking into account soil conditions and economic specific of territories;

#### ***Measures concerning rational distribution of soil resources***

Distribution of agricultural crops in the arable land should ensure a harmonious co-report of the field crops and livestock, which would provide annual production of at least 10 million tons of manure, needed to stabilize humus balance the soil and thier fertility preservation. It is recommended following use of 1.8 million hectares of arable land: perennial grasses (lucerne and

esparceta involving up to 30% of grasses) - 20-30% (it will restore the soil structure, production the protein for quality fodder and 35-40 tons of biological nitrogen); grain - 25% corn - 20%, sugar beet - 7%, sunflower - 8%, tobacco - 3%; vegetable cultures - 5%, potatoes - 3%; heteroleageneous cultures - 1%, forage crops - 8%. The recommended structure will allow crop production volume required: grain for food security of people, feed for livestock, technical and vegetable crops for processing needs of industry and population. Along this crop structure will allow apply in the agriculture soil protective crop rotations.

***Measures related to combating soil compaction:***

For compaction control of the arable layer of soil is recommended:

- application of organic fertilizers from all possible sources - storage and incorporation of plant residues, manure, compost, green manure, crop intermediate complexes sludge from livestock and household waste (last two only after special training);
- introduction to soils with acid reaction of arable layer, along with organic fertilizers, 4-6 t/ha of defecate from sugar factories to create in the arable layer a reserve of CaCO<sub>3</sub> that will contribute to the formation of hidrostabile aggregates and improvement the structural status of the soils;
- perform at least once in three years the autumn plowing at 35 cm of depth, to which was plowing in the years until the land reform in aimed to destroyed underlying arable layer recent compacted;
- application of crop rotations with a 20-30% of perennial containing it takes up to 30% of grasses.

Along with the traditional tillage is necessary to implement progressively "mini till" system for soil conservation. Application of this system is subject to the production of machines suitable for executing several combined operations, the use of insecticides, fungicides, herbicides, fertilizers and machinery for their incorporation into the soil, knowledge of the peculiarities of crops, soil and local climate conditions, the use of crop hybrids varieties and adapted to the conditions created by this technology. To implement this system is recommended:

- Testing the system in 2-3 households and adapted to conditions of Moldova;
- Production enterprises of machines and aggregates necessary for republic.

Unchanging system of chernozems farming will lead to intensification of dehumification processes, destructuration, compaction of arable layer with serious consequences for the status of soil quality and agricultural production.

***Protection measures related to soil erosion:***

- allocation of agricultural uses on the slopes depending of land suitability for arable crops or orchards and vineyards, meadows and forest plantations (conform climatic and relief conditions);
- determining the number of work sole and lots, their shape and size for each slope separately, in accordance with the inclination, slope form and size, sole orientation on the long side overall contours, thus creating the possibility of performing agrotechnical work in this direction and favorable conditions for application the good agricultural practices;
- establishing a optimal network of technological roads, correct size and their location on the slopes (mining roads, located on the general line of the contour, roads connecting the hill-valley with oblique way, slope roads - 2-3°, secondary roads, turning areas);
- establishing a optimal network of channels for removal of excess water directed from the slopes and prevent erosion in depth;
- perform work fighting formations and rain depth erosion: leveling-modeling, channel level, falls and steps, thresholds, dams, consolidation, etc. grassed outlets;
- develop fitoameliorative arrangements: establishment farmland protection forest belts, mandatory establishment of forest plantations on slopes above 30°, afforestation of ravines and landslides, creating woodland protection of aquatic resources, transformation of arable

strong degraded and excessively eroded land into meadows and pastures, grassing outlets, embankments, drains, gullies;

- agro-technical measures to protect soil: antierosion crop rotation, antierosion agricultural technique, cultivation of crops in alternative strips on the 2-5° inclination slopes and alternative strips grassed on slopes with 5-8°.
- erosion control by stabilizing bottom in deep of ravines and banks; grassing and afforestation of ravines banks, work to retention and controlled discharge of water in the catchment area.

#### ***Combating landslides***

The main measures of prevention and control of landslides are the rapid construction of chimney swift rainwater, land drainage in various ways, captures the coastal springs, building fences, retaining walls for banquets, performing works by sealing cracks and leveling-modeling afforestation affected or likely to be affected. Recovery landslides is expensive, but more expensive is neglect, abandonment affected areas. The simplest and most efficient use of the land slipped afforestation with species of tree that rapidly increasing (willow, poplar, locust), which will increase over time to stabilize the landslide. In the republic of Moldova about 22.3 thousand ha of active landslide with deteriorated soil cover requires afforestation.

#### ***Improving degraded by salinization and swampy soils***

Improving the salinization soils has been based on projects developed in natural areas and watersheds. Land improvement works and agropedameliorative measures are:

- reconstruction and maintenance of drainage network usually an area of 88 thousand ha;
- gypsum arranging and salt washing of saline irrigated alluvial soils of the Nistru and Prut meadow area about 50 thousand ha;
- repeated gypsum amendment of 25 thousand ha of arable salinization chernozems;
- introduction of plants tolerant to salinity and sodium enrichment to restore grasslands and meadows, grazing regulation in those territories (area 50-60 thousand ha).

#### ***Soil fertilization with mineral and local fertilizers***

To conserve and improve soil fertility up to 2020 is necessary to take the following actions:

- optimization of crop rotation and biological soil nitrogen accumulation by increasing rate of leguminous in crop rotation as 20-30%;
  - incorporating into the soil of 5-6 t/ha manure, total 9-10 mln t;
  - the annual application of 150-160 thousand tons of chemical fertilizers in active substance or 180 thousand t of amofos and 240 thousand t of ammonia silitra.
  - VAT exemption for farmers to purchase fertilizers and plant protection chemicals.
  - limiting the profitability of importing agrochemical companies at 10%.
- Enforcement action will provide increasing harvests by 35-45%.

#### ***Ecological reconstruction of grassland vegetation***

Measures to improve recovery and extensive grasslands are:

- the regulation grazing based on the capacity of pastures;
- carrying out surface work (harrow pastures in late autumn or early spring, fertilizer, gypsum amendment of alkali land etc.)
- to use mixed hay – pasture or pasture – hay;
- combating soil erosion through afforestation, overseeding degraded land;
- combating salinisation using facilities of improvement works, sowing the plants resistant to salinity;
- restoration of degraded grasslands by creating radical land sown pastures.

#### ***Implementation of sustainable agriculture***

The existing system of agriculture in the Republic of Moldova is extensive, chaotic and lead to lower agricultural output and the degradation of soil and other natural resources. Out of this

situation is the gradual implementation (along with land consolidation) of sustainable agricultural system, in that agriculture and research are concerned not only high yields but also to optimize the system as a whole to maintain soils long-term productivity. Activity in a household with sustainable agriculture is based primarily on the use of natural processes, on biological resources and regenerable sources of household and only the second – on the purchased resources. For each climatic zone of the Republic of Moldova is necessary to achieve sustainable agricultural systems, specific local conditions. To implement sustainable agricultural system is recommended:

- creation of agricultural farms-model with large area (2000-3000 ha) and medium (400-800 ha) in three climatic zones of the country (North, Central and South);
- testing technologies for sustainable agricultural system in these households and their gradual implementation throughout the area;
- creating the necessary infrastructure to provide technical and material support for sustainable agricultural system (machinery, seeds, fertilizers, fuels, pesticides, etc.)
- improving the national research and design system of tillage for the organizing and planning, land reclamation in accordance with the needs and requirements of sustainable agricultural system.
- creating the infrastructure for training, education, extension and advocacy in sustainable agriculture;
- creating a viable economic mechanism that would ensure improvement of price and tax credit policy, which would allow farmers implement sustainable agricultural and technologies system.
- implementation of sustainable farming system for all forms of ownership and management.

The agriculture strategy based on sustainable agriculture and combating degradation of soil cover must be made the term "ecological limits of the territory", which characterizes the natural regeneration limits [4].

## CONCLUSIONS

The quality of the soil cover of Moldova on most agricultural land is unfavorable. Continue to expand the area affected by erosion and landslides, processes dehumification, damage to structure and compaction, sodium enrichment, salinization and swampy soil, drought intensified. Annual loss due to the national economy as a result of soil degradation is 436 million USD. Rational management of soil resources should be based on a combination of technologies and activities aimed at achieving concurrent issues: bioproductivity, food security, protection of soil quality, economic viability and social acceptability. This can be done if it acts primarily on the main objective - protection of soil quality. Most measures to combat degradation processes of the soil cover are directed at eliminating degradation processes and causes that generate them. Integrated agricultural management must be represent the comprehensive initiatives of farm management, which aim, in addition to enforcement, strengthening the positive impact of agricultural practices on the environment and harm reduction, no doubt the economic profitability of farms.

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# THE FINANCIAL IMPACT OF CAP MEASURES PROPOSED BY THE 2020s HORIZON

LEPĂDATU CLAUDIA<sup>1</sup>

## Summary:

*The paper intends, starting from the analysis of Commission Communications on the Common Agricultural Policy and associated policies (cohesion and communication on budgetary perspective) and the package proposed by the European Commission to assess the financial impact of proposed measures to come to meet decision makers in the development of a position towards the new draft regulation and some of the topics under discussion, among which the direct payments and convergence, capping direct payments, introduction of multiple payments, the payments specific for small farms and attracting young people to agriculture, practically a new strategic vision integrated.*

*Examining coordinates rural development can be appreciated that the entire rural area is a sensitive area that can become objects of rural development policies. Romania has now a rural area that works structures which define a complex and diverse rurality.*

**Keywords:** *cohesion, legislative, convergence, direct payments*

## INTRODUCTION

The expanse of the European Union to 27 member states has modified the perspectives and requirements for the agricultural sector at an European level, which in the present, includes a large diversity of agricultural types, with large discrepancies in terms of development and the valorification of agricultural potential. In this article I will stop on the efficient methods that have brought success to this politic in Romania. At the same time I believe that developing this sector would lead to the alleviation of the issues brought on by the financial crisis in the world and through a proper agricultural politic of rural development, not only Romania, but all affected countries would manage to pass the financial crisis. In Romania, a large part of state budget funds have been directed towards sustaining the investments in the private sector. Personally, I believe, that the financial resource is very important and completing the rural development is tied to it, but other types of resources should not be overlooked.<sup>2</sup>

With this new reality in mind, the reform of the Common Agricultural Policy has become again, a necessity for the member states, including Romania, in the context that our country needs to reevaluate and clearly define its needs and priorities based on a punctual analysis.

## MATERIALS AND METHODS

The evaluation of the impact of the reform for Common Agricultural Politic based on alternative politics has been created in the study „ The CAP towards 2020, Impact assessment of alternative policy options”. The Common Agricultural Politic is the document through which the general directions and main reform elements for the new CAP reform, are established. A large stage of public consultation was established, which went on throughout 2010, and a large number of impact studies were made during the last few years. The budgetary perspective after 2013 is based on the following principles:

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- Focusing on the priorities of the key politics
- Focusing on added value growth at a EU level
- Focusing on impact and results
- Assuring mutual benefits at the level of the whole EU

The main elements referring to the future CAP, extracted from the preliminary official position of Romania, on the budgetary perspective refers to the need of keeping the agricultural budget at least at the same level and the CAP architecture should be based on the two support pylons. This way, orienting direct payments to the EU media should assure the reduction of the differences between the direct payment level and the new member states. Romania asks for the establishing of an orientation mechanism that reflects the equity principle better regarding the payments per surface level. This demands a just re-projection and taking into consideration objective acceptance criteria by all member states. New adhering states will want a very strong pylon, with direct payments that rise significantly after 2013. These states will also want a direct payment redistribution between countries but it is hard to believe that contributing states will accept this new situation. If the newly adhered states will force towards a major redistribution of direct payments, then the political support for adjusting the CAP will be diminished.

The introduction of a percentage of direct payments for practices that benefit the climate and soil could raise the bureaucracy and institutional costs. Despite that, through this measure real economic stimulants can be offered for higher production methods or for losses caused by the application of these technologic methods. Ceiling direct payments: the structure of EU farms is varied in the sense of the activity size, work conditions, work productivity and juridical form.

Romania disagrees with ceiling direct payments for large exploitations, the ones that are the most competitive. In the case that the limiting will be demanded, Romania will back up the application of a high limit, so that the total number of potential surface, will not affect the food security or to produce further agrarian dissidence. Also, Romania will propose a gradual application of this measure and also the limited sums to be used within Pylon I for giving additional payments to the young farmers and for the small farms.

## **RESULTS AND DISCUSSION**

This study again raises the issue of direct payments given to European farmers and the apparently inefficient use these sums, because it is considered that these payments do not produce the added value for European citizens and do not contribute to the creation of public goods, and this money could be used in the infrastructure, or improving internal and external security of European countries. A sure thing is that financing the CAP consumes about 40% of the whole EU budget, and in the conditions of the economic crisis, there could be pertinent positions that would ask for the reconsideration of the support and the budgetary size given to the CAP.

For example, the CAP budget for 2010 was 57 billion euros, which means 150 million euros a day. The distribution of this money between member states can create tensions in the years to come, if the crisis deepens and the population becomes more and more susceptible to spending public money (table 1).

The first problem that is raised here is tied to the use of the historic criteria after which these payments were given and that contribute to the large differences of productivity between the countries with a strong state assisted agriculture and the ones with less state help. So, the countries that in the past produce cereals or meat, strongly assisted by the state, receive today, most of the direct payments. On the other hand, the countries with a less effective agricultural system or specialize in products that receive less help (like vegetables and fruit), receive today the fewest payments. The most important

contributor in sustaining the CAP budgets, is, as its well know, Germany, that had a net contribution in 2010.

**Table 1 The contribution of member states and the corresponding direct payments, 2010 million euro**

| Member states | Absolute receivables | Absolute contributions | Total receivables |
|---------------|----------------------|------------------------|-------------------|
| Austria       | 745                  | 972                    | -227              |
| Belgium       | 612                  | 1300                   | -688              |
| Denamrk       | 1030                 | 920                    | 110               |
| Finland       | 566                  | 691                    | -125              |
| France        | 8421                 | 7552                   | 869               |
| Germany       | 5772                 | 8216                   | -2444             |
| Greece        | 2212                 | 947                    | 1265              |
| Ireland       | 1341                 | 528                    | 813               |
| Italy         | 4207                 | 5819                   | -1612             |
| Louxiemburg   | 38                   | 112                    | -74               |
| Holland       | 853                  | 1685                   | -832              |
| Portugal      | 589                  | 606                    | -17               |
| Spain         | 5091                 | 4026                   | 1065              |
| Sweden        | 463                  | 914                    | -151              |
| Great Britain | 3976                 | 4368                   | -392              |
| UE-15         | 36125                | 38658                  | -2443             |
| Bulgaria      | 336                  | 134                    | 202               |
| Ciprus        | 39                   | 69                     | -30               |
| Czeh Republic | 654                  | 501                    | 153               |
| Estonia       | 72                   | 52                     | 20                |
| Hungary       | 947                  | 325                    | 622               |
| Latvia        | 105                  | 68                     | 37                |
| Lithuania     | 271                  | 103                    | 168               |
| Malta         | 4                    | 23                     | -19               |
| Poland        | 2192                 | 1121                   | 1071              |
| România       | 730                  | 491                    | 239               |
| Slovakia      | 280                  | 264                    | 16                |
| Slovenia      | 102                  | 142                    | -40               |
| UE -12        | 5734                 | 3292                   | 2442              |
| <b>Total</b>  | <b>41950</b>         | <b>41950</b>           | <b>0</b>          |

Source: Public Money for public goods: Winners and Losers from CAP Reform, Valentin Zahrnt, ECIPE, 2010

The issue of the newly adhered states EU-12 and then EU-2, is brought in to discussion, because after the year 2013, some of them will be among the biggest beneficiaries of the CAP. So, in 2013, when the states EU-12 will receive 100% of the direct payments levels, the biggest net earnings from direct payments will be received by Poland (1.8 billion euro), Greece (2.1 billion euro) and Hungary (1 billion euro).

The new reform does not propose any calendar regarding future direct payments. The question is raised, if they will be given indefinitely and if the farmers have had enough time to adjust to the price fluctuation. In the new perspective, the reasoning for further giving direct payments, is motivated by the desire to keep farms viable and assuring an easy structural adjusting, because farms are absolutely necessary in the European economic landscape. This raises the following two issues:

- First of all, direct payments constitute a sustaining method that is untied to production, so a contradiction appears when saying that direct payments contribute to the food security by stimulating the agricultural production.
- Second, the economic justification of giving these payments is that income from agriculture is smaller than other domains. It depends on how these are evaluated.



Although, on this point, our opinion is that things should be judged differently, because behind European statistical medias, the incomes per country are very spread. In 2009 for example, in Romania, the income of a agricultural household was under the level of income of a medium household (78% at the level of total income and 53% at the level of money income). For that reason, the necessity appears for the redistribution of direct payments between countries, so that the differences between incomes for Western farmers and those of Eastern farmers should become smaller.

What should be remember as a sensible subject for Romania from the point of view of the future CAP is tied to the approach within the partnership contract for those priorities that are less correlated with the 2020 European Strategy, their lack leading to the suspension or canceling of funds.

For Bulgaria and Romania the direct payments are still completed with money from the national budget. For this, for Romania and Bulgaria the total value that can be given from the national budget, for completing surface payments, is expressly mentioned. For Romania, in the year 2014 the ceiling for payments from the national budget is 330.9 million euros and in 2015 156.6 mil euros, which would correspond to a payment of 16 euro/ha extra besides the payments from the European budget. I believe this option is similar to the old philosophy of the CAP.

## CONCLUSIONS

The main elements that refer to the CAP of Romania that refers to the budgetary perspective are the following:

- The budget for agriculture should remain at least at the actual level;
- The CAP architecture should be based on the two pylons;
- The convergence of the direct payments to the UE media should assure the reduction of the differences between the level of direct payments to older and newer members, so Romania ask for the creation of a convergence mechanism that better reflects the principle of equity regarding the level of pay per ha
- The introduction of a percentage of the direct payments for practices that benefit the climate and soil.

In case the ceilings become forced, Romania will sustain the application of high ceiling so that the total numbers of hectares that this measure will include are not affected when it comes to food security or to produce administrative crumbling, especially that Romania is in a starting stage of the process of gathering all farm land.

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# ANALYSIS OF LIVESTOCK HOLDINGS BY SIZE CLASS IN ROMANIA DURING 2002-2010

LEPĂDATU CLAUDIA<sup>1</sup>

## **Abstract:**

*Romanian agriculture is heterogeneous in terms of operating structures and their dual nature is accentuated to the most EU Member States. Structures of exploitation in Romanian agriculture have some positive developments, but insufficient in adapting to the European agricultural model and to enhance the capitalization of national resources. Although there has been some progress still remains an excessive number of individual farms, small and very small performing as a few large and extra large units whose activity was not restructured to become compatible. The notion of size reflects the qualitative side of the production process of concentration and size of the quantitative side mirrors. Farm size refers to agricultural land used or the average farm. In this paper follow the evolution of livestock (no heads) in the farm size classes of utilized agricultural area. In the period 2002-2010, the operating structures in Romanian agriculture have been some developments, but insufficient in adapting to market demands for superior turning community resources that Romania has.*

**Keywords:** national resources, nonperforming, agricultural area, heterogeneous

## INTRODUCTION

Each category of farms has advantages and disadvantages, but in general you should prevail, medium-sized farms and very large and the small farms must be an exception. In practice must be kept in mind not only the economic but also the criterion of social and ecological abundance or scarcity, production, stocking, natural population, transitions. However, low production in agriculture survived over many centuries despite the changes. The tendency of growth of average size is naturally accompanied in another trend-that of reducing the total number of agricultural farms. The reduction is based on the disappearance in every year of an important number of small agricultural farms, economically unsustainable. The phenomenon of reduction the number of agricultural holdings and increase the average size of a farm meets with different intensity, in most countries of the world. In accordance with the structure of farms in the E.U. also Romania will be necessary as most of the livestock production, consumer market, designed to be operated in family farming. This type of farm may not appear and cannot develop on its own, but through a process spurred, supported and led. In Romania, the right direction can only be towards the organization of such size that the holdings to implement modern technologies and management. Socio-economic conditions in our country, raising livestock in terms of performance, competitiveness and profitability must be based on the family farm, were the farmer directly operates. General Agricultural Census 2002 indicates that coexist in our agriculture 2 types of farms: individual farms and farms mainly peasant.<sup>1</sup>

## MATERIAL AND METHOD

In Romania the small subsistence farms have proved to be very sturdy and survived, after 1990, over the structure of the old rural households. Structural changes should lead to the development of multi-purpose households, particularly through the development of organic production, the association for the marketing of products, such as industrial inputs. To reduce the numbers of subsistence farms and commercial training sector-sized holdings have not implemented adequate measures of structural policy, together with the reform of land property. From 2002 to

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2007, the total number of agricultural holdings decreased by only 447,57 thousand (about 90 thousand per year, and from 2005 to 2007 with 269,46 thousand, about 135 thousand per year). In Romania, the number of small family farms and very little remains high, and in the future due to the historical tradition of structures resulting from the application of the laws of the land unsuitable for this era.<sup>2</sup>

## RESULTS AND DISCUSSION

During the period 2002-2010, the structures of Agriculture of Romania had some unsatisfactory developments, but in the process of adapting to the requirements of the Community market and to make the top of the national resources that require an in-depth approach of reality. According to the provisional results of the General Census of Agriculture 2010, the number of agricultural holdings in Romania was 3.856 thousands. Reduction in the number of agricultural holdings was due mainly merging farms without legal personality.<sup>3</sup>

**Table 1 Evolution of agricultural holdings with livestock, on class size in the period 2002-2010 (number).**

| The size of the used agricultural surface (ha) | 2002           |               |                |                | 2010          |               |                |                |
|--|----------------|---------------|----------------|----------------|---------------|---------------|----------------|----------------|
|  | cattle         | sheep         | swine          | birds          | cattle        | sheep         | swine          | birds          |
| under 1  | 540207         | 168572        | 1442916        | 1464815        | 176195        | 70083         | 757015         | 1406036        |
| 1-2  | 340604         | 139948        | 582643         | 694797         | 163359        | 50239         | 331615         | 508269         |
| 2-5  | 494445         | 239194        | 696951         | 787189         | 267406        | 91598         | 409035         | 559244         |
| 5-10   | 125445         | 74299         | 160747         | 176351         | 86277         | 38037         | 110476         | 139611         |
| 10-20  | 19951          | 12776         | 25719          | 27422          | 20949         | 11667         | 25850          | 30532          |
| 20-30  | 2700           | 1855          | 3702           | 3715           | 4205          | 3030          | 5494           | 6080           |
| 30-50  | 1682           | 1181          | 2451           | 2385           | 3231          | 2712          | 4338           | 4689           |
| 50-100   | 1318           | 1027          | 1902           | 1777           | 2370          | 2106          | 3221           | 3436           |
| peste 100                                      | 1797           | 1159          | 2203           | 1601           | 2065          | 1794          | 2434           | 2490           |
| <b>Total farms</b>                             | <b>1528149</b> | <b>640011</b> | <b>2919234</b> | <b>3160052</b> | <b>726057</b> | <b>271266</b> | <b>1649478</b> | <b>2660387</b> |

Source: INS 2002-2010, RGA 2002-2010

**Table 2 Development of livestock in agricultural holdings by size classes, during the period 2002-2010 (heads)**

| The size of the used agricultural surface (ha) | 2002           |                |                |                 | 2010           |                |                |                 |
|--|----------------|----------------|----------------|-----------------|----------------|----------------|----------------|-----------------|
|  | cattle         | sheep          | swine          | birds           | cattle         | sheep          | swine          | birds           |
| sub 1  | 627647         | 1594820        | 2934212        | 37774120        | 324907         | 1287289        | 1741386        | 38249027        |
| 1-2  | 594483         | 1093458        | 1364917        | 13166839        | 289930         | 703129         | 655778         | 9658043         |
| 2-5  | 1031598        | 2283751        | 2113602        | 18059995        | 606625         | 1731009        | 1095567        | 15058046        |
| 5-10   | 358481         | 1156288        | 813900         | 6502098         | 306093         | 1313854        | 407674         | 6285640         |
| 10-20  | 90552          | 432333         | 347705         | 4850267         | 138724         | 872837         | 187183         | 4046561         |
| 20-30  | 22321          | 126828         | 129470         | 157465          | 46660          | 418580         | 111798         | 249132          |
| 30-50  | 17919          | 109680         | 143934         | 158618          | 50279          | 543546         | 48580          | 726692          |
| 50-100   | 18053          | 137978         | 68898          | 196483          | 55557          | 602582         | 125992         | 831679          |
| peste 100                                      | 109728         | 303268         | 343042         | 1541167         | 166402         | 912923         | 1013482        | 3761935         |
| <b>Total result</b>                            | <b>2870782</b> | <b>7238404</b> | <b>8259680</b> | <b>82407052</b> | <b>1985177</b> | <b>8385749</b> | <b>5387440</b> | <b>78866755</b> |

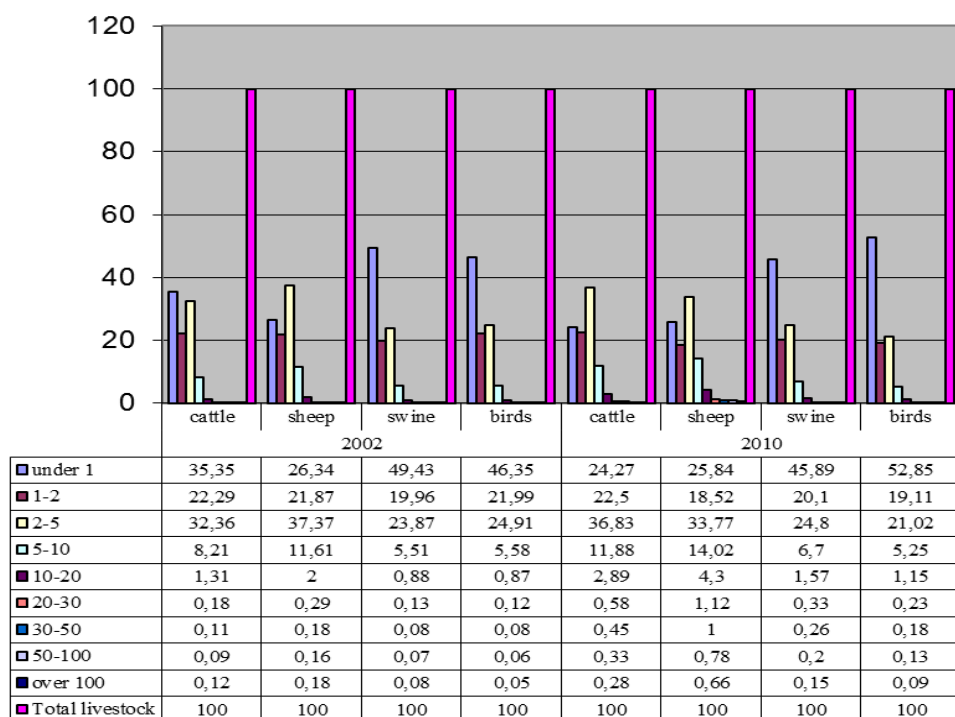
Source: INS 2002-2010, RGA 2002-2010

Evolution of agricultural holdings with livestock in the period 2002-2010 shows the following trends:

- analysis of the structure of the class size under 1 ha in 2010 to the birds was recorded a decrease of farms with livestock of 11,08% in cattle, hogs 3,54% compared to 2002, while the birds to registered an increase of 6.50% in 2010 compared to 2002;

- for classes of 1-2, 2-5 ha in 2010 has registered a growth of farms with livestock from cattle of 4.31% from 2002 and on other species increases in 2010 compared to 2002 have not been significant being between 2-3.5%.
- for agricultural enterprises with livestock with the class size ranging between 5-10 and 10-20 hectares in cattle has registered an increase of 3.67% in 2010 compared to 2002, 2.41% in sheep in 2010 compared to 2002;
- for class size ranging between 20-30, 30-50 hectares and over increases for agricultural enterprises with livestock were negligible in 2010 compared to 2002 which is between 0.07-0,87%.

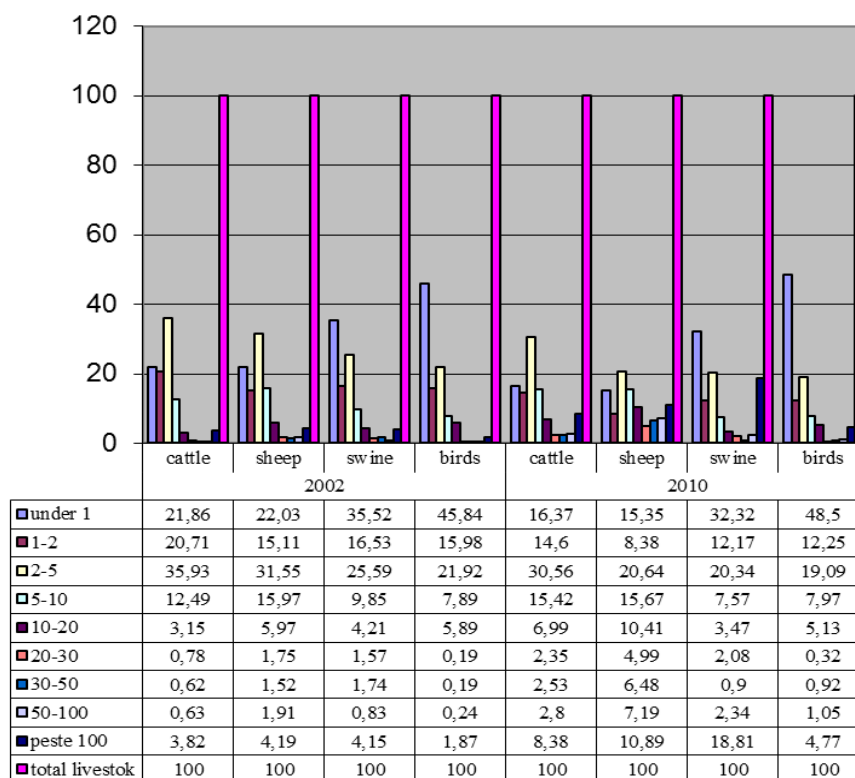
**Figure No. 1 the structure of agricultural holdings with livestock from 2002-2010**



Livestock development in the period 2002-2010 shows the following trends:

- the share of livestock in class > 1 ha recorded a trend descending to the level of species: cattle animals (5%), sheep (7%), swine (3%) and a slight increase in bird species (3%) in 2010, compared with 2002;
- the share of livestock in the classes of size 1 to 2, 2 to 5 ha had also held to a trend in the species-cattle (6%), sheep (6%), swine (4%), poultry (2%);
- weights of classes of size 5-10, 10-20 hectares were registered in cattle (an increase of 2%-3%) in 2010, compared with 2002 in sheep (4%) in 2010 compared to 2002 and at the swine and bird species were recorded in 2010 towards decreasing of 2002 approximately 0,80%;
- for class size ranging between 20-30 hectares and over livestock share recorded a slight growth in 2010 compared with 2002 almost all animal species mentioned in table 2;
- for the amount of over 100 hectares, the weights have increased significantly (4,5%) in cattle, sheep (6.7%), swine (14.6%), poultry (2,90%).

**Figure No. 2 structure of the livestock farms in the period 2002-2010**



## CONCLUSIONS

Livestock, very important domain of agriculture will have to become a huge national housing wealth. To this end, strategic, sustained financial imperative should ensure not only the increase in the number of livestock, but more importantly, productivity per animal, the quality of production and economic efficiency, implementation and use of animal products.

To do this, it must be implement the process of genetic improvement of livestock, modern biotechnology is used for breeding, to introduce a new concept of animal nutrition in accordance with physiological requirements of each category.

The main directions of restructuring of large companies specializing in agriculture can be connected with: diversification of economic activities, the development of cattle breeding farms, cooperation with small and medium enterprises sector, the structural adjustment of production to market requirements.

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# ENERGY ANALYSIS AND IRRIGATIONS ECONOMY

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## **Abstract**

*The authors propose in the present material an energy analysis of the irrigated agriculture in which the inputs as well as the outputs, respectively the production are evaluated in energy units, meaning in Kcal/ha. For inputs, different methods are being applied, depending on the nature of materials, products or of the energy forms, in this manner: a)the energy consumed as mechanical work of: human, animal or windmill, hydraulic, ecc. origin can be measured as such and expressed in any energy measurement unit; b)the energy released by different forms of fuel is measured also knowing the equivalence coefficients; c)the energy contained in engines, constructions, materials that either is consumed once (tying rope), either is consumed slowly during the time (the tractors and agricultural machines' wearing out). In turn, the main agricultural products and the entire plant taken as biomass are also energy carriers stored by means of photosynthesis. The authors operate an energy and economical analysis of the romanian agriculture based on the statistical data obtained during the last years of the planned economy (1986-1989). The analysis comprises two versions: a) the design numbers in which the energy production is evaluated based on some high yield per area (ha). As a consequence, the energy efficiency indicators, respectively the balance and the energy efficiency have higher values. b) Based on the real yields obtained during the respective period of time when the energy efficiency indicators are much lower and the economical efficiency indicators are at limit or even negative. Irrigated agriculture is a big energy consumer. Compared with the non irrigated technological system, the energy consumption is higher with 28-30% at cereals, with 48-50% at oil plants or with 53-55% at sugar beet. The commercial cost of the energy unit in the irrigated technological system depends on many factors, among which the most important are: the structure of cultures, the irrigation norms and the number of applications the degree of use of the effective irrigated area from an irrigation system; the pumping height and the water transport distance from the source to the irrigated area; the attainment of the estimated productivity parameters; the energy crisis are directly affecting the irrigation water crisis as well, as a resource as well as price, that is why, at national level, a judicious management policy of the irrigation water and its associated energy is recommended.*

**Key words:** food, irrigation, water, energy.

## INTRODUCTION

Food, water, energy. Food's dependence on water, and of the water for the energy irrigations is a well known truism nowadays. In this field, the XXI century takes from the previous one a problem as global as it is controversial.

In the view of an uncontrolled demographic growth quartered in the poorest and hungriest area of EARTH, how will mankind's food be ensured?

The material is not intended to answer this question but to place the energy role and place in the production of a food surplus by irrigating the cultivated plants. Primary agriculture, the main food source in the energy consumption structure is increasing.

For a balance of the food sector of 16.5% from the total commercial energy consumption of the United States of America, John N. Walker and Wayne H. Smith [8] are proposing the following dissociation: production 2.9%; processing 4.8%; marketing 1.3%; food preparation inside the house 4.3%; food preparation outside the house 2.8%; transport 0.4%.

Hence, the farmer's energy consumption represents less than 3% from the total and less than 1/5 (17.5%) from the energy consumed by the food system. Industrial processing, food preparation inside and outside the house are consuming at least the same, or more than the agricultural producer in order to obtain it.

Agriculture's balance in the energy consumption at the farm's level differ from region to region, as well as depending on the economical growth level. According to B.A.Stout [6], agriculture's balance in the energy consumption has been during the period of time 1972-1973 of 3.5% in the developed countries; 4.8% in the developing countries; 6.4% in the Middle East or of 3.2% in the countries with planned economy. For what concerns the balance of irrigations in the

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energy consumption at the farm's level, it would be of 14.1% from the total consumption after the mechanical works 44.6% and fertilization 33.7%.

In Romania, agriculture's balance in the energy consumption at national level has been of 1.9% in 1969, of 3.2% in 1989 and of 1.1% in 2009. But in absolute numbers, the agriculture has consumed 528 thousand tons of CF (conventional fuel) in 1969, 4307 thousand CF in 1989 (with almost 3 million ha exploited in irrigated systems) and 385 thousand t of CF in 2009 (with an irrigated area of 288 thousand of ha, 10 times smaller than the one irrigated in 1989).

In the present material the authors are proposing an energy analysis of the irrigations in which the inputs as well as the outputs, respectively the production, are evaluated in energy units, meaning Kcal/ha.

In Romania, the energy analysis has been the research topic especially for the Agricultural Economy Institute's researchers, since the early '80's of the past century [7, 3, 1, 4].

## MATERIAL AND METHOD

At the basis of the present article is the work „Irrigations in Romania's agriculture” [Lup, 1997] whose V-th chapter deals with: The analysis of the irrigations energy, whose importance is growing with the intensification of the agricultural systems with the purpose of producing more food supplies. The analysis data are brought to date for the level of the year 2009.

A special analysis method is being used in which all technological consumptions, including the energy embedded in the infrastructure of irrigations and work equipments system, are expressed in energy units, respectively Kcal, KWhour, ecc.

On the other hand, the harvest, the main one – grains - as well as the secondary one is expressed in the same energy units. For the inputs, different methods are being applied, depending on the nature of materials, products and forms of energy, as it follows:

- the energy consumed as mechanical work of: human, animal or windmill, hydraulic, ecc. origin can be measured as such and expressed in any energy measurement unit;
- the energy released by different forms of fuel is measured also knowing the equivalence coefficients;
- the energy contained in engines, constructions, materials that either is consumed once (tying rope), either is consumed slowly (the tractors and agricultural machines' wearing out).

A classification of the main forms of energy inputs in agriculture is presented in figure 1. In turn, the main agricultural products and the entire plant taken as biomass are also energy carriers stored by means of photosynthesis.

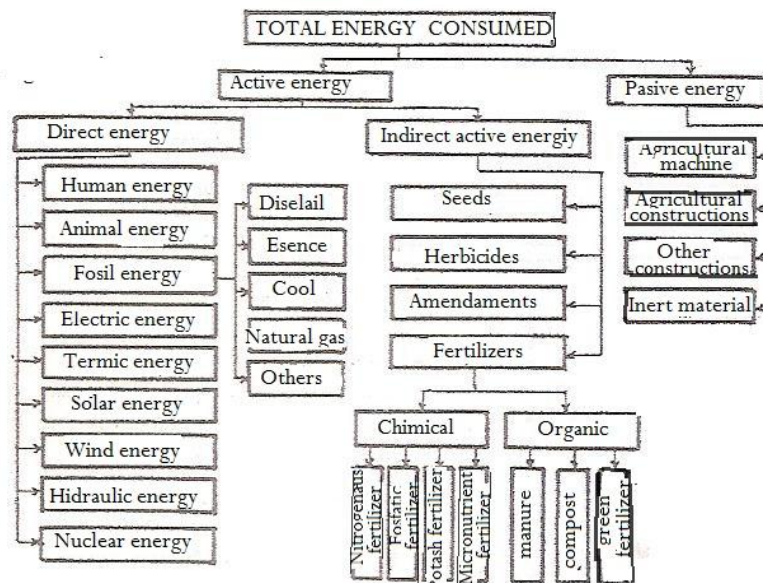


Figure 1. Schema structures the energy consumption in plant production (after I. Ieșu and V. Baghinschi)

Thereat, an indication must be made: the plants' energy content is slightly different for different parts of the plant and even within some groups of plants, such that the main product is not usually much higher than the secondary one (stems, leaves ecc.). Nevertheless, we cannot consider as equal the two categories of products (at least for the actual stage of development of the secondary production).

Taking into account at „inputs” the main production, as well as the secondary one, leads to a significantly higher energy efficiency.

## RESULTS AND DISCUSSIONS

### *Energy analysis of the agricultural technological processes.*

The energy analysis represents an investigation method or, rather an original concept of approaching the technological processes that allows the results' comparison with the effort made to obtain them, expressed in a single measurement unit. Similarly, the value system, the energy unit (caloric units, joule). The analysis allows the measurement of any product, matter, energy resource consumed or produced in a simpler or more complex technological process, going to an economical branch or even to a complex of branches (the agrifood sector, for example).

The energy analysis, unlike the economical one, is in fact the shift from the notion of „cost” to the one of „resource”. Until recently, the assessment of results in agriculture was made only by two main criteria:

a) *efficiency*, expressed by the medium production at the area unit, livestock ecc.

b) *profitability*, respectively the economical efficiency of the allocation of factors, lately more searched, but with possible negative effects on the production's development.

But none of the evaluation criteria of the obtained results was not taking into account the fact that a series of results, although convenient from an economical point of view (at least for a certain stage), are limited.

The energy analysis and balance represent a method and, respectively, an indicator by which the economical future is approached not only from an economical point of view, but also according to the resources rarity and environment protection criteria.

At the most general, the energy analysis involves the drawing up of an energy calculation at the inputs, as well as at the outputs from a technological process, the relationship between them being the energy efficiency.

*The energy efficiency.* It was first defined as a report between the total energy outputs and inputs. This would mean that at outputs it should be taken into consideration the entire produced biomass, including the secondary plant: stems, roots, ecc., that are not being used.

At inputs, it should also be taken into consideration the free energy sources, for example the solar one. In this case, we would obtain what we can call the *ecological efficiency*, formulated as it follows:

$$R = \frac{\text{Production used by man+production not used by the human}}{\text{Energy consumption with value+free energy consumption (from the sun)}}$$

For what concerns the free energy sources for the technological processes of plants production, they are practically represented exclusively from the solar energy transformed by means of photosynthesis in biomass with energy value, but with an extremely low efficiency (under 1%). In the specialists circles, it is known the expression *energy octopus* (la pieuvre energetique), that expresses the extreme dissipation of the solar energy. Thus, from the solar energy that enters the atmosphere, approximately 30% is reflected by it before it reaches the ground.



Also in the atmosphere, approximately 30-45% of radiations are lost. The soil receives in turn 5-10% of these to reflect again approximately 30% of the trapped radiations. Thus, just an insignificant quantity, appreciated at less than 1% is used in the photosynthesis process.

In fact, what happens if we include the solar energy in the balance? Of the 30 percent that reach the ground, only approximately 1-3% are found in the organic products, less than 1% take part in the biomass forming, and from it only 55% is harvested by the human.

The maximum solar energy quantity recovered by the human would be:

$$0,01 \text{ (photosynthesis useful efficiency)} \times 0,55 \text{ (part harvested by the human)} \times 100 \text{ (days of active plants)} \times 90 \text{ cal/cm}^2/\text{day (received by the soil)} \times 10^8 \text{ cm}^2 \text{ at hectare} \times 10^3 \text{ cal/year} \neq 10^6 \text{ kcal/year}$$

Thus, only  $50 \times 10^6$  kcal/ha pass into the biomass, which would correspond to a grain efficiency of 125 q/ha (grains and straws).

Worldwide, on an area of  $1,45 \times 10^9$  ha, the agriculture produces  $8,7 \times 10^9$  tons of dry substance/year biomass, that would correspond to a value of  $3,5 \times 10^{16}$  kcal. But the caloric value of the plants production is of only  $10^{16}$  kcal, so only 1/3 of the produced biomass is harvested, which means a huge waste of plant calories [4].

For what concerns the produced energy, we observe that most of the plant mass that remains on the field or that is exploited, represents half or less of what is being produced. The energy efficiency is significantly growing, but by introducing the energy contained by the secondary production into the calculation.

For this reason, the specialists are searching for new methods of exploiting the secondary products, by the most different means: in the animals' food, as fertilizer, in fuel, raw material for the production of biogas, even in constructions, ecc.

For what concerns the energy inputs, at first view it seems normal to be taken into consideration only the inputs with value, meaning the ones that represent, in one form or the other, a financial effort, the remittance of the work force, the fuel, the machines' wearing out, the irrigation water, the seeds and other materials, ecc.

Also here, the man, the agricultural science could intervene in the improvement of the energy balance. It is known the fact that not all plants have the same exploitation coefficient of the solar energy or of other ecological resources (pedological, agro-physical and agro-chemical factors, relief ecc.).

Currently, the energy efficiency is calculated as a report between the main and secondary production evaluated in commercial energy units and the commercial consumptions evaluated in energy units, as it follows:

$$R = \frac{\text{Produced energy}}{\text{Energy consumptions with value (that costs)}}$$

Thus, this efficiency would be nothing else than the productive efficiency of the commercial energy used in agriculture. In this case, the energy efficiency could grow by obtaining a higher quantity of energy, with a lower additional energy, with the same energy quantity or even lower energy consumption.

For what concerns the economical concept (the second one) of the energy efficiency, this allows an evaluation of the report inputs-outputs as the energy carrier biomass use degree is increasing. Also, according to the biological agriculture principles, the secondary production that is not being used, as well as the organic debris of the roots, are not considered as loss, including from an economical point of view. In any case, the energy analysis represents an extremely complicated method, used for fundamental research studies, while the economical analysis of the inputs and energy production could represent a particularly useful practical instrument to optimize the production activities in any agricultural department.

Energy analysis and energy efficiency calculation involves the inputs and outputs' quantification and separate integration for every element taking part in the technological process. This means that we need a common measurement unit in which we can convert the consumptions, as well as the obtained productions.

The most used energy measurement units, in order of frequency, are: the kilocalorie - kcal, the kilowatt hour - kWh, the conventional fuel - kg CF; the horse-power - HP/h.

The conversion in energy units is rather difficult considering the diversity and nature of the products that need to be taken into consideration.

For the agricultural products (outputs), the evaluation can be made by two methods:

- a) measurement of caloric content obtained by direct combustion;
- b) measurement of energy content broken down by the biochemical processes, method that cannot be applied to some groups as textiles, tobacco and others.

### ***Analysis of the irrigations energy.***

As a production factor, irrigations are appreciated as being a high energy consumer, competing with the mechanization and chemification. But their balance in the energy consumption on the whole agriculture is more modest in comparison with the first two factors because of the scale differences. While the mechanization's energy consumptions affect the whole cultivated lands, and the chemification most of them, the irrigations generate additional energy consumptions only on improved and exploited in an irrigated system areas.

We mentioned earlier that agriculture occupies a modest place in the country's energy balance, and the trend is downward. If in the year 1977 the agriculture had 4,9% of the energy resources on the entire economy, this balance has decreased at 3,6% in 1993 and only 2,9% in the year 1994 or 1,1% in 2009. Nevertheless, on the irrigated lands, the energy consumption is much higher.

### ***Energy consumption structure in irrigations.***

Irrigation requires the consumption of two categories of energy resources, meaning:

- Passive energy, embedded in the structure of the hydrotechnical systems: ducts, pipelines, water intakes, pumping and repumping stations, distribution network, electrostations or aggregates of putting under pressure, works of art etc;
- active energy, necessary to pump and distribute the water to the plants: electric power, fossil fuel, human energy or of any other nature.

Passive energy embedded in the hydrotechnical systems and the watering equipment's vary in very large limits, depending on the type of establishment and the watering method, on the used materials, conditions specific to the area etc.

At its turn, the active energy depends on the system's irrigation norms, watering method, constructive performances synthesized by the general efficiency of the pumping aggregates, watering network and equipment but also of the energy agent's nature (electric current, different fossil fuels, etc.).

According to the data, the passive energy embedded in the establishments for irrigations has been evaluated in round figures at approximately 13000 kcal/ha, and the annual consumption representing the wearing out at approximately 600 Kcal/ha/year, energy that is being consumed whether or not the system is being exploited, since it represents the physical wearing out of the infrastructure and equipment's.

Of course, depending on the constructive characteristics, on the materials, placement, but also according to the used methodology, the evaluation of the energy embedded in the establishments for irrigations, differ from system to system, as well as from one author to another. For example, for the hydrotechnical systems from Romania, E.Cazacu and colab. [2] evaluate the energy included at approximately 3600 kcal/ha for the single-core establishments and 5400 kcal/ha in the case of the plots of 2000 ha.

In these calculations are included the electrostations of putting under pressure – SPP - (560-1200 kcal/ha), but not the watering equipment. Also for the hydro improvement establishments from our country, Ecaterina Mihăescu, V.Blidaru and Gh.Pricop have evaluated the passive energy included at approximately 9600 kcal/ha [5].

All these numbers represent the energy invested in the construction of the infrastructure or in the fabrication of the equipments from which the annual quota is generated depending on the life-cycle of different components of the irrigation system.

At the passive energy is added the active energy necessary to pump the distribution and to actually irrigate the plants. Some passive and active energy consumptions specific to the hydrotechnical systems from Romania have been evaluated as it follows:

Passive energy:

- Irrigation network with electro pumps (pumping and repumping) life-cycle 30 years 319.1 kcal/year
- Stations of putting under pressure +rain wings (life-cycle 15 years) 270.9 kcal/year

Active energy:

- Raising at 1000 m<sup>3</sup> water by pumping at 1 m height 10.8 kcal/1000 m<sup>3</sup>
- Achieving the pressure in stations of Putting under pressure SPP of 1000 m<sup>3</sup> water 812.7 kcal/1000 m<sup>3</sup>

According to these medium energy consumptions for Romania's irrigation systems from the '80's, the energy consumption has been calculated on structure at the area unit for the main cultivated plants (tab.1).

**Table 1 Energy consumption structure at some Plants cultivated in Romania in an irrigated technological system**

| Specification            | U/M            | Wheat       | Maize       | Sun-flower  | Sugar beet   |
|--------------------------|----------------|-------------|-------------|-------------|--------------|
| <b>Total consumption</b> | <b>mcal/ha</b> | <b>7324</b> | <b>7796</b> | <b>4270</b> | <b>13733</b> |
| of which:                |                |             |             |             |              |
| - direct active energy   | Mca/ha         | 1166        | 2875        | 1266        | 4350         |
|                          | %              | 15.9        | 36.9        | 29.6        | 31.7         |
| - indirect active energy | Mca/ha         | 5203        | 3790        | 2167        | 7910         |
|                          | %              | 71.0        | 48.6        | 50.7        | 57.6         |
| - passive energy         | Mca/ha         | 955         | 1131        | 837         | 1473         |
|                          | %              | 13.1        | 14.5        | 19.7        | 10.7         |

Source: Teșu I., Baghinschi V.: *Energy and agriculture* [7] , p.136.

Energy production. In order to calculate the energy efficiency of an agricultural product, we also need the energy production embedded in the harvest of grains and stems or only grains.

The harvest's energy content at the plants given as example is the following<sup>3</sup> [9]:

- Wheat:-grains..... 3.836 kcal/kg
- straws..... 3.646 „
- Maize: - grains ..... 3.921 „
- cobs ..... 3.653 „
- Sunflower: - seeds ..... 3.921 „
- stems ..... 3.452 „
- Sugar beet: - roots ..... 0,980 „
- packages and leaves .. 0.570 „

<sup>3</sup> *Energy allowances and Feeding system for Ruminants.* Technical bulletin nr.33 Department of Agriculture, Londra, 1978.

For the crops estimated at the beginning of the '80's, the cultures from the previous table (1), considering the secondary production (straws, cobs), the following energy efficiency indicators have been calculated (tab.2).

The data from table 2 demonstrate the energy efficiency of the main cultures during the estimation and construction period of the big hydro improvement systems from Romania.

Considering of course also the solar energy input not taken into account.

**Table 2 Designed energy efficiency of some culture plants in the technological conditions of the '80's**

| Culture    | Yield Kg/ha | Produced energy Mcal/ha | Consumed energy Mcal/ha | Energy balance Kcal/ha | Energy efficiency |
|------------|-------------|-------------------------|-------------------------|------------------------|-------------------|
| Wheat      | 5800        | 35240                   | 7324                    | 27916                  | 4.81              |
| Maize      | 9000        | 62677                   | 7796                    | 54881                  | 8.04              |
| Sunflower  | 3000        | 16977                   | 4270                    | 12707                  | 3.98              |
| Sugar beet | 60000       | 70200                   | 13733                   | 56467                  | 5.11              |

Source: Teșu I., Baghinschi V.: *Energy and agriculture* [7], p.132.

For the actual technologies, more intense, with crops at hectare significantly bigger and lower irrigation norms, the energy efficiency that expresses the number of energy units produced with a consumed energy unit could be much higher: 7-8 for wheat, 10-12 for maize, 4-5 for sunflower or 8-10 for sugar beet.

In reality, due to an inadequate technical exploitation and especially of the shortage of direct and indirect active energy (fuel, electric power, fertilizers, pesticide) all assorted with many organizational dysfunctions, much lower crops than the estimated ones have been obtained. These in turn have affected to a large extent the efficiency of the irrigations energy (tab.3).

**Table 3 Energy efficiency in Romania's agriculture on the lands exploited in irrigated and non irrigated system depending on the medium efficiency per hectare obtained in the period 1986-1989**

| Culture                              | Harvest Kg/ha | Energy production Mcal/ha | Energy consumption Mcal/ha | Energy balance Kcal/ha (col.3-4) | Energy efficiency (col.3/col.4) |
|--------------------------------------|---------------|---------------------------|----------------------------|----------------------------------|---------------------------------|
| 1                                    | 2             | 3                         | 4                          | 5                                | 6                               |
| Wheat                                | 3350          | 19890                     | 7324                       | 12566                            | 2.71                            |
| Maize                                | 3850          | 26796                     | 7796                       | 19000                            | 3.44                            |
| Soya                                 | 1155          | 9125                      | 6734                       | 2391                             | 1.35                            |
| Sunflower                            | 1595          | 9026                      | 4270                       | 4756                             | 2.16                            |
| Sugar beet                           | 26465         | 22495                     | 13733                      | 8762                             | 1.6                             |
| Plant production in irrigated system | x             | 13203                     | 6310                       | 6893                             | 2.09                            |
| Plant production (not irrigated)     | x             | 11692                     | 5042                       | 6650                             | 2.32                            |

Source: Lup A.: *Irrigations in Romania's agriculture* [4], p.199.

The difference between the levels of the energy efficiency indicators, presented in the previous table, calculated using the project data and the ones from the above table calculated using the real efficiency obtained during the respective period of time is very high and is practically exclusively due to the low productions on hectare.

We notice that the energy efficiency obtained on the exploited lands in an irrigated system – 2, 09 - is even lower than the one obtained on the non irrigated lands – 2, 32.

Fact explained by the totally inadequate technologies applied on the so called irrigated lands where the electric power allocation for irrigations was insufficient (fig.2).

We notice that during the plants' maximum water consumption period of time, it should have been allocated to the irrigations almost one third of the electric power production at national level, thing that the economy structure from that period of time could not afford considering the huge consumptions of the industrial giants that were given absolute priority.

*The economical efficiency of the agricultural production of the last years of the socialist agriculture.*

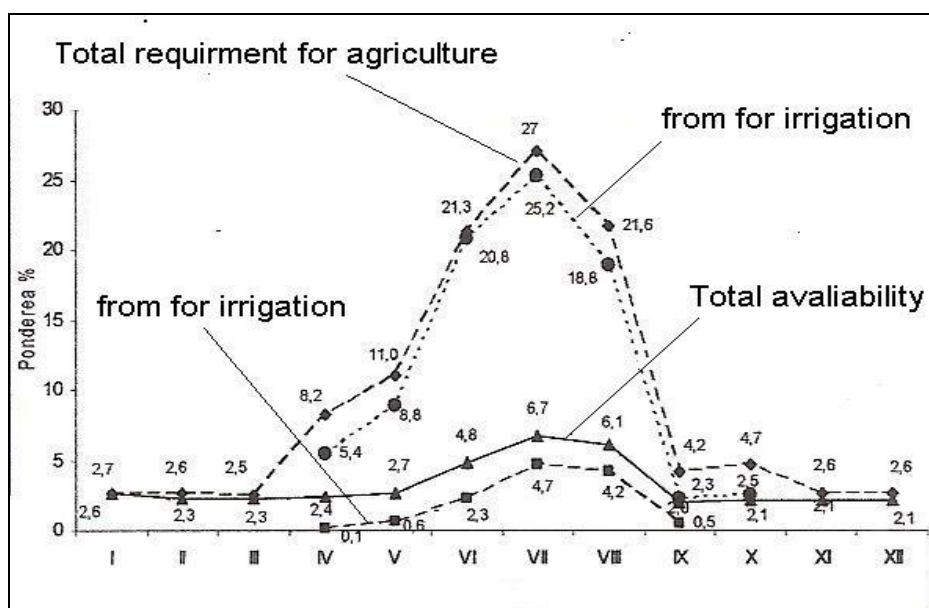


Figure 2. Season distribution of the large requirement and electric power consumption in agriculture and irrigations in relation to the consumption on the total of economy (1989)

The fall of the Romanian economy during the last years of socialism was largely due to the continuation in a fast pace of the investments without ensuring the resources necessary to their exploitation.

**Table 4 Economical efficiency of some cultures depending of the yield per hectare (1986-1989) on the lands exploited in an irrigated system**

| Specification       | U/M    | Grain | Maize | Soya  | Sun flower |
|---------------------|--------|-------|-------|-------|------------|
| Productions         | kg/ha  | 3315  | 3850  | 1355  | 1595       |
| Incomes             | lei/ha | 5967  | 5675  | 4472  | 4626       |
| Technological costs | „      | 5345  | 5583  | 5481  | 4382       |
| Profit              | „      | 622   | 92    | -1009 | 244        |
| Profit rate         | %      | 11.6  | 1.6   | -18.4 | 5.6        |

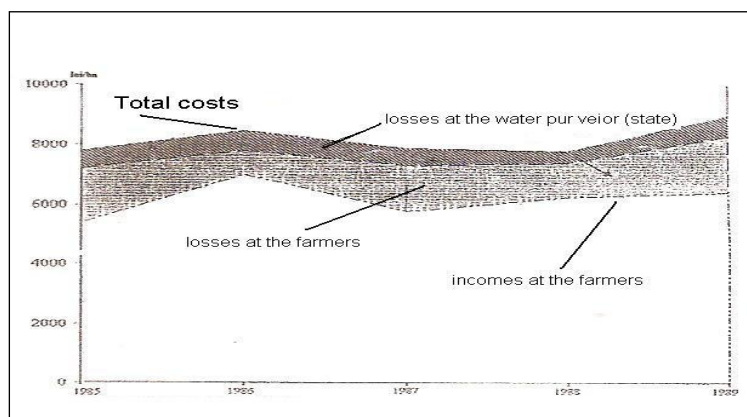
Source: Calculations belonging to the authors.

At the end of the year 1989, over three million hectares were improved to be irrigated, but the target was of 5.5 million hectares, and the financial resources were more and more precarious.

The data from table 4 should not surprise. In 1989, for example, with almost one third of the arable area exploited in an irrigated system, the country's medium production was of 3364 kg/ha at wheat, 2472 kg/ha at maize, 593 kg/ha at soya, 1512 kg/ha at sunflower or 26465 kg/ha at sugar beet<sup>4</sup> [10].

For the irrigated area the water was subsidized in proportion of over 75%, the water purveyor (the state) registering as loss the cost difference for the water pumping and distribution. On the other hand, the inadequate exploitation at the level of agricultural exploitations did not ensure any production increases that should cover the own expenses made with the irrigation of cultures. This state of affair is expressed synthetically in fig.3.

<sup>4</sup> Romania's statistical yearbook, 1990.



**Figure 3. Economical efficiency of the plant production in an irrigated system at the level of agriculture (water supplier and user) in the case of state farms Constanta Trust during the period of time 1985-1989**

## CONCLUSIONS

1. The energy analysis is an original concept of research of the agricultural technological processes by which the obtained production, as well as any kind of consumptions that contributed to its procurement are expressed in energy units: cal., kwh, joule.

2. Unlike the economical analysis in which the measurement unit is the one of value, the energy analysis represents the shift from the category of „cost” to the one of „resource”.

3. The agriculture, as branch of the national economy has a small balance in the energy complex structure, not exceeding 3-5% of the total, unlike the agro-industrial-food ensemble that could reach 18-20% from the total energy consumption in the developed countries.

4. Irrigated agriculture is instead a great energy consumer. Compared with the non irrigated technological system, the energy consumption is higher with 28-30% at cereals with 48-50% at oil plants or with 53-55% at sugar beet.

5. The commercial cost of the energy unit in the irrigated technological system depends on many factors, among which the most important are:

- The structure of cultures, the irrigation norms and the number of applications;
- The degree of use of the effective irrigated area from an irrigation system;
- The pumping height and the water transport distance from the source to the irrigated area;
- The attainment of the designed productivity parameters,
- The energy crisis is also directly affecting the irrigation water crisis as, as a resource as well as price, that is why, at national level, a judicious management policy of the irrigation water and its associated energy is recommended.

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# THE ROLE AND PLACE OF THE INDIVIDUAL PEASANT FARMS IN THE ECONOMIC SUSTENABILITY OF THE RURAL POPULATION IN ROMANIA

LUP AUREL<sup>1</sup>

## Abstract

*The paper is a analyse of the exploitation structures, the evolution of the land resource in the agriculture focussed on the part and place of the individual-peasant farms in agricultural economy of Romania. The farms were grouped by size and in each group is calculated the weight in agricultural aria, average size in hectares, number of the animals for the main species average per farm, density per 100 ha. Is compared economic performances of the individual peasant farms with those of the units with legal status, great sized. On the basis of the results obtained is evident the economic and social role of the individual peasant farms in sense off the durable rural development concept. Is proposed adjustment of much support for the purpose of increasing the performances of this category of farms inclusively by increasing their size.*

**Key words:** *individual, farm, rural population, rural development, performances, market economy.*

## INTRODUCTION

Is unanimously accepted that Romanian agriculture is characterized by an exaggerated degree of crumble of the properties and respectively of the agricultural farms that being one of the main reason of poor technical and economic performances. Implicitly economic performance is characterized at its turn the guarantee of society welfare as main purpose of any economic activity.

In the agriculture the performance is measured by the yield level per hectare or animal head profit, work productivity. Without contest validity of these indicators the author consider that in the last 20years peasant households of little size of a majority had a leading part in economic sustainability (supporting) economic of rural population in this period.

In Romania with a rural population of the almost 50% of total and almost 30% working in primary agriculture, have to make choice between a little performance or lack of any activity and unemployed status for a indefinite period.

The author take in account the part and the role of individual small farms in the economic sustainability of Romanian rural pleading in the sometime for the amalgamation in family farms sized as in vest-European countries.

## MATERIAL AND METHOD

Were too gathered up and selected statistical data regarding the subject and were consulted old works by different authors and a rich bibliography. The data is analysed, processed and processed by specific methods of the economic research. Finally the data were synthesized in some conclusions. The author considers them important concerning real state of the Romanian rural and its future evolution.

## RESULTS AND DISCUSSION

**3.1. Social-economic structure of romanian rural.** According to the regional classification system adopted by European Charte of Rural Space, all territory of Romania belongs to rural space category because the weight of rural population is not over 50 percent. These areas is called *significant rural aria*. From the eight development region only Bucharest is *predominant urbane*.

The evolution of the proportion between rural and urban population is very slow. In 1965-1989 when the communist regime forced the urbanization processes the weight of rural population

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was reduced from 66.3% to 46.8% respectively with a rate of 0.85% yearly. In exchange in the last 18 years (1989-2007) the weight of rural population is reduced only from 46.8% to 44.9% with a rate of 0.12% yearly.

From this point of view, the structure by medium urban/rural Romania is significant different comparative with many European Union countries (tab.1).

**Table 1 The weight of rural population and of the population employed in agriculture in the world, in EU and different countries**

| Country      | Weight of rural population % | Weight of active population employed in agriculture % |
|--------------|------------------------------|---|
| <i>World</i> | 53                           | 44.7  |
| EU-27        | 24                           | 6.3   |
| EU-15        | 20                           | 4.3   |
| - Belgium    | 3                            | 1.8   |
| - Holland    | 10                           | 3.4   |
| - Germany    | 12                           | 2.5   |
| - Denmark    | 15                           | 3.8   |
| - France     | 24                           | 3.4   |
| - Italy      | 33                           | 5.3   |
| - Hungary    | 35                           | 10.7  |
| - Poland     | 37                           | 21.7  |
| - Slovakia   | 42                           | 9.0   |
| - Romania    | 45                           | 32.2  |
| - USA        | 23                           | 2.1   |

Source: FAO Yearbooks.

The most part of the rural population is sustained economically by the agricultural activities of subsistence and semi-subsistence family farms, small and very small. In 2007 year the incomes and self consumption of peasant families came into account from the products obtained from in their farms.

This state of things is not tacked in consideration by the economists of market economy and by the governors too.

**3.2. Exploitation structure of land resource in Romanian agriculture.** Exclusive of the period of planned economy (1960-1989) in Romania the structure of land exploitation was represented by two kinds of farms; great estates belonging to the landlords and small farms belonging to million peasant families. This state of things was considered unjust because while estates produced for enriching, the little plots belonging to the peasants did not produce enough incomes for economic sustainability of their families.

Beginning of the middle of XIX century social movements determined the governors to legislate land reforms from which a part of the large estates were divided and distributed to the peasants with little or without land. So happened in 1864, 1921, and 1945 years [1] but the problem had not worked out, the average size of the individual-peasant farm was 4.55 ha after 1864 land-reform, 3.76 ha after 1921 land-reform and 4.37 after 1945 land-reform. In all cases too little for the sustainability a peasant family. After 1989 the history is repeated. The reconstitution of the private rights on the land by Law 18/1991 has as consequence a unprecedented crumbling of the agricultural lands. The press of this time had mentioned the figure of 40 million parcels of land.

The phenomenon was disquieting so that in 1991 by the Law 36/1991 was possible to constitute associations with public status and family-associations bigger sized (tab.2).

The evolution of constitution of agricultural farm more great sized wasn't not attractive in this period so in 2001 year, comparative by 1993 year, the number and the weight of individual farm was greater than the number of the associations. In this situation the Government forced somehow the processes of association by Law 166/2002 regarding agricultural farm from which some facilities were landed to greater farms (subsidies for some products).



**Table 2 The evolution of the kind of agricultural private farms in Romania in 1993-2001 period**

|  | Year | SAU Thou. hectares | Weight in total private surface % | Number Thou. | Average size ha/unit. |
|--|------|--------------------|-----------------------------------|--------------|-----------------------|
| Society (associations) with public status SA | 1993 | 1940               | 17.4                              | 4265         | 448                   |
|  | 1997 | 1714               | 14.8                              | 3913         | 438                   |
|  | 2001 | 1685               | 13.2                              | 4376         | 385                   |
| Family associations without public status AF | 1993 | 1763               | 16.0                              | 13772        | 128                   |
|  | 1997 | 1000               | 8.6                               | 9489         | 105                   |
|  | 2001 | 790                | 6.2                               | 6494         | 122                   |
| Individual farms                             | 1993 | 7333               | 66.6                              | 3419         | 2.10                  |
|  | 1997 | 8897               | 76.6                              | 3946         | 2.33                  |
|  | 2001 | 10311              | 80.6                              | 4170         | 2.47                  |

Source: A.Lup: *Introducere în economia și politica rural-agrară* p.462.. Ed Ex Ponto [6].

The minimum size established by law were the following:

- Cereals, technical and medicinal plants in plain zones ... 110 ha
- " " " " " in hilly zones ..... 50 „
- Meadows and fodder plants in hilly zones ..... 25 „

In the last decennium the size of the agricultural farm had differentiated and only few of them are compatible with the size of agricultural farms from numerous European Union countries.

By a grouping by size made by APIA (Payment and Intervention in Agriculture Agency) in 2010 year the agricultural farms were classified in the following way (tab.3).

**Table 3 The structure of agricultural farms by size of surface in Romania in 2010 year**

| Farm type                              | Limit of size | Number of farms |              | Area used    |              | Average ha per farm |
|--|---------------|-----------------|--------------|--------------|--------------|---------------------|
|  |               | Thousand        | %            | Thousand ha  | %            |                     |
| Subsistence and semi-subsistence farms | Under 10 ha   | 3784            | 93.5         | 8181         | 55.7         | 2.16                |
| Family farms                           | 10-50 ha      | 54              | 4.8          | 1042         | 7.1          | 19.29               |
| Commercial-family farms                | 50-100 ha     | 6               | 0.6          | 452          | 3.1          | 75.33               |
| Commercial societies                   | over 100 ha   | 12              | 1.1          | 5010         | 34.1         | 417.50              |
| <i>Total farms</i>                     | x             | <i>3856</i>     | <i>100.0</i> | <i>14685</i> | <i>100.0</i> | <i>x</i>            |

Source: APIA and General Agricultural Census 2010.

To remark that almost 3.8 million subsistence and semi-subsistence farms representing over than 93 percent possess only 55.7% from total agricultural area of the country.

From the last group detach a number of 35 farms which possess together 352 thousand hectares with an average of over 10000 ha by farm.

This figures remember us the state (situation) of the XX<sup>th</sup> century beginning as it described by Ctin.Garoflid one of the ministries of agriculture in that times „ *The estates were large ones of them as a principality. The estate Macovei din Buzău had 17500 ha. In Ialomița county and in Bărăgan was more sized estates. The greatest estates were tacked in lease. The brothers Fischer Trust had ruled a third of Moldavian estates* [4].

The rapid extension of the great and very great farms in the last years in the most fertile zones in south and south-eastern part of the country disquiet because contravene of (to) the vest-european model and on the internal plan these farms don't contribute to grow (increase) of incomes of rural population of a majority in these regions.

Academician P.I.Otiman [7] remark the fact that even in these zones there are concentrated real poverty purses.

At the other extreme over than million farms sized between 1-10 ha (3 ha average) exploited only 1/3 from agricultural areas of the country.

The amalgamation of the lands and increase (growth) of the agricultural farms was as subject of agrarian politics in the old Common Market too. Since in the `50 years the Plan Manshold had foresee that until 1980 year the cereal and technic plant farms to reach at 80-120 hectares.

In reality in almost six decades (1950-2007) the medium size of a farm in several country of European Union had increased as following way:

- France from 14.2 ha to 52.6 ha
- Holand from 9.6 ha to 25.5 ha
- Autriche from 8.7 ha to 19.4ha
- Spain from 8.7 ha to 24.2 ha
- Ireland from 12.5 ha to 32.3 ha

Average for EU was in 2007, 20.0 ha/farm and 7.47 ha/farm in Hungary 6.5 ha/farm in Poland, and 3.57 ha/farm in Romania but the weight of rural population in Romania is greater of 10 percent than in Hungary and with 8 percent greater than in Poland.

**Table 4 Evolution of the agricultural, aria used by the agricultural farms by their status an size in 2002-2010 period in Romania**

| Specification                | U/M         | 2002  | 2007  | 2010  |
|------------------------------|-------------|-------|-------|-------|
| Total agricultural farms     | thousand    | 4485  | 3931  | 3856  |
| from witch:                  |             |       |       |       |
| - individual farms           | thousand    | 4462  | 3914  | 3826  |
| - weight                     | %           | 99.5  | 99.6  | 99.2  |
| Total agricultural aria used | thousand ha | 13931 | 13753 | 13298 |
| from witch:                  |             |       |       |       |
| - individual farms           | thousand ha | 7709  | 8966  | 7445  |
| - weight                     | %           | 55.3  | 65.2  | 56.0  |
| Average size per total       | ha          | 3.24  | 3.57  | 3.45  |
| from witch:                  |             |       |       |       |
| - individual farms           | ha          | 1.80  | 2.34  | 1.95  |
| - units with legal status    | ha          | 282.2 | 275.4 | 193.7 |

Source: Romanian Yearbook 2008 and Agricultural census 2010.

**3.3. The role and place of little farms in economic sustainability of rural population.** If theoretically there are some measures for constitution of greater farms which can sustain economically the needs of a peasant family in reality the small farms isn't never helped in a developing process. The banks refuse to credit them *they haven't vocation for the credit* affirm the bankers. And on the other hand the process of constitution of very great farms is encouraged inclusively by projects financed from European founds because the great farms can pay their part of the credit. Recent propositions to limit them the subsidies aren't liked by the government which consider that in this manner the state income will be reduced and competitively of them too. The great landlords tell us like in the old times. *We pay the taxis and contribute of the growth of the state incomes.*

However the small individual farm have an important role in agricultural economy and the main weight in the economic sustebability of the rural population firstly by their number and by the weight in agricultural aria of the country and even by their technical and human capital (tab.4).

Each of the 3.8 million individual farms (2010 data) represents a family and constitutes for it the main or single income source. For the agricultural economy of the country the small farms are important because they possess almost all from live-stock (tab.5).

At cattle species the number of the animal is into reduction but the most of them belong at small farms less than 5 hectares, 61.4 percent from the total. The situation is like it of another animal species. The farms greater than 10 hectares holder in 2010 year only 23.2 percent from number of cattle, 22.9% from goats number at (to) small farm under 5 hectares, 61.4 percent from the total. The situation is like it of the author animal species. The farm greater than 10 hectares

posses in 2010 year only 23.2 percent from number of cattle, 22.9% from goats number, 6% from pigs but 40 percent from sheep number.

**Table 5 The evolution of the distribution of the live-stock depending on the size of the farms in 2001-2010 period**

| Year         | Limit of size | U/M        | Cattles  | Sheep's  | Goats    | Pigs     |          |
|--------------|---------------|------------|----------|----------|----------|----------|----------|
| <i>0</i>     | <i>1</i>      | <i>2</i>   | <i>3</i> | <i>4</i> | <i>5</i> | <i>6</i> |          |
| 2002         | Under 1 ha    | thousand   | 628      | 1595     | 253      | 293      |          |
|              |               | %          | 21.9     | 22.0     | 34.0     | 3.5      |          |
|              | 1.1-5.0 ha    | thousand   | 1626     | 3377     | 367      | 3479     |          |
|              |               | %          | 56.6     | 46.7     | 49.3     | 42.1     |          |
|              | 5.1-10.0 ha   | thousand   | 358      | 1156     | 78       | 814      |          |
|              |               | %          | 12.5     | 16.0     | 10.5     | 9.9      |          |
|              | Over 10.0 ha  | thousand   | 259      | 1110     | 46       | 3674     |          |
|              |               | %          | 9.0      | 15.3     | 6.2      | 44.5     |          |
|              | <i>TOTAL</i>  | thousand   | 2871     | 7238     | 744      | 8260     |          |
|              |               | %          | 100.0    | 100.0    | 100.0    | 100.0    |          |
|              | <i>0</i>      | <i>1</i>   | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> | <i>6</i> |
|              | 2007          | Under 1 ha | thousand | 365      | 979      | 174      | 1295     |
| %            |               |            | 13.4     | 11.5     | 19.9     | 27.5     |          |
| 1.1-5.0 ha   |               | thousand   | 1402     | 3007     | 391      | 1739     |          |
|              |               | %          | 51.3     | 35.2     | 44.7     | 36.9     |          |
| 5.1-10.0 ha  |               | thousand   | 503      | 184      | 141      | 511      |          |
|              |               | %          | 18.4     | 2.2      | 16.2     | 10.8     |          |
| Over 10.0 ha |               | thousand   | 464      | 4362     | 168      | 1164     |          |
|              |               | %          | 16.9     | 51.1     | 19.2     | 24.8     |          |
| <i>TOTAL</i> |               | thousand   | 2734     | 8532     | 874      | 4769     |          |
|              |               | %          | 100.0    | 100.0    | 100.0    | 100.0    |          |
| 2010         |               | Under 1 ha | thousand | 322      | 1287     | 330      | 1741     |
|              |               |            | %        | 16.2     | 15.3     | 26.7     | 32.3     |
|              | 1.1-5.0 ha    | thousand   | 897      | 2434     | 464      | 1751     |          |
|              |               | %          | 45.7     | 29.0     | 37.5     | 32.5     |          |
|              | 5.1-10.0 ha   | thousand   | 306      | 1314     | 160      | 408      |          |
|              |               | %          | 15.4     | 15.7     | 12.9     | 7.6      |          |
|              | Over 10.0 ha  | thousand   | 460      | 3751     | 283      | 1487     |          |
|              |               | %          | 23.2     | 40.0     | 22.9     | 27.6     |          |
|              | <i>TOTAL</i>  | thousand   | 1985     | 8386     | 1237     | 5387     |          |
|              |               | %          | 100.0    | 100.0    | 100.0    | 100.0    |          |

Source: General Agricultural Census 2010.

To the sheep's the greater weight in number of animals in great farms is explained because at this species the most animals is bred by the great traditional breeder. In the (likely) same manner the goats are bred in the great farms. In exchange the pigs are bred especially by the family small farms. Animal breeding in the individual small farms especially for self consumption or inside of communities is a tradition and a necessity inherited from planned economy period when animal production were orientated priority to export or urban consumption.

Is meritorious to underline that in planned economy period the families of the cooperative members held an important part from the live-stock of the country: 33.1% from cattle's, 46.6% from sheep's, 100.0% from goats and 28.6% from the pigs. The individual households in 2010 year comparatively with 1990 year, possess 87.2% from cattle number, with 13.4% more much sheep's, with 19% more much goats and with 6.6% more much pigs.

The importance of individual-peasant farms in agricultural economy is proved especially by the weight of them in the live-stock of the country still in ours days (tab.6)

**Table 6 Number and density of the main animal species in individual farms and in units with legal status**

| Specification                                     | U/M      | Cattles | Sheep | Goats | Pigs   |
|---|----------|---------|-------|-------|--------|
| Total farms with animals                          | thousand | 726.1   | 271.3 | 176.3 | 1649.5 |
| from: individual farms                            | „        | 724.5   | 270.8 | 176.1 | 1648.5 |
| %   | %        | 99.8    | 99.8  | 99.9  | 99.9   |
| Number of animals                                 | thousand | 1985    | 8386  | 1237  | 5387   |
| from: in individual farm                          | „        | 1815    | 8152  | 1210  | 3554   |
| %   | %        | 91.4    | 97.2  | 97.8  | 66.0   |
| Number of animals per farm                        | head     | 2.7     | 30.9  | 7.0   | 3.3    |
| - per individual farm                             | „        | 2.5     | 30.1  | 6.9   | 2.2    |
| - per unit with legal status                      | „        | 106.3   | 468.0 | 135.0 | 1833   |
| Density of animals/100 ha in the individual farms | head     | 25.0    | 112.2 | 16.6  | 25.2   |
| Density in the legal status unities               | „        | 2.9     | 4.0   | 0.46  | 31.1   |

Source: General Agricultural Census 2010 [15]

The individual small farm possess over than 91% from cattle live-stock, over than 99% from sheep live-stock and 2/3 from pigs. These are more uniform distribute don country territory, uses better fodder resources from the meadow and from household, which are cheaper.

By self consumption and consumption into rural communities of animal products, cheaper these have an important role in economic sustainability of almost four million peasant families with small incomes.

For national agricultural economy is very important the density of the animals at 100 ha agricultural land, one of more reduced among European Union countries especially at cattle's an pigs (tab.6).

In this case the differences between the two categories of farms are significantly. Density per 100 ha agricultural land is 25 head at cattle's, 112.2 head at sheep's , 16.6 head at goats in the small individual farms by comparison with 2.9 head/100 ha cattle`s, 4.0 head/100 sheep`s, 0.46 head /100 ha goats to the great farms. Only at pigs the density is greater to the commercial societies.

**3.4. The social role of the individual-peasant farms in the economic sustainability of the Romanian rural.** From the data presented in table 1 result that the weight of rural population from the total population of Romania (45%) is two times greater than average of European Union, or France, over four times greater than in Holland or Germany, 15 times greater than in Belgium.

For the Romanian rural population witch count near four million families and almost the same number of households, the primary agriculture represent the main source of income and consequently of the survival and for a decent life.

**Table 7 The distribution of the incomes per hectare in agricultural farms and the weight of self consumption and the soled products depending of size farms (1930-1931)**

| Size of farm | Income lei/ha | Self consumption lei/ha | The weight of soled products from total income |
|--------------|---------------|-------------------------|--|
| Under 3 ha   | 6510          | 3841                    | 41.0   |
| 3-5 ha       | 4876          | 2796                    | 42.6   |
| 5-10 ha      | 4565          | 2145                    | 53.0   |
| 10-20 ha     | 3964          | 1599                    | 59.6   |
| Over 20 ha   | 2967          | 945                     | 68.1   |

Source: Nicholas Georgescu-Roegen: *Economia României II...* p.191-192.[5]

The weight of rural population and especially over agrarian population was studied along the time by many economists. Axenciuc (1996) appreciate that a long period of time (1860-1947) the found of work time has used in a proportion of 40-60%. M.Lazar (1930) said: „many peasants few land. Other researchers among V.Madgearu (1936), I.L.Ciomac (1943), I.C.Vasiliu (1945), O.Parpala (1975) reach to the like results. Letitia Zahiu (2002): 146 work-days used yearly in the agriculture. A.Lup find that degree of time work in agriculture was 33.5% in 1950, 47.1% in 1984 and 37.5% in 2002 year.

Land reforms of 1864, 1921, Law 18/1991 did not had as result the constitution of farm economically sized for the million of peasant families forced to be contents with the few offered by their mini-farms. In revenge the peasants offer gratuitous their labour and diversify their activities so that the incomes per hectare are even greater then to the great farms (tab.7)

Professor Letitia Zahiu lease after near a century to the same conclusion (tab.8).

**Table 8 The value of agricultural production by economical size clase in Romania in 2007 year**

| Specification                 | 0 - <4 | 4- <8  | 8 - <16 | 16 - <40 | 40 - <100 | ≥100    | Total  |
|-------------------------------|--------|--------|---------|----------|-----------|---------|--------|
| The structure of farms        | 94.43  | 2.82   | 1.66    | 0.59     | 0.31      | 0.18    | 100.00 |
| Ha/farm                       | 4.89   | 15.16  | 66.66   | 115.42   | 391.18    | 1141.53 | 10.17  |
| Value of production per expl. | 6255   | 20802  | 52508   | 98068    | 226606    | 982915  | 10470  |
| Value of production per ha    | 1279.1 | 1372.2 | 787.7   | 849.7    | 579.3     | 861.1   | 1029.5 |

Source: Letiția Zahiu și colab.: Agricultura în economia României între așteptări și realități, p.189 [10].

The explanation can't be „*respecting the technologies and provisioning with production factors*”, because in this case yields would have been greater and the income too.

I believe that the peasant small farms are more complex and with a more large pattern, more animal species as explanation.

**3.5. Peasant agriculture and market economy.** The most of economists are convinced and affirm by all media canals that if we are in the market economy we must sale our products and buy the same products processed or not, from the market. In other words we are not dignified citizen of market economy if we do not get contribution to TRADE GOD.

On the other hand the peasant households participate in a more and more great proportion to the commercial exchanges because it need to buy many things as for the farm (fertilizer, seed, tolls), both for family, clothes and ... bread inclusively.

One of the known economist of the world – Galbraith believe that we must pay taxis for washed our linen in our household and for cleaning and other services must call specialized firms and for the daily lunch and diner to go to a restaurant.

Galbraith introduces the notion: *social convenient virtue* understanding by that pleasure of a housewife to arrange her house for an event or even for each day [3].

Only the Romanian peasant has yet this social convenient virtue, he really likes to be owner, employer, and worker in his agricultural universe. And what is wrong in that? Why we convict the self consumption, which is in fact advantageous from many points of view and especially is cheap and healthy? Why to consider the self consumption as undevelopment indicator?

Is not more suitable to eat our products from our garden from our pigsty from our stable? Is not an ecological kind of live?

We save time, money, energy and especially we consume healthy products which did not had transported, transformed, stored by many conserving substances for resisting on the supermarkets self.

Energy prodigality in transport was pointed out many years ago in ones of the most developed country, USA, for example. In the *Cornucopia Project* [8] we can read: „*for each two dollars spent to obtain the food we spend another dollar for its transport to the market and from the market and a processed food unity cross 1300 miles before be consumed*”. That in the conditions when energy crisis is as much acute as alimentary crisis.

The small peasant households under a hectare in number of 2700 thousand possess however 5073 thousand hectares (34.5%) the most weight in the structure of the farm by size.

They have most complex the live and considering into account animal shelters - the live-stock too - labour equipment – even if are primitive (but that is never mind for a over agrarian population which can and have the will to use its hands, we are in the face an important economic resource which is not negligible.

In the some time we attend to a proliferation of mega-farms (one of them called *family farm*) possess thousand and thousand hectares.

These use performants technologies with a narrow pattern, are vertically integrated, develop activities of transformation, export etc. from which its gain more than from agricultural activities.

The owner of leased lands do not participate to the business because they *don't have a turn for credit*. So they are looking for their live in the foreign countries.

This time we are talking about new ruralism and rural durable development.

I consider that to help the small peasant farm for increase their technical and economical performances must be a priority for the governors, now.

## CONCLUSIONS

1. The technic and economic differences that separate Romanian agriculture from the majority of the European Union countries are put down to a great degree of crumbling of land properties and to an exaggerated number of small and very small farms.

2. A more attentive analysis of the structure by size of the farms point out the importance of the individual-peasant farms in the economic sustainability for over than 3.5 million rural families whom the main income source are the agricultural farm products obtained in their farms for self consumption and for market too.

3. In Romania the weight of rural population is the greatest from European Union and the active population employed in agriculture too, and its degree of occupation is only 35-40%.

4. The existence of a numerous over agrarian population was made evident by economists still 150 years ago without find actual solutions for its decrease at reasonable weight.

5. At level of 2010 year peasant farms possess almost all livestock of the country, unlike to great farms of which weight are insignificant and distributed punctual in great agglomeration in the most fertile zones of the country, where these cultivate immense land aria with very few animals.

6. Between the two categories of farms the size compatible with the farms of European Union - 10-50 hectares- possesses only rather than 10% from agricultural aria of the country, even if these represent over than 50 percent of the total number of farms.

7. Is recommended more support to the small farms for the purpose of increase their performance but especially for creating activities in the secondary and tertiary sectors, the main way of increase their economic size and the degree of employment too.

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# FACTOR ANALYSIS ASSOCIATED WITH THE TOTAL FREIGHT PRODUCTION PROFITABILITY. CASE STUDY: S.C. TOHANI S.A.

MATEI FLORENTINA DANIELA<sup>1</sup>

## Abstract

*Small vineyard holdings become profitable in a market increasingly globalized, but through a process of structural adjustment supported by external and internal funds, which at this stage is essentially technical modernization in conditions of optimum size training structures, so that it can be used to the full resources available. For, ultimately, that means a higher return? Means studying the market needs to know what to produce and at what price to sell, means an optimal equipment machinery, equipment, technology etc.. That gives the vine and wine products of superior quality with minimum costs, means the effective use a well qualified workforce, tailored for the use of modern technologies, with a high labor productivity, means continuing growth of viticulture and wine quality products so that the selling price to be accepted by buyers and to sell products as easily; means a positive economic environment, characterized by a stable economy that would provide public money winnings safe so it can consume greater quantities of vine and wine products, means of export support, through appropriate economic leverage, sales just like the majority wine country.*

**Keywords:** cost, commodity production, price, marketing wine, market

## INTRODUCTION

In a market economy, the competitiveness of a wine holding is estimated by volume and price structure that is practiced to manufacture goods compared with the same profile units. Needs of their significant financial resources, are necessary to achieve a competitive return from selling goods production as a condition "sine qua non" of survival on the market.

"Consequently, gross profitability factor analysis for total goods production due to possible analytical information, acquires new meanings in the cognitive and operative management, demonstrating practical means of identifying and mobilizing internal reserves for the final economic efficiency of resource use ... " [1].

## MATERIALS AND METHODS

Based on the data in Table 1 on the achievements of SC Tohani in 2009 and 2010 will calculate profitability indicators.

**Table 1: Factor analysis of commodity production for total gross return obtained by SC Tohani in 2010-2011**

| Indicators  | Simboluri                            | Made in previous year | Made this year |
|---|--------------------------------------|-----------------------|----------------|
| Commodity production expressed in average selling prices without VAT (sold production income)                 | $\Sigma Qmp$                         | 2.463.232             | 2.945.767      |
| Maximum yield expressed in unit costs of production (costs of production sold)                                | $\Sigma Qmc$                         | 2.208.614             | 2.568.471      |
| Gross profit for the total commodity production (rows 1-2)  | Pfb                                  | 254.618               | 377.296        |
| Gross rate of return for commodity production total (r 3x100: 2) – in %                                       | Rrb                                  | 11,53                 | 14,69          |
| Production of goods made in the current year expressed in average prices of the previous year                 | $\Sigma Qm_1p_0$<br>$\Sigma Qm_1p_0$ | x                     | 2.583.507      |
| Goods used in production this year expressed in unit costs of production of the previous year (excluding VAT) | $\Sigma Qm_1c_0$<br>$\Sigma Qm_1c_0$ | x                     | 2.316.456      |

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|  |                           |         |         |
|--|---------------------------|---------|---------|
| Expenses to 1000 RON revenue from the sale of production (row 2 x 1000:1) in RON | Ch 1000/<br>$\Sigma Qmc$  | 896,633 | 871,761 |
| Gross profit for 1000 lei revenues from production sold (1000 - Rd7) - in RON    | Pfb 1000/<br>$\Sigma Qmp$ | 103,367 | 128,239 |

Source: S.C.Tohani accounting records S.A.

The model used is based on the following formula [2]:

$$\Delta Pfb = Pfb_1 - Pfb_0 = 377.296 - 254.618 = 1.226.789 \text{ RON}$$

Of which due to:

(1) action on the physical volume of production of goods produced.

$$\begin{aligned} \Delta P_{jb} &= \frac{P_{jb_0} \cdot i \cdot Q_m}{100} - P_{jb_0} = \frac{P_{jb_0} \cdot \sum Q_{m_1} p_0}{\sum Q_{m_0} p_0} - P_{jb_0} = \frac{254618 \cdot \frac{2583507}{2463232} \cdot 100}{100} - 254618 \\ &= \frac{254618 \cdot 104,88}{100} - 254618 = 267043,35 - 254618 = +12425,35 \text{ ron} \end{aligned}$$

(2) measures total goods production structure:

$$\begin{aligned} \Delta P_{jb(s)} &= \left( \sum Q_{m_1} p_0 - \sum Q_{m_1} c_0 \right) - \frac{P_{jb_0} \cdot i \cdot Q_m}{100} = 2583507 - 2316456 - \frac{254618 \cdot 104,88}{100} \\ &= 267051 - 267043 = 0 \end{aligned}$$

(3) the action cost per unit of commodity:

$$\begin{aligned} \Delta Pfb(c) &= \left( \sum Q_{m_1} p_0 - \sum Q_{m_1} c_1 \right) - \left( \sum Q_{m_1} p_0 - \sum Q_{m_1} c_0 \right) = (2583507 - 2568471) - \\ &= (2583507 - 2316456) = 15036 - 267051 = -252015 \text{ ron} \end{aligned}$$

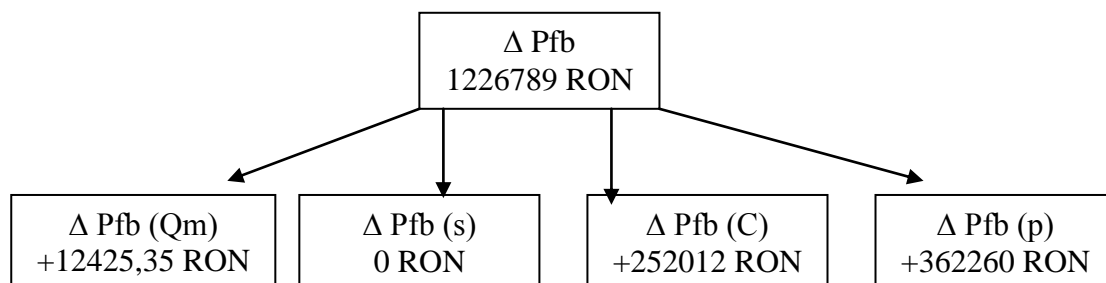
(4) The average sales price action (excluding VAT) per unit of cargo:

$$\begin{aligned} \Delta Pfb(b) &= \left( \sum Q_{m_1} p_1 - \sum Q_{m_1} c_1 \right) - \left( \sum Q_{m_1} p_0 - \sum Q_{m_1} c_1 \right) = (2945767) - (2568471) - \\ &= (2583507) - (2568471) = 377296 - 15036 = 362260 \text{ ron} \end{aligned}$$

$$\Delta Pfb = \Delta Pfb(Qm) + \Delta Pfb(s) + \Delta Pfb(p) :$$

$$1226789 = 12425,35 + 0 - 252015 + 362260$$

Recorded synoptic factor quantification results are as follows:



For the calculation of gross profitability using the following model:

$$\Delta Rrb = Rrb_1 - Rrb_0 = 14,69 - 11,53 = +3,16$$

Of which due to:



1) Total freight action production structure:

$$\Delta R_{r(s)} = \frac{\sum Q_{m_1 p_0} - \sum Q_{m_1 c_0}}{\sum Q_{m_1 c_0}} \cdot 100 - \frac{\sum Q_{m_0 p_0} - \sum Q_{m_0 c_0}}{\sum Q_{m_0 c_0}} \cdot 100 =$$

$$\frac{2583507 - 2316456}{2316456} \cdot 100 - \frac{2463232 - 2208614}{2208614} \cdot 100 = 11,53 - 11,53 = 0$$

2) the action cost per unit of commodity:

$$\Delta R_{rb(c)} = \frac{\sum Q_{m_1 p_0} - \sum Q_{m_1 c_1}}{\sum Q_{m_1 c_1}} \cdot 100 - \frac{\sum Q_{m_1 p_0} - \sum Q_{m_1 c_0}}{\sum Q_{m_1 c_0}} \cdot 100 =$$

$$\frac{2583507 - 2568471}{2568471} \cdot 100 - \frac{2583507 - 2316456}{2316456} \cdot 100 = 0,59 - 11,53 = -10,94\%$$

3) The average sales price action, excluding VAT, per unit of cargo:

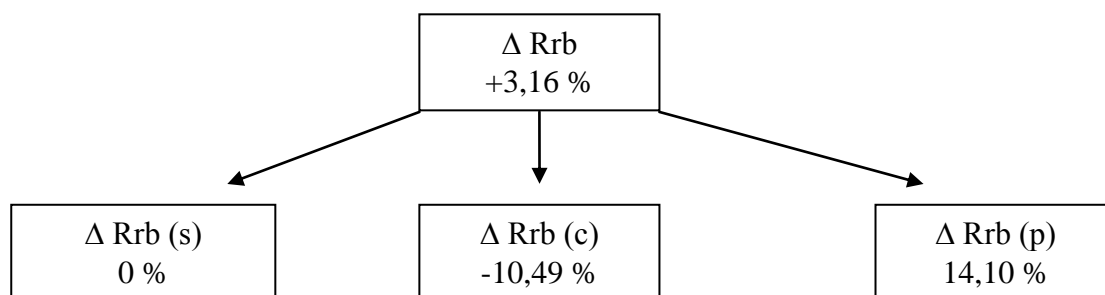
$$\Delta R_{r(p)} = \frac{\sum Q_{m_1 p_0} - \sum Q_{m_1 c_1}}{\sum Q_{m_1 c_1}} \cdot 100 - \frac{\sum Q_{m_1 p_0} - \sum Q_{m_1 c_0}}{\sum Q_{m_1 c_0}} \cdot 100 =$$

$$\frac{2945767 - 2568471}{2568471} \cdot 100 - \frac{2583507 - 2568471}{2568471} \cdot 100 = 14,69 - 0,59 = +14,10\%$$

$$\Delta R_{rb} = \Delta R_{rb(s)} - \Delta R_{rb(c)} + \Delta R_{rb(p)}$$

$$+3,16\% = 0 - 10,94\% + 14,10\%$$

Recorded synoptic factor quantification results are as follows:



## RESULTS AND DISCUSSION

Based on data from Table 1 and the results quantified factorial diagnosis on profitability trend for total merchandise production can be established as a synthetic sense and in an analytical sense. A synthetic sense, the diagnosis is of a general, findings regarding the essence of the situation. In this context, the dynamics of profitability can be assessed generally as positive as [6]:

There has been a substantial increase in gross profit from the sale of commodity production total (41.18%) - component of operating activities, thus leading financial resource created to enhance fund development, and legal reserves, the fund employee participation in profits, own sources of financing, dividends paid to shareholders.

However, this increase should be appreciated given that inflation has acted in all industries and hence the gross profit.

At the same time, there has been a significant increase in the rate of production of goods for total gross return (27.41 % ) which basically means raising the degree to which financial, material and human land consumed by holding for commodity production , brought profit.

Among the factors quantified commodity production structure did not affect the size of profit, this means that the unit went on "old patterns", failing to increase the share of quality, allowing to obtain higher selling prices for production sold.

Influence the unit cost of production was generally unfavorable result from the event which resulted in a purchase price of inputs (fertilizers, fuels, raw materials, services, etc.). Phenomenon known as the "price scissors".

Gross profit increased from the previous year (with 1,226,789 RON) was obtained mostly on account of higher average selling price of commodity production, which shows an improvement in product quality, which has made it possible to find buyers to accept higher prices. The growth rate of gross profitability was lower than the growth rate of gross profit which indicates that the unit has internal reserves unused, contributing to the increase in profitability, especially in the use of modern technology to determine rationalizing consumption.

Gross profitability growth for total goods production may be a result of economic and financial entirely positive, to the extent that amounted to a competitive level of return on domestic and foreign markets given stage, making it possible to establish the necessary funds for the introduction of technologies both in the taking of wine grapes and in the industrialization of production achieved. Only in this way, SC Tohani S.A. can withstand the demanding conditions of increased internal and external competitive market.

In an analytical sense, gross profitability diagnosis for total commodity production may gain by a maximum depth of investigation in each causal factor, a character based on rigorous economic and financial standpoint [5].

In this context, explain and correct assessment of the physical volume of production of goods action on items of gross profit should take into account, first, of a series of coordinated management requirements and market economy. If SC Tohani, increase physical volume of production of goods the product (with 4.88%) resulted in an increase in gross profit mass 12425.35 RON. Such a favorable measure of the quantitatively factor on the gross profit can be fully assessed as positive in terms of economic and financial only if [4]:

- physical volume of production increased freight items correspond to market demands - having therefore a guaranteed sale - and at the same time, they could receive by selling affordable. If SC Tohani physical volume increase was due to the increasing market requirements and high quality of products sold made it possible to obtain a reasonable price for the unit;
- efforts of SC Tohani to increase physical volume of production aimed at the same time and increase quality, in full compliance with international standards and consumer demands;
- increase in the physical volume of output produced merchandise was performed in differentiated rates based on financial possibilities of unity and internal and external market demands for high quality red wines.

In terms of total goods production structure, it did not affect the amount of gross profit due to outdated marketing strategies of staff working in the marketing department, under which contracts were renewed without seeking new partners, and new products to exploit domestic and foreign markets. In this direction, leadership managerial units should consider allocating substantial funds for a prospect rigorous market trends for separation manifested in this direction to meet consumer demands.

In terms of cost per unit of commodity, the influence of this factor was negative value being 252,015 RON. Among the causes which contributed to the increase in cost per unit of commodity

mention first general situation unfavorable economic environment, which increased the price of inputs (fuel, fertilizers, pesticides, energy, services and so on).

Secondly, we notice the high cost of bank loans unit must pay banks to provide financial liquidity to finance activities in viticulture and winemaking, which have a long development cycle.

Thirdly, it should be noted the high cost of repairs on tractors and agricultural machinery generated so high price, spare parts and the need for frequent repairs due to the high degree of wear of machinery wine.

Fourthly, it is necessary to review the growing technologies and those to improve their processing, based on the latest research in vitivol. This could result in the removal of parasitic technological links that consume financial resources, improve the quality of work performed and make savings on staff remuneration costs.

Diagnosis average sales price action (excluding VAT) per unit of cargo on gross profitability must take into account both the contribution of this factor to improve profitability commodity and the extent to which such a favorable situation was the result of a strategy adopted by wine in terms of unit sales prices using the factor specific role in the context of the market economy.

Thus, if SC Tohani S.A. increase in average selling price per unit of cargo caused an increase in gross profit of 362,260 RON, from the previous year and an increase in gross return of 14.10%. These data shows that the unit under study recorded increases in average unit sales price (VAT over again) from the previous year in all commodity products

## CONCLUSIONS

In the context of complex efforts are required to increase market economy freight profitability, such a favorable situation can appreciate only positive to the extent that was due to their own efforts, or whether this increase in average selling price (excluding VAT) per unit product was based on optimizing organizational structure subunits freight output production (the farm) on business partners for periods of production and delivery as well as by quality.

Pricing strategy for sales (excluding VAT) must take into account adherence market prices so that products are available in wine consumers. To this end, some products, such as table wine must have a relatively low price to be affordable to low-income buyers, while others, such as quality wines psr may have higher prices due their outstanding quality, which recommends that consumers with higher financial possibilities.

At the same time, should be considered to establish relatively low selling prices for new products in order to attract as wide a segment of buyers, after that, depending on the evolution of the demand-supply, the unit can choose the most appropriate strategy.

The data used shows that Romanian viticulture through its strengths (extremely favorable natural conditions, well-trained workforce, relatively good material conditions) can become a competitive sector domestically and internationally. To this end, the efforts to create viable production structures to benefit from increased support from the state, leading to the strengthening of private property within wine farms viable.

Given the high degree of fragmentation of exploitations wine is impossible to calculate efficiency indicators against which to judge the extent to which their work was profitable. Therefore, the government should engage more decisively by introducing appropriate policies that create the conditions to encourage Association, lease and sale of land this way will effectively use the funds made available to viticulture by special programs of European Union and World Bank, and the wine will become an attractive and efficient business.

Smallholder wine can become profitable in a market increasingly globalized, only through a process of structural adjustment supported by internal and external funds, which at this stage is essentially technical modernization formation of structures under optimum size, so that it can be used to maximum available resources. After all, what is a high return? Means studying the market

needs to know what to produce and what price to sell, means an optimal equipment machinery, equipment, technologies and so on, which gives the wine-growing products of high quality with minimum costs, means efficient use of a well qualified workforce, adapted to the use of modern technologies with high labor productivity, product quality means continuous growth in wine sales so the price is accepted by buyers, and to sell products as easy; means a favorable economic environment, characterized by a stable economy, providing secure financial gains population so that it can consume in greater amounts in wine products, means export support through appropriate economic levers of sales as shall most wine country [3].

Profitability growth during 2000-2010 in wine products shows that activity in viticulture is still profitable in growing companies as they have designed optimal production structure in size. In the technical facilities used cars, the most powerful installations exploitations of vineyard vines Dealu-Mare, there is an obvious lagging behind, in that they are worn out physically, through a standardized service over time and moral by the emergence of performance cars, such as yields, but as ways of ensuring quality. Regarding labor necessary steps towards a senior, allowing efficient use of new machines and technologies and labor productivity growth as the main factor to minimize production cost.

In terms of marketing performance, it should be noted that most companies, commercial vineyards as old methods still work, which not only allowed them a little exploitation of market opportunities. Therefore, for this vital sector of modern enterprise, determined action is required to change attitudes towards aging, with a view to introducing appropriate marketing strategies Romanian viticulture integration requirements into EU structures.

Thus, it is possible to adapt on the fly to changing buyer requirements arising both domestic and export. This will allow the preservation of old markets and their adaptation to new requirements and conquest of new markets, which will positively influence the sales volume to increase both their structure and business partners in order to obtain favorable prices for the enterprise.

Small holding, currently not used efficiently or wine-growing areas or production-related or employment, should be encouraged and supported by appropriate measures in order to pair them to create viable units that can meet the demands of competition fierce. In the process of EU integration of Romanian viticulture, it is impossible to believe that we can compete and be competitive with vineyard holdings in countries like France, Italy, Spain, and so on, which have received significant support from their countries and from the EU Europe.

The experience of these countries shows that it is possible to establish some wine farms viable provided focus all efforts - both the owners and the state - so that the funds received from the European Union, World Bank, etc.. be fully and efficiently used. Only in this way, Romania may maintain one of the top ten spots on the surface it holds wine production. It would be a shame as the result of work done by several generations so easily be lost, for none of the wine countries with conditions similar to ours, did not miss the chance to adapt them to the requirements viticulture era in which we live.

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# VISION ANALYSIS OF ARGES COUNTY FARMERS INTEND TO ASSOCIATE AND FOR WHAT PURPOSE

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## Abstract:

*This paper aims to present an outlook for agriculture in terms of vision Arges county farmers. This paper will disseminate only part of the information obtained using two types of questionnaires in Arges county. The first questionnaire was applied farm representatives with legal form and the individual holdings without legal form and the second was applied forms of association representatives. The first purpose of applying the questionnaire was to identify opinion of farmers depending on the legal form of its intention to join, a second purpose is why farmers were intending to associate Taking into account the legal form of holdings and landform located where to be found, also sought the opinion of farmers on possible advantages they can get through their association. Observe farmers desire to enter into a form of association (85%), the existence of associations representing an important milestone in the growth of production and hence the profitability of farms and for which evidence is to supply. Analyzing parallel views of farmers, the benefits that you can get for joint association forms and forms of association presidents opinion on the benefits that farmers can get them in combination, it is found that in both cases the flagship advantage is the increased ability to promote products.*

**Key words:** *association, forms of association, agricultural producers, questionnaire, Arges county*

## INTRODUCTION

Association Agriculture is an area where the association was and is perhaps more necessary than in any other field of human activity, isolated farmer feels almost powerless, based on this premise we can say that the base lies the necessity mutual aid association.

The agricultural market are disadvantaged individual producers with small manufacturers who do not have the possibility of knowing enough information to raise the level of market demand.

These small producers can not have any influence on the market due to the existence of competitive producers who takes over. Market economy leads to tough competition, farmers association is a form that aims to improve the competitiveness of farmers associates.

In general associations of farmers are made to sell the fruits obtained from farms affordable for a higher profit, or to purchase agricultural machinery more profitable prices. The advantage is that the association market oriented agricultural protects competition and affect prices of agricultural products and services which cannot insulate small farmers. Globally there is a trend of concentration of agricultural production to meet the new production technologies. This concentration of production is manifested in two ways: through free association of producers of agricultural and cooperative development of large enterprises. Compared to this, the paper aims at analyzing farmers' intention to associate Arges county, the factors that determine and impact on farmers.

In data collection have taken into account: relief areas (plains, hills and mountains), and the legal personality (individual holdings and holdings of legal form). Of this was taken into account in interpreting statistical data collected from different sources of information, in conjunction with theoretical analysis which allowed farmers pragmatic vision of perspective to join in the near or distant future. This vision could be captured through the application of two types of questionnaires, one for managers association forms existing in Arges county, and other agricultural producers as potential cooperative members.

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## MATERIAL AND METHOD

Questionnaire (*Questionnaire A, Questionnaire B*) were applied during July to November 2011 in 34 of the 95 common as Arges county totals after relief form prevalent in the villages lies questionnaires were applied:

- in 17 communes in the plains of the 32 communes that are located in the lowlands of Arges county;
- in 14 communes in the hilly region of the 53 communes in the hilly ranges of Arges county;
- in 3 communes in the mountains, in the 10 communes in mountain ranges of Arges county.

Data from the questionnaires were collected from July to November 2011, the 34 joint total of 125 respondents.

For *questionnaire A*, people were interviewed for associations representatives from Arges County.

The questionnaire applied was well structured and is divided into 8 parts, relevant, containing 53 questions.

It was applied in communities where the questionnaire was implemented and B, which were identified common forms of association, a total of the number of 25 questionnaires forms of association Arges County.

For *questionnaire B*, people were interviewed representatives of both the legal form of farms and individual holdings without legal form.

In each commune were applied by 3 questionnaires (if applicable), a total of the number of 100 questionnaires farm in the county of Arges.

The questionnaire applied was well structured and is divided into 8 parts, relevant, containing 56 questions.

To establish the statistical significance of the data collected by questionnaire Chi-square test was used, which involves checking the hypothesis of association between: a questionnaire responses to a question alternatives and verification of a particular set of data that can follow a known statistical distribution. The socio-economic problems after the composition is applied to contingency tables in which data are categorized by one, two or more variables of segmentation (Michael, N.V.)(4).

This test allows to highlight the existence / non-existence of a link between under collectivities association created segmentation variables studied.

Since the Chi-square test expression is obtained from observations that is a statistic and so there is a parameter, so is also called non-parametric statistical test or distribution free test, ie a test that does not depend on the form of the initial law base (Iosifescu, M., 1985) (1).

Chi-square formula ( $\chi^2$ )(Sava F.A., 2002)(5):

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

where: - O = observed frequency;  
- E = Expect frequency.

## RESULT AND DISCUSSIONS

From table no. 1. farmers clear desire to engage in a form of association, 85% of the association representing a milestone in increasing farm production and profitability;

Interesting, however, Presidents of the associative perception compared with farmers opinion. When asked "Agricultural producers are hesitant when it comes to unite in a form of association?" Presidents interviewed considered that reluctant farmers a rate of 72% (Table no. 2.).

**Table no. 1 Structure farmers opinion on entry into a form of association to increase farm production and profitability**

| Following legal personality | Unite Size | Yes                 | Not  | Total |      |
|-----------------------------|------------|---------------------|------|-------|------|
|                             |            | No.                 | No.  | No.   | %    |
| Holding with legal form     | No.        | 29                  | 9    | 38    | 38%  |
| Individual farm             | No.        | 56                  | 6    | 62    | 62%  |
| Total                       | No.        | 85                  | 15   | 100   | 100% |
|                             | %          | 85%                 | 15%  | 100%  |      |
| Chi-Square =                | 3.63       | Critical Value =    | 3.84 |       |      |
| Degrees of freedom (df) =   | 1          | Probability level = | 0.05 |       |      |

Source: Data processing by: „Questionnaire on farmers association in Arges County’’ (Micu M.M., 2011) (1);

**Table no. 2. Structure opinion association presidents forms on entry in a form of association for farmers to increase production and farm profitability**

|   | U.M. | Yes | Not | Total |     |
|---|------|-----|-----|-------|-----|
|   |      | No. | No. | No.   | %   |
| Agricultural producers are hesitant when it comes to unite in a form of association?" | Nr.  | 18  | 7   | 25    |     |
|   | %    | 72% | 28% |       | 100 |

Source: Data processing by: „Questionnaire forms of association in Arges County’’ (Micu M.M., 2011) (2);

**Table no. 3. Structure farmer’s opinion on the purpose of entering into a form of association to increase farm production and profitability, according to legal form**

| Supply                      |            |                     |      |       |     |
|-----------------------------|------------|---------------------|------|-------|-----|
| Following legal personality | Unite Size | Yes                 | Not  | Total |     |
|                             |            | No.                 | No.  | No.   | %   |
| Holding with legal form     | No.        | 30                  | 8    | 38    | 38  |
| Individual farm             | No.        | 33                  | 29   | 62    | 62  |
| Total                       | No.        | 63                  | 37   | 100   |     |
|                             | %          | 63                  | 37   |       | 100 |
| Chi-Square =                | 5.63       | Critical Value =    | 3.84 |       |     |
| Degrees of freedom (df) =   | 1          | Probability level = | 0.05 |       |     |
| Production                  |            |                     |      |       |     |
| Following legal personality | Unite Size | Yes                 | Not  | Total |     |
|                             |            | No.                 | No.  | No.   | %   |
| Holding with legal form     | No.        | 20                  | 18   | 38    | 38  |
| Individual farm             | No.        | 46                  | 16   | 62    | 62  |
| Total                       | No.        | 66                  | 34   | 100   |     |
|                             | %          | 66                  | 34   |       | 100 |
| Chi-Square =                | 3.97       | Critical Value =    | 3.84 |       |     |
| Degrees of freedom (df) =   | 1          | Probability level = | 0.05 |       |     |
| Commercialization           |            |                     |      |       |     |
| Following legal personality | Unite Size | Yes                 | Not  | Total |     |
|                             |            | No.                 | No.  | No.   | %   |
| Holding with legal form     | No.        | 29                  | 9    | 38    | 38  |
| Individual farm             | No.        | 43                  | 19   | 62    | 62  |
| Total                       | No.        | 72                  | 28   | 100   |     |
|                             | %          | 72                  | 28   |       | 100 |
| Chi-Square =                | 0.27       | Critical Value =    | 3.84 |       |     |
| Degrees of freedom (df) =   | 1          | Probability level = | 0.05 |       |     |

Source: Data processing by: „Questionnaire on farmers association in Arges County’’ (Micu M.M., 2011) (1);

Analyzing the structure of farmers' opinion on the purpose of entering into a form of association to increase farm production and profitability, according to the legal form (Table no. 3.) and landform (Table no. 4.) observed the following:

- as to supply 63% of respondents answered "yes", almost equally: 30% holdings with legal form and 33% individual holdings, 38% of which are located in the lowlands;
- order after production, 66% of respondents answered "yes" individual holdings manufacturers considering this effect more obvious 46%;
- after commercialization purposes, 72% of respondents answered "yes", all individual holdings manufacturers considering this effect more obvious 43%.

After statistical testing on the goals of the association of agricultural producers enter into a form of association to increase farm production and profitability given type, we find the following:

- the supply intended to enter into a form of association depending on the legal form of farms analyzed, it is found that there is a significant association between intention to enter into a form of association depending on the legal form of the problem analyzed (Chi -Square = 5.63, critical value = 3.84 at a probability <0.05), we see that the largest distribution of respondents who intend to enter into a form of association aimed supplies are recorded at individual farm level (33 respondents) (Table no. 3.);
- on production intended to enter into a form of association depending on the legal form of farms analyzed, it is found that there is a significant association between intention to enter into a form of association depending on the legal form problem analyzed (Chi -Square = 3.97, critical value = 3.84 at a probability <0.05), we see that the largest distribution of respondents who intend to enter into a form of association with the aim of production is at the level of individual farms (66 respondents) (Table no. 3.).

**Table no. 4. Structure farmers opinion on the purpose of entering into a form of association to increase farm production and profitability, according to landform**

| Supply                    |            |                     |      |       |      |
|---------------------------|------------|---------------------|------|-------|------|
| By landform               | Unite Size | Yes                 | Not  | Total |      |
|                           |            | No.                 | No.  | No.   | %    |
| Plain                     | No.        | 38                  | 13   | 51    | 51   |
| Hill                      | No.        | 15                  | 23   | 38    | 38   |
| Mountain                  | No.        | 10                  | 1    | 11    | 11   |
| Total                     | No.        | 63                  | 37   | 100   |      |
|                           | %          | 63                  | 37   |       | 100% |
| Chi-Square =              | 15.6       | Critical Value =    | 5.99 |       |      |
| Degrees of freedom (df) = | 2          | Probability level = | 0.05 |       |      |
| Production                |            |                     |      |       |      |
| By landform               | Unite Size | Yes                 | Not  | Total |      |
|                           |            | No.                 | No.  | No.   | %    |
| Plain                     | No.        | 28                  | 23   | 51    | 51   |
| Hill                      | No.        | 30                  | 8    | 38    | 38   |
| Mountain                  | No.        | 8                   | 3    | 11    | 11   |
| Total                     | No.        | 66                  | 34   | 100   |      |
|                           | %          | 66                  | 34   |       | 100  |
| Chi-Square =              | 5.86       | Critical Value =    | 5.99 |       |      |
| Degrees of freedom (df) = | 2          | Probability level = | 0.05 |       |      |
| Commercialization         |            |                     |      |       |      |
| By landform               | Unite Size | Yes                 | Not  | Total |      |
|                           |            | No.                 | No.  | No.   | %    |
| Plain                     | No.        | 37                  | 14   | 51    | 51   |
| Hill                      | No.        | 26                  | 12   | 38    | 38   |
| Mountain                  | No.        | 9                   | 2    | 11    | 11   |
| Total                     | No.        | 72                  | 28   | 100   |      |
|                           | %          | 72                  | 28   |       | 100  |
| Chi-Square =              | 0.78       | Critical Value =    | 5.99 |       |      |
| Degrees of freedom (df) = | 2          | Probability level = | 0.05 |       |      |

Source: Data processing by: Questionnaire on farmers association in Arges County'' (Micu M.M., 2011) (1);



After statistical testing on the goals of the association of agricultural producers enter into a form of association to increase farm production and profitability given where found landform located holdings held by respondents, we find the following:

- on supply intended to enter into a form of association considering where found landform located farms analyzed, it is found that there is a significant association between intention to enter into a form of association given the form of relief on the issues involved (Chi-square = 15.6, critical value = 5.99 at a probability <0.05), we see that the largest distribution of respondents who intend to enter into a form of association with the aim of supplying is in the lowlands (38 respondents) (Table no. 4.)
- on production intended to enter into a form of association considering where found landform located farms analyzed, it is found that there is a significant association between intention to enter into a form of association Given the form relief on the issue under examination (chi-square = 5.86, critical value = 5.99 at a probability <0.05) (Table no. 4.)
- for commercialization purpose to enter into a form of association considering where found landform located farms analyzed, it is found that there is a significant association between intention to enter into a form of association Given the form relief on the issue under examination (chi-square = 0.78, critical value = 5.99 at a probability <0.05) (Table no. 4.)

**Table no. 5. Structure opinion on whether farmers benefit in a form of association to increase farm production and profitability**

| By size class             |            |                     |       |       |     |
|---------------------------|------------|---------------------|-------|-------|-----|
| Specification             | Unite Size | Yes                 | Not   | Total |     |
|                           |            | No.                 | No.   | No.   | %   |
| <1 ha                     | No.        | 3                   | 0     | 3     | 3   |
| 1-5 ha                    | No.        | 11                  | 0     | 11    | 11  |
| 5-10 ha                   | No.        | 13                  | 0     | 13    | 13  |
| 10-20 ha                  | No.        | 17                  | 0     | 17    | 17  |
| 20-50 ha                  | No.        | 21                  | 2     | 23    | 23  |
| 50-100 ha                 | No.        | 10                  | 0     | 10    | 10  |
| 100-150 ha                | No.        | 7                   | 0     | 7     | 7   |
| 150-200 ha                | No.        | 3                   | 0     | 3     | 3   |
| >200 ha                   | No.        | 8                   | 5     | 13    | 13  |
| Total                     | No.        | 93                  | 7     | 100   |     |
|                           | %          | 93                  | 7     |       | 100 |
| Chi-Square =              | 24.68      | Critical Value =    | 15.51 |       |     |
| Degrees of freedom (df) = | 8          | Probability level = | 0.05  |       |     |

Source: Data processing by: Questionnaire on farmers association in Arges County'' (Micu M.M., 2011) (1);

Analyzing questionnaire B is remarkable to note that 93% of producers surveyed considered that there would be advantages if a form of association, only 7% of irrelevant considering this association. Of the 7% most are owners of operational holdings with areas over 150 hectares (Table no. 4.5.).

The statistical test of association (chi-square = 24.68, = 15.51 Critical value at a probability <0.05) the existence of benefits in a form of association by size class of holdings held by respondents, we find that there is a significant association between respondents' opinion based on problem size classes analyzed, we see that most respondents considering distribution of benefits is a form of association is found at farm level holding between 20-50 ha (21 respondents) (Table no. 4.5.).

Analyzing questionnaire B is remarkable to note that 93% of producers surveyed considered that there would be advantages if a form of association, only 7% of irrelevant considering this association. Of the 7% most are owners of operational holdings with areas over 150 hectares (Table no. 6.).

**Table no. 6. Structure opinion on whether farmers benefit in a form of association to increase farm production and profitability**

| By size class             |            |                     |       |       |     |
|---------------------------|------------|---------------------|-------|-------|-----|
| Specification             | Unite Size | Yes                 | Not   | Total |     |
|                           |            | No.                 | No.   | No.   | No. |
| <1 ha                     | No.        | 3                   | 0     | 3     | 3   |
| 1-5 ha                    | No.        | 11                  | 0     | 11    | 11  |
| 5-10 ha                   | No.        | 13                  | 0     | 13    | 13  |
| 10-20 ha                  | No.        | 17                  | 0     | 17    | 17  |
| 20-50 ha                  | No.        | 21                  | 2     | 23    | 23  |
| 50-100 ha                 | No.        | 10                  | 0     | 10    | 10  |
| 100-150 ha                | No.        | 7                   | 0     | 7     | 7   |
| 150-200 ha                | No.        | 3                   | 0     | 3     | 3   |
| >200 ha                   | No.        | 8                   | 5     | 13    | 13  |
| Total                     | No.        | 93                  | 7     | 100   |     |
|                           | %          | 93                  | 7     |       | 100 |
| Chi-Square =              | 24.68      | Critical Value =    | 15.51 |       |     |
| Degrees of freedom (df) = | 8          | Probability level = | 0.05  |       |     |

Source: Data processing by: „Questionnaire on farmers association in Arges County’’ (Micu M.M., 2011) (1);

The statistical test of association (chi-square = 24.68, = 15.51 Critical value at a probability <0.05) the existence of benefits in a form of association by size class of holdings held by respondents, we find that there is a significant association between respondents' opinion based on problem size classes analyzed, we see that most respondents considering distribution of benefits is a form of association is found at farm level holding between 20-50 ha (21 respondents) (Table no. 6.).

**Table no. 7. Structure farmer’s awareness about the benefits that can be obtained when combining farmers in forms of association**

|   | Grades according to the extent considered |    |    |    |    |    |    |    |       |
|---|---|----|----|----|----|----|----|----|-------|
|   | 1   | 2  | 3  | 4  | 5  | 6  | 7  | 8  | Total |
| Reducing production expenses  | 31  | 17 | 7  | 14 | 10 | 3  | 6  | 12 | 100   |
| Increasing chances of bank borrowing  | 6   | 24 | 10 | 16 | 11 | 14 | 4  | 15 | 100   |
| Increasing chances of obtaining a grant from European funds   | 11  | 13 | 30 | 8  | 12 | 9  | 11 | 6  | 100   |
| Increasing competitiveness itself through application of advanced technologies                          | 15  | 2  | 15 | 32 | 10 | 9  | 10 | 7  | 100   |
| Proper dosage production according to demand  | 2   | 6  | 14 | 8  | 36 | 14 | 12 | 8  | 100   |
| Increase communication both between farmers, members of the association, and between farmers and others | 10  | 5  | 6  | 4  | 14 | 29 | 10 | 22 | 100   |
| Increased capacity to negotiate the procurement of goods or services, and the development of products   | 8   | 20 | 9  | 8  | 5  | 15 | 29 | 6  | 100   |
| Increased capacity to promote products  | 6   | 7  | 3  | 11 | 10 | 10 | 21 | 32 | 100   |

Source: Data processing by: „Questionnaire on farmers association in Arges County’’ (Micu M.M., 2011) (1);

Note: There are advantages numbered 1-8 in the order that they considered that they may have by association;

Analyzing parallel views of farmers (Table no. 7.) On the advantages can be obtained when combining the forms of association and opinion Association Presidents forms (Table no. 8.) The benefits the farmers can get when combining shows that in both cases the advantage is representative capacity building to promote products.

**Table no. 8. Presidents of the associative structure of opinion on the advantages they can get farmers in combination**

|   | Grades according to the extent considered |   |   |   |   |   |   |   |       |
|---|---|---|---|---|---|---|---|---|-------|
|   | 1   | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Total |
| Reducing production expenses  | 8   | 3 | 1 | 3 | 2 | 1 | 2 | 5 | 25    |
| Increasing chances of bank borrowing  | 5   | 3 | 4 | 2 | 4 | 2 | 1 | 4 | 25    |
| Increasing chances of obtaining a grant from European funds   | 2   | 5 | 7 | 4 | 2 | 2 | 1 | 2 | 25    |
| Increasing competitiveness itself through application of advanced technologies                          | 2   | 1 | 6 | 6 | 5 | 2 | 2 | 1 | 25    |
| Proper dosage production according to demand  | 1   | 4 | 2 | 4 | 2 | 5 | 6 | 1 | 25    |
| Increase communication both between farmers, members of the association, and between farmers and others | 1   | 3 | 1 | 3 | 7 | 7 | 1 | 2 | 25    |
| Increased capacity to negotiate the procurement of goods or services, and the development of products   | 2   | 3 | 2 | 5 | 3 | 1 | 7 | 2 | 25    |
| Increased capacity to promote products  | 1   | 1 | 1 | 1 | 3 | 5 | 4 | 9 | 25    |

Source: Data processing by: „, Questionnaire forms of association in Arges County’’ (Micu M.M., 2011) (2);

Note: There are advantages numbered 1-8 in the order that they considered that they may have by association;

## CONCLUSIONS

- Observe farmers desire to enter into a form of association (85%), the existence of associations representing an important milestone in increasing production and farm profitability;
- Presidents of the associative perception according compared with farmers wish to join, is different from that of the producers. When asked "Agricultural producers are hesitant when it comes to unite in a form of association?" Presidents interviewed considered that reluctant farmers a rate of 72%;
- Analyzing the structure of farmers' opinion, the purpose of entering into a form of association to increase farm production and profitability, according to legal form and landform is noted that:
  - as to supply 63% of respondents answered "yes", almost equally (30% holdings with legal form and individual holdings 33%), 38% of which are located in the lowlands.
  - as for production, 66% of respondents answered "yes" individual holdings manufacturers considering this effect more obvious 46% and
  - for commercialization purposes, 72% of respondents answered "yes", all individual holdings manufacturers considering this effect more obvious 43%;
- Regarding product supply as reasons to enter into a form of association, depending on the legal form and landform is found that there is a significant association. The greatest distribution of respondents who intend to enter into a form of association aimed sourcing and production and record the individual holdings and farms are found in the lowlands;
- Most of the producers interviewed (93%) believes that there are advantages if they would be in a form of association, and only 7% of them consider irrelevant the combination. Of the 7% most surfaces are owners of operational holdings above 150 hectares;
- The statistical test of association, the existence of benefits in a form of association, by size class of holdings held by respondents, it appears that there is a significant association between respondents' opinion based on problem size classes analyzed, and observe that largest distribution of respondents who believe that there are advantages in a form of association is holding found at farm level between 20-50 ha;
- Analyzing parallel views of farmers, the benefits that you can get for joint association forms and forms of association presidents opinion on the benefits that farmers can get them in combination, it is found that in both cases the flagship advantage is the increased ability to promote products.

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# ROMANIAN WINE SECTOR IN THE CONTEXT OF CLIMATE CHANGE

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## Abstract

*Climate change is one of the major challenges of our century - a complex area in which to improve our knowledge and understanding to take immediate measures to effectively address and correct, in terms of the challenges of climate change, respecting precautionary principle. (Romanian National Strategy on Climate Change). In this paper we discussed the main issues facing the wine and measures to mitigate possible negative effects.*

**Key words:** Viticulture, Climate changes, Agriculture, Food safety

## INTRODUCTION

Climate change – and their impact on the way in which we produce and consume – are becoming increasingly at the Centre of sustainable development policy. They are therefore at the Centre of regional development, representing an unprecedented challenge, but also an opportunity for the European regions in terms of their ability to innovate and create new jobs [10, 11].

During the last century, the average temperature in Europe has increased to 0.95 ° C warming which meant a more accelerated than the global average of outer space, which was 0.4 ° C. Climatic conditions have become much more variable. Economic losses caused by weather-related disasters have increased substantially in recent decades [16].

In fact, climate change poses a double challenge: how might reduce the emission of gases responsible for global warming, and how it can adapt to present and future climate change [7].

## MATERIAL AND METHOD

The Intergovernmental Group of experts on the evolution of Climate – the GIEC (Intergovernmental Panel on Climate Change-IPCC) in its fourth assessment report (2007) presented the schematic of the factors responsible for the formation of antropogeni climate change effects and responses to climate change and the links between them. This scheme is actually a framework for research relating to climate change. Connections on the schema (clockwise) provides information on the assessment of climate change and the effects thereof. For the purposes of vice versa it is estimated that the possible development paths and global constraints on emissions which would reduce the risk of future effects that society would like to avoid them [17].

Considering its dependence on climatic conditions, agriculture remains, without indoaiala, the most vulnerable sector of the economy than climate change. Climate instability is one of the main causes of unstable harvests, representing a risk for agriculture țării. Moreover, the disastrous condition of agriculture is determined and a series of macroeconomic and structural changes. Among these factors are the most important: increasing the share of Agriculture of subsistence agriculture to commercial, agricultural subsidising inefficient, lack of capital investment, excessive fragmentation of agricultural land and destroyed the irrigation system.

As shown in recent research in the field of climate change, these phenomena are largely associated with global warming. In Romania, the extreme temperatures have affected, primarily rural areas, where the majority of the inhabitants practiced agriculture least productive and almost entirely dependent on climatic conditions.

Subsistence agriculture combined with limited access to markets is not a productive model for future perspective in modern society, integrated in the european context. In addition, the specific effects of climate change are all subsistence farming less feasible.

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The biggest impact of climate change on agriculture will come through the water. Climate change may cause a decrease in the availability of many parts of Europe as a result of the reduction in the amount of rainfall during the various areas – mainly in the South and in parts of Central Europe. In Western Europe and Atlantic regions, the summers are likely to be dry and warmer, with reduced water resources during this season. Many EU countries, especially in southern States, have practiced irrigation of hundred years-that being part of the tradition, but this sector will need revisions of irrigation technique in light of climate change. For more regions may be necessary to increase irrigated area to ensure a continuous production. But there is no doubt that agriculture must make further efforts to improve the efficiency of water use to reduce losses, and irrigation plans will have to be based on a careful planning and detailed assessment of their impact [6].

## **RESULTS AND DISCUSSIONS**

The impact of climate change on cultivation of vines is an issue of major importance for researchers from different fields. These climate changes concern the greatest specialists in viticulture, given the fact that the vineyards producing high-quality wines are extremely sensitive to any change in the pedo-climatic conditions. An important issue to be considered is that relating to the possibility of human adaptation to climate change. In regions with a strong tradition of vine growing, people could watch the substantial reluctance for any suggestion to replace the traditional varieties of vines or moving them to areas more suitable for the climate.

Global temperature increase due to a series of changes in electing of vine varieties resistant to prolonged drought conditions. In addition, the provision of additional quantities of water for keeping moisture in the soil is required. The introduction of special techniques of land management should be taken if the heating observed trends will remain. The possible proliferation of diseases and pests as a result of maintaining high temperatures is another unknown to be taken into account when choosing varieties of vine. Given that global warming affects the normal conduct of vine at continental and regional level should be a re-evaluation of the use of land in these areas on the basis of a detailed study pedo-climatic features, and implementation of a viable strategy-growing in front of future climate change.

Effects of temperature on the growth of vines led to bringing the right moment for blossom, as well as shortening the duration of these phases of vegetative development. At the same time, it was found and a trend of forced ripening of the grapes, which are undesirable repercussions on the quantitative and qualitative production of vine. Maturation of the grapes is triggered suddenly, with repercussions on the process of growth has grains characteristic of each variety in size and thus the decline in yields in the mash, because they lack the turgidity of grains.

The excessively high temperatures, coupled with prolonged drought and atmospheric pedologic, varieties have tended to get very early in “pârgă” (late July-early august), a phenomenon caused by very high temperatures of the air and of the extreme values that exceed 30 ° C frequently. The phenomenon is accentuated when there is scarcity and hydric.

At the beginning of forced ripening red varieties are manifested by the grains before they reach the size of typical of the variety. If hydric deficit in the short term, it slows the restore and colorize the beans continues increasing. Otherwise, the grapes, the leaves are fading partially or totally dry and fall one by one, the grape production is thus make Spiramycin less dramatically. The present severe burns with foliar appearance of dryness, which affects the major process of photosynthesis and accumulation of the active substances that encourage the maturation of the grapes.

## **CONCLUSIONS**

In recent years, there is a tendency to decrease in rainfall regime. Also, there is an uneven distribution of rainfall throughout the year with dry intervals within short periods with heavy rains and, often, a downpour. Although vines has a great capacity for adaptation to extreme conditions (excess or shortage of water) in the dry, they disturb the plant and main physiological processes.

Water scarcity has severe effects, and when it is accompanied by high temperatures, causing the closure of stomata, reducing spraying area, wilting of tendrils and leaves and even premature drying, changing the color of the leaves, vegetative downturn.

High concentrations of CO<sub>2</sub> in association with extremely high temperatures during the period of flowering, may in fact lead to an opposite effect. Also, although the increase productivity, high concentrations of CO<sub>2</sub> results in a lower quality of crops. The high temperatures associated with a low level of rainfall increases the concentration of sugar in grapes, but at the same time, reduced productivity overall, net result being very little predictable.

Possible measures that could be taken to counter the effects of climate change are [6]:

- improving weather forecasting ability, protection of soil fertility, irrigation systems, efficient use of rainfall through the application of management measures that preserve the water in the soil during drought;
- harnessing the potential of soils under climate conditions characteristic of the area;
- limiting the use of chemical treatments;
- a new focus on varietal structure and species with high tolerance to high temperatures and stress generated by water shortages hydric;
- the adaptation of technologies of cultivation to the effects of climate change;
- fenoclimatic simulation of damage in vineyards wine under the action of climate change, in order to determine the probability of the occurrence of the damage precisely;
- whereas the technology of planting and upkeep the vineyards young with heat stress and hydric over 50% may occur, requiring irrigation goals.

According to the study prepared by Metroeconomica (2004), the estimate of the economic impact of climate change and global value benefit of adaptation strategies must be carried out according to the scheme shown below.

**Figure 1 Scheme of economic estimation of climate change and of global value benefit of adaptation strategies**

| <b>Economic value estimation of climate change impact</b>    | <b>Global value benefit estimation of adaptation strategy</b>  |
|--|--|
| Economic value of climate change impact (value units)        | Global value benefit of adaptation strategy (value units)  |
| =  | =  |
| Estimated impact of climate change (physical units)          | Efficiency of adaptation strategy in attenuation of receptor exposure at climate change risks (physical units) |
| X  | X  |
| Economic value on impact unit (value units on physical unit) | Economic value on deviated impact unit (value units on physical unit)  |

Source: MetroEconomica 2004 8-9

Global warming could have a remarkable influence on the vineyards producing high quality wines for the cultivation of vines. Northern vineyards, this will be a beneficial warming, while the southern part it will be disadvantageous because the climate too hot [18].

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# THE EVOLUTION OF THE AGROTURISTIC PENSIONS IN BUZĂU COUNTY, PERIOD 2004-2011

NECULA DIANA<sup>1</sup>

## Abstract

*Unlike other counties, whose relief consists only of plains (Teleorman , Ialomița) , mountains or hills-(Brașov, Sibiu, etc.), Buzău county has plain, hill and mountain, what makes it distinctive from other counties. Buzău county region is one of the important areas in terms of tourist potential in its natural, historic, and effective architecture monuments, folk art, people living here, householders, good preservers of old traditions. In the County there is a fairly developed agroturistic network, supported mainly by ANTREC, most hostels are in the area Sarata Monteoru, and then in the Buzău Valley (Berca, Nehoiu, Gura Teghii, Siriu). Most tourists and agroturistic pensions of Buzău County are small, indicating that they only bring complementary tourist income for their owners. There are few agroturistic pensions deriving income from this activity only.*

**Keywords:** agritourism, accommodation, overnights, average rate

## INTRODUCTION

County is located in the South-Eastern part of the country, it is bordered by the counties of Covasna and Brașov in North-West , in North -Vrancea, East - Brăila, Prahova in West and Ialomița to the South .The County area is 6103 km<sup>2</sup> (2.6% of Romania's surface), being on 17 place among the other counties.

Agritourism is a form of rural tourism practiced in rural areas which uses (as a touristic structure) households with all amenities. As such, this form of tourism uses for the accommodation and dining only tourist and agroturistic pensions farm, benefiting from an unpolluted environment and natural attractions, cultural-historical values, traditions and customs of the countryside. It represents the most effective way of exploiting local resources existing in rural areas [1].

Agroturistic pension is defined as a touristic structure, accommodation with a capacity of up to 10 rooms, totalizing not more than 30 available seats in rural areas and up to 20 rooms in urban areas. This works in the house of the citizens or in stand-alone buildings, providing accommodation in specially arranged places for tourists and preparation and serving of meals.

Agroturistic pensions (the equivalent of agroturistic farms) can ensure (beside the accomodation ) the meals of the tourists with the nourishment of its own production, without any obligation to for serving it.

## MATERIAL AND METHODS

Indices are numerical expressions resulting from comparing or reporting two indicators expressing the same phenomenon, but are either at different times or in different drives or refers to planned levels of the phenomena. With their help , we ca determine the dynamics to a fixed base or chain base , constructing rhythms, feedback on performance, the evolution of the system ability to evaluate in a given context.

*Analysis to the achievements of previous years*

Fixed-base index – establish the dynamics of a phenomenon or process taking a fixed reference base.

Basic chain indices help determining the evolution of phenomena through reporting achievements in a given year to the achievements of the previous year [3]

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## RESULTS AND DISCUSSION

Due to the demand of accommodation higher than supply, the provision of accommodation is to be located in the vicinity of tourist resorts. In these areas there are many factors that contribute to the development of rural tourism : modern roadways; more natural and anthropogenic objectives.

In table 1 we have a situation at the level of the existing agrotouristic pensions in Buzau County and accommodation capacity in the period 2004-2011, where we can observe an increase in the number of pensions and accommodation capacity.

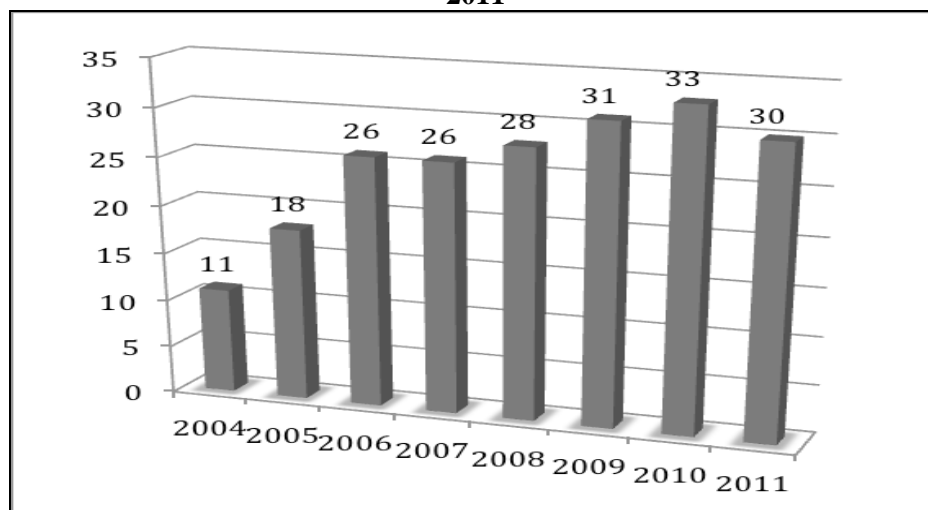
**Table 1. The number of agrotouristic pensions and accommodation capacity in Buzau County in the period 2004-2011**

| Specification   | UM           | 2004   | 2005   | 2006   | 2007   | 2008   | 2009   | 2010   | 2011   | Average rate % | Annual rate % |
|---|--------------|--------|--------|--------|--------|--------|--------|--------|--------|----------------|---------------|
| Agrotouristic pensions                                | Nr           | 11     | 18     | 26     | 26     | 28     | 31     | 33     | 30     | x              | x             |
|   | %            | 100.00 | 163.64 | 236.36 | 236.36 | 254.55 | 281.82 | 300.00 | 272.73 | <b>230.68</b>  | x             |
|   | %            |        | 1.64   | 1.44   | 1.00   | 1.08   | 1.11   | 1.06   | 0.91   | x              | <b>15.41</b>  |
| The existing capacity of the accommodation of tourist | Place        | 160    | 262    | 364    | 365    | 427    | 483    | 499    | 496    | x              | x             |
|   | %            | 100.00 | 163.75 | 227.50 | 228.13 | 266.88 | 301.88 | 311.88 | 310.00 | <b>238.75</b>  | x             |
|   | %            |        | 1.64   | 1.39   | 1.00   | 1.17   | 1.13   | 1.03   | 0.99   | x              | <b>17.54</b>  |
| Tourist accommodation capacity in operation           | No place/day | 55187  | 77629  | 131546 | 132863 | 148047 | 172695 | 181799 | 181812 | x              | x             |
|   | %            | 100.00 | 140.67 | 238.36 | 240.75 | 268.26 | 312.93 | 329.42 | 329.45 | <b>244.98</b>  | x             |
|   | %            |        | 1.41   | 1.69   | 1.01   | 1.11   | 1.17   | 1.05   | 1.00   | x              | <b>18.57</b>  |

Source: Statistical Yearbook of 2004-2011 County Buzau, Buzau DSJ[5]

The number of agrotouristic pensions grow during the period analyzed with 172% in 2011 compared to 2004, with an 15,41% annual rate of growth and a annual average rhythm of 230,68%; You can see an increase of 63% in 2005 from 2004 un till 2010 when it achieves 200%, in 2011 has a decrease compared to the previous year with 27,27%.

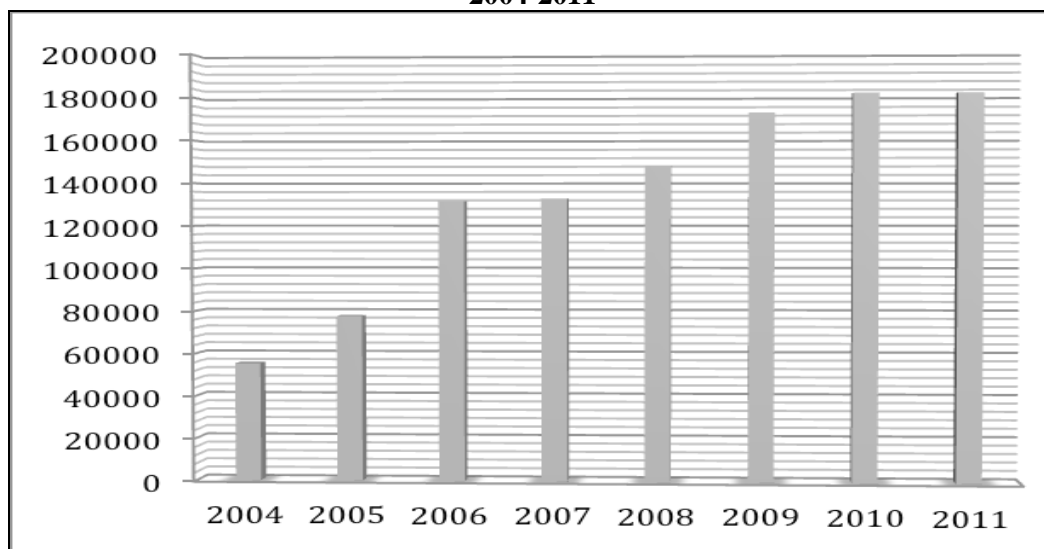
**Figure 1: The evolution of the number of agrotouristic pensions in Buzau County in the period 2004-2011**



Source: Statistical Yearbook of 2004-2011 County Buzau, Buzau DSJ[5]

In terms of tourist accommodation capacity in operation, as we can see from the data analyzed in table 1 and shown in Figure 2, it has also a continue growth, at with 40,67% 2005 compared to 2004, 140,75% in 2007, to reach an increase of 229,45% in 2010 and 2011 compared with the year of reference; through this period is established an annual growth rate of 18,57% and an average rate of 244,98%.

**Figure 2: The evolution of the agroturistic capacity accommodation in Buzau County in the period 2004-2011**



Source: Statistical Yearbook of 2004-2011 County Buzau, Buzau DSJ

The arrival of a tourist in a touristic accommodation shall be registered when a person is entered in the register of the structure in question, to be hosted by one or more nights.

In each structure of the tourist accommodation shall be regarded as a single tourist registration, regardless of the number of nights of its uninterrupted stay [2].

From the analysis of table no. 2 stands out the ascending evolution of the number of tourists in the agro touristic pensions in the period considered, especially romanian tourists, this is due to the fact that the district is not known internationally.

So, if in the 2004 Romanian tourists represent 98,35% of total arrivals and the foreign tourists arrivals represent 1.65% of those, in 2011 the number of romanian tourists arrivals represents 95.97% of the total and the number of foreigners has risen to 4, 03%.

**Table 2 Arrivals and overnights stays by the types of tourists in agroturistic pensions , Buzau County in the period 2004-2011**

| Specification                                    | Tourists   | UM | 2004   | 2005   | 2006   | 2007   | 2008   | 2009   | 2010   | 2011   | Average rate % | Annual rate % |
|--|------------|----|--------|--------|--------|--------|--------|--------|--------|--------|----------------|---------------|
| Arrivals of tourists with accommodation services | Total      | no | 5465   | 5462   | 6900   | 9458   | 11754  | 9903   | 9241   | 9809   | x              | x             |
|  |            | %  | 100.0  | 99.95  | 126.26 | 173.06 | 215.08 | 181.21 | 169.09 | 179.49 | <b>155.52</b>  | x             |
|  |            | %  |        | 0.999  | 1.26   | 1.37   | 1.24   | 0.84   | 0.93   | 1.06   | x              | <b>8.72</b>   |
|  | Romans     | no | 5375   | 5369   | 6799   | 9172   | 11395  | 9502   | 8895   | 9414   | x              | x             |
|  |            | %  | 100.00 | 99.89  | 126.49 | 170.64 | 212.00 | 176.78 | 165.49 | 175.14 | <b>153.30</b>  | x             |
|  |            | %  |        | 0.999  | 1.27   | 1.35   | 1.24   | 0.83   | 0.94   | 1.06   | x              | <b>8.34</b>   |
|  | Foreigners | no | 90     | 93     | 101    | 286    | 359    | 401    | 346    | 395    | x              | x             |
|  |            | %  | 100.00 | 103.33 | 112.22 | 317.78 | 398.89 | 445.56 | 384.44 | 438.89 | <b>287.64</b>  | x             |
|  |            | %  |        | 1.033  | 1.09   | 3.20   | 1.26   | 1.12   | 0.86   | 1.14   | x              | <b>23.53</b>  |
| Overnights on types of tourists                  | Total      | no | 7068   | 8464   | 10294  | 16259  | 20091  | 18713  | 16386  | 17419  | x              | x             |
|  |            | %  | 100.00 | 119.75 | 145.64 | 230.04 | 284.25 | 264.76 | 231.83 | 246.45 | <b>202.84</b>  | x             |
|  |            | %  |        | 1.198  | 1.22   | 1.58   | 1.24   | 0.93   | 0.88   | 1.06   | x              | <b>13.75</b>  |
|  | Romans     | no | 6925   | 8334   | 10090  | 15678  | 19241  | 17643  | 15625  | 16,539 | x              | x             |
|  |            | %  | 100.00 | 120.35 | 145.70 | 226.40 | 277.85 | 254.77 | 225.63 | 238.83 | <b>198.69</b>  | x             |
|  |            | %  |        | 1.203  | 1.21   | 1.55   | 1.23   | 0.92   | 0.89   | 1.06   | x              | <b>13.24</b>  |
|  | Foreigners | no | 143    | 130    | 204    | 581    | 850    | 1070   | 761    | 880    | x              | x             |
|  |            | %  | 100.00 | 90.91  | 142.66 | 406.29 | 594.41 | 748.25 | 532.17 | 615.38 | <b>403.76</b>  | x             |
|  |            | %  |        | 0.909  | 1.57   | 2.85   | 1.46   | 1.26   | 0.71   | 1.16   | x              | <b>29.64</b>  |

Source: Statistical Yearbook of 2004-2011 County Buzau, Buzau DSJ

Romanian tourists arrivals have increased during the period considered by 75,14% in 2011 compared to 2004, while foreign tourists with 338,89% in the same period.

Overnight stay is an indicator that represents the interval of 24 hours, starting with the hotel hour, for which a person is recorded in the track structure of tourist accommodation and benefit from the tariff corresponding to the hosting space occupied, even if the duration of stay is less than the effective range. There are envisaged and related the supplementary beds installed (paid by tourists) [2].

When analyzing the data in the table above, regarding the types of tourists, we discover also a significant growth in this period. The overnights stays of Romanian tourists increased by 138,83% in 2011 compared to 2004, and for foreigners with 515,38%. Though, the share of overnights of Romanian tourists of the total is much higher than the share of the overnights of foreigners in agro touristic pensions, but in an ascending line, so in 2004 the Romanian tourists overnights accounted 97,98% of the total and in 2011 at 94,95%, while of foreign tourists to be of 2.02% in 2004, and in 2011 at 5,05%.

## CONCLUSIONS

In Buzau County there is a very valuable tourism potential, with a natural richness in all its components, but also by significant anthropogenic and varied tourist attractions, plus the maintenance of old occupations and crafts, folk customs and beautiful habits.

Touristic anthropic fond impose increasingly more in the tourist circuit through his qualities of diversity, originality and uniqueness.

The number of tourists arriving (tourists stay) in agro touristic pensions, has an ascending evolution, this is due to the increase from year to year of the number of tourists. Other reasons that could cause this increase in the number of arrivals are: quality of services offered to tourists, the tourism potential of the region, the tariffs in accommodation, sightseeing, etc.

In County Buzau arrive more Romanian tourists than foreign tourists, this is because the County promotion is not organized at the international level, organizations are looking for ways so the tourism to release his agro touristic potential.

Regarding the evolution of the number of overnight stays recorded in the agro touristic pensions, it has an increasing trend to both Romanian and foreign tourists.

The practice of rural tourism involves a development of the infrastructure and a sustainable urban-rural balance, the use of unconventional forms of energy, less polluting techniques, depending on the types of landscape and environment.

Local authorities have a responsibility to draw up a strategy to support the culture, tradition and agro tourism, which can valorize the local attributes, in line with the principles of the sustainable development.

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# THE ANALYSIS OF THE ACCESS TO INFORMATION REGARDING THE ADOPTION OF INNOVATION, IN BUZAU COUNTY, YEAR 2012

NECULA RALUCA<sup>1</sup>

## Abstract

*The information represents the engine of development both for the individual and for society. I watched by our analysis to make a link between the possibility of accessing information and the respondents, in order to understand the consequences of adoption of innovation, and disseminating them. The study was done in Buzau County, in the communes of Bisoca, Pietroasele and Gheraseni, a total of 90 people. The importance of understanding the concept of innovation, the implementation of new in households, it is great, just by getting more information and free access to reach an optimum development of the agriculture.*

*In our study we wanted to touch several points of interest with regard to access to information with a view to their adoption of the innovation in agriculture, i looked through most of the information ways , evaluating the autodidactic profile and access to technical updates.*

**Keywords:** *innovation, technical news, information, questionnaire*

## INTRODUCTION

The term "agricultural innovation" refers to innovation in crop plants, livestock, forestry, fisheries/aquaculture and agro-industry sectors. Agricultural innovation system – the term refers to individuals, organizations and businesses that bring new products, processes and forms of organization to ensure food security, economic development and sustainable management of natural resources. Like any "system", it will include different stakeholders made up of actors, and the linkages between them. It also includes a "favorable environment", which includes the factors that make it all possible, such as vision, policy and legal frameworks, economic and budgetary allocations, the structures of governance and power; incentives and social rules [2].

How it will be approached the increasing societal challenges, climate change, energy supply, resource shortages and the impact of demographic change? How it will be enhanced health and safety and how will be provided water sustainably and affordable food of high quality?

The only answer is innovation, which constitutes the core of the Europe Strategy 2020 [1], agreed by Member States at the European Council in June 2010 , that supports smart growth, sustainable and positive inclusion endorsed by this strategy.

## MATERIAL AND METHOD

In investigating the multiple problems relating to the innovation, the goal is that, on the basis of the results of processing the data obtained, to estimate, using the principles of probability theory, the proposed parameters to be analyzed in the dissemination of innovation and its evaluating implementation at farm level. The poll was conducted at the county level in Buzau, 3 villages of different relief areas: Bisoca-mountain, Pietroasele- hill and Gheraseni-plain. In each township were elected randomized a total of 30 respondents. I proposed a system of questions for the factors of innovation, through which I wanted to monitor the performance of family exploitation in relation to the many features of innovation (products, processes, etc).

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## RESULTS AND DISCUSSION

The main questions were focused on sources of information (either personal or institutional sources, the media).

**Table 1 Frequency analysis departure to Buzau, 2012**

| Specification          | Um | Mountain | Hill  | Plain | Total |      |
|------------------------|----|----------|-------|-------|-------|------|
| Less than once a month | No | 13       | 10    | 8     | 31    | 21.4 |
|                        | %  | 26.0     | 32.3  | 16.0  | 100   | x    |
| 1-3 times per month    | No | 9        | 8     | 8     | 25    | 17.3 |
|                        | %  | 36       | 32    | 32    | 100   | x    |
| 1 time per week        | No | 4        | 8     | 2     | 14    | 9.7  |
|                        | %  | 28.57    | 57.14 | 14.29 | 100   | x    |
| Several times per week | NO | 4        | 4     | 12    | 20    | 22.2 |
|                        | %  | 20       | 20    | 60    | 100   | x    |

Source: Necula Raluca , 2012, questionnaire, perception and dissemination of agricultural innovations, Buzău County [5]

Hints of distance and age played a very important role to the answers given in table 1, in particular for the commune of Bisoca, which stood at 64 Km from the city of Buzau, Pietroasele commune at 23,6 km distance and the village Gheraseni at 17,2 km:

- Those who responded that go at least once a month, had the largest share, 34%, nearly 42% of these being in the mountains, 32% of the hill and 25,8% of the plains area.
- The proportion of those who go 1-3 times a month at Buzau is of 27.8%, divided almost equally between the three villages.
- Of those who go once a week (15.6%), most are from Pietroasele-57%
- Of those who go several times a week, 22,2% of the total, are persons aged till 50 years, of which 60% are located in Gheraseni.

The analysis of innovation has been through several questions, namely: “A householder who don't do as the others do is not a good householder?; “A householder who tries new techniques is a good householder?”.

Since the question that made the theme table has a double negation , it was hardly understood by the respondents, but the proportion of results is the following:

- 47,78% were fully agree that an owner must do like other householders, about 70% of them have over 50 years of age;

**Table 2: The analysis of the innovation: “A householder who doesn’t do as the others do is not a good householder?”**

| Age   | UM | A householder who does not like the others |                      |                    |                  |               | Total  |        |
|-------|----|--|----------------------|--------------------|------------------|---------------|--------|--------|
|       |    | I am completely agree                      | Faltering, undecided | Not really I agree | Not at all agree | I do not know | no     | %      |
| < 30  | no | x  | x                    | x                  | 1                | 1             | 2      | 2.22   |
| 30-40 | no | 4  | x                    | 1                  | 1                | x             | 6      | 6.67   |
| 40-50 | no | 5  | 2                    | 4                  | 4                | 1             | 16     | 17.78  |
| 50-60 | no | 13   | 1                    | 3                  | 8                | 2             | 27     | 30.00  |
| 60-70 | no | 8  | 1                    | 3                  | 4                | 1             | 17     | 18.89  |
| > 70  | no | 13   | 2                    | 4                  | 2                | 1             | 22     | 24.44  |
| Total | no | 43   | 6                    | 15                 | 20               | 6             | 90     | 100.00 |
|       | %  | 47.78                                      | 6.67                 | 16.67              | 22.22            | 6.67          | 100.00 |        |

Source: Necula Raluca , 2012, questionnaire, perception and dissemination of agricultural innovations, Buzău County [5]

- 22.2% not at all agree with this assumption and not too 16,67 agree
- 13, 3% don't know or soavitori regarding the answer to this question.

From the analysis of the test did not reveal a hi square link between age and respondents or the way you responded to this question, all agreeing that tether, demonstrating that all support the introduction of the new, the risk is that it may have.

**Table 3: An analysis of creativity trying new techniques for the householder is a householder good.**

| Specification |    |                       |                  |                      |               | Total  |        |
|---------------|----|-----------------------|------------------|----------------------|---------------|--------|--------|
| age           | UM | I am completely agree | I am quite agree | Faltering, undecided | I do not know | nr     | %      |
| < 30          | nr | 1                     | x                | x                    | 1             | 2      | 2.22   |
| 30-40         | nr | 5                     | 1                | x                    | x             | 6      | 6.67   |
| 40-50         | nr | 13                    | 1                | 2                    | x             | 16     | 17.78  |
| 50-60         | nr | 23                    | 2                | x                    | 2             | 27     | 30.00  |
| 60-70         | nr | 15                    | x                | 1                    | 1             | 17     | 18.89  |
| > 70          | nr | 15                    | 1                | 1                    | 5             | 22     | 24.44  |
| Total         | nr | 72                    | 5                | 4                    | 9             | 90     | 100.00 |
|               | %  | 80.00                 | 5.56             | 4.44                 | 10.00         | 100.00 | x      |

Source: Necula Raluca , 2012, questionnaire, perception and dissemination of agricultural innovations, Buzău County [5]

The answers to this question is of special importance for our analysis, as it shows us the way that respondents do agree with the adoption of new techniques, specifically the adoption of innovation.

With a very high proportion, 80% are the ones who are completely agree as a householder who try new techniques is a good householder, 31,9% of them are aged between 50-60 years old and 41,6% have over 60 years.

On this question no one questioned answered that disagrees with this hypothesis. The proportions have shown a pretty small part of respondents agreeing with both questions, which reflect the fact that the others do not necessarily involve the householders to adopt new techniques, or the adoption of new techniques does not mean that is followed by other householders.

**Table 4. Media channels that access depending on the geographical area.**

| Specification |     | Um | Mountain | Hill | Plain | Total |
|---------------|-----|----|----------|------|-------|-------|
| TV?           | Yes | No | 30       | 30   | 30    | 90    |
|               |     | %  | 100      | 100  | 100   | 100   |
| Radio?        | Yes | No | 22       | 27   | 25    | 74    |
|               |     | %  | 45.5     | 90.0 | 83.3  | 51.1  |
|               | Not | No | 8        | 3    | 5     | 16    |
|               |     | %  | 16.6     | 6.2  | 10.4  | 11.1  |
| Computer?     | Yes | No | 15       | 15   | 15    | 45    |
|               |     | %  | 50       | 50   | 50    | 50    |
|               | Not | No | 15       | 15   | 15    | 45    |
|               |     | %  | 50       | 50   | 50    | 50    |

Source: Necula Raluca , 2012, questionnaire, perception and dissemination of agricultural innovations, Buzău County [5]

Computer and Media, are some of the most important ways of informing people , in the table are analyzed data that reflect how many of the respondents have in their own households these means:

- 100% of respondents have TV
- 73,3% of those from the mountain area, 90% of the hill area and 83,3% of plain area responded affirmatively when asked if they have radio;

- Regarding owning a computer, the proportions are equal on both areas and affirmative or negative response, namely 50%.

The Press, it is also a very important factor for access to information, the manner in which respondents have recourse to the written press is presented in the table:

- 14.4% read newspapers every day, of which 46% are in the plains area and 46% of the deal.
- 30% of respondents read newspapers at least once a week, 40,7% of these are in the mountain zone, 37% - hill and 22.2% - plain.
- the majority though, over 55% responded that they never read newspapers, thus, access to information is denied

**Table 5. Evaluation of autodidactic profile by reading newspapers**

| Specification        | Um | Mountain | Hill  | Plain | Total |
|----------------------|----|----------|-------|-------|-------|
| Yes, every day       | No | 1        | 6     | 6     | 13    |
|                      | %  | 3.3      | 20    | 20    | 8.9   |
| At least once a week | No | 11       | 10    | 6     | 27    |
|                      | %  | 22.8     | 20.7  | 20    | 30    |
| Not                  | No | 18       | 14    | 18    | 50    |
|                      | %  | 60       | 46.67 | 60    | 55.56 |

Source: Necula Raluca , 2012, questionnaire, perception and dissemination of agricultural innovations, Buzău County [5]

**Table 6. Evaluation of autodidactic profile by reading magazines**

| Specification        | Um | Mountain | Hill | Plain | Total |
|----------------------|----|----------|------|-------|-------|
| Yes, every day       | Nr | 1        | x    | 1     | 2     |
|                      | %  | 3.3      | x    | 3.3   | 2.2   |
| At least once a week | Nr | 6        | 6    | 10    | 22    |
|                      | %  | 20       | 20   | 20.7  | 15.2  |
| Not                  | Nr | 23       | 24   | 19    | 66    |
|                      | %  | 76.67    | 80   | 63.3  | 45.5  |

Source: Necula Raluca , 2012, questionnaire, perception and dissemination of agricultural innovations, Buzău County [5]

So far, the specialised magazines (magazines with agricultural profile) the answer of those who have not read is worrisome 73,3% , their distribution map has been quite forthcoming (34,9% of Bisoca, 36,4% of the Pietroasele, 28,7 % of Gheraseni). Among those who read daily magazines, 2,2%, 1 is from the Bisoca and 1 of Gheraseni. At least once a week have answered 24.4%, 45,4 % are from Gheraseni, 27,3% from Pietroasele and 27,3% from Bisoca.

**Table 7 Profile evaluation by participating in information meetings.**

| Specification  | Um | Mountain | Hill | Plain | Total |
|----------------|----|----------|------|-------|-------|
| Always         | No | x        | x    | 6     | 6     |
|                | %  | x        | x    | 20    | 6.67  |
| Whenever I can | No | 3        | 3    | 1     | 7     |
|                | %  | 10       | 10   | 3.3   | 4.8   |
| Sometimes      | No | 7        | 7    | 6     | 20    |
|                | %  | 14.5     | 14.5 | 20    | 22.2  |
| Never          | No | 20       | 20   | 17    | 57    |
|                | %  | 66.7     | 66.7 | 56.7  | 63.3  |

Source: Necula Raluca , 2012, questionnaire, perception and dissemination of agricultural innovations, Buzău County [5]

For those who are interested in agriculture news, of national and european programs , information meetings are the best. 6,67% of the total respondents, ie 6 respondents, all from the plain area said they always attend meetings; 7,8% of the total, how many times they can, 22,2% sometimes (almost equally distributed for the villages studied), and the majority, 63.3% do not engage in such activities never.



The role of the SAPARD programme was to create the necessary deployment of a modern agriculture and sustainable development of rural areas in the candidate States.

SAPARD program was intended to promote the takeover of the acquis communautaire and gradual adaptation market mechanisms governing principles CAP [4].

**Table 8. Analysis of knowledge concerning SAPARD and FARMER programmes, PNADR**

| Specification                             | Um | Mountain | Hill | Plain | Total |
|---|----|----------|------|-------|-------|
| Yes, good                                 | Nr | 7        | 3    | 12    | 22    |
|   | %  | 14.5     | 10   | 40    | 15.2  |
| I heard about them but I do not know more | Nr | 14       | 18   | 11    | 43    |
|   | %  | 29.0     | 60   | 22.8  | 29.7  |
| Not                                       | Nr | 9        | 9    | 7     | 25    |
|   | %  | 30       | 30   | 14.5  | 17.3  |

Source: Necula Raluca , 2012, questionnaire, perception and dissemination of agricultural innovations, Buzău County [5]

The FARMER was "a set of measures intended to help transform the small farms in commercial farms, to strengthen and improve access to farm financial resources" [3] almost a quarter – 24.4%-of those who participated in this poll, know the programs that have been implemented for the development of agriculture in Romania, most of them, being from Gheraseni. Among them were people, most who have heard about these programs but do not know more, 47,8% of the total.

The share of those who do not know the SAPARD and the FARMER programmes, is with a few percent over the share of those who are well informed, 27,8%, due to the fact that they did not have the needed information regarding European support, or did not have access to such information.

**Table 9. The channel's broadcast on new technical innovation.**

| Specification   | Um | Mountain | Hill | Plain | Total |
|-----------------|----|----------|------|-------|-------|
| A neighbor      | Nr | x        | 2    | x     | 2     |
|                 | %  | x        | 4.2  | x     | 2.2   |
| A specialist    | Nr | 6        | 5    | 8     | 19    |
|                 | %  | 20       | 10.4 | 16.6  | 13.1  |
| A family member | Nr | 2        | 7    | 2     | 11    |
|                 | %  | 4.2      | 14.5 | 4.2   | 7.6   |
| Someone Else    | Nr | 14       | 3    | 4     | 21    |
|                 | %  | 29.0     | 10   | 8.3   | 14.5  |
| Nobody          | Nr | 8        | 13   | 16    | 37    |
|                 | %  | 16.6     | 26.9 | 53.3  | 25.5  |

Source: Necula Raluca , 2012, questionnaire, perception and dissemination of agricultural innovations, Buzău County [5]

We are also interested in farming, how the respondents manage to update information on technical developments. Over 41% responded that they don't have a person to inform them regularly, many justifying that are old to be interested on technical news. The remaining 59% of polled responded with the following proportion: 2,2% are informed by a neighbor, 21,1% obtain information from a specialist, a 12,2% consult with a family member and 23,3% have indicated another person whose keeping them up to date with developments in the technical field.

## CONCLUSIONS

1. Due to the rather large distance to the city of Buzau and the mountain zone which makes movement more difficult, leaving from Bisoca is more difficult, as most of respondents said arrive in Buzau less than once a month. For the other two villages, an impediment is for some of them the age quite old.

2. In the analysis of innovation, we have used a number of questions, and we have tried to make a connection between two of them "A householder who don't do as the others do , is not a good householder?"and "A householder who try new techniques is a good householder?". The answers to the two have released a link quite small, only a part of respondents agreeing with both questions posed, resulting not necessarily following the others householders means to adopt new methods.

3. Nearly a quarter – 24.4%-of those who participated in this poll, know the programs that have been implemented for the development of agriculture in Romania, most of them, belong to the village Gheraseni. Almost half of the polled, only heard about these programs but do not have more information.

4. How respondents manage and update information about technical news, is also an important aspect of our study and the way they responded, emphasize the fact that for most there is no person to inform regularly.

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# THE EVOLUTION OF AGRICULTURAL PRODUCTIONS IN BUZĂU COUNTY DURING THE PERIOD 1999-2010

NECULA RALUCA<sup>1</sup>, NECULA DIANA<sup>2</sup>

## Abstract

*Agriculture is an important sector of economic activity of the County, we observe in this respect, the special quality of the arable land. This is why it is necessary the knowledge not only of the agricultural productions, but also of the value of agricultural production, which we have analyzed in this paper. One of the main issues is that the level of crop productions is due to climate conditions for the period 1999-2010, but in great measure to the level of the existing technical-material endowment at the level of farms. For the animal production we observed that it has had a descending trend in this period, for the main categories of animals.*

**Keywords:** Agriculture, crop production, animal production; value of the agricultural production sector; agricultural services.

## INTRODUCTION

Buzău County territory holds a share of 2,7% in the total agricultural area of the country, as well as 2.3% of the total population. The land potential of the County is framed on the three forms of relief, namely: plain (where arable land predominate), hill (the vineyards and fruit plantations are the specific branches) and mountains (where cattle breeding is based on large expanses of pastures and meadows). Regarding the crops structure, we can enumerate the following: cereals (wheat, rye, barley, oat, maize, sorghum); technical crops (sugar beet, flax, rapeseed, sunflower); vegetables (peppers, cucumbers, onions, cauliflower, pumpkin, beans, peas, carrot, dill, parsley, parsnips, radishes, tomatoes, lettuce, spinach, celery, garlic, cabbage, Eggplant); fruits (apricots, cherries, walnuts, apples, quinces, pears, plums, cherry trees, shrubs (blueberries, blackberries, raspberries, wild strawberries); vineyards (such as those from Breaza, Merei, Zorești, Pietroasa, Cernătești, Râmnicu Sărat, Zărnești, Rușetu). Also you can add branches of animal sciences, such as raising cattle, pigs, sheep and poultry [1].

## MATERIAL AND METHODS

We have gathered data from the Statistical Yearbook of Buzau County and processed them with the indicators below.

In their evolution, the indicators can be evaluated by different methods. We describe below the method for indices with fixed base and chained base, and annual growth rate.

Annual growth rate [2] =  $r_{1999-2010} = \sqrt[n]{\prod (p_1/p_0)} - 1$ ; in which:

$R_{1999-2010}$  = annual growth rate;  $\prod p_1/p_0$  = indicators of chained growth

## RESULTS AND DISCUSSION

The cultivated areas and the average productions obtained per hectare determined the oscillations of vegetal productions in the considered period.

Thus, the total production in 2010 to the wheat, barley and camp vegetables exceeded with 101,7%, 358,5% and respectively 68,8% those obtained at the beginning of the period. On the

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other hand, for maize, potato, sunflower the accomplishments of the last year had smaller values with 19,6%, 24.4% and respectively 37.7% compared with the reference year 1999.

**Table 1 The evolution of vegetal productions for the main crops in Buzau County during the period 1999-2010.**

| Culture          | UM | 1999   | 2000   | 2005   | 2008   | 2009   | 2010   |
|------------------|----|--------|--------|--------|--------|--------|--------|
| Wheat and Rye    | to | 127052 | 128691 | 136761 | 292241 | 201877 | 256263 |
|                  | %  | 100.0  | 101.3  | 107.6  | 230.0  | 158.9  | 201.7  |
| Barley           | to | 9921   | 8606   | 10926  | 23795  | 23309  | 45485  |
|                  | %  | 100.0  | 53.9   | 110.1  | 239.8  | 234.9  | 458.5  |
| Corn             | to | 480846 | 241904 | 467927 | 168681 | 159572 | 386569 |
|                  | %  | 100.0  | 50.3   | 97.3   | 35.1   | 33.2   | 50.0   |
| Sunflower        | to | 67506  | 45055  | 59864  | 51938  | 51171  | 42084  |
|                  | %  | 100.0  | 66.7   | 88.7   | 47.8   | 75.8   | 62.3   |
| Potato           | to | 20935  | 15184  | 17604  | 14392  | 17733  | 15831  |
|                  | %  | 100.0  | 72.5   | (4.1)  | 68.7   | 52.6   | 75.6   |
| Field vegetables | to | 63422  | 54285  | 111260 | 112097 | 106433 | 107037 |
|                  | %  | 100.0  | 53.2   | 175.4  | 176.7  | 167.8  | 168.8  |

Source: Statistical Yearbook of the Buzau County, 2004,2007, 2011 CSD Buzau[3]

Vegetable productions made in the private sector have had also an increasing trend.

Thus, the limits of these weights were of 83,3% to 99,1%, for wheat and rye; 44,8-99,1% at barley; 96,7-99, 7% for maize; 84,4 to 98,6% for sunflower; 99,2% – 100% for potatoes and 94,9– 99.9% for field vegetables. The analysis of accomplishments for fruit-growing sector is presented in table 2.

**Table 2 Total production of the fruits species and grapes in agricultural individual farms , in the Buzău County I during the period 1999-2010**

| Category                  | UM | 1999  | 2000  | 2005  | 2008  | 2009  | 2010  | Compared to 1999 (%) | Annual growth rate (%) |
|---------------------------|----|-------|-------|-------|-------|-------|-------|----------------------|------------------------|
| Fruits<br>Total of which: | t  | 25894 | 29286 | 70041 | 44310 | 50862 | 88837 | 343.1                | 11.78                  |
| Plum                      | t  | 12487 | 15066 | 42460 | 25927 | 34586 | 60477 | 484.3                | 15.42 refined          |
| Apples                    | t  | 6045  | 7485  | 19625 | 9585  | 6685  | 18341 | 303.4                | 10.62                  |
| Pears                     | t  | 1931  | 1705  | 1967  | 1372  | 1800  | 2679  | 138.7                | 3.02                   |
| Peaches                   | t  | 247   | 356   | 521   | 773   | 779   | 844   | 341.7                | 11.82                  |
| Grapes                    | t  | 49314 | 69007 | 19682 | 81403 | 76457 | 38019 | 77.1                 | -2.0                   |

Source: Statistical Yearbook of the Buzau County, 2004,2007, 2011 CSD Buzau[3]

From the data presented above we see that, for the total fruit production sector, production have permanently increased , so that at the end of the period the total fruit production was more than 243% higher as compared with 1999, with variations between species from 38.7% to 384,3.

In terms of production of grapes was very fluctuating and in the year 2010 , it was with 22,9% lower compared with the reference year 1999.

The vegetal productions level was due to climate conditions of the years, but in great measure of the extent of the existing technical-material endowment at the level of farms.

**Table 3. The evolution of agricultural livestock productions at the main species in Buzau County during the period 1999-2010.**

| Animal product            | UM               | 1999  | 2000  | 2005  | 2008  | 2009  | 2010  |
|---------------------------|------------------|-------|-------|-------|-------|-------|-------|
| Meat of bovine animals    | To. live weight  | 33100 | 35300 | 9448  | 9169  | 6297  | 5312  |
|                           | %                | 100.0 | 106.6 | 28.5  | 17.2  | 11.8  | 9.9   |
| Pig meat                  | To. live weight. | 13400 | 11600 | 12495 | 11146 | 10565 | 11688 |
|                           | %                | 100.0 | 86.6  | 57.9  | 83.2  | 49.0  | 54.2  |
| Chicken meat              | To. live weight. | 8323  | 10531 | 20150 | 19959 | 16682 | 5622  |
|                           | %                | 100.0 | 126.5 | 242.1 | 239.8 | 200.4 | 41.9  |
| Milk from cow and buffalo | Thousand hl      | 1108  | 1192  | 1637  | 1335  | 1254  | 1113  |
|                           | %                | 100.0 | 107.6 | 147.7 | 120.5 | 113.2 | 139.5 |
| Eggs                      | Mil PCs.         | 154   | 139   | 222   | 251   | 245   | 198   |
|                           | %                | 100.0 | 90.3  | 144.2 | 163.0 | 159.1 | 128.6 |
| Extracted honey           | To.              | 294   | 366   | 457   | 409   | 467   | 387   |
|                           | %                | 100.0 | 124.5 | 155.4 | 139.1 | 158.8 | 131.6 |

Source: Statistical Yearbook of Romania, INS, 2011[4]; Statistical Yearbook of Buzău County, CSD, 2011[3]

The data in table 3 shows that the product of meat, bovine and swine, production had a descending trend, being lower in 2010 with 84% and respectively 12.8%. Chicken meat had a very significant growth until 2009, because in 2010 production was less with 32.6% compared with 1999. Milk product, in 2005 the production has increased by more than 47%, after which the trend was down; and in 2010 topped lightly the one in 1999. The eggs and honey productions have achieved maximum in 2008 and 2009, so that in 2010 they will be higher with 31.6% and respectively 28.6% compared to those realized in 1999.

Productions made in the private sector have set very high shares as follows:

- meat of bovine animals, from 98.4% up to 100%;
- the meat of swine, from 98.2% to 99.9%;
- the chicken meat and eggs – 100%;
- the milk of cow, from 97.5% up to 100%;
- the honey extracted from 97,6% up to 99.5%.

For the County, the level of the agriculture situation summary is output by the structure of the value of production of agricultural frame. In table 4, are presented comparative structures for vegetal, animal and agricultural services, in the dynamic of 2001-2010, where it can be highlighted the following issues:

**Table 4 The structure of the value of agricultural production in the private sector in Buzau County, for the period 2001-2010**

| Agricultural branches | Forms of ownership | Um      | 2001   | 2005    | 2008    | 2009    | 2010    |
|-----------------------|--------------------|---------|--------|---------|---------|---------|---------|
| Total                 | Total              | mil lei | 734.8  | 1219.86 | 1745.7  | 1466.4  | 1839.1  |
|                       |                    | %       | 100.0  | 166.0   | 237.6   | 199.6   | 250.3   |
|                       | Private property   | mil lei | 714.40 | 1175.70 | 1700.20 | 1430.10 | 1796.10 |
|                       |                    | %       | 100.0  | 164.6   | 238.0   | 200.2   | 251.4   |
| Vegetal               | Total              | mil lei | 478.00 | 725.50  | 1191.40 | 872.40  | 1358.00 |
|                       |                    | %       | 100.0  | 151.8   | 249.2   | 182.5   | 284.1   |
|                       | Private property   | mil lei | 461.30 | 685.50  | 1147.60 | 838.50  | 1315.80 |
|                       |                    | %       | 100.0  | 148.6   | 248.8   | 181.8   | 285.2   |

| Agricultural branches | Forms of ownership | Um      | 2001   | 2005   | 2008   | 2009   | 2010   |
|-----------------------|--------------------|---------|--------|--------|--------|--------|--------|
| Animal                | Total              | mil lei | 244.90 | 486.50 | 548.20 | 585.40 | 472.60 |
|                       |                    | %       | 100.0  | 198.7  | 223.8  | 239.0  | 193.0  |
|                       | Private property   | mil lei | 244.40 | 485.80 | 547.60 | 584.30 | 472.60 |
|                       |                    | %       | 100.0  | 198.8  | 224.1  | 239.1  | 193.4  |
| Agricultural services | Total              | mil lei | 11.80  | 7.70   | 6.10   | 8.60   | 8.50   |
|                       |                    | %       | 100.0  | 40.6   | 32.1   | 72.9   | 72.0   |
|                       | Private property   | mil lei | 5.4    | 4.40   | 4.90   | 7.30   | 7.70   |
|                       |                    | %       | 100.0  | 50.6   | 56.3   | 52.1   | 88.5   |

Source: Statistical Yearbook of the Buzău County 2011; CSD Buzău [3].

The value of production in the agricultural sector that was obtained in the private sector grew up in 2010 with 151,4% compared to the reference year 2001, representing percentages between 97,2%- 97,7% compared to the total value of the branch.

In the vegetal sector, the production value in private, was greater with 185,3% , registering between 96,5 and 96,6% from total amount obtained in vegetal production.

The value of livestock production made in private was higher in 2010 with 93,3%, with shares between 99,8-99,9% of the total value of the animal products obtained.

The amount of the production part of the agricultural services in the private farming has been lower in the year 2010 with 11.7% compared with 2001, achieving shares between 56,5-89.8% compared to the total value of agricultural services obtained.

**Table 5. The annual evolution of the value of agricultural production in Buzău County, for the period 2001-2010**

| Structure             | UM                         | 2001   | 2005    | 2007    | 2008    | 2009   | 2010   |
|-----------------------|----------------------------|--------|---------|---------|---------|--------|--------|
| TOTAL                 | mil lei                    | 734.88 | 1219.86 | 1154.46 | 1745.77 | 1466.4 | 1839.2 |
|                       | %compared to the year 2001 | 100    | 165.9   | 157.1   | 237.5   | 199.5  | 250.3  |
| Vegetal               | mil lei                    | 478.1  | 725.58  | 644.44  | 1191.47 | 872.4  | 1358   |
|                       | %compared to the year 2001 | 100    | 151.7   | 134.7   | 249.2   | 182.5  | 284.0  |
| Animal                | mil lei                    | 244.94 | 486.55  | 502.96  | 548.2   | 585.4  | 472.6  |
|                       | %compared to the year 2001 | 100    | 198.6   | 205.3   | 223.8   | 239.0  | 192.9  |
| Agricultural services | mil lei                    | 11.85  | 7.74    | 7.05    | 6.1     | 5.3    | 5.3    |
|                       | %compared to the year 2001 | 100    | 65.2    | 59.4    | 51.4    | 45.1   | 44.6   |

Source: Statistical Yearbook of Romania, INS, 2011[4] ; Statistical Yearbook of Buzău County , CSD, 2011[3]

From table 5 stands out that the total value of agricultural production obtained in Buzău County was higher in 2010 with 150,3% as compared with the reference year.

The higher contribution is due to vegetal production, whose value increased in the same period by 184%. A substantial increase has been achieved at the animal production, on which the amount has increased to 35,5%.

In terms of agricultural services, it emphasize a lower value of production by 28,3% compared with 2001.

## CONCLUSIONS

From the analysis of the evolution of the main agricultural productions of the Buzău County in the period 1999-2010, we observe a number of relevant issues which may constitute prerequisites for the activity for the next period:

- The total achieved productions were higher at the end of the period for wheat, barley and field vegetable; at the same time, maize, sunflower and potato yields were lower than in 1999.

- Note the character of fluctuating productions from all cultures caused by yields per hectare and occupied areas.
- In the sector of fruit growing, notice a significant increase in production of fruit species at the end of the considered period, while a decrease in the production of grapes. And in this sector we see a oscillatory character during the period.
- The analysis of livestock production in the period 1999-2010 shows that the beef and poultry production was lower in 2010 with 84% and 12.8%; until 2009, the increases were significant, so that by 2010 production dropped to 32.6% compared to the beginning of the period.
- Milk production has increased by 47 percent in 2005, after which the trend was downwards, so that in 2010 will exceed with little the one in 1999.
- The eggs and honey, the biggest productions were made in 2008 and 2009, and in 2010 they have overrun by 28, 6% and 31.6% those obtained in 1999.
- An important indicator, is that of agricultural production value obtained in the private sector, which has seen a rise in 2010 with 151,4%, representing 97,2-97,7% of the total value of the branch.
- Within the framework of vegetal production, the private production value increased by 185,3% in 2010, with shares of 96.5-96,6% from total amount obtained in crop production.
- The value of livestock production in the private sector was more with 93,3% in 2010, resulting shares between 99,8-99,9% as compared with the total amount achieved in animal production.
- The output of the private sector of agricultural services had a lower value with 11.7% in 2010, 56,5-89.8% of the total value of services obtained.

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# AGRICULTURAL KNOWLEDGE DEVELOPMENT - INVESTING IN PEOPLE (HUMAN CAPITAL)<sup>1</sup>

NJEGOVAN ZORAN<sup>2</sup>, JELOČNIK MARKO<sup>3</sup>, POTREBIĆ VELIBOR<sup>4</sup>

## Summary

*In the paper the authors are challenging the human capital in agriculture issues and its ability to ensure development and reduce poverty, bringing such way better quality of life for the entire people. They are also discussing the role of high educational system – the causes of inefficiency and value of education people are getting. They are criticizing the position that land is overestimated and human capital underestimated, trying to identify that human capital (education, skills, experience and health are) is representing the base for the further national development. The hypothesis of the paper is to elaborate need for the better quality of the people as a factor of its prosperity. In that purpose they are bringing the critical approach to the high educational system and from that point of view the possibility of efficient management of knowledge and human capital as well.*

**Key words:** *agriculture, knowledge, agro-economy, high education, human capital.*

## INTRODUCTION

Problems of agricultural development from an aspect of its role and importance within the overall economic development are the subject of permanent and comprehensive research in number of paperwork. From primordial times people have been constantly confronted to care about food and available agricultural-production space (primarily about the way of its use)<sup>5</sup>. In parallel, considering the decreasing physical abilities of land, due to its improper and excessive use for various human needs, appears a large dose of pessimism. Logically, adequate solutions have been usually sought and offered in this direction, but with, it seems, negligence of role and importance of constantly increasing human capabilities, which are able to compensate and substitute decreasing physical abilities of natural factors. This topic has been discussed for many times over the previous decades, but with resignation should be noted that mentioned approach didn't find larger foundation, neither in professional, nor in political circles. Having this in mind, the basic intention was pointing to fact that investing in quality and knowledge of the population (primarily producers of goods and services in agriculture) can largely determine future appearance of national agriculture, as well as complete economy.

Mentioned supports practice in many underdeveloped countries where by investing in knowledge were achieved significant development results. In other words, human factor can be taken as a critical factor in poverty while the land for itself is not. Therefore, for a long time developed attitude about the importance of total population to agricultural production, in modern conditions has to be expanded by necessity of quality of population (human capital) improvement, how this can be the only possibility for improvement of economic prospects for the wellbeing of poor people. This includes development of home and work experience, gaining of general and specific knowledge, information and skills through education, as well as investment in better health and physical predisposition of population. Such this model of investment was everywhere and always brought success, except in cases of unstable political conditions, as well as under recent affects of global economic crisis. Because of that, although the investment in research and development in agriculture look justified, not so often this topic is neglected or inadequately approached.

Fact is that economists in developed countries are mainly dealing with the economy of developed, and that economists in developing countries follow their *Western paragons*. Meanwhile is forgotten that

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<sup>5</sup> According to Rikardo, D. and Malthus, R. T., one of the most important world theorists at the end of XIX and beginning of XX century.



majority of world population is poor and that only by knowing of economics of poverty will be implied conversance of larger segment of real applicable economics. Or, as most of the poor people are engaged in agriculture, surely that then elements of agriculture economics will be known much better. Unfortunately, economists rarely understand the preferences and limitations of scantiness that poor (small farmers are classified here too) are facing with.

Encourage the fact that in Serbia in recent decades, despite relative underdevelopment and low-incomes, agriculture evinced potential and economic capacity to produce sufficient quantities of quality food, both for its own and for population of countries in near and far surrounding. Support for aforementioned can be found in larger understanding of economics of agriculture and human capital, especially the segment of economics of research.

It should be commended reactions showed under the influence of current trends in agriculture by critical group of farmers (leaders of developmentally oriented husbandries) toward their relation to new, more efficient production techniques and technologies, which ensured better production completeness, relative prosperity and better family economics. Aforementioned represents considerable improvement, how in Serbia still dominates traditional view that the land and natural factors, as well as the number of people engaged in agriculture are the main factors of agricultural development. According to that it isn't a great mistake in statement that *the land is overestimated*. This indicates the fact that development of industry of mineral fertilizers, agro chemistry and seeds, then genetic engineering and other scientific-technical disciplines can provide growth of agricultural production without use of additional land surfaces (production growth is achieved even in conditions of its decreasing). On the other hand, additional labour is not required, as the development of agricultural mechanization and general computerization ensured its physical substitution in favour of smaller group of educated manpower that disposes with special skills and knowledge. Thus in both cases come to increase of human capita limportance<sup>6</sup>.

## RESULTS AND DISCUSSION

### *Quality of the human factor is underestimated*

It's not difficult to conclude that the land doesn't represent a key factor of poverty in some countries (in agriculture too), but the human factor, for sure, can be. This is especially obvious during the economic crisis, which may be the primary element of overall economy exhaustion in long-term period, when usually most of measures with so-called physical character (mostly product of fiction and extrapolation) doesn't show desired effects. Problem overcoming is exclusively transferred to the field of poverty consequences elimination (inadequate living standard). Meanwhile, as cause of newly arisen problems, approach to spiritual poverty elimination (adoption of knowledge and skills) looks unsatisfactorily and inadequately. Strategic orientation of the state towards knowledge-based economy during the previous years at least increased on marketing level the importance of human resources.

Although more and more companies connect their financial success with the value of human capital of their employees, there is a paradox that while the company accepted the general importance of human resources corporate investment in human resources (such are basic skills, qualitative training and financing of further education) are internally rarely measured, or in other words there is still unknown how much benefit mentioned investments made. Unfortunately, enterprises rarely show level of investment in human resources in their financial statements [16].

Permanent care for children, gaining of home and work experience, adequate approach to information, skills overmastering and specialization through training, investment in the health care system,

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<sup>6</sup> Characteristics of gained population quality, represented by value that can be increased with adequate investments, are usually treated as *human capital*. Starting from the fact that all human abilities are or innated or acquired, then the element of quality that a human being achieves during his lifetime contains a certain amount of cost. According to aforesaid, the learning process increase human capital, but it is also the cost as for the state budget, as well as for the individual and its close surrounding (family, company, etc.).

etc. can improve the general quality of the population. Expectations of producers in agriculture are formed through new opportunities and incentives on which they want, or are able to respond. On the other hand, aforementioned incentives expressed through the parity of final products prices and input prices were greatly deformed under certain level of state influence, what can decrease the potential contribution of agriculture as a vital branch of national economy.

Although within the segment of manpower contingent focused to agricultural production, there are individuals with different abilities to recognize, observe (interpret) and initiate various actions as response to actual trends in surrounding. All of them represent a significant resource of national entrepreneurship. Nowadays, state with its inadequate interference, or no interference in agricultural flows, succeed to deform significantly the interactivity and relationships within the production chains, or to destimulate (discourage) the entrepreneurial spirit of agriculturalists (especially small farmers). In fact, agriculture should be observed as a highly decentralized system, in which the ability of resource allocation is immanent to number of employees in micro production units (husbandries)<sup>7</sup>. Having this in mind, there is often impression that in agricultural activities, at which state overtook the entrepreneurial function, did not come to improvement in relations and establishment of stimulating business environment, or did not come to more efficient allocation of resources that would contribute modernization of agriculture.

Funds availability (domestic and foreign), good organization of activities and capable scientific-research sector represent the base of function of entrepreneurship and efficient agriculture development. Lack or insufficient development of some of mentioned elements has resulted that many developing countries do not use completely their developmental potentials [4]. Hence, the potential obstruction and lack of real technical-technological modernization (as source of new experiences that will improve human skills and allow the gaining of valuable information/knowledge) does not favor the developmental efforts within the national agriculture.

National research-scientific auditorium often points out the absence or low level of human capital quality, what also indicates most of available literature from the domain of economic-analytical statistics of population. Observations go even to the thesis that poorer population in rural areas is not motivated to overcome with skills that can affect the improvement of human capital quality, as they are too tied to tradition. However, this assertion is in collision with the fact that poor agriculturalists successfully manage marginal costs and marginal returns within the lines of agriculture in which they are active<sup>8</sup>.

Therefore, farmers ability in developing countries (mainly in transition countries too) to realize, interpret and respond to emerging situations, in the context of production risks, represents important competitive advantage of human capital. In economy that ability is defined as entrepreneurial capacity of farmers, which in conditions of Serbian agriculture is mainly a consequence of experience, knowledge and skills gained through a working activities (*learning by doing*). Of course, more and more complex economic conditions impose a necessity of formal knowledge owning as a basis for further development and improvement.

### ***Education as an investment in human capital***

We are witnesses of often criticism of higher education in Serbia, where in focus is mostly actual implementation of the Bologna education system, which is done, as many critics say *on Serbian way*. It's usually reproached to educational institutions that they don't unreservedly support state policy, redirecting the discussions into those which generate the most public impact. Before all is said that faculties ignore fairness in student enrollment, that tuition fees are not adequate or that they should be abolished (because education is something that should be accessible to all), that exists disparity of evaluation criteria of

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<sup>7</sup> Modern business practice knows three basic concepts for employee organization: simple exchange seller-buyer, hierarchy and team work [3]. Until the 21st century we had a domination of hierarchy, where everyone had a certain position of a superior and/or subordinate. As opposed to that, the networks (in some cases production chains) have no centre/leader, everyone has certain autonomy and authority could be achieved by possessed permanently improved knowledge and skills [5].

<sup>8</sup> In favor to this comes the fact that in Serbia for years are achieved relatively low yields, not because farmers "*do not know how to produce*", but because they usually work in highly unstable and exhausting production conditions.

adopted knowledge by students, etc. So, in light of generality and populism are ignored essence, importance and mission which have to be carried by the act of pure education. Simply, there is some kind of animosity toward the universities for their devoted work on promotion of science and research, as on development of technologies that arise from these knowledge. In developing countries such as Serbia is unwillingly observed any help from abroad addressed to improvement of education, science and research.

It should be pointed out that higher education in each society is highly specialized and expensive activity. According to that, it should not be a concealed valve to state authorities to cover their inability to create new jobs, or to delay the time of confrontation with reality by misuse of education, how that can greatly impairs its quality. On the other hand, there is potential imbalance of generally scarce resources invested in state universities against the valuable services they provide. At the same time, it is much easier to calculate the costs of higher education<sup>9</sup> than its value. The value can be expressed by absolute gain in the wages of highly educated people, not in their relative difference, because no matter if education is valuable or not, the expected higher earnings (not the costs of education) primarily justify investment in it [6]. Based on these, relatively reliable information, the students, their parents, or public institutions and their employees can make allocation (investment) decisions.

During the time, at the global level, planning jobs (labor force) was not present reliability, so until now there is no economic model of planning that can solve mentioned problem in a longer-term<sup>10</sup>. Limitations of such models (projections) were proving in recent decades for many times through scientific researches [10]. Therefore, it is emphasized that the development in developing countries such as Serbia integrates at least three limitations: general capital scantiness; lack of long-term character of most of investments in higher education; and greater time-lag in public than in private behavior during the process of learning from previous experiences.

Capital from abroad (most often FDI and donations) is always under doubt, while relatively scarce domestic funds are usually spending irrationally (primarily on the maintenance of buildings, eventually on new equipment and minimally on investment in human capital). Hence, the total investments observed in relation to the GDP do not give a real picture, because already small financial resources for education and science also include investments in physical infrastructure (buildings). So, in 2009 from the national budget were allocated only about 4,5% of GDP for education and about 0,3% for science. On the other hand, even with meeting the recommended level of public investment in education from 6% of GDP (UNESCO), or 3% in science (according to EU request) can be asked a question of mentioned funds allocation (in which extent the funds for education and science are observed as investments in long-term sustainable development of the knowledge-based society, and in which part only as current expenditures).

Establishing appropriate teams (pool of researchers and university professors) in all segments of science and education, in agriculture too, can be a great developmental potential of Serbia. Also, long-term character of instrumentarium for monitoring and evaluation of scientific and applied research in agriculture should contribute to its modernization. Unfortunately, slowness in learning of authorized agencies that education policy needs to be constantly adjusted to changeable economic conditions has to be pointed out. Instead, it often happens that the authorities adjust economic conditions to its' own policy. Therefore, critics of higher education potentially underestimate the contribution of research to growth of agrarian economy (underestimating with that profession too). To this certainly contributes those employees (within the sphere of scientific-research activities) which for various motives put themselves at the service of mentioned slowdown policy. On the other hand, by using common sense and logic can not be bypassed the fact that each country, including Serbia, must develop and nurture its educational and research, in other words developmental capacity according to spirit of civilization progress.

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<sup>9</sup> Usually are not reconsidered expenditures of parents for their kids' education that are not negligible.

<sup>10</sup> The European Employment Strategy represents mechanism of law made to set up the employment policies of Member States in EU. Priorities and targets are agreed at EU level, but the national governments are completely responsible for formulating and implementing the required policies. On other hand, the National Action Plan for Employment is the main instrument of implementation of active employment policy in Serbia. It represents annually defined goals and priorities of employment policy and establishment of programs and measures which have to be realized and implemented, in order to achieve the set of planned goals and provide the sustainable incensement of employment [15].

According to international classification (ISCED), higher education includes higher (first degree of high education – college) and high (university) education. During the school year 2009/2010 education activity in Serbia was done in 59 colleges with 43.707 enrollees (11.674 graduated students), as well as in 130 faculties with 183.065 enrollees (31.871 graduated students). As indicator of success of higher education implementation is taken the share of population aged 30-34 years with completed higher education process within the total population aged 30-34 years. In compare to EU average (32,3%), as well as to some neighboring countries (Bulgaria 27,9%, Hungary 23,9%, Slovenia 31,6% and Croatia 20,5%), height of mentioned indicator in Serbia in 2010 (19,2%) can be considered as relatively low. Strivings of EU is to raise the value of presented indicator to 40% until 2020. According to conclusions of competent authorities, in future higher education in Serbia will be exposed to changes, both in segment of financing from the state budget and in adjustment of enrollment policy with labor market needs and national development priorities (according to available capacities of higher education institutions).

Currently, system of higher education in Serbia includes few accredited faculties that are active within agriculture, veterinary medicine and forestry: Faculty of Agriculture in Belgrade, Novi Sad and Zubin Potok, Agronomic Faculty - Čačak, Faculty for bio-farming - Sombor, Faculty of Veterinary Medicine - Belgrade and Faculty of Forestry - Belgrade. Among mentioned institutions only one is private [1]. Agriculture as a discipline is researched also in few high agricultural and food-technological schools. Besides formal education system, transfer of knowledge and human capital improvement in agriculture is provided by public scientific-research institutes, system of extension service, Ministry of Agriculture and some big companies professionally involved in agro complex<sup>11</sup>, which organizes series of educational workshops, conferences, seminars, lectures, etc.

Among group of institutes active in some segment of agriculture and accredited by the Ministry of Education and Science next could be stressed: Institute of agricultural economics Belgrade; Institute of scientific appliance in agriculture Belgrade; PKB Agroekonomik Padinska Skela; Institute of field and vegetable crops Novi Sad; Maize research institute „Zemun polje“ Belgrade; Fruit research institute Čačak; Institute for animal husbandry Zemun; Institute for vegetables and crops Smederevska Palanka; Institute for plant protection and environment Belgrade; Institute of pesticides and environment protection Belgrade; Institute of veterinary of Serbia in Belgrade; Institute of land Belgrade; Institute of forage crops Kruševac; Institute for medicinal plants “Dr Josif Pancic” Belgrade; Institute of forestry Belgrade; Institute for meat technology and hygiene Belgrade; Institute for water resources „Jaroslav Cerni“ Belgrade; etc.

Generally, presence of traditionalism in agriculture brings to situation that many potentials and possibilities of science are used insufficiently, while the appliance of knowledge and innovations is on relatively low level. Principles of sustainable agricultural and rural development impose the need for greater willingness of local farmers to adjust their production to economic requirements of GAP, as well as to current EU agricultural legislation [14]. For decades national science has successfully parried on world market by creation of high-yielding sorts and hybrids of crops and fruits. Also, domestic breeders have created numerous high-productive species in livestock breeding production. Although there is no tight functional connection between scientific potentials of faculties and institutes and individual producers, cooperatives and enterprises in agro-complex, there are much more cases of establishment of good cooperation between scientific-research institutions and producers, when successfully are implemented and monitored technological transfers in agriculture. Some good examples are contemporary orchard of company Delta Agrar - Čelarevo (area of 100 ha under world recognized sorts of apple is covered by information system, frost protection, anti-hail network, drop-by-drop irrigation system, Global Gap standards, etc.), as well as modern greenhouse of concern Farmakom M.B. - Debrec (area of 4,2 ha under vegetables is heated by geothermal water of 53<sup>0</sup>C, while production process, irrigation and microclimate maintaining is completely computerized). So, modern agricultural business needs to adapt to

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<sup>11</sup> In months with low level of activities in agriculture (usually in winter) certain companies through workshops and presentations in rural areas pass to farmers, besides marketing messages, certain level of modern technologies applicability contained in their products and services.

changes on the global market in order to become more competitive. Efforts to increase productivity include knowledge and innovations on policy, institutional, program and household level [17].

### *Expectations and opportunities*

Criticism to higher education comes also into direction that it does not meet expectations in terms of social needs. Elitism is underlined, or even that it causes an outflow of population from rural areas. On the other hand, many believe that the quality of education, not politics, is the biggest cause of unemployment among large number of graduates, as education and organized university research are obsolete in many parameters. Of course, regarding this topic opposite opinions can be said too, but real answer comes from a simple question - What do we want to achieve by education? Efforts to realize the expectations that will go beyond the level of possible, lead to distortions in resources allocation. Therefore, recognition of the realistically assessed boundaries of possible can be the basis for the achievement of positive results within the system of higher education, and consequently within the processes of research, transfer of knowledge, as well as in modernization and development of agricultural activities.

Higher education isn't without limitations, as well as isn't untouchable. It's limited by available resources (material and human), teaching staff quality, administrative and organizational structure of faculties and universities. Mentioned limitations are result of production abilities of the universities (higher education), limited by systemic and measurable values. Approach that leads to potential problems and gaps is pronounced by fact that society has to provide possibilities for human capital improvement. This is additionally potentiated by long-term practice from the socialist period that education (regardless the students quality) is the right, and in lesser extent obligation of the population. Mentioned generally implies the weakness of human nature that selfishly and ambitiously leads the fight for higher education diploma, but not to gain, keep and use the offered knowledge as a scarce (critical) resource. Accordingly, the real question may be reduced to different interpretation of political intervention, i.e. whether educational goals are under political system, or policy became a means of strengthening and redefining of educational goals.

Unfortunately, fundamental (inner science) critique of education policy is often not welcome, although it is considered normal in the developed countries, since it is really important for determination and efficient troubleshooting. In advanced world from higher education is expected to produce reformers (carriers of idea of improvement), and that faculties and universities have to be proactive conductors of this activity. In Serbia, expectations within this segment are also exaggerated, as the reforms can not instill new values in a short period, because they are mostly directed to form, and not to essence. Maybe is not the best parallel, but it is enough picturesque that in period 2000-2012 in Serbia are changed eight ministers of agriculture. In mentioned period is done almost the same number of strategies of agricultural development, which in practice have not brought many positive results, but more often they have created greater confusion. One can concluded that the expectations from reforms were substantially exceeded the ability of involved teams within the official department.

### *Basic deformations of education in Serbia*

Usual estimate is that higher education systems in Serbia perform their function inadequately. Rating goes so far as to significantly differentiate public from private universities, giving priority to the first one (according to quality of teaching and primarily by profit orientation private are considered inappropriate)<sup>12</sup>. Parents are often aware that their children do not receive adequate quality of education, but on this point little can be done. On the other hand, students are primarily focused on obtaining of faculty diploma, giving to gained knowledge minor importance. Faculty marks for students' knowledge assessment are more and more unreliable, given that the average high school score which freshmen bring

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<sup>12</sup> It is an open secret that owners of private universities (faculties) are primarily profit-oriented, so that quality of education and level of knowledge that students gain are in the background. In this regard, there is small number of faculties that care about their long-term strategy, as most are more concerned to operative, often significantly affecting the quality of teaching staff activities.

to faculty is little higher than what they are later able to demonstrate through teaching. This is another indicator of decreasing quality of teaching, as by rule during the fight for students they are received in system with different level of previously adopted knowledge<sup>13</sup>.

Therefore, the price (value) of schooling does not have to be the main goal of the education system, what at persons oriented to knowledge provokes a desire to study outside the country, creating the phenomenon of *brain drain* that has disastrous consequences for society in developing countries (estimations are that besides aristocratic, more often in use are kakistocratic principles). Criticism addressed to mechanisms established to coordinate the basic elements and goals of education usually touch the system of financing of institutions of higher education. So the funding mechanism, according to number of enrolled students, can manage faculties to turn to quantity and not quality. Furthermore, deficiency of public control of used funds is pointed out too, what also accelerate the deformation processes. On the other hand, relatively scarce financing funds initiate a number of problems to higher education institutions. However, question is whether they, no matter how plenteous they are, will lead to improvement of institutions and employed staff quality.

Fact is that individual can not convey (physically sell) its educational capital to others. Personal fund of human capital is generally unique, and if beside that certain individual posses appropriate skills and if constantly improves and increases existing fund by further education during the lifetime, it can be exchanged for a certain sum of money on the labor market. By comparison of the production and consumable services of the human and physical capital can be concluded that they have many common features. They are in many segments of economic activities complementary, or even substitute each other. It should agree the fact that highly qualified labor is important for performing of working activities. For example, physical capital, expressed through agricultural mechanization reduces the number of needed workers, however their modernization requires more and more skilled labor force. Even more plastic example of their substitution is creation of first computer (ENIAC) at the beginning of last decade, whose enormously rapid development significantly substitute certain intellectual functions of a qualified personnel, but never completely.

As in all high education system main problems that have touched agronomy and agro-economic science are: system does not provide or provide minimum practical skills; educated young experts have limited possibilities to find a job; small number of scientific papers published in recognized international journals; small share of micro-agro economic research in total number of researches in agriculture, etc.

## CONCLUSIONS

We are witnesses of negligence of role and importance of constantly increasing man capabilities, as relevant element of progress that is able to compensate and substitute decreasing physical capacities of the natural production factors. In this regard, it is particularly important (especially in developing countries) to make significant investments in creation and strengthening of human capital, how will be avoided a vicious circle of poverty. Investment in population quality (in increase of the level of their knowledge) largely determines future outlook of the national agriculture, or complete economy. Accordingly, agronomic and agro-economic science and profession in Serbia represent important carriers and promoters of quality agricultural development, what means that investment in education and research in agriculture can be definitely considered justified.

Economics of agriculture has its own specificities that are not only caused by dependence on natural conditions, but also from the fact that it occurred in a specific economic circumstances. As the most of agriculturalists live in poor rural areas, development of agro-economics requires good knowing of such an environment that is very different from environments of other economic activities. Therefore, knowing of the agro-economics in Serbian conditions means mastering the economics of poverty. Also, under the influence of widespread opinions and tradition, in national science, and especially in practice, the

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<sup>13</sup> If the classes are set up by the best students, others will not be able to follow, therefore, any simplification of criteria and teaching will be the base of education quality (value) decrease.

importance of physical factors of production (before all land) is overestimated, while the human capital is underestimated. Land isn't key factor of poverty, but human capital is for sure. Figuratively speaking, as in infertile areas of Pešter plateau, as well as in fertile areas of Banat farmer is de facto poor.

Human capital in agriculture or at least its elite part is formed within institutions of higher education (agricultural faculties). Unfortunately, more and more often are criticism of higher education in Serbia, where mostly is criticized the form (not content), or the consequences (but not the causes). Without the focus on essence, significance and mission of education, is established a sort of animosity towards the universities, although they represent the bastions of science and research improvement, in other words technology transfer that arises from upgraded knowledge.

Also it has be pointed out relatively low level of financial resources that are invested in public universities, as well as the fact that it is much easier to calculate the costs of higher education than the value that it generates (value should be the decisive factor in the process of resources allocation). Regarding to this, the assessments are that planning of manpower in accordance with market needs during the time is proved to be very unreliable.

Although the competent bodies have significant authorizations, it is notable a certain dose of inertness in the adjustment process of official policy to dynamic and changeable economic conditions. Contrary to expectations, there are frequent attempts of economic conditions adjustment to their own policy what is in conflict with reality. Therefore, in criticism of higher education are usually make mistakes through underestimation of research contribution to agro economic growth (parallel, by this act agro economics as profession is underestimated too).

It can be concluded that higher education has its limits. Limitations are primarily in available physical and financial resources, teaching staff quality, organizational and administrative structure of universities and faculties. The fundamental criticism of higher education policy usually does not come to good response, what makes one think that the value of education is not the main goal of the education system. So, focusing on production and improvement of human capital can not surprise an increased presence of *brain drain* phenomenon, which significantly reduces developmental opportunities of Serbia. So far mentioned problem does not meet adequate long-term strategic solutions.

From the aspect of agriculture, establishment of competitive and innovative agro-sector can not be done without tight connection of public and private institution, as well as without good communication between government, systems of high education and science, agro-consultants, primary agricultural producers and processing industry. As current economic growth is dominantly based on technical-technological development and knowledge economy, that leads to conclusion that only with full application of achieved knowledge and its prompt transfer within the whole reproduction chain in agriculture could be created high-quality, safe and worldwide competitive food-products.

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# SOFTWARE APPLICATION USING .NET PLATFORM FOR A COMPANY THAT PRODUCE AND SELLS WINE

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## Abstract

*In the first part of the paper is presented a short review of the main concepts regarding .NET platform and VSTO. In the second part of the paper we present application of the software that will attach a code, to a Word document. The software application attach Office code to a document, for a company that produces and sells wine, using the .NET platform and this application transform a static document, in a dynamic document. The developed application is important in wine sales, because by querying the database application we can obtain different information that can bring good profits and optimize the costs of a company that produces and sells wine.*

**Key words:** VSTO - Visual Studio Tools for Office, framework, EOM – Excel Object Model, WOM - Word Object Mode

## INTRODUCTION

The software application presented in this paper, attach Office code to a document, for a company that sells wine, using .NET platform, and provides novelty in domain in that it is an application that combines text formatting in a document, attribute that is specific for text editing applications, layout facility, allowing to a user to customize the document. Adding such a code to a document, transforms a static document, in a dynamic document and user can implement different functionalities. Thus this software application is different from other software applications used in online virtual space of commerce, being a new marketing concept.

Viticulture is a production branch of agriculture and through placing on the market of vine and wine products (grapes, raisins, grape juice, wine, wine distillate) we can achieve significant profits. Using a software application for a company that produces and sells wine is necessary because it can optimize costs and increase profits.

We present below some information about .NET platform [2]. From historically point of view, .NET Framework [3] has evolved continuously since his launch, each version added new features and capabilities [4] main ones are illustrated in Figure 1.

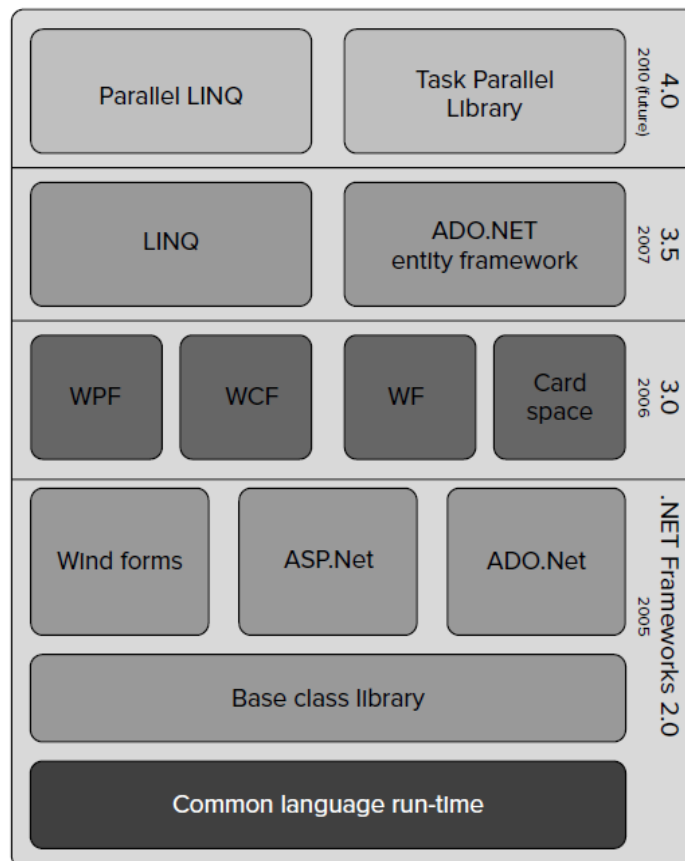
In terms of architecture .NET Framework contains three components [1]: Common Language Run-time (CLR), the Base Class Library and finally frameworks and development technologies that are reusable solutions which can customize a wide variety of programming tasks [7].

We can say that .NET Framework [9] is an application development platform that implements an efficient mechanism for memory allocation to store data and instruction [10].

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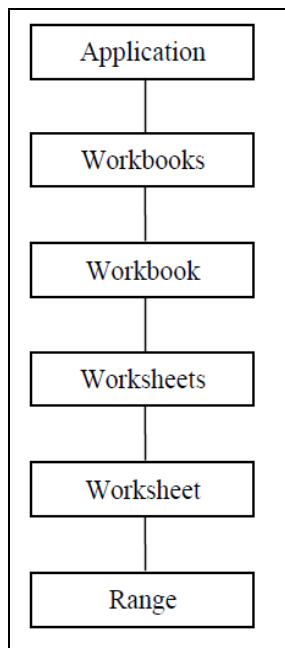


**Figure 1. Evolution of .NET Framework platform**  
Source: Dårdalä Marian, 2012

## RESULTS AND DISCUSSION

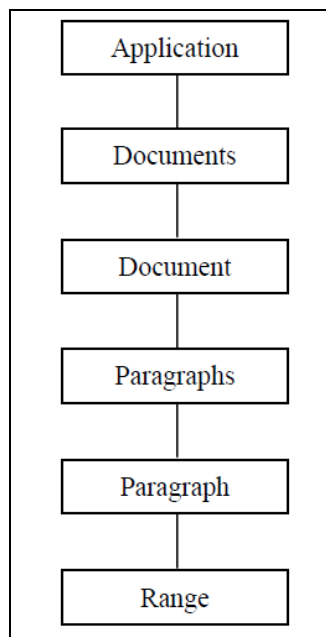
### Development of Software Applications based on Microsoft Office

Applications based on programs from Office suite are particularly useful in practice because they use existing facilities of Microsoft Office applications. To develop such applications or extensions on .NET platform, there was built a framework known as Visual Studio Tools for Office (VSTO). It provides .NET programming support for Word, Excel, Outlook, PowerPoint, Project, Visio and InfoPath in Visual Studio. VSTO framework allows Word and Excel documents to use .NET programming features such as support for data binding, controls that can be used in the windows form's etc. Writing code for applications based on Office require the use of a model known as OOM - Office Object Model. This model contains a set of classes and objects needed to control Office applications. Models are customized according to applications they control, for example EOM - Excel Object Model, WOM - Word Object Model etc. In general, these models contain a hierarchy of classes and are organized so that in the root of the hierarchy Application class is located, that models behaviour of a particular application from Microsoft Office software package. In addition to Application class which is present in all hierarchies, there are particular classes in the hierarchy that depend on the application itself and correspond to entities that are actually manipulated in Office applications. For an Excel application [2], the main classes and their relationships are shown in Figure [5].



**Figure 2. Excel Object Model hierarchy model**  
 Source: Dârdală Marian, 2012

For Word application, the main classes and their relationships are shown in Figure 3.



**Figure 3. Word Object Model hierarchy model**  
 Source: Dârdală Marian, 2012

Using a series of OOM programming model [6] applications can be developed in different ways [12]:

- Construction of existing functional modules as dynamic link libraries (DLL - Dynamic Link Library).
- User applications that interact with Office applications [8] .
- Attaching code to Office documents.

## Presenting Software Application that attach code to a document for a company that produces and sells wine using Net platform

Software application will attach a code to a Word document. This application was developed using the framework Visual Studio Tools for Office (VSTO) from the .NET platform and is designed for a company that produces and sells wine. Software application was performed to define custom operations that will be performed only on the data of a Word document well defined. The application will build a document template that will insert specific controls to a Word document, such a user to be able to customize the document. The application will attach to the document a Document Actions type window that will contain two buttons with custom functionality: *Add data in table (Adauga date in tabela)* and *Upload data in document (Incarca date in document)*.

We have developed an application in Visual Studio 2010, building a project based on Office 2010, of Word 2010 Document type. Application made by us will be attached to a document, building a new document with Visual Studio interface, document called WordDocument5.

Whether we are in design mode, Word application interface will allow us to edit a new document as we can see in Figure 4. The document is built as a template because it has a fixed part represented through regular text and a part that will customize the information about wine which is represented in the document, through appropriate controls for interaction. In this case we have a document template for describing a variety of wine through the following ten characteristics: *wine category (categoria de vin)*, *origin vineyard (podgoria de proveniență)*, *wine type (tipul de vin)*, *grade (clasa de calitate)*, *manufacturer (producator)*, *alcoholic strength (taria alcoolică)*, *crop year (an recoltă)*, *stock (stoc)*, *price (preț)* and *quantity of grapes (cantitate de struguri)*. For data editing, we assign controls from the Word Controls group existing in the window ToolBox of Visual Studio with these features. For fields: *wine category (categoria de vin)*, *origin vineyard (podgoria de proveniență)*, *grade (clasa de calitate)*, *manufacturer (producator)*, *alcoholic strength (taria alcoolică)*, *crop year (an recoltă)*, *stock (stoc)*, *price (preț)* and *quantity of grapes (cantitate de struguri)* were used Plain Text Content Control type controls in order to edit values, while for the *wine type (tipul de vin)* field we have used Drop Down List Content Control type control, to choose from several options value (in our case we have three values: *White (Alb)*, *Red (Rosu)* and *Rose (Rose)*).

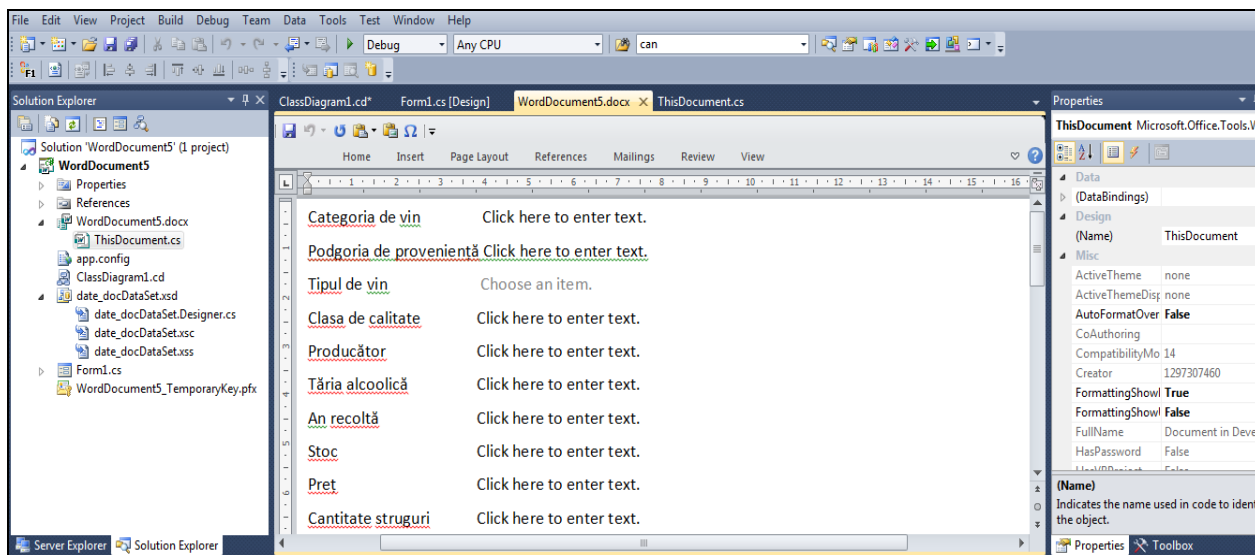


Figure 4. Editing the new Word document

A new document WordDocument5.docx is created and it has an associated This Document class that allows to any programmer to respond to events triggered in working with the document and to extend document functionality. Data will be introduced in document controls, and these will be retrieved and will be stored in a database called date\_doc.accbd. This database was created in

Access program from Microsoft Office suite, creating a table called *Wines (Vinuri)*. *Wines* table fields are: *ID*, *wine category (categoria de vin)*, *origin vineyard (podgoria de proveniență)*, *wine type (tipul de vin)*, *grade (clasa de calitate)*, *manufacturer (producator)*, *alcoholic strength (taria alcoolică)*, *crop year (an recoltă)*, *stock (stoc)*, *price (preț)* and *quantity of grapes (cantitate de struguri)*.

We will build two buttons: *Add data in table (Adauga date in tabela)* and *Upload data in document (Incarca date in document)*. *Add data in table (Adauga date in tabela)* button serves as a trigger backup operation on the database. *Upload data in document (Incarca date in document)* button is used to load data from Word template table.

By launching the application from Visual Studio we will load the document template in Word, as can be seen in Figure 6. On the right side of the document, in Figure 5, we can observe that appeared the Document Actions form and in it appeared two buttons that were defined in the method described above.

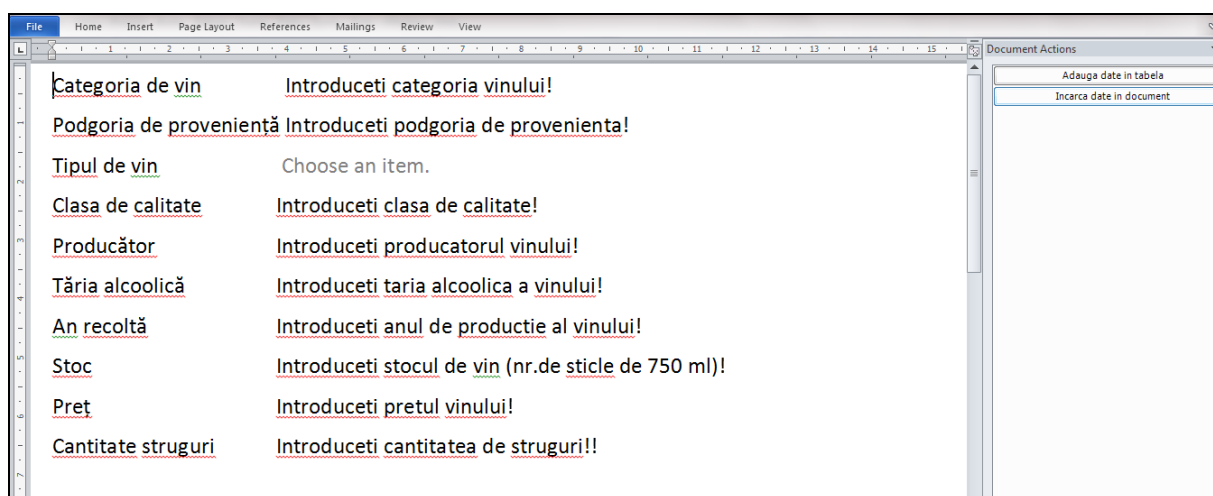


Figure 5

Next controls will be filled with data from the document, and if is pressed the *Add data in table (Adauga date in tabela)* button the data will be added to the existing data in *Wines (Vinuri)* table from *date\_doc.accdb* database. To enter data into the *type of wine (Tipul de vin)*, the user must choose one of three available options *White (Alb)*, *Red (Rosu)* or *Rose (Rose)*. If the user does not select any option, it is advised that it must choose something from the list, to add data in the table. The existing options in the selection list for the *Type of wine (Tipul de vin)* field can be seen in Figure 6.

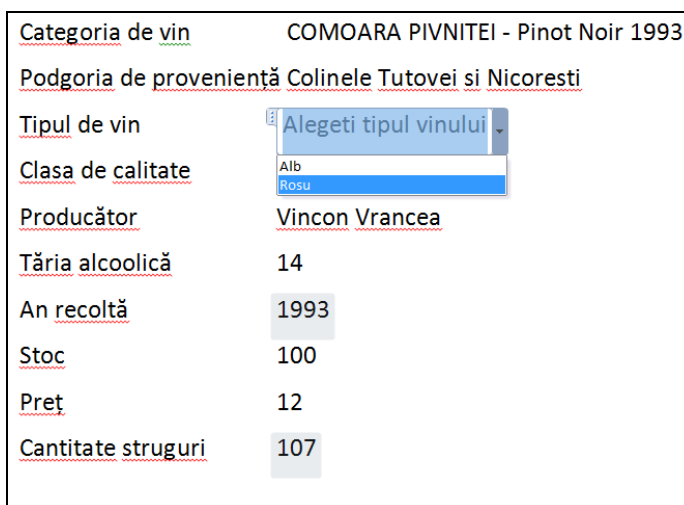
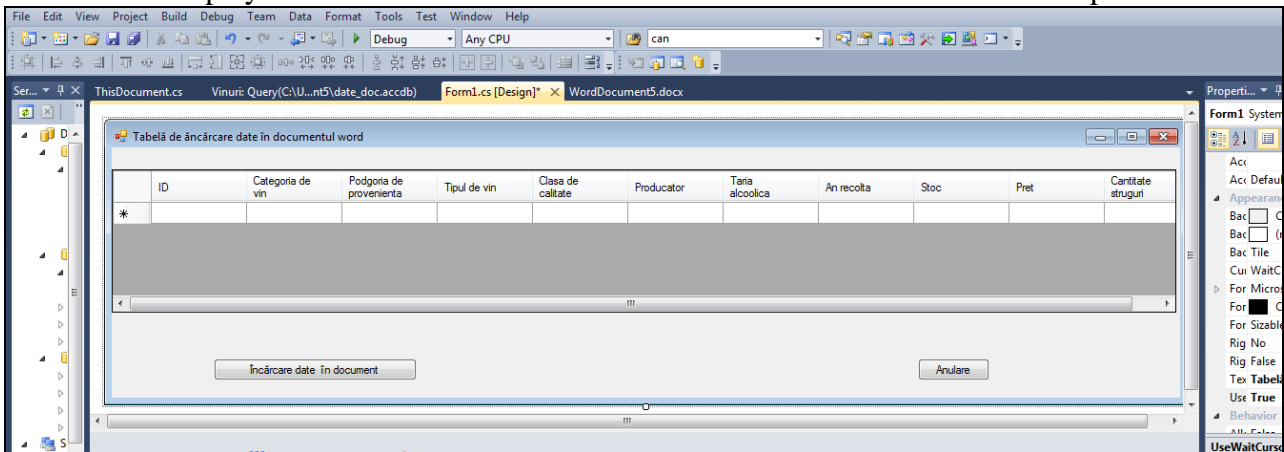


Figure 6 Selection options for *Type of wine (Tipul de vin)* field

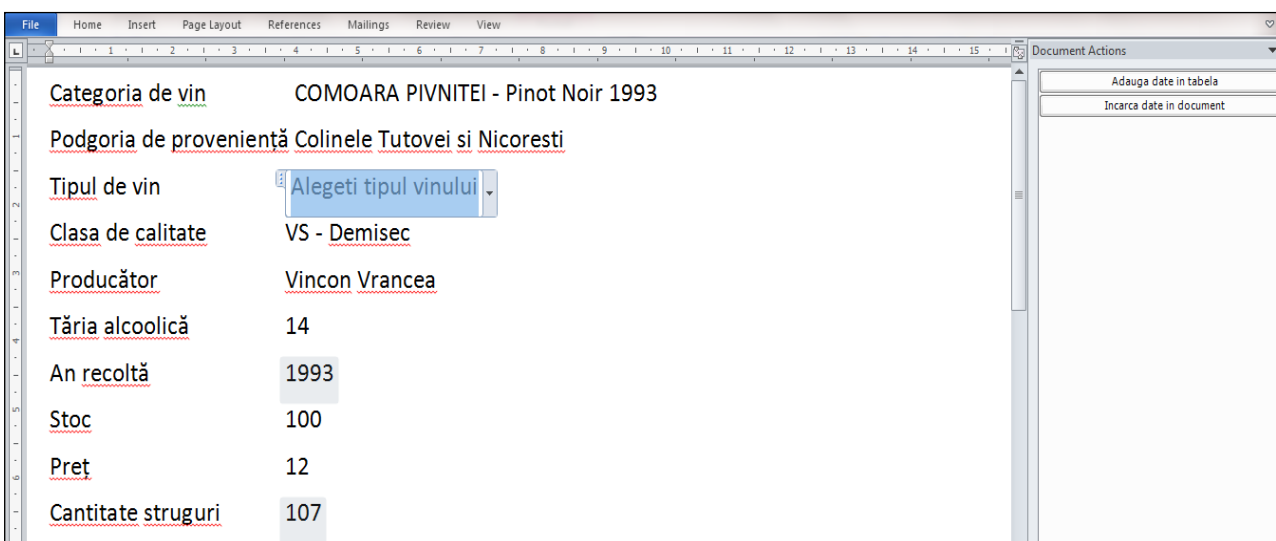
Retrieving data from table and loading them into Word document template is done by pressing the *Upload data in document (Incarca date in document)*, which will cause a dialog window that displays a DataGridView from which the user can select their desired tuple.



**Figure 7 Dialog window for data selection**

To create *Upload data in document (Incarca date in document)* button functionality, we must add a new form to our project through Windows Form application from Visual Studio.

New Form1 form is created, the name Form1 is the default name given by Visual Studio. We will add to this form a DataGridView type control (gv) that will bind to *Wines (Vinuri)* table for displaying tuples. Fields that will be displayed on the grid are: *Wine category (Categoria de vin)*, *Origin vineyard (Podgoria de proveniență)*, *Wine type (Tipul de vin)*, *Grade (Clasa de calitate)*, *Manufacturer (Producător)*, *Alcoholic strength (Tăria alcoolică)*, *Crop year (An recoltă)*, *Stock (Stoc)*, *Price (preț)* and *Quantity of grapes (Cantitate de struguri)*. The selection of a tuple from DataGridView type control marks that data will be loaded into the Word document, which is reflected by pressing *Load data in the document (Încărcare date în document)* button. The second operation possible is cancellation of selection by pressing *Cancel (Anulare)* button. Dialog window is closed by pressing either of two buttons. In Figure 7 we can see the newly created form that contains selection grid for tuples. In this figure we can see the two buttons, *Upload document data (Încărcare date în document)* and *Cancel (Anulare)*. We will introduce in document template new data wine categories, as is shown in Figure 8.



**Figure 8**

If the new wine type is not introduced, we will press *Upload document data (Încărcare date în document)* button in the document and a message appears in the window shown in Figure 9

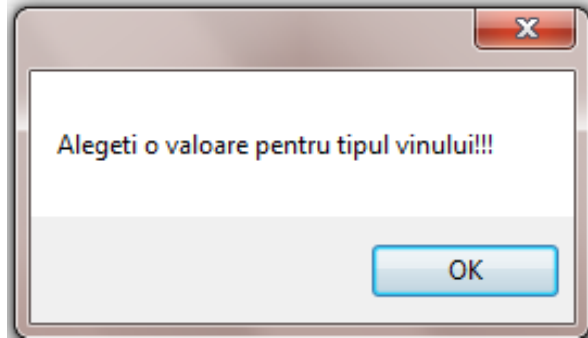


Figure 9

After that we will introduce *wine type (tipul vinului)*, which in our case is *Red (Rosu)*, we have in the Word document all information about a new category of wine, as can be seen in Figure 10.

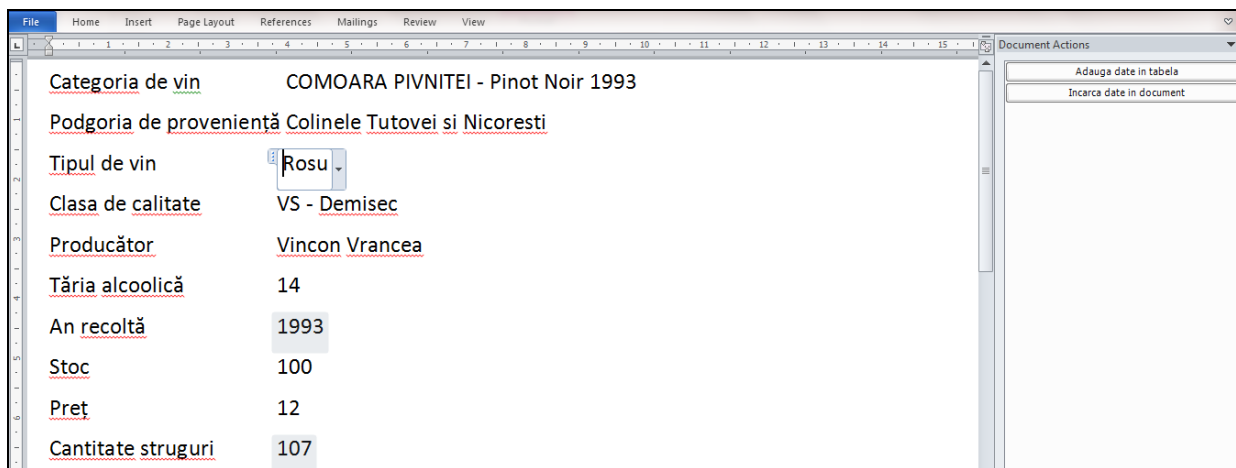


Figure 10

It is time to introduce new data in the table. This is done by pressing the *Upload data in document (Incarca date in document)* the effect will be the input and displaying data in table successfully, as can be seen in Figure 11.

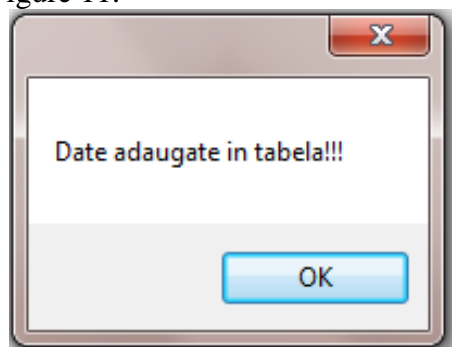
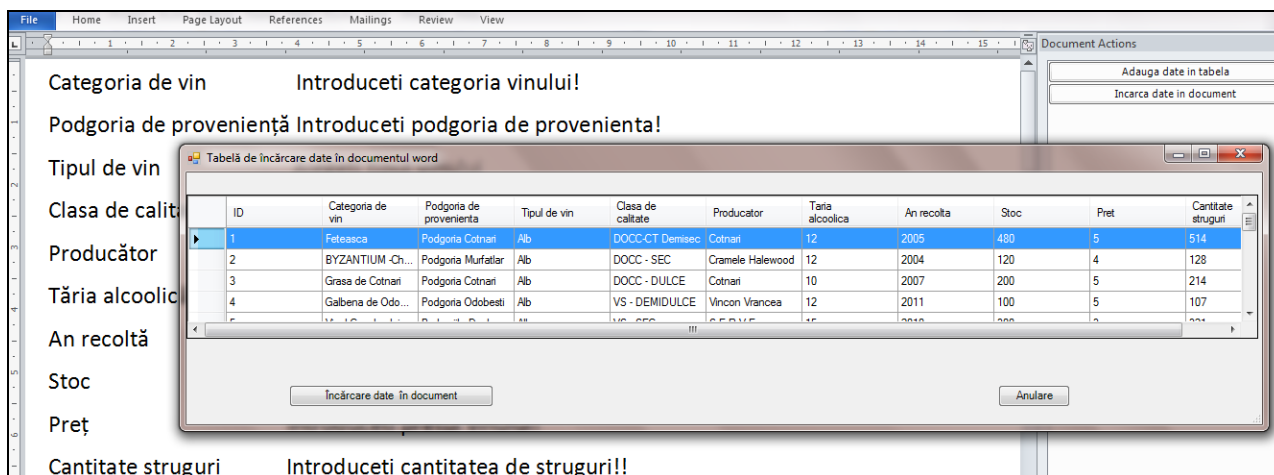


Figure 11

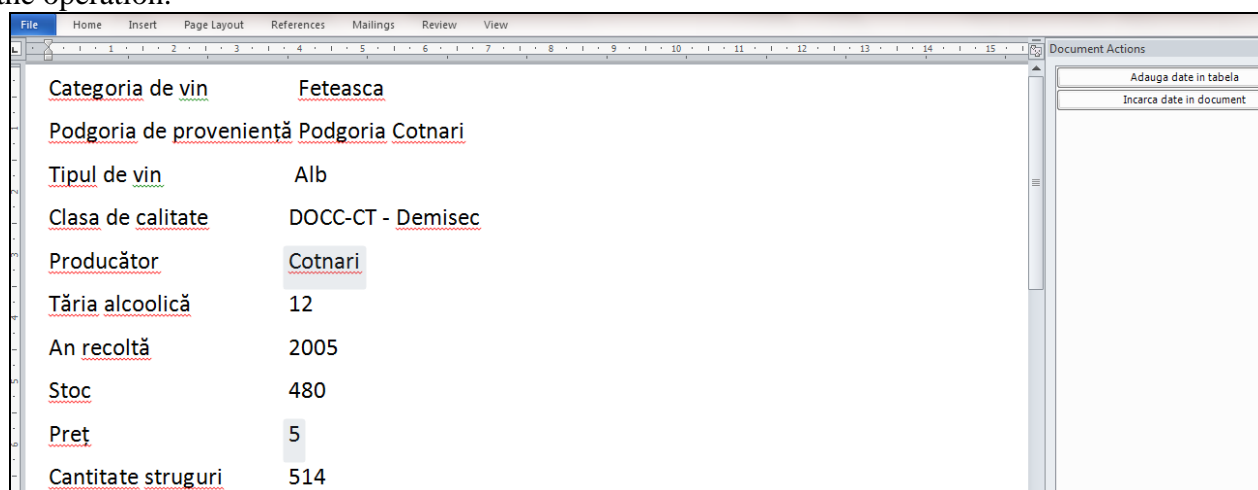
Retrieval of data from the database and uploading them into the Word document is presented below, as we can see in Figures 12 and 13. From Document Actions form of Word document, we press the second button, *Upload data to document (Incarca date in document)* and dialog window is now built into the project with grid control populated with data from table *Wines*

(*Vinuri*) of *date\_doc.accdb* database. An application user may select a tuple from grid as can be seen in Figure 12, and then it has two options: either to load selected data or cancel the operation.



**Figure 12**

Therefore, by pressing the *Upload data into the document (Încărcare date în document)*, we will load the selected data in the Word document and by clicking *Cancel (Anulare)*, we can cancel the operation.



**Figure 13 Uploading selected data in document**

In Figure 13 we can see that after we have pressed the *Upload data into the document (Încărcare date în document)*, the selection window that contain the selected grid data will be closed and will be loaded in the appropriate fields from the Word document.

## CONCLUSIONS

The software application develops an application based on Word and it has characteristic that custom code sequence will run in the same process with the Office application. Code associated documents does not need to be registered, however it is associated with the document by adding specific properties which are stored in the document file. When the Word document is loaded then we consult properties and we load the associated code of document. We have developed an application on .NET platform using the Visual Studio Tools for Office framework (VSTO). VSTO programming supports .NET for Word, Excel, Outlook, PowerPoint, Project, Visio and InfoPath in Visual Studio, and in our application we have used for a Word application. Within our application



for a company that produce and sells wine, I noticed how Visual Studio Tools for Office framework, allows Word documents to use programming features from .NET platform.

Through this method we combine text formatting in a document, application-specific attribute which is performing for text editing, with facility layout, that allow users to customize the document. Therefore software application presented in this paper is different from software used in online virtual space of commerce, being a new marketing concept, in that if we add such a code to a document, it will convert the document from a static document, in a dynamic document and thus its user can implement specific functionality.

The application developed is important in wine sales, because after entering data relating to wine in the Word file, i.e. after the introduction of wine ten features of wine: *wine category (categoria de vin)*, *origin vineyard (podgoria de proveniență)*, *wine type (tipul de vin)*, *grade (clasa de calitate)*, *manufacturer (producator)*, *alcoholic strength (taria alcoolică)*, *crop year (an recoltă)*, *stock (stoc)*, *price (preț)* and *quantity of grapes (cantitate de struguri)* this data will be inserted automatically into the *Wines (Vinuri)* database. By querying this database we can get different information, such as stocks come from a particular producer, the grapes needed to be purchased from a vineyard to produce a certain quantity of wine.

Another advantage would be an information extraction from our database that comes directly to our Word document, where it can be further processed. All the information that can be extracted from the application software can optimize costs and can make good profits a company that produces and sells wine.

## ACKNOWLEDGEMENT

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# THE EVOLUTION OF THE MAIN INDICATORS OF AGRICULTURE IN THE NORTH-EAST REGION OF ROMANIA

OLTEANU VICTOR<sup>1</sup>

## Abstract

*In the article, we watched developments in the last 10 years, for the region of North-East of Romania, in the following areas: available land, technical-material base of agriculture, the agricultural area, agricultural crop Production, Livestock and crop production, livestock and farm animal animals a few inputs in agriculture: chemical fertilizers, plant protection treatments.*

**Key words:** *available land, improvements to land, crop production and cattle breeding*

## INTRODUCTION

The North east region is a development region in Romania, which was incurred, as well as other areas of regional development, following the adoption of law 151/1998 on regional development in Romania. According to the law, this is not an administrative-territorial unit and does not have legal personality. The region thus formed is on implementation and evaluation of regional development policy. The North-East region is made up of six counties in the historical region of Moldavia: Bacău, Botoșani, Iași, Neamț, Suceava and Vaslui. The total area of the region is 36,850 km<sup>2</sup>, with a population of 3.712.396 inhabitants (estimated 2010), making it the region with the highest density of the country.

The landscape is varied, and has included the full range of relief on the territory of Romania. Maximum altitude is 2,100 meters, of top of Călimani Mountains Pietrosul (Suceava County), and the minimum in the 100 meters, the Valley of the Prut River. Moldavian plateau is present in each of the six counties. The territories of the counties of Iași and Botoșani, Vaslui are sub-units of plain and Meadow belonging to the Plain and the embankment of the Prut River. The region is drained by a number of significant water eight courses, which is divided on the North-South direction, the largest catchments areas returning the Siret River (42.890 km<sup>2</sup>) and Prut (10.990 km<sup>2</sup>).

Climate varies according to relief. The annual average temperature of 0 ° C and a rainfall of 1400 mm on the highest mountain peaks in the Călimani temperatures 9.8 ° C (Bârlad) and rainfall of 450-500 mm (plain areas in the counties of Iași and Botoșani, Vaslui). The vegetation and fauna are determined by climate and terrain, ranging from Alpine and underalpin area on the mountain peaks in Romania on the second floor of the steppe, and the counties of Iași and Vaslui, Botoșani.

## MATERIAL AND METHODS

In this article the method of analysis was used in calculating the dynamics and interpretations have been made of the Land Fund, technical-material base of agriculture, the agricultural area, agricultural crop Production, Livestock and crop production, livestock and a few inputs in agriculture: chemical fertilizers, plant protection treatments to determine the context of the economic and development of agriculture in the region of North-East. of Romania.

## RESULTS AND DISCUSSION

### *Available land.*

As regards the evolution of the Land, presented in table 1 is this evolution in Dynamics, reference year 2000. Although the share of private property in land fund structure has increased in the period 2000-2010, a slight decrease of agricultural purpose (by 0.4%), and increasing non-

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agricultural surface instead. Reduction of the total agricultural area is due to the decrease in the areas for pasture (-2.3%), vines and vineyards (-18.8%), fruit orchards and nurseries (26.4%).

**Table 1 The evolution of the Land Fund in the period of use 2000 – 2010 (2000 = 100%)**

| Use form                           | Property type | 2000 | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  | 2010  |
|------------------------------------|---------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Total                              | total         | 100  | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
|                                    | private       | 100  | 100.2 | 101.3 | 103.1 | 104.0 | 104.9 | 107.6 | 109.4 | 109.8 | 109.7 | 111.1 |
| Agriculture                        | total         | 100  | 99.9  | 100.0 | 100.1 | 99.9  | 99.9  | 100.5 | 99.8  | 99.8  | 99.7  | 99.6  |
|                                    | private       | 100  | 99.8  | 99.8  | 99.5  | 99.4  | 99.5  | 99.3  | 98.5  | 98.0  | 97.7  | 97.2  |
| Arable                             | total         | 100  | 100.4 | 100.6 | 100.8 | 101.1 | 101.1 | 102.0 | 101.2 | 101.2 | 101.2 | 101.1 |
|                                    | private       | 100  | 100.4 | 100.6 | 100.7 | 100.9 | 100.9 | 102.2 | 101.3 | 100.5 | 100.4 | 99.9  |
| Pastures                           | total         | 100  | 98.7  | 98.8  | 98.9  | 98.1  | 98.3  | 97.2  | 97.9  | 98.3  | 98.0  | 97.7  |
|                                    | private       | 100  | 98.6  | 98.3  | 97.0  | 96.3  | 96.7  | 91.5  | 92.0  | 92.1  | 90.8  | 90.5  |
| Hayfields                          | total         | 100  | 100.5 | 100.5 | 100.7 | 100.4 | 100.4 | 103.0 | 101.4 | 101.4 | 101.6 | 101.5 |
|                                    | private       | 100  | 100.5 | 100.6 | 101.0 | 100.9 | 101.0 | 104.0 | 102.4 | 102.5 | 102.7 | 103.3 |
| Vineyards and nurseries            | total         | 100  | 97.1  | 94.7  | 90.3  | 87.1  | 87.2  | 87.7  | 82.5  | 78.8  | 78.2  | 77.9  |
|                                    | private       | 100  | 97.0  | 94.6  | 90.1  | 86.8  | 86.9  | 87.5  | 82.2  | 78.4  | 77.8  | 75.8  |
| Orchards and nurseries             | total         | 100  | 97.4  | 92.8  | 90.9  | 89.8  | 88.1  | 83.3  | 74.8  | 73.5  | 72.8  | 73.6  |
|                                    | private       | 100  | 97.0  | 92.2  | 90.3  | 89.0  | 87.2  | 85.5  | 76.6  | 75.6  | 75.1  | 73.5  |
| Total non-agricultural land        | total         | 100  | 100.1 | 100.1 | 99.9  | 100.1 | 100.1 | 99.4  | 100.3 | 100.3 | 100.4 | 100.6 |
|                                    | private       | 100  | 103.2 | 113.6 | 133.6 | 142.6 | 150.9 | 178.4 | 202.0 | 210.6 | 212.0 | 229.7 |
| Forest and other forest            | total         | 100  | 103.8 | 103.8 | 103.5 | 103.9 | 103.8 | 103.8 | 103.7 | 103.7 | 103.9 | 104.1 |
|                                    | private       | 100  | 116.9 | 154.5 | 210.4 | 236.3 | 259.8 | 361.1 | 416.2 | 450.8 | 458.6 | 496.3 |
| Water                              | total         | 100  | 99.9  | 99.8  | 97.6  | 97.3  | 97.3  | 100.0 | 100.5 | 100.2 | 100.3 | 99.8  |
|                                    | private       | 100  | 99.9  | 82.3  | 89.3  | 86.0  | 87.3  | 94.3  | 94.6  | 98.3  | 85.8  | 115.7 |
| Constructions                      | total         | 100  | 100.4 | 100.4 | 101.6 | 103.2 | 104.3 | 108.8 | 109.5 | 109.8 | 110.1 | 112.1 |
|                                    | private       | 100  | 101.5 | 101.9 | 108.9 | 112.2 | 113.7 | 122.9 | 124.2 | 124.3 | 124.4 | 126.2 |
| Communications routes and railways | total         | 100  | 99.9  | 100.0 | 99.8  | 99.8  | 99.6  | 97.2  | 97.6  | 97.7  | 97.5  | 97.1  |
|                                    | private       | 100  | 97.7  | 97.9  | 84.9  | 94.7  | 95.4  | 71.5  | 76.5  | 80.0  | 75.8  | 85.2  |
| Degraded and unproductive          | total         | 100  | 69.7  | 69.2  | 70.6  | 68.6  | 69.3  | 57.7  | 67.5  | 67.8  | 66.8  | 66.7  |

Source: Calculation on data from Statistical Yearbook of Romania 2001-2010

Of the total land, private property grew by 129,7 percent. This growth is mainly occupied with developments in the areas of forests and other vegetation, forest rose almost 5 times (in anul 2010 compared with 2000). On the other hand, degraded and unproductive land declined by 33.3%.

### ***Technical-material base of agriculture.***

In this region, from the point of view of agricultural equipment, surface arable the tractor is of 69 hectares (at the level of the year 2010).

**Table 2 Endowment with machinery and equipment in the period 2000-2010 (2000 = 100%)**

|  | 2000  | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  | 2010  |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Tractors                                 | 100.0 | 98.9  | 97.1  | 98.9  | 102.6 | 109.2 | 109.9 | 110.5 | 112.2 | 114.7 | 116.6 |
| Plows for tractors                       | 100.0 | 100.9 | 101.9 | 104.3 | 110.0 | 110.9 | 113.8 | 115.3 | 117.2 | 118.2 | 121.8 |
| Mechanical cultivators                   | 100.0 | 82.4  | 87.0  | 83.3  | 91.8  | 75.8  | 78.5  | 79.6  | 80.6  | 81.9  | 80.6  |
| Mechanical seeders                       | 100.0 | 98.1  | 98.2  | 98.1  | 101.0 | 105.8 | 110.2 | 110.6 | 114.3 | 116.3 | 118.4 |
| Mechanical machinery for spray and dust  | 100.0 | 105.6 | 93.1  | 93.9  | 90.7  | 86.0  | 90.1  | 96.6  | 92.7  | 92.5  | 75.4  |
| Mechanical combines for cereal harvest   | 100.0 | 91.2  | 89.5  | 87.2  | 85.2  | 88.3  | 86.7  | 86.4  | 81.6  | 84.7  | 84.3  |
| Mechanical combines for fodder harvest   | 100.0 | 74.4  | 60.6  | 55.2  | 56.7  | 32.0  | 39.9  | 37.9  | 37.4  | 40.9  | 37.9  |
| Mechanical combines for potatoes harvest | 100.0 | 106.4 | 110.3 | 126.5 | 135.8 | 136.8 | 132.3 | 143.6 | 151.9 | 159.1 | 158.6 |
| Hay and straw presses                    | 100.0 | 74.8  | 61.9  | 61.2  | 65.4  | 49.0  | 67.4  | 69.9  | 79.3  | 88.9  | 102.7 |
| Fodder vindovere                         | 100.0 | 81.6  | 68.9  | 68.9  | 63.1  | 51.6  | 57.8  | 56.1  | 54.5  | 57.4  | 54.1  |

Source: Calculation on data from Statistical Yearbook of Romania, 2001-2010.

The data in table 1.2, it appears that the low number of mechanical cultivators, with 19.4% of steam machines and dusty with mechanical traction, with 24,6% of their combinations for self-propelled harvesters with 15.7%, but the most drastic declines are observed to combine harvesters, self-propelled forage harvesters for having reached the level of 37.9% compared to the year 2000 and reference Fodder vindovere for animal feed decreased to 54,1% compared to 2000. A positive evolution is found at the level of their cars and harvested potatoes, their number increased to 58,6%. Positive developments have had and the number plows for tractors for tractors (21.8%), with mechanical seeders of mechanical (18.4%) and al mills for straw and hay with only (2,7%).

Taking into account that the arable of the region decreased during the analysis period, the increase in the number of agricultural machines do not represent an economic benefit for those working in agriculture. On the other hand, this increase is due to the increase in the share of private property in Land Fund total.

#### ***Agricultural plant area.***

North-East region is not a traditional region for the production of grain, and the meteorological conditions, redistribution agricultural areas and market requirements has shown that during the analysis period, farmers had turned his attention to the cultivation of industrial plants. The area under rape increased 6.7-fold, with soybeans grown by approximately 4.4 times, at the expense of, say, the area cultivated with cereals, sugar beet and pulses, which took most of the dramatic decrease in 2004, less than a third compared with the year 2000.

**Table 3 The main crops cultivated area in the period 2000-2010 (2000 = 100%)**

| Principally culture | 2000 | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009   | 2010  |
|---------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|
| Cereal grains       | 100  | 107.7 | 104.5 | 98.1  | 108.1 | 100.0 | 87.2  | 88.7  | 83.8  | 82.7   | 79.7  |
| Wheat and rye       | 100  | 144.2 | 136.6 | 96.0  | 134.6 | 129.2 | 98.3  | 105.8 | 105.1 | 102.1  | 97.6  |
| Rye                 | 100  | 81.8  | 81.1  | 81.9  | 143.3 | 153.5 | 133.5 | 95.0  | 123.2 | 133.5  | 93.8  |
| Wheat-total         | 100  | 145.8 | 138.1 | 96.3  | 135.0 | 128.6 | 97.3  | 106.1 | 104.7 | 101.3  | 97.7  |
| Common wheat        | 100  | 146.4 | 138.7 | 96.8  | 135.6 | 129.0 | 97.8  | 106.6 | 105.1 | 101.1  | 97.4  |
| Barley              | 100  | 96.0  | 108.2 | 62.9  | 49.2  | 74.9  | 63.0  | 76.0  | 77.1  | 85.0   | 62.3  |
| Maize               | 100  | 99.6  | 95.7  | 101.7 | 107.6 | 94.2  | 85.3  | 83.8  | 76.9  | 75.4   | 74.5  |
| Legumes             | 100  | 99.6  | 115.5 | 114.2 | 64.8  | 90.3  | 84.2  | 79.3  | 77.7  | 68.4   | 67.9  |
| Pea seeds           | 100  | 83.2  | 97.0  | 86.1  | 50.4  | 75.9  | 57.5  | 74.3  | 50.8  | 45.4   | 50.1  |
| Beans               | 100  | 103.6 | 120.2 | 119.8 | 67.8  | 94.1  | 89.5  | 81.1  | 84.0  | 73.8   | 69.8  |
| Oil plants          | 100  | 107.6 | 120.0 | 156.1 | 155.0 | 179.4 | 164.2 | 196.5 | 175.1 | 200.7  | 176.0 |
| Sunflower           | 100  | 111.6 | 116.8 | 152.5 | 148.6 | 166.9 | 138.1 | 141.3 | 124.4 | 128.4  | 123.7 |
| Rape                | 100  | 93.3  | 175.2 | 21.1  | 194.5 | 226.5 | 242.3 | 763.8 | 924.0 | 1259.7 | 667.1 |
| Soybeans            | 100  | 73.2  | 116.4 | 246.3 | 186.2 | 292.1 | 396.5 | 465.6 | 281.5 | 352.8  | 438.0 |
| Sugar beet          | 100  | 77.9  | 88.1  | 72.3  | 28.8  | 36.8  | 67.2  | 50.8  | 34.0  | 33.3   | 32.6  |

Source: Calculation on data from Statistical Yearbook of Romania 2001-2010

#### ***Agricultural production crop.***

Although the area under cereal cultivation has decreased, the total production of these crops grown, which means an increase of productivity per unit area planted. Decrease of vegetal production to just cultures is evident and the area in which declined significantly (e.g., beet sugar, which in 2004 was at the level of 46.5% compared to 2000). Increases in total production from rape is observed (production has increased about 20 times in 2010 and 35 times in 2008). Interesting is that the production of medicinal herbs and aromatic rose 34 times in 2004, dropping in the coming years, and in 2010 again increased 24 times. Potato production has had a slight growth, by around 5% in 2001 and 2002, decreasing gradually afterwards to 79.4% in 2010 compared to 2000.

**Table 4 Total production of the main crops produced in the period from 2000-2010 (2000=100%)**

|                               |       |       |       |        |        |       |       |        |        |        |        |
|-------------------------------|-------|-------|-------|--------|--------|-------|-------|--------|--------|--------|--------|
|                               |       |       |       |        |        |       |       |        |        |        |        |
| Grains                        | 100.0 | 167.6 | 175.9 | 130.3  | 182.3  | 176.0 | 149.6 | 76.0   | 163.9  | 143.4  | 155.8  |
| Wheat and rye                 | 100.0 | 236.0 | 208.2 | 46.8   | 179.9  | 219.7 | 161.6 | 105.4  | 190.1  | 150.8  | 149.0  |
| Rye                           | 100.0 | 115.2 | 115.7 | 57.5   | 200.2  | 198.4 | 182.5 | 128.6  | 180.1  | 172.2  | 130.6  |
| Wheat - total                 | 100.0 | 238.9 | 210.4 | 46.5   | 179.4  | 220.2 | 161.1 | 104.8  | 190.4  | 150.3  | 149.4  |
| Common wheat                  | 100.0 | 240.0 | 211.4 | 46.7   | 180.2  | 220.9 | 161.9 | 105.3  | 191.1  | 150.0  | 149.0  |
| Barley                        | 100.0 | 167.4 | 158.2 | 41.0   | 79.2   | 108.2 | 88.5  | 65.8   | 133.9  | 112.9  | 95.3   |
| Barley                        | 100.0 | 138.1 | 138.6 | 87.1   | 111.6  | 152.0 | 147.3 | 123.0  | 163.6  | 134.8  | 139.4  |
| Maize                         | 100.0 | 149.9 | 169.6 | 161.1  | 192.2  | 168.8 | 149.7 | 66.0   | 157.9  | 143.2  | 161.5  |
| Legumes                       | 100.0 | 189.5 | 174.5 | 151.4  | 233.3  | 137.6 | 131.2 | 66.6   | 94.9   | 90.8   | 98.2   |
| Pea seeds                     | 100.0 | 133.4 | 131.1 | 85.2   | 78.5   | 115.1 | 88.5  | 45.7   | 56.1   | 72.2   | 70.1   |
| Beans                         | 100.0 | 201.7 | 183.9 | 164.9  | 267.6  | 142.5 | 140.0 | 71.4   | 103.6  | 94.9   | 102.4  |
| Oil plants                    | 100.0 | 142.9 | 211.6 | 233.7  | 224.7  | 273.1 | 266.7 | 174.1  | 321.3  | 297.3  | 309.7  |
| Sunflower                     | 100.0 | 139.9 | 202.6 | 230.3  | 199.1  | 227.8 | 209.7 | 98.7   | 193.2  | 183.0  | 198.8  |
| Rape                          | 100.0 | 335.8 | 410.3 | 37.4   | 784.7  | 902.0 | 620.3 | 1618.5 | 3565.6 | 3350.0 | 2057.8 |
| Soybeans                      | 100.0 | 110.2 | 237.3 | 324.7  | 306.8  | 563.5 | 770.0 | 518.4  | 631.8  | 515.3  | 928.0  |
| Sugar beet                    | 100.0 | 96.8  | 122.9 | 85.2   | 46.5   | 55.0  | 123.3 | 71.0   | 69.3   | 70.5   | 76.2   |
| Medicinal and aromatic plants | 100.0 | 604.5 | 540.9 | 1477.3 | 3418.2 | 668.2 | 622.7 | 9.1    | 568.2  | 413.6  | 2404.5 |
| Potatoes - total              | 100.0 | 105.6 | 105.6 | 99.3   | 97.6   | 96.9  | 102.2 | 81.1   | 88.2   | 97.3   | 79.4   |

Source: Calculation on data from Statistical Yearbook of Romania 2001-2010

### ***Livestock and animal production***

Livestock development in the period under review has seen a growth if we refer the number of animals per cent hectares, but in 2010 it decreased: about 20 percent in cattle, buffaloes, cows, and heifers with 7,5% from 10,7%, with breeding sows. In sheep and goats, the largest decrease was recorded in 2004, when the number of animals per 100 hectares fell by 14.1%.

**Table 5 The number of animals per 100 hectares in the region North East 2000-2010 (2000=100%)**

|                          | 2000  | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  | 2010  |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Cattle                   | 100.0 | 97.5  | 104.1 | 104.4 | 100.3 | 106.3 | 110.5 | 111.4 | 112.7 | 107.3 | 80.6  |
| Buffalo cows and heifers | 100.0 | 99.5  | 102.6 | 102.1 | 101.0 | 107.3 | 106.8 | 105.2 | 105.2 | 103.7 | 79.1  |
| Swine                    | 100.0 | 91.9  | 107.0 | 103.1 | 125.7 | 131.1 | 137.7 | 129.2 | 124.8 | 115.5 | 92.5  |
| Swine for breeding       | 100.0 | 103.6 | 125.0 | 107.1 | 125.0 | 153.6 | 175.0 | 157.1 | 125.0 | 110.7 | 89.3  |
| Sheep and goats          | 100.0 | 97.2  | 97.9  | 97.5  | 85.9  | 91.6  | 93.1  | 107.9 | 119.6 | 122.9 | 99.0  |
| Sheep, and goats         | 100.0 | 101.2 | 101.9 | 98.4  | 90.5  | 100.4 | 102.5 | 119.5 | 131.9 | 133.8 | 111.4 |

Source: Calculation on data from Statistical Yearbook of Romania 2001-2010

### ***Livestock.***

Total number of animals recorded a fall in 2010 compared to the year 2000: the cattle by almost 20%, heifers, cows and buffaloes with over 20%, of pigs by 7.5%. It was observed a rise in herds of sheep and goats, Ewe in the period 2005-2010, with growth being greater than in 2009, when their number increased by 33.8%. Although on the whole, the number of animals in the region has increased over the period considered, it seems that 2010 had a decreasing trend, below the level of 2000.

**Table 6 Livestock categories of animals in the region North East 2000-2010 (2000=100%)**

|                          | 2000  | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  | 2010  |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Cattle                   | 100.0 | 97.5  | 104.1 | 104.4 | 100.3 | 106.3 | 110.5 | 111.4 | 112.7 | 107.3 | 80.6  |
| Buffalo cows and heifers | 100.0 | 99.5  | 102.6 | 102.1 | 101.0 | 107.3 | 106.8 | 105.2 | 105.2 | 103.7 | 79.1  |
| Swine                    | 100.0 | 91.9  | 107.0 | 103.1 | 125.7 | 131.1 | 137.7 | 129.2 | 124.8 | 115.5 | 92.5  |
| Swine for breeding       | 100.0 | 103.6 | 125.0 | 107.1 | 125.0 | 153.6 | 175.0 | 157.1 | 125.0 | 110.7 | 89.3  |
| Sheep and goats          | 100.0 | 97.2  | 97.9  | 97.5  | 85.9  | 91.6  | 93.1  | 107.9 | 119.6 | 122.9 | 99.0  |
| Sheep, and goats         | 100.0 | 101.2 | 101.9 | 98.4  | 90.5  | 100.4 | 102.5 | 119.5 | 131.9 | 133.8 | 111.4 |

Source: Calculation on data from Statistical Yearbook of Romania 2001-2010

Evolution of agricultural inputs has experienced an increasing trend over the period 2000-2010, at least in terms of the amount of fertilizers managed to level the region North-East. Increased both the amount of chemical fertilizers (even with 88% in 2009), but also the quantity of natural fertilizers (the highest growth was recorded in 2005, with 54,6%).

**Table 7 Evolution dynamics of fertilizers administered in the region North East 2000-2010**

| Fertilizers | 2000  | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  | 2010  |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Chemical    | 100.0 | 97.6  | 90.4  | 125.0 | 117.4 | 151.6 | 121.8 | 124.5 | 99.4  | 188.0 | 104.1 |
| Nitrogen    | 100.0 | 95.0  | 89.1  | 119.4 | 112.2 | 138.7 | 112.4 | 110.9 | 94.2  | 175.6 | 104.4 |
| Phosphate   | 100.0 | 103.2 | 92.2  | 134.6 | 125.0 | 167.9 | 140.6 | 151.5 | 102.4 | 170.3 | 94.7  |
| Potash      | 100.0 | 105.2 | 101.1 | 161.0 | 158.9 | 274.3 | 159.5 | 180.1 | 173.6 | 545.6 | 166.2 |
| Natural     | 100.0 | 105.1 | 105.8 | 114.1 | 121.6 | 154.6 | 114.8 | 117.6 | 67.9  | 105.3 | 129.8 |

Source: Calculation on data from Statistical Yearbook of Romania 2001-2010

Pesticide application records a still increasing over the past five years, consider the highest growth tragedy in 2009 to insecticides (38.1%) and with the fungicides (10.5%). Instead, the seeds, the highest growth was recorded in the year 2010, when the area that have been treated with herbicides increased by 89,4%.

**Table 8 Dynamics of surfaces that have been treated with pesticides during the period 2000-2010 in the region North-East**

| Types of pesticides | 2000  | 2001  | 2002  | 2003 | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  | 2010  |
|---------------------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| Insecticides        | 100.0 | 92.9  | 88.4  | 87.9 | 90.3  | 99.9  | 101.0 | 103.6 | 119.0 | 138.1 | 129.4 |
| Fungicides          | 100.0 | 102.6 | 85.7  | 72.2 | 82.7  | 88.1  | 105.5 | 94.5  | 104.0 | 110.5 | 100.9 |
| Herbicides          | 100.0 | 114.6 | 105.3 | 96.6 | 115.9 | 188.3 | 183.0 | 176.8 | 176.2 | 152.6 | 189.4 |

Source: Calculation on data from Statistical Yearbook of Romania 2001-2010

## CONCLUSIONS

After analyzing the data above and in the context of the current economic and competitive we can draw the following conclusions from specific regional development-North east:

- the arable dropped,
- but crop yield has increased, indicating increasing the professionalism of those engaged in agriculture, which are becoming increasingly aware that a modern agriculture may be granted only if due attention throughout the agricultural technologies and take into account the area's natural conditions;

- leaving aside purely technical constraints associated with crop rotation, farmers have turned his attention to the cultivation of industrial plants, which have had an outlet yet assured before sowing,
- increasing the number of machines reported an increased degree of agriculture technology, but that may seem inefficient to a detailed account of the,
- Agriculture is an important branch of the economy in that area and it looks like that will become even more important as other industries are starting to lose ground in global and national economic development.

The agricultural potential of this region is certainly not achieved, but with the right tools and support required can become an area with a significant contribution from national economy.

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# PROFITABILITY OF ROMANIAN COMPANIES ON FOOD TRADE

POPESCU CRISTIAN GEORGE<sup>1</sup>

## Abstract

*Through this paper we intend to highlight some answers of the questions that we ask ourselves often be in terms of the entrepreneur who wants to develop a business with some ideas on food trade, either in terms of consumer who knows sometimes the prices of some products are more expensive than other similar food stores. Here are some of the questions that we seek answers in the paper: How profitable are companies operating in the food trade, regardless of their organizational structure? What is the threshold of affordability of food trading enterprises on running a business? What is the contribution to the state budget of an undertaking of this kind and under the laws of Romania as moral are these fees compared to exertion by business to support a business? What would be the daily earnings of a company to survive the current economic circumstances? What major challenges facing NGOs engaged in charitable activities to help disadvantaged groups such as state aid and the legal entity? (some NGOs even assuming important functions that should be the government rule).*

**Key Words:** *financial results, market food, food trade, profitability, NGO*

## INTRODUCTION

Relevant answers to questions that we have had we tried to analyze the balance of receipts and payments under return zero that a company should have as concrete examples. We consider current levels of state taxes and the average salary remuneration for work stations in several fields.

To highlight the level of taxation in Romania, especially in terms of charity NGOs, we will consider including a firm with such a profile. We also oppose the legislation in Romania country with the oldest democracy in Europe, England. Thus, we analyze the ethical application of laws in force in Romania according to the principle of social equity (the major taxes should attach great importance to social action).

## MATERIAL AND METHODS

We have researched on the Romanian market of food trade, highlighting the financial results of them, but sometime, when we didn't have data, we applied the method of calculation of some indicators. What was important, that every time, we had been reporting to the real market and we have considered all indicators to calculate very exactly the results.

Achieving a ranking by size of enterprises analyzed (in the food trade, commerce or hereafter catering services, hereinafter service), we will first present table summarizing the most important indicators (in RON) for each enterprise profitability under zero. Thus, we postpone enterprises in micro, small, medium and large.

## RESULTS AND DISCUSSIONS

We begin to highlight the most important financial results, that we develop further discussions and later the conclusions:

**Table 1. Source: author's own calculations**

| No. of employees | Turnover /month | Turnover /year | VAT to be paid/month | average income /day | activity | Dimension of company |
|------------------|-----------------|----------------|----------------------|---------------------|----------|----------------------|
| 1                | 11100           | 133200         | 957                  | 444                 | Trade    | Micro-company        |
| 9                | 138925          | 1667100        | 12983                | 5557                | services | Micro-company        |
| 10               | 175975          | 2111700        | 20506                | 7039                | Trade    | Small company        |
| 24               | 472200          | 5666400        | 54714                | 18888               | Trade    | Small company        |

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Commenting on the above table, it appears that a family business with the field of food trade activity, must have average daily earnings of 444 lei (without employees, labor is provided by family members) and an enterprise of same field, with 10 employees, with one retail outlet must have daily receipts 7039 lei, over 16 times more. Mention that both companies do not make profits, but not losses (with a return level 0). A larger enterprise, all commercially available, field of activity, with 24 employees, but will have 3 outlets will have a minimum level of earnings of 18888 lei, or 6296 lei each point as a daily average, compared the company had 7039 lei as a single point of sale. Economic, is a predictable result because fixed costs are reported a turnover higher. Also here, it is worth noting that the number of employees refers to the average area per retail outlet thus to an area of about 100 square meters we need seven employees, according to the program each retail outlet is 12 hours a day. Here we add on average about 3 employees for administrative work of each company. Given the above, each company in our example will have different efficiencies depending on the actual amount of activity that is recorded in the table below.

**Tabel 2. Source: author's own calculations**

| No. of employees | Expenses Suppliers | Net wage bill | Utilities expenses | Fixed expenses | Other expenses | Taxes | Trade margin | Field work |
|------------------|--------------------|---------------|--------------------|----------------|----------------|-------|--------------|------------|
| 1                | 6394               | 0             | 200                | 958            | 96             | 0     | Average 40%  | Trade      |
| 9                | 70023              | 11922         | 2500               | 5173           | 12992          | 9421  | Average 60%  | services   |
| 10               | 101368             | 10605         | 2500               | 13947          | 5304           | 8189  | Average 40%  | Trade      |
| 24               | 272005             | 27485         | 7500               | 38091          | 14500          | 21227 | Average 40%  | Trade      |

With the companies listed have no benefit with employees they will pay taxes to the state budget as following:

**Tabel 3. Source: author's own calculations**

| No. of employees | Taxes | VAT TOTAL |
|------------------|-------|-----------|
| 1                | 0     | 957       |
| 9                | 9421  | 12983     |
| 10               | 8189  | 20506     |
| 24               | 21227 | 54714     |

Even if VAT is a tax paid by Romanian citizens is collected and transferred to the budget by the customers (people), so that is a tax paid by the final consumer through or by companies. Company with 9 employees with activity in service will pay more money to the state budget than the company with 10 employees, due to higher wage for people working in services.

Taking those mentioned before, we analyze the minimum average daily revenue per enterprise cost-effectively zero current legislative circumstances Romania.

For the family business, labor is provided by family members, so it will record expenditure on wages and related taxes. Such a deal can't be developed only in the form of micro companies, most times it is either self-employed or working in the trade sector with small district stores with different products. The latter should have a minimum average daily earnings of 444 lei, which equates to a month with 25 working days with a volume of 11100 lei. There is a difficult to achieve amount, on the contrary, as the working day is from 8 hours to 12 hours (maybe even more, but harder to covered family members), this implies that the worst hour such an undertaking should have minimum 55 lei revenue that is economically acceptable.

Worst are companies with a larger number of employees. Thus, for business, a company with 10 employees can only have one workstation with an area of greater exposure equivalent to a mini or even a district supermarket (approx. 100 sq.). Average daily sales volume amounts to 7039

lei per day which equates to earnings of approximately lei 586 per hour. Given that there is only one cashier this volume would be quite difficult to achieve, because it is assumed that in an hour more than 30 clients can be run, the average amount of revenue for them is approximately 20 lei per purchase. Is virtually impossible to have this number of customers, even if the mean value of 20 lei shopping is acceptable (mean shopping - studies).

For companies focused on services, with an average of 9 employees, falling in the category of micro, minimum daily average receipts should be 5557 lei for a minimum subsistence level (in terms of zero profitability). Year, such a firm should have a minimum turnover 1667100 lei or the equivalent of 384000 euro. Apparently an amount not difficult to achieve, depending very much on the type of activities catering provided. I would say rather that for some industries catering services sector is more difficult to achieve.

For the last example it is a business enterprise with a trade in food, with three outlets, the average daily receipts should be 6296 lei on each site to achieve a profitability zero. It is noted that this average drops over the number of outlets. We could say that the average daily amount of revenue is still relatively high, hard to reach by a trader in the current economic situation in Romania.

In conclusion, we see that the current situation of the national economy, there is high pressure in terms of taxation on businesses in Romania. This is because in conditions of profitableness zero, each economic agent of the review are required to pay taxes to the state budget consistent.

What happens to NGOs whose work is purely charitable and benefit society? Romanian state practice a principle of diverting funds collected by the non-profit legal entities in order to respect the principle of reallocating funds social purpose?

The most important issue facing these organizations would be related to pay VAT. Under the current Tax Code, these organizations are exempt from VAT, but not entitled to deduct all or part. An NGO has two choices: either to declare the VAT, looking to trade (income from such activities entitle the deduction of VAT) or not having declared taxable business income. Of both the state budget has won and NGOs, regardless of the activities they provide are totally disadvantaged.

To give an example, I chose the UK economy. In the UK, VAT is paid by NGOs as well as in Romania, but the rates for groups of products that are in this country are only for those NGOs who have a charitable activity (without a service company). VAT on most goods used by these organizations is recovered, with some categories of products and services with a reduced rate of VAT (such as drugs). Unfortunately for us, all countries with older democracies have implemented such facilities to organizations who are recognized merit in their community service, making Romania exception to this rule. Thus, in Romania, the central funding from the state budget are not redirected in a widely accepted by law to work for the society, such as NGOs charity.

## **CONCLUSION**

The companies in Romania who work in the food trade are subject to high levels of debt through higher taxation and taxation activities while being exposed to high competitive field of great interest, because they represent food trade.

NGOs, regardless of the activities they perform in Romania laws are disadvantaged due to their undifferentiated business enterprises, and also by the Tax Code there is no way to support these legal entities for the society. Thus, the accumulated funds from the state, because of high taxes in Romania, have no natural circuit of restoring the economy to support activities providing services company.

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# SUSTAINABLE MANAGEMENT AND CONSERVATION OF BIOTA IN AGRICULTURAL SOILS OF THE REPUBLIC OF MOLDOVA

SENICOVSCAIA IRINA<sup>1</sup>

## Abstract

*In present research the ways and methods of the sustainable management and conservation of the soil biota in the modern agricultural ecosystems of the Republic of Moldova are considered. The database of invertebrates, microorganisms and enzymatic activities of different zonal soils in the long-term field experiments has been developed and constantly is updated with a view to the operative evaluation of the degradation processes and ecological effectiveness of the land management. The current status of the biota of arable soils of the Republic of Moldova is characterized by the significant reduction in the abundance, biomass, activity and diversity in comparison with soil's standards that are in conditions of natural ecosystems. The long use of soils in agricultural production led to the imbalance between the processes of decomposition and humus formation and promoted the decrease of soil biota stability and degradation. The values of most soil biological indices decrease in the following sequence: virgin and fallow land → arable land under organic system with farming manure and incorporation of crop residues → arable unfertilized land. A soil management with the involvement of areas with natural vegetation in a crop rotation system created conditions for the improvement of the biota's vital activity in the soil which degraded as a result of a long-term arable use. The recovery rate of the population of Lumbricidae family reaches of 3.0-5.6 worms m<sup>-2</sup> per year. Annual increase in the content of microbial biomass in the typical chernozem can be up to 81.3 kg C ha<sup>-1</sup> in the layer of the 0-50 cm. The organic farming system greatly improves the enzymatic and humus status of the old - arable soils, but does not restore the biodiversity of invertebrates.*

**Key-words:** soil biota, humus, conservation, organic fertilizer

## INTRODUCTION

The definition of sustainable management of agricultural soils is a spatial or temporal harmonization of all soil and land uses in a given area, avoiding or minimizing irreversible natural and anthropogenic impacts. The agricultural land use can only be sustainable when all other land uses are sustainable as well [10]. The sustainability is determined by technical, ecological, social as well as by economic and cultural factors. Ecological indicators (soil and water quality, biodiversity and human health) are the most important and sensitive to external impacts. In this context, soil biological indicators contain the information about the landscape stability and environmental benefits for the agricultural politics at the national level.

Soil biota should be considered as a component of the integrated management of natural resources. Soil biota plays an important role in the realization of soil ecosystem services and land productivity [2, 8]. Soil biota provides intermediate services in agriculture. It supplies nutrients to plant [4], maintains the soil structure, improves the water infiltration, and participates in the soil organic matter decomposition [2, 9]. Nevertheless the functions and services provided by the soil biota in the agricultural ecosystems are poorly recognized in the ecological management of soils of the Republic of Moldova. Managers should take into account the recommendations on the use and management of soil biota for the long-term conservation and sustainable productivity of terrestrial ecosystems.

The problem of the fertility restoration in soils of the Republic of Moldova depends largely on the ability of the soil biota to recover their functions and to stabilize the enzymatic potential at a high level. To stop the degradation process and to restore the biological soil functions, it is necessary to carry out a set of measures aimed at increasing the carbon sink in degraded soils. Crop residues and animal wastes are the most accessible and can be used as the source of the organic matter for the soil biota and the plant nutrition.

**The purpose of the research** was to compare the influence of different land management practices on the biological properties of zonal soils and to evaluate the application of organic

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fertilizers for the biota's restoration of soils, degraded as the result of the long-term agricultural utilization.

## MATERIAL AND METHODS

**Experimental sites and soils.** Three experimental sites located in different zones of the Republic of Moldova have been tested. Various ways of treatment-utilization of the soil and 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 of Field Crops "Selectia" (Beltsy). It had 3 plots: fallow land (60-year-old), fallow land (10-23-year-old) and the long-term arable land with crop rotation (management without fertilizers and with the farmyard manure application in the dose of  $60 \text{ t ha}^{-1}$ ). The soil was the typical chernozem.

**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 and organic manure with crop residues treatments were tested. Crop residues were plowed annually; farmyard manure was introduced in the dose of  $60 \text{ t ha}^{-1}$  in 1991, 1996 and 2005. Soils were presented by the leached chernozem and the gray forest soil.

**The third site** was located in the southern zone, in the Ursoaia village of the Lebedenco district and in the Tartaul de Salchie village, Cahul region. These were plots with the fallow (55-year-old) land and the long-term arable land management without organic fertilizers and with the sheep manure application in the dose of  $50 \text{ t ha}^{-1}$ . The soil was the ordinary chernozem.

Sampling was carried out from the 0-30 cm layer. Samples of the experimental plots without organic fertilizers and with the sheep manure application on the ordinary chernozem were collected from the 0-25 cm layer.

**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 [5]. The identification of invertebrate's diversity at the level of families and their classification according to nutrition was conducted by Gilyarov and Striganova's method [5].

**Microbiological properties.** The microbial biomass was measured by the rehydration method based on the difference between C extracted with 0.5 M  $\text{K}_2\text{SO}_4$  from dried soil at  $65-70^\circ\text{C}$  within 24 h and fresh soil samples with  $K_c$  coefficient of 0.25 [3].  $\text{K}_2\text{SO}_4$  – extractable organic C concentrations in the dried and fresh soil samples were simultaneously measured by dichromate oxidation. The quantity of  $\text{K}_2\text{SO}_4$  – extractable C was determined at 590 nm with "Specol-221" spectrophotometer (Germany).

Counts of microorganisms (heterotrophic bacteria, humus-mineralizing microorganisms, actinomycetes, fungi, bacteria from the *Azotobacter* genus) were obtained on agar plates [11].

**Enzymatic activity.** The (potential) urease activity was measured by estimating the ammonium released on incubation of soil with buffered urea solution by colorimetric procedure [6]. The (potential) 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 [6]. The (potential) polyphenoloxidase activity was determined by the colorimetric technique with the use of hydroquinone as a substrate [7].

**Soil chemical properties.** Organic C was analyzed by the dichromate oxidation method. The humus content was calculated using the coefficient of 1.724 [1].

The database of the soil biological indicators covers the period between 1989 and 2011. The biological indices were evaluated statistically using the variation analysis. Statistical parameters of the state of soil invertebrates were calculated taking into account the depth of soil fauna occurrence, microorganisms and enzymes – for the layer of 0-30 cm and 0-25 cm.

## RESULTS AND DISCUSSIONS

The current status of the biota of agricultural soils in the all zones of the Republic of Moldova is characterized by the significant reduction in the abundance, biomass and activity in comparison with soil's standards that are in conditions of natural ecosystems (Table 1 and 2). The long use of soils in agricultural production led to the imbalance between the processes of decomposition and humus formation that promoted the decrease of soil biota's stability and its degradation. The decline of the natural resistance of soils is mainly determined by the reduction of their biochemical potential and the diminution of zones of homeostasis of invertebrates and microorganisms.

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. Undisturbed virgin and fallow soils are medium for the reproduction of various species of invertebrates and microorganisms and have a high level of the biomass and enzyme activity.

The number of invertebrates in natural soils is reached to 195.8-448.0 ex m<sup>-2</sup>, *Lumbricidae* family – to 83.0-340 ex m<sup>-2</sup>, and its biomass – to 46.9-84.0 and 41.5-74.8 g m<sup>-2</sup> accordingly (Table 1). The exception is the leached chernozem under fallow with the low faunal abundance. Perhaps this fact is connected with the low moisture content in the soil during the selection of faunal samples. The share of earthworms in the total abundance of invertebrates constitutes of 35.3-75.9 % and their biomass – 59.1-89.0 % in the soils of natural ecosystems. It should be noted the tendency towards increasing the share of *Lumbricidae* family in the total number of invertebrates in the direction from the north to the south. The weight of one exemplar of *Lumbricidae* family in chernozems constitutes 0.22-0.27 g, in the gray forest soil – 0.5 g. The largest share of invertebrates and *Lumbricidae* family is concentrated in the 0-10 cm layer of soil and in the debris layer. The soils of natural ecosystems are characterized by a high diversity of invertebrates. In addition to the *Lumbricidae* family species from the families of *Formicidae*, *Arthropoda*, *Carabidae*, *Aranei*, *Apidae*, *Forficulidae*, *Pieridae*, *Pentatomidae*, *Coccinellidae* and other have been found in soils of natural ecosystems. The soil under the natural vegetation contains 5-12 families of invertebrates.

Indices of the number and biomass of invertebrates and earthworms decreased in arable soils by 1.9-7.4 and 3.7-10.3 times respectively in comparison with virgin and fallow soils. Agricultural soils contain only 2-5 families of invertebrates.

**Table 1. Conservation of soil invertebrates in natural ecosystems in the Republic of Moldova (mean values, n = 3-32)**

| Index   | North zone        |             | Central zone      |             |                  |             | South zone         |             |
|---|-------------------|-------------|-------------------|-------------|------------------|-------------|--------------------|-------------|
|   | typical chernozem |             | leached chernozem |             | gray forest soil |             | ordinary chernozem |             |
|   | fallow land*      | arable land | fallow land       | arable land | virgin land      | arable land | fallow land        | arable land |
| Number of invertebrates, ex m <sup>-2</sup>           | 339.6             | 141.4       | 81.6              | 84.9        | 195.8            | 63.8        | 448.0              | 76.4        |
| Biomass of invertebrates, g m <sup>-2</sup>           | 82.2              | 17.8        | 11.5              | 9.8         | 46.9             | 7.6         | 84.0               | 8.4         |
| Number of <i>Lumbricidae</i> fam., ex m <sup>-2</sup> | 227.3             | 91.1        | 28.8              | 61.3        | 83.0             | 43.2        | 340.0              | 46.2        |
| Biomass of <i>Lumbricidae</i> fam., g m <sup>-2</sup> | 61.2              | 16.5        | 6.8               | 9.7         | 41.5             | 6.8         | 74.8               | 7.3         |

\* 60-year-old fallow land

The total biomass of microorganisms in natural soils constitutes in average 355.8-876.0 μ g C g<sup>-1</sup> soil in the 0-30 cm layer. It is much greater than its abundance in arable soils (Table 2). A similar trend has been noticed in the number of the heterotrophic bacteria and fungi. But the number of the humus-destroying microorganisms and actinomycetes in most cases is much lower than in the

soils of agricultural ecosystems. The greatest numbers of *Azotobacter* genus are in the typical and I the ordinary chernozem, in the gray forest soil these microorganisms are discovered only sometimes in conditions of the arable management.

Microorganisms in virgin and fallow soils are concentrated in the 0-60 cm layer (78-83 %), the biomass index decreases sharply in the soil profile to a depth of 30-50 cm. The highest levels of the microbial biomass, enzyme activities and organic carbon content have been determined in the A<sub>1</sub> horizons of soil profiles. Microorganisms in the virgin and fallow soils were found at the depth of 138 cm, and some species were encountered at the depth of 200 cm. The abundance of heterotrophic microorganisms in soils under the natural vegetation is provided by the high level of the organic matter content. The humus content (confidence intervals,  $P \leq 0.05$ ) in virgin and fallow soils constitutes: 4.0-5.7 % in the gray forest soil, 3.8-4.0 % in the ordinary chernozem, 3.7-4.6 % in the leached chernozem and 4.9-5.1 % in the typical chernozem.

**Table 2. Microorganisms, enzymes and humus content in soils of the Republic of Moldova under different land management (mean values, 0-30 cm layer)**

| Index   | North zone        |             | Central zone      |             |                  |             | South zone         |             |
|---|-------------------|-------------|-------------------|-------------|------------------|-------------|--------------------|-------------|
|   | typical chernozem |             | leached chernozem |             | gray forest soil |             | ordinary chernozem |             |
|   | fallow land*      | arable land | fallow land       | arable land | virgin land      | arable land | fallow land        | arable land |
| Microorganisms (n = 8-33)   |                   |             |                   |             |                  |             |                    |             |
| Microbial biomass, $\mu\text{g C g}^{-1}\text{ soil}$   | 355.8             | 318.4       | 492.5             | 314.7       | 876.0            | 244.3       | 415.6              | 288.3       |
| Heterotrophic bacteria, $\text{CFU g}^{-1}\text{ soil} \cdot 10^6$  | 6.3               | 5.2         | 5.4               | 4.3         | 5.9              | 3.3         | 4.7                | 4.5         |
| Humus-mineralizing microorganisms, $\text{CFU g}^{-1}\text{ soil} \cdot 10^6$                               | 6.5               | 16.2        | 2.7               | 9.6         | 1.9              | 8.9         | 5.5                | 11.9        |
| Actinomycetes, $\text{CFU g}^{-1}\text{ soil} \cdot 10^6$   | 2.5               | 3.1         | 1.6               | 2.8         | 2.5              | 2.4         | 5.4                | 3.3         |
| Fungi, $\text{CFU g}^{-1}\text{ soil} \cdot 10^3$   | 64.6              | 37.4        | 60.0              | 30.2        | 110.0            | 40.5        | 53.6               | 35.0        |
| <i>Azotobacter</i> gen., $\text{CFU g}^{-1}\text{ soil}$  | 127.3             | 209.3       | 11.2              | 91.6        | 0                | 8.1         | 74.5               | 179.5       |
| Enzyme activity (n = 3-30)  |                   |             |                   |             |                  |             |                    |             |
| Urease, $\text{mg NH}_3 10\text{ g}^{-1}\text{ soil } 24\text{ h}^{-1}$                                     | 12.5              | 4.5         | 8.6               | 3.1         | 8.1              | 1.4         | 5.5                | 3.5         |
| Dehydrogenase, $\text{mg TPF } 10\text{ g}^{-1}\text{ soil } 24\text{ h}^{-1}$                              | 2.92              | 1.94        | 2.31              | 1.47        | 2.40             | 0.74        | 2.79               | 1.78        |
| Polyphenoloxidase, $\text{mg } 1,4\text{-p-benzoquinone } 10\text{ g}^{-1}\text{ soil } 30\text{ min}^{-1}$ | 7.4               | 6.8         | 5.5               | 3.9         | 4.1              | 2.3         | 20,1               | 18.6        |
| Humus content, %  | 4.9-5.1           | 4.4-4.7     | 3.7-4.6           | 3.2-3.8     | 4.0-5.7          | 2.1-2.4     | 3.8-4.0            | 2.9-3.2     |

\*10-23-year-old fallow land

The characteristic feature of microbial communities of agricultural soils is the high content of the humus-mineralizing microorganisms and actinomycetes and the low enzyme activity. More intensive land-use involving soil tillage stimulates the microbial decomposition of organic matter and tends to result in a decrease in the microbial carbon pool and ultimately in a decrease in the humus content. The humus content (confidence intervals,  $P \leq 0.05$ ) in arable soils constitutes: 2.1-2.4 % in the gray forest soil, 2.9-3.2 % in the ordinary chernozem, 3.2-3.8 % in the leached chernozem and 4.4-4.7 % in the typical chernozem.

The process of natural recovery of the soil biota composition and activity in agricultural lands has been slow. The recovery rate of the population of *Lumbricidae* family reaches of 3.0-5.6

worms m<sup>-2</sup> per year by the use of soils under recreation. Annual increase in the content of microbial biomass in the typical chernozem can be up to 81.3 kg C ha<sup>-1</sup> in the layer of the 0-50 cm.

The manure application separately and with plant residues additives restores the biota of old arable soils. Biological parameters (by some indicators) are at the level of soils under natural vegetation (Table 3). The number of invertebrates increased by 1.2-1.7 times, the biomass of *Lumbricidae* family – 1.7-2.3 times respectively. The biomass of worms remained practically unchanged only in the ordinary chernozem. The share of saprophagous in the total population of soil invertebrates increased from 69.7-77.8 % to 72.0-85.9 %.

The recovery of components of soil invertebrates in conditions of the manure application was mainly due to the *Lumbricidae* and *Enchytraeidae* families. The diversity of the soil fauna was not significantly improved.

**Table 3. Recovery of the biota of long-term arable soils in conditions of the land management with farmyard manure and plants residues (mean values, 0-30 cm layer)**

| Variant                                    | Number of invertebrates, ex m <sup>-2</sup> | Biomass of <i>Lumbricidae</i> fam., g m <sup>-2</sup> | Saprophagous, ex m <sup>-2</sup> | Microbial biomass, μ g C g <sup>-1</sup> soil | Dehydrogenase, mg TPF 10 g <sup>-1</sup> soil 24h <sup>-1</sup> | Polyphenoloxidase, mg 1,4-p-benzoquinone 10 g <sup>-1</sup> soil 30 min <sup>-1</sup> |
|--|---|---|----------------------------------|---|---|---|
| North zone, typical chernozem (n = 6-8)    |   |   |                                  |   |   |   |
| Martor                                     | 175.6                                       | 14.7  | 122.3                            | 298.4   | 2.32  | 9.2   |
| Manure 60 t ha <sup>-1</sup>               | 214.7                                       | 33.7  | 157.3                            | 324.3   | 2.69  | 15.5  |
| Central zone, leached chernozem (n = 8-34) |   |   |                                  |   |   |   |
| Martor                                     | 76.0  | 7.0   | 56.0                             | 314.7   | 1.47  | 3.9   |
| Fond*                                      | 85.0  | 12.0  | 73.0                             | 362.0   | 1.99  | 5.9   |
| Central zone, gray forest soil (n = 6-33)  |   |   |                                  |   |   |   |
| Martor                                     | 96.0  | 7.6   | 74.7                             | 244.3   | 0.74  | 2.3   |
| Fond*                                      | 133.3                                       | 15.1  | 96.0                             | 302.4   | 1.40  | 5.0   |
| South zone, ordinary chernozem ** (n = 9)  |   |   |                                  |   |   |   |
| Martor                                     | 54.8  | 7.8   | 42.2                             | 212.6   | 1.34  | 7.8   |
| Manure 50 t ha <sup>-1</sup>               | 94.1  | 7.0   | 72.3                             | 300.9   | 1.28  | 8.6   |

\* Fond: plant residues + farmyard manure 60 t ha<sup>-1</sup>

\*\* 0-25 cm layer

According to average values, the microbial biomass content increased from 212.6-314.7 μ g C g<sup>-1</sup> soil to 300.9-362.0 μ g C g<sup>-1</sup> soil. A similar trend was evident in dehydrogenase and polyphenoloxidase activities. The effect of organic fertilizers on the soil biota of the central and northern zones of the country was more significant than in the soil of the southern zone.

The humus content level was higher under application of organic fertilizers by 0.2-0.3 %. Thus, the organic farming system greatly improves the biological properties and fertility of arable soils.

## CONCLUSIONS

Landscapes with the natural vegetation play a particular role in the preservation, maintenance and restoration of the soil biota's vital activity. The wide spectrum of families and species of invertebrates and microorganisms, the high level of the microbial biomass and the soil enzymatic activity are inherent to soils of natural ecosystems. These features enhance their stability to various natural and anthropogenic impacts. The database of the biota's state of virgin and fallow soils has a practical importance as the natural standard for the operative evaluation of degradation processes and ecological effectiveness of the land management.

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. A stable state of the biota is provided by the humus content in the level of 4.0-6.0 % in the 0-30 cm layer. A soil management with the involvement of areas with natural vegetation in a crop rotation system created conditions for the improvement of the biota's vital activity in the soil which degraded as a result of a long-term arable use.

The agricultural management without application of organic fertilizers leads to the degradation of soils. This is reflected in the deterioration of soil biological properties and in the reduction of humus content in the soil. In the arable soil humus-destroying microorganisms dominate. The values of most soil biological indices decrease in the following sequence: virgin and fallow land → arable land under organic system with farming manure and incorporation of crop residues → arable unfertilized land.

Application of organic fertilizers in the form of farmyard manure and the annual addition into degraded soils of crop residues helps to prevent ecological violations in the state of soil biota, to restore individual species and populations of invertebrates and microorganisms, stabilize and improve the enzymatic activity. Measures aimed to the enrichment of soils with organic matter and to reduce of the anthropogenic impact on natural conservation areas, the creation and preservation of the natural habitat of the soil biota will help to restore its functional activity and diversity.

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# THE CONTRIBUTION OF HUMAN ACTIVITIES TO CLIMATE CHANGES

SLAVE CAMELIA<sup>1</sup>, MAN CARMEN<sup>2</sup>

## Summary

*Some of the components of the climate system, the oceans and biosphere primarily affects the concentration of greenhouse gases in the atmosphere. Plants take CO<sub>2</sub> from the atmosphere and convert it in the process of photosynthesis, carbohydrate. In the industrial era, human activities have contributed to increased concentrations of greenhouse gases in the atmosphere. In addition, human activities contribute to climate change by altering the concentration of aerosols and clouds cover. Greatest contribution has fossil fuel that releases CO<sub>2</sub> into the atmosphere. Impact of human activities on the climate is much higher than that of natural processes. The purpose of this paper is to show how the main compounds resulting from human activities contribute to climate change.*

**Keywords:** *climate change, , climate regions, greenhouse effect, global temperature, precipitation*

## INTRODUCTION

Intergovernmental Panel on Climate Change - was established in 1988 by the World Meteorological Organization (WMO) and United Nations Environment Program. According AMN IPCC's role is to assess, in an objective and transparent manner, scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of climate change due to human activity induced potential effects of climate change and adaptation options and mitigation of these effects.

## MATERIALS AND METHODS

Climate Change (IPCC- Intergovernmental Pannel on Climate Change) means a variation statistically significant or average state of the climate or in its variability, persisting for a longer period of time, is due to internal processes, pressure (forcing) or external changes major anthropogenic atmospheric composition and land use.

Definition is accepted United Nations Framework Convention on Climate Change: Climate change attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is added to natural climate variability observed during comparable periods.

Intergovernmental Panel on Climate Change (IPCC) released in early 2007, three Working Groups contributions to the Fourth Assessment Report Global climate change presents the results of scientific research, observations on the effects of climate change at global and projections made on the basis of using climate models.

The main conclusions of this paper are:

- warmest 15 years were registered globally in the last two decades, in 1998 and 2005 being the warmest;
- Europe-wide temperature increased by about 1 degree Celsius, rather than the overall rate of warming of 0.74 degrees Celsius;
- greenhouse gas concentrations in the atmosphere exceeds the values recorded in the last 650,000 years and projections indicate an unprecedented growth;
- by 2100, global temperature will increase by 1 to 6.3 degrees Celsius and global sea level will rise by 19 to 58 cm;
- to increased frequency and intensity of extreme weather events (storms, tornadoes, hurricanes), changed precipitation patterns and regional climate (heat waves, droughts, floods), and trends indicate a gradual increase in the coming years;

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- reduced thickness and extension of glaciers in the Arctic (by 40% in the last 30 years) and can complete their extinction by 2100;
- retreating glaciers in mountain areas (Alps, Himalayas, Andes) and the possibility disappearance of more than 70% of continental glaciers;
- development of mutations in bio - systems: Early flowering plant species, extinction of amphibian species etc..

The report recommends the need for policies and measures to reduce emissions of greenhouse gases (carbon dioxide, methane, nitrous oxide, hydro fluorocarbons, per fluorocarbons, sulphur hexafluoride - regulated by the Kyoto Protocol), as without these measures increase global temperature worryingly high. Limiting average global temperature increases, the maximum 2 ° C above the pre - industrial levels by 2100, requires the reduction of greenhouse gas emissions by 2050 by at least 50% from current levels.

## **RESULTS AND DISCUSSION**

Factors driving climate change. Climate system evolves in time under the influence of its own internal dynamics and because of external factors affecting climate change factors called "forcing - s".

External factors include natural phenomena such as volcanic eruptions and variations in solar activity and changes induced by human activity.

Solar radiation plays the most important role. There are three basic ways that can change the radiative balance of the Earth:

- due to variations in incident solar radiation as a result of the changes which suffers orbit or solar activity itself;
- by changing the fraction of reflected solar radiation (the albedo), this spending is due to the coverage of clouds, particles suspended in the atmosphere (aerosols) or soil cover (vegetation, snow, ice);
- impaired long-wave radiation emitted to space by the Earth's surface, for example by changing the concentration of greenhouse gases.

Climate responds to these changes in turn either directly or indirectly through a variety of mechanisms to feed - back.

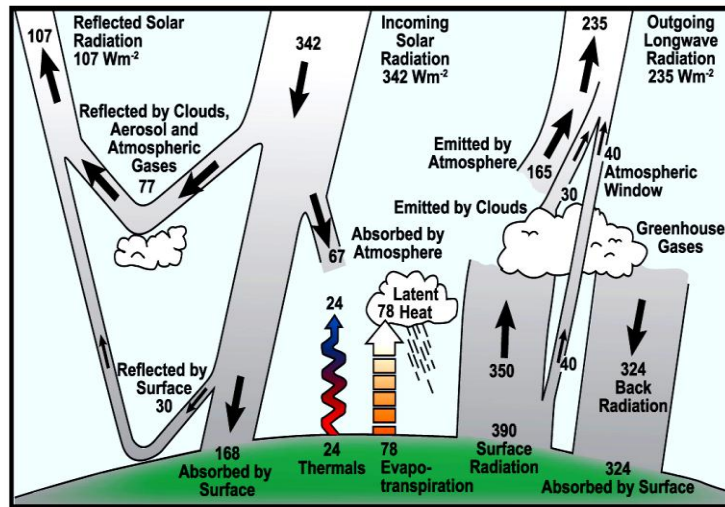
The amount of solar energy reaching the upper atmosphere every second surface of 1 m<sup>2</sup> during the day is about 1370 watts and the amount of energy per square meter per second, averaged over the globe, is about ¼ of the (342 W/m<sup>2</sup>). About 30% of solar radiation is reflected back into space (Fig.1). Approximately two thirds of this reflectivity is due to clouds and aerosols. The rest is reflected by surfaces covered with snow, ice, and desert. Dramatic change of reflectivity aerosols occurs when major volcanic eruptions occur. They influence the climate a year or two before being driven to the ground by rainfall. Some aerosols resulting from human activities also reflect solar radiation.

The energy that is not reflected is absorbed by Earth's atmosphere and Earth's surface (about 240 W/m<sup>2</sup>). Earth radiates to turn about the same amount in space (long-wave radiation, permanently). To issue this energy emitting body temperature, in this case Earth, should on average - 19 ° C, much less than is actually Earth (about 14 ° C). Why the Earth's surface "appears" much warmer is the presence of greenhouse gases (natural greenhouse effect). Clouds, on the other hand, exerts a similar effect to that of greenhouse gases. However, this effect is offset by their reflectivity so that, on average, clouds tend to have a cooling effect on the climate, although locally may be perceived as warming effect. Human activities such as burning fossil fuels, deforestation, and so on, leading to increased greenhouse effect.

Contribution of human activities to climate change Some of the components of the climate system, the oceans and biosphere primarily affect the concentration of greenhouse gases in the

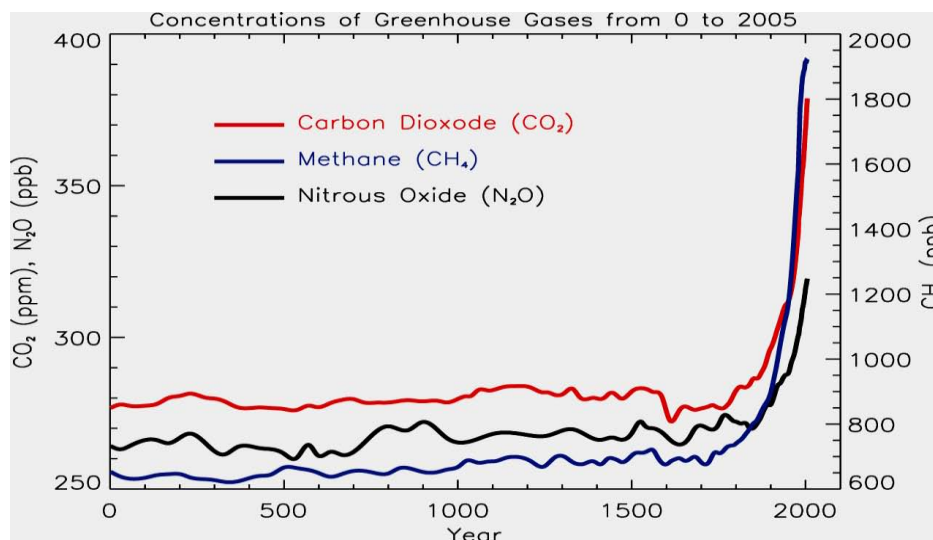
atmosphere. For example, plants take CO<sub>2</sub> from the atmosphere and convert it in the process of photosynthesis, carbohydrate.

**Figure 1. Radiative balance at the Earth's surface**



In the industrial era, human activities have contributed to increased concentrations of greenhouse gases in the atmosphere (Fig.2). In addition, human activities contribute to climate change by altering the concentration of aerosols and clouds cover.

**Figure.2 The atmospheric concentration of major greenhouse gases with high life time in the last 2000 years**



Greatest contribution has fossil fuel that releases CO<sub>2</sub> into the atmosphere. Impact of human activities on the climate is much higher than that of natural processes.

Principal components as a result of human activity, which plays an important role for climate change:

- Carbon dioxide (CO<sub>2</sub>), resulting from the combustion of fossil fuels for transport, heating, cement production, deforestation, etc.. , Is also released natural processes;
- Methane (CH<sub>4</sub>) - a result of agricultural activities, natural gas distribution, waste disposal, and natural processes occur, especially in areas where there are swamps;

- Nitrogen oxides (N<sub>2</sub>O) - are emitted as a result of nitrogen fertilization and burning of fossil fuels and natural processes in the soil there and oceans issues (N<sub>2</sub>O);
- Halocarbon (combinations of fluorine, bromine, chlorine, carbon and hydrogen) exist naturally in very small quantities, the main product of human activity CFC11 and CFC12 are (used as coolants and other industrial processes), their concentration declined in recent years as a result of international conventions on the protection of the ozone layer;
- Ozone (O<sub>3</sub>) - generates and continuously destroys the atmosphere as a result of chemical reactions under the action of UV radiation, in the troposphere, human activities have increased the amount of O<sub>3</sub> by releasing CO, N<sub>2</sub>O and other substances that react chemically and produce O<sub>3</sub>;
- Water vapour - considered the most abundant and important 'gas' greenhouse, human activities have only a small direct impact on the amount of water vapour in the atmosphere, indirectly, people have the potential to substantially affect the amount of water vapour by climate change: a warmer atmosphere contains more water vapour;
- Aerosols - some are emitted directly into the atmosphere while others are formed of various other compounds, human activities responsible for the presence of aerosols in the atmosphere are:
  - fossil fuel and biomass burning (which made to increase the concentration of sulphur compounds, those organic and carbon black)
  - surface mining and
  - other industrial processes;

Natural sources of aerosols are dust from the surface, breaking waves, biogenic emissions, and volcanic eruptions.

## CONCLUSIONS

Some aspects of current climate change are unlike the previous periods. At the same time, the concentration of CO<sub>2</sub> in the atmosphere has reached a record high relative to the last half million years and this was an exceptional rate. Current global average temperatures are higher than they were during at least the last centuries, perhaps even more than a millennium. If warming continues in this way, changes may be unusual in terms of geological time. Another unusual aspect of current climate change is that, if past changes have natural causes warming of the last 50 years is mainly attributable to human activity.

When comparing the current climate of past ages, to consider three aspects:

- choice of variables for comparison: greenhouse gas concentration, temperature and other climatic parameter (absolute value or growth rate);
- local changes will not be confused with global, sometimes can be much higher than global;
- should be made distinctions between time scales: climate change over millions of years can be much higher and may have different causes (eg moving continents) than climate change at the scale of hundreds of years.

Finally, in the 21st century warming can only be explained by natural climate variability.

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# STUDY ON ACCESSING EUROPEAN FUNDS FOR ADDING VALUE TO AGRICULTURAL AND FORESTRY PRODUCTS

STAFIE ALINA GIORGIANA<sup>1</sup>

## Summary:

*The study aims to analyze the state of the accessing of European funds for rural development within the Measure 123 (adding value to agricultural and forestry products). The paper develops quantitative and qualitative analysis of specific projects that have been approved under measure 123 of rural development policy in Romania. The analysis follows the evolution in time during four years (2008-2011) of the number of projects submitted for this measure, and especially the number of projects selected and the number of projects that have received the final funding decision. We noticed that, over time, the Measure 123 became a successful solution of investments for Romanian farmers (the last session for receiving projects in 2011 had a real success with a public value of submitted projects four time greater than the approved budget for that session). The measure also met its objectives regarding the type of companies that applied for the European funds: the vast majority is represented by small and medium enterprises. Although the average numbers for accessing this measure improved in 2010 and 2011, disparities between development regions are evident.*

**Keywords:** rural development, European funds, measure 123, adding value to agricultural and forestry products.

## INTRODUCTION

Romania's EU accession brought to Romanian farmers an enlargement of opportunities for agricultural activities by opening the European market, but at the same time it came with an intensification of the competition. European standards of quality and food safety constrain farmers to seek solutions in order to increase the competitiveness of their products to suit the most demanding requirements of the common market.

Measure 123 of the National Rural Development Program for 2007-2013 is part of the first priority direction for the rural development: Axis 1. The principal objectives of the Axis 1 is to focus on measures aimed at promoting knowledge and improving human potential (information actions, establishment of young farmers), restructuring and developing physical potential (modernization of agricultural and forestry holdings by introduction of new technologies), improving the quality of production and products (assist farmers in adapting to the demanding rules adopted in EU legislation, encourage farmers to adopt quality food schemes).

In Romania, the measure 123 have specific objectives such as: development of new technologies and procedures in order to obtain competitive products, adaptation to EU standards, improvement of the farmers income by increasing the added value of agricultural products, improvement of the processing and the marketing of agricultural products.

Through its specific objectives very ambitious, but also through the large amounts of money that can be accessed within this measure (one of the measures that receive most sums, the maximum grant rate in the total project can be up to 50 %), measure 123 is one of high importance for rural development in Romania. Hence the importance of analyzing farmers access to European funds available under this measure and the adjustment of the mandatory requirements to be met by farmers in order to improve access to the European funds and to assure the right implementation of the measure 123 objectives.

## MATERIAL AND METHODS

In order to analyze the degree of access to European funds, quantitative methods both descriptive and analytical were used. The source of data is represented by the data available on the Paying Agency for Rural Development and Fishery website, in particular the practical information for the approved projects from 2008 until the end of 2011. The correlation between the results of the

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analysis of the contracted projects within the measure 123 and the objectives of this measure (specified in the official documentation) have permitted a better understanding of the impact of current projects on rural development in Romania.

## RESULTS AND DISCUSSIONS

Since the beginning of the implementation of the rural development policy in Romania for the period 2007-2013, in March 2008 (when the European Commission approved the National Rural Development Program) and until the end of 2011, the Measure 123 received a total number of 1242 projects submitted with a public value of 1.264.346.587 euro. In 10 sessions that were organized until the end of 2011, a number of 751 of the submitted projects were selected by the authorities with a public value of 495.631.968 and a number of 499 of projects received the final funding decision (which represents around 85,21% of the total value approved for Measure 123 until 2013). The payments made for the same period of time have a public value of 142.734.080 euro, therefore the usage of European funds for this measure is around 24,54% (Table 1).

The usage of European funds for measure 123 is below the average of usage of European Funds for rural development (about 41%). For example, the Measure 123 has a lower usage than the Measure 121 (modernization of agricultural farms) and a higher usage than measure 125 (improving and developing infrastructure related to the development and adaptation of agriculture and forestry).

**Table 1. The number and the public value of the projects within the Measure 123 and the payments made**

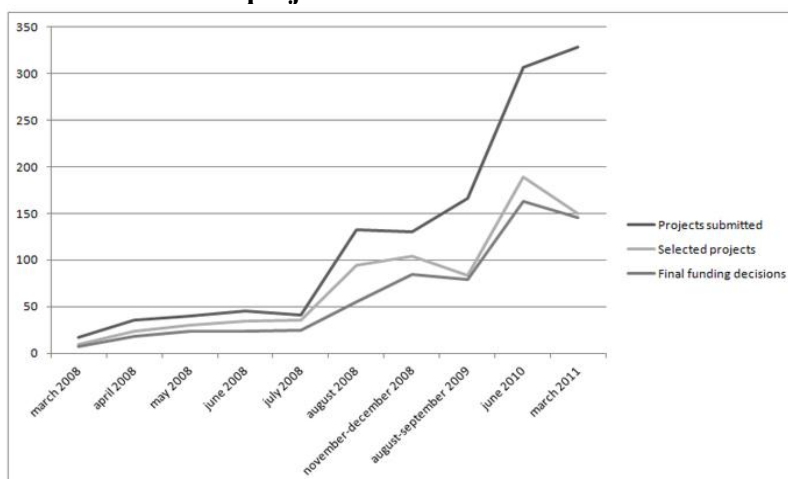
| Measure | Projects submitted |               | Selected projects |              | Final funding decisions |              | Payments made |
|---------|--------------------|---------------|-------------------|--------------|-------------------------|--------------|---------------|
|         | Number             | Public Value  | Number            | Public Value | Number                  | Public Value | Public Value  |
| 123     | 1.242              | 1.264.346.587 | 751               | 758.612.236  | 499                     | 495.631.968  | 142.734.080   |

Source: www.apdrp.ro

The analysis of the evolution of the number of projects since the first session in March 2008 show that the number of submitted projects increased from 17 in March 2008 up to 329 in March 2011 (Graphic 1). If the average number of the projects submitted within the first 5 sessions was around 35 / session, since August 2008 the number increased significantly up to over 100 projects. The last two sessions in June 2010 and March 2011 received a greater number of submitted projects: over 300.

If for the very first session in March 2008 the total value of the submitted projects was two times less than the approved funds for that session, in March 2011, the public value of the submitted projects was four times bigger than the available amount for this session. These figures show a growing interest of farmers for investments that add value to agricultural and forestry products.

**Graphic 1. Evolution of the number of projects over time**



Data source: www.apdrp.ro

Except the Bucuresti-Ilfov region who has specific characteristics (being especially an urban area and where the maximum grant rate in the total project can be up to 40 %), we notice three regions that received the fewest projects: South-West, North-East and Centre. At the opposite two development regions received a number of contracted projects over the average: South and South-East (Table 2).

**Table 2. The number of contracted projects by development regions**

| Region            | Contracted projects for Measure 123 |
|-------------------|-------------------------------------|
| North - East      | 44                                  |
| South - East      | 103                                 |
| South             | 127                                 |
| South - West      | 41                                  |
| West              | 61                                  |
| North -West       | 67                                  |
| Centre            | 42                                  |
| Bucuresti - Ilfov | 11                                  |

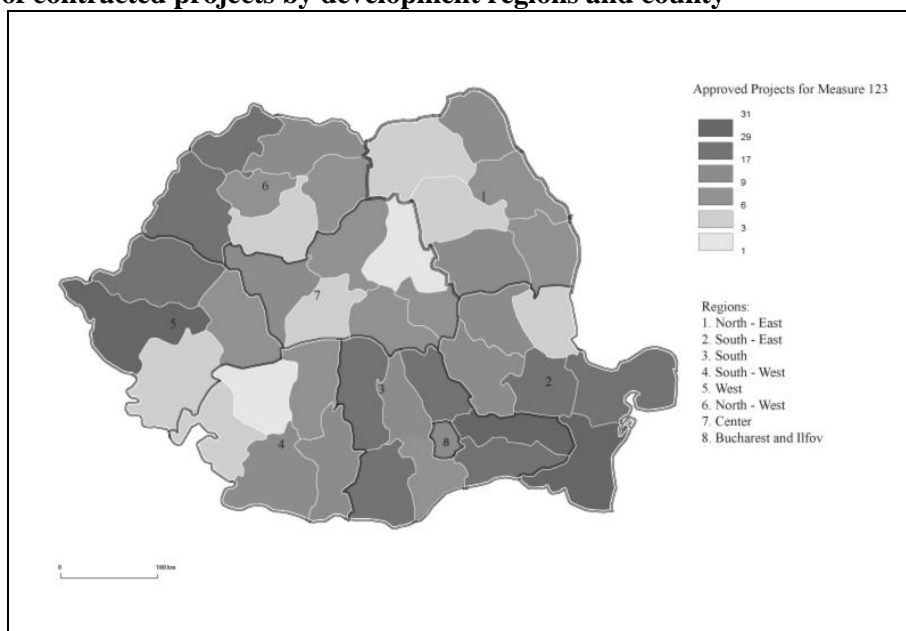
Source: www.apdrp.ro

Although North-East region is the largest region of the country and benefiting from harmonious forms of relief, it was not able to generate investment by through Measure 123. This is explained by the fact that it is the least developed region of Romania [1]. South-West region also shows a low level of development. The increasing number of people employed in agriculture, crumbled land and the use of less advanced technologies explain the low level of access to European funds [1]. Central region has a population concentrated mainly in urban area and relief forms of highlands predominate. Industry and services also are developed at the expense of agriculture [1].

The South region, although it shows a low level of development in the south counties, was able to obtain the largest number of approved projects. The explanation could reside in the fact that the majority of the population lives in rural areas and the reliefs forms stimulate farming.

The map of the contracted projects by county (Image 1) shows that the largest number of projects was obtained in the counties: Ialomița, Constanța, Timiș, Teleorman, Brăila, Satu-Mare, Arad. Except București, two counties had only one project approved: Gorj and Harghita.

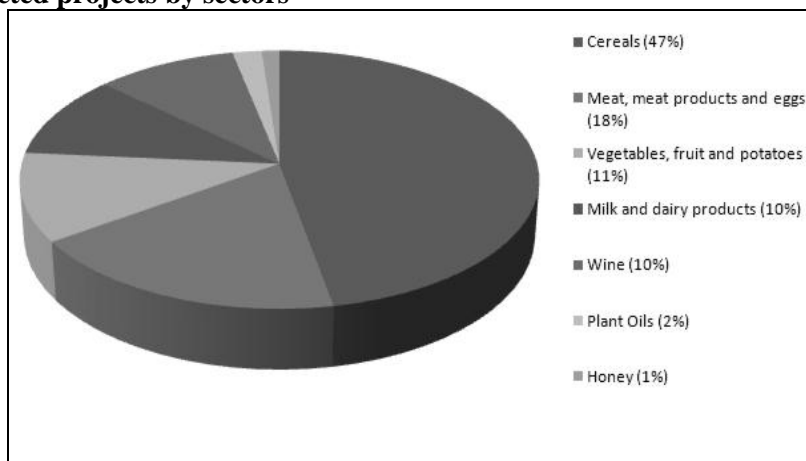
**Image 1. Map of contracted projects by development regions and county**



Source: www.apdrp.ro

The figures in Graphic 2 show that the main beneficiary of the measure 123 is the cereals sector with 47%, almost half of the total contracted projects. The cereals sector is followed by the meat, meat products and eggs sector with 18%. We also notice a significant percentage of the wine sector (10%).

**Graphic 2. Contracted projects by sectors**



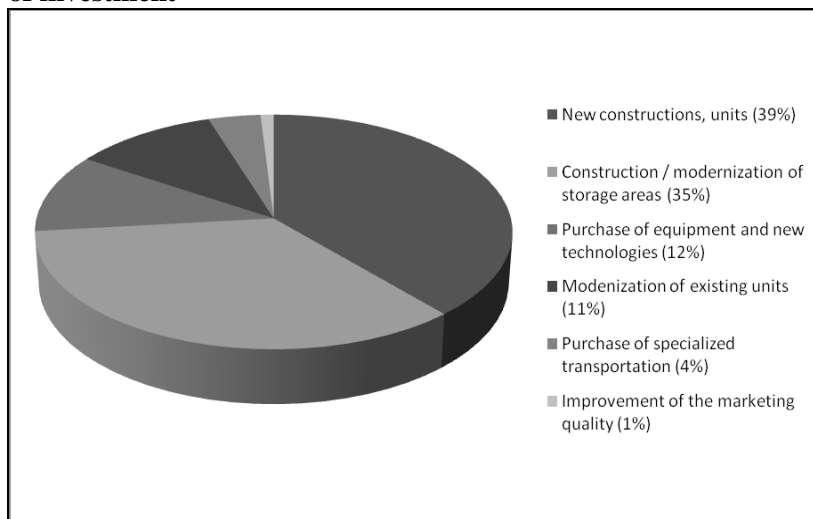
Source: www.apdrp.ro

The Measure 123 allow investments for a variety of actions:

- new constructions or modernization of buildings used for the production process, including constructions for environmental protection, internal infrastructure and utilities
- acquisition of new machinery, installations, equipment
- new constructions or modernization for the storage of products
- investment to improve the internal quality control of raw materials, supplies, products
- investments to produce and use renewable energy
- acquisition of new specialized transport means, needed for production;
- software acquisition [2].

The analysis of the types of investments shows that the majority of projects focused on new constructions or the construction / modernization of storage areas. Only a small percentage (1%) proposes investments in intangible assets, such as improving the marketing of products. But in these cases too, the investments also focused on tangible assets (such as improving the production quality).

**Graphic 3. The types of investment**



Source: www.apdrp.ro



Only 4% of the total contracted projects are ecological projects (producing ecological agricultural products, using wastewater treatment or using renewable energy sources). EU rural development policy attaches great importance to environmental protection and the promotion of ecological agriculture is a solution from from which the agriculture in Romania can benefit. The ecological agriculture provides a viable response to the new market requirements, constitute a guarantee for protecting the environment, a solution to sell products at a price 20-60% higher, an opportunity to revitalize rural areas [3].

The analysis of the legal status of the companies receiving approval for projects within the Measure 123, denote that the measure is successful for small and medium companies, family associations.

**Table 2. Legal status of companies receiving approval for their projects**

| Private limited company | Public limited company | Agricultural cooperative | Family business | Individual enterprise | Authorized person |
|-------------------------|------------------------|--------------------------|-----------------|-----------------------|-------------------|
| 432                     | 40                     | 7                        | 7               | 7                     | 3                 |

Source: www.apdrp.ro

The agricultural cooperatives have the projects with the largest amount of public value (between 2 million and 3 million euro – only agricultural cooperative can submit projects with a public value greater than 2 million). Family business and individual enterprises obtained approval for projects with a public value between 100 000 and 1 million euro.

The classification of the projects by their public value indicates that the most projects have a public value between 1 million and 2 million euro. The second category after the number of projects it is represented by projects with a public value between 100 000 and 500 000 euro.

**Table 3. Classification of projects by their public value**

| Public value <100 000 | 100 000 - 500 000 | 500 000 - 1 000 000 | 1 000 000 - 2 000 000 | 2 000 000 - 3 000 000 |
|-----------------------|-------------------|---------------------|-----------------------|-----------------------|
| 29                    | 144               | 110                 | 196                   | 18                    |

Source: www.apdrp.ro

The largest amount are used for projects in the cereal sector; projects with a public value between 1 million and 2 million euro belong to cereal sector, fruits and vegetables sector, wine sector and meat sector; projects with a public value between 500 000 and 1 million euro belong to meat sector, fruits and vegetables sector, wine sector and milk sector; projects with a public value between 100 000 and 500 000 belong to cereal sector, milk, fruits and vegetables sector, meat sector and wine sector; projects with a public value below 100 000 belong to honey sector, cereal sector, milk sector.

## CONCLUSIONS

Although initially less used by farmers, the Measure 123 has become very attractive to agricultural producers. It has a good rate of usage of the European Funds, particularly if the last two sessions are counted (except for the first sessions, not very encouraging). The types of companies that obtained the approval for projects within this measure are especially small and medium companies which are the targeted category of companies for this measure.

If the average figures for this Measure are positive, the analysis of the distribution of projects by regions shows clear disparities, especially in regions left behind in economic development. Even though the measure permits investments in intangible assets, only a very small percentage of farmers used this type of investments. We can also note that the ecological projects approved form a very small group (ecological agriculture can be a huge opportunity for the Romanian agriculture and for rural development).

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# DIAGNOSIS OF THE AGRI-FOOD VALUE CHAINS IN THE REPUBLIC OF MOLDOVA

STRATAN ALEXANDRU<sup>1</sup>, MOROZ VICTOR<sup>2</sup>, LUCASENCO EUGENIA<sup>3</sup>

## Abstract

*The main aim of the paper is to present the state of the agro-food value chain in the Republic of Moldova in conditions of incomplete information and uncertainty. In order to accomplish this general scope, the methodological approaches were adjusted to the available scarce data and existing research resources. Three important outputs are foreseen as a result of the investigation: description of the current situation of the components of agri-food value chains and interaction among them; the rapid analysis of the main dimensions of the chain; identification of constraints and development opportunities. Performance of the agro-food value chains in the Republic of Moldova is affected by high energy costs, unstable sources of inputs supply, restricted access to end-markets. It is also necessary to improve the investment climate in order to modernize the agri-food chains.*

**Key words:** *agri-food value chains, added value, vertical integration*

## INTRODUCTION

The transformation and modernization of the world agri-food sector has met different challenges over time. Countries with transitional economies have been experienced a complex processes of transforming their political and economic systems. In case of the Republic of Moldova the results of the reforms have not yet met original expectations.

The challenge for the Moldovan agri-food sector is to identify specific agricultural and rural development needs and opportunities across the value chains, and to focus investment in areas where the greatest impact will be achieved. This identification and resource allocation process can be facilitated by analyzing the main dimensions of value chains in order to develop an understanding of local factors and linkages. [3, 5, 10]

The most important effect of an agri-value chain derives from a series of activities that add value to a final product, beginning with production, then processing, transforming into final product, and marketing, sale to the end user or consumer and disposal after use. In conditions of small transitional economies value chain diagnosis as a rule is based on scarce data and incomplete information. Specific methods and techniques were used to investigate the real status of different dimensions of value chains.

## MATERIAL AND METHODS

The scientific discussion about the vertical integration of production and distribution processes lasts more than 50 years. Thirty-two manuals and guidelines for value chain analysis were identified [5]. The most common became methods for the rapid appraisal of the value chain.

In the Republic of Moldova the agriculture is decomposed into a series of sectors and value chains which together form an “industry system” comprised of a series of inter-related sub-systems. The sub-systems and the relationships between them are examined through a diverse set of analytical tools, thus forming a multi-disciplinary and integrated study. The main objectives of this research are to evaluate the supply chain and trends in the agri-food sector in the Republic of Moldova and to determine the driving forces behind these changes (demand side, supply side, policies, and institutions). To identify previous insights useful in addressing the study objectives, the literature review was focused on relevant studies in the domains of rural development, the development of markets, agribusiness, agricultural systems and change in agri-food value chains.

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A number of discussions on value chains modernization have taken place within the working groups organized by the Ministry of Agriculture and Food Industry. They were based on qualitative and quantitative analysis provided by the participants.

## RESULTS AND DISCUSSIONS

The value chain concept is a systems approach that evolved over time drawing from different disciplines. The scientific discussion about the vertical integration of production and distribution processes started in the 1960s. [5]

These concepts vary mainly in their focus on specific products or target markets, in the activity that is emphasized, and in the way in which they have been applied. Nevertheless, the different value chain concepts tend to identify opportunities for and constraints against increasing productivity.

A common definition presents the value chain as a mechanism that allows producers, processors, and traders—separated by time and space—to gradually add value to products and services as they pass from one link in the chain to the next until reaching the final consumer (domestic or global). Main actors in a value chain are firms from the private sector. The private sector draws from a range of public services and private technical, business and financial service providers. They also depend on the national and global legislative context and socio-political environment. In a value chain the various business activities in the different segments become connected and to some degree coordinated. [3]

By contrast, the term “supply chain” is used internationally to encompass every logistical and procedural activity involved in producing and delivering a final product or service, “from the supplier’s supplier to the customer’s customer”. Since the primary focus of supply chains is efficiency, the main objectives are usually to reduce “friction” (for example, delays, blockages, or imbalances), reduce outages or overstocks, lower transaction costs, and improve fulfilment and customer satisfaction.

Another related concept is the Francophone *filière* (literally “thread” in English). “*Filière*” is used to describe the flow of physical inputs and services in the production of a final product, and is essentially similar to the modern value chain concept in its emphasis on vertical and horizontal coordination. The framework paid special attention to how local production systems are linked to processing industry, trade, export and final consumption. [5]

The specific feature of ‘*filière*’ analysis was a static character, reflecting relations at a certain point in time. The concept is often used as synonymous to commodity chain or subsector.

As it was mentioned, there are many ways to analyze a value chain. The modern approach of value chain diagnosis represents a method for understanding how firms under given framework conditions operate and coordinate their businesses to ensure that primary materials are transformed, stored, transported and reach end-consumers in certain form and quality. Value chain diagnostics looks at the existing constraints and opportunities to value chain development, which are multiple by nature. It also looks at the various effects that operations in the chain have on groups of people, e.g., with regard to poverty reduction, employment, income generation, firm development, economic growth, or environmental sustainability. [3]

Favourable climate and high quality soils historically have determined Moldova’s agricultural specialization, particularly in the production of high value crops like fruits and vegetables. The status of the agricultural sector has changed dramatically over the last two decades, principally related to the disruption of production and distribution networks.

Land areas used for high value crops have been reduced by half. The shift in production has also been accompanied by significant reductions in land productivity.

Currently, Moldova remains dependent on its agricultural sector, which contributes with almost 12% to the GDP. Over 31% of the active population of the country is engaged in agriculture and food sector. Agriculture is divided into two distinct sectors: commercial agriculture and

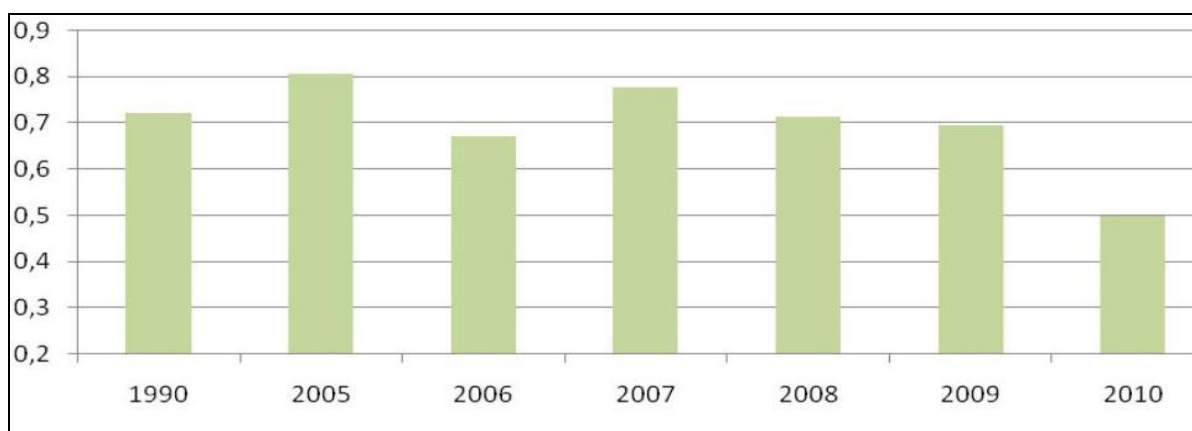
subsistence agriculture. The overwhelming majority of the farmers work within non-commercial small and medium farms.

**Table 1. Number of agricultural holdings, 2007-2011**

|                                   | 2007  | 2008  | 2009  | 2010  | 2011  | 2011/2007, % |
|-----------------------------------|-------|-------|-------|-------|-------|--------------|
| Agricultural cooperatives         | 239   | 259   | 283   | 233   | 232   | 97,1         |
| Joint stock companies             | 116   | 109   | 108   | 170   | 161   | 138,8        |
| Limited liability companies       | 1342  | 1344  | 1513  | 2038  | 3624  | 270,0        |
| Farms (thousands)                 | 390,4 | 386,2 | 380,9 | 399,8 | 391,7 | 100,3        |
| <i>Including with the area of</i> |       |       |       |       |       |              |
| more than 100 ha                  | 186   | 209   | 203   | 276   | 559   | 3 times      |
| from 50 to 100 ha                 | 105   | 113   | 143   | 524   | 780   | 7,4 times    |
| from 10 to 50 ha                  | 746   | 904   | 1126  | 1794  | 2729  | 3,7 times    |
| from 5 to 10 ha                   | 3307  | 4156  | 4320  | 3958  | 4175  | 126,2        |
| from 1 to 5 ha (thousands)        | 239,5 | 216,1 | 223,5 | 240,8 | 239,9 | 100,2        |
| Up to 1 ha (thousands)            | 146,5 | 164,7 | 151,6 | 145,5 | 143,5 | 97,9         |

Source: Developed by the author based on Land Cadastre data

The overall added value to the agricultural raw material is very low. Moldovan agricultural production and export are specialized mostly in raw material and semi processed agri-food products. Thus reported to each lei of primary agricultural production have been produced only 0,7 lei of food products in the year 2009, that is comparable with the level of the 90th. And this ratio is steady decreasing during the recent years that means stagnation in the large scale food industry.



**Figure 1. Ratio between the production of agri-food industry and total agricultural production, 1990-2010**

Nevertheless, the food industry has maintained its importance. Thus food processing and beverage industry contributes with almost 33% of the total industry production in the year 2010. At present in this sector activates several hundreds of companies and specialized units. The most important companies are concentrated in domains of vine production, fruit and vegetables processing, meat production and processing, mills and bakeries, and dairy production.

**Wine and brandy production.** Wine and distilled spirits represent the largest portion of Moldova's food processing and a significant part of all industrial output. Moldova has 130 enterprises dealing with wine production and bottling. In addition there are 7 brandy factories producing, maturing and bottling distillates. About 70,000 individuals, mostly smallholder farmers, grow grapes. More than 6,000 workers are engaged in wine processing that is almost twice less than in the year 2005.

**Mills and bakeries.** A number of 293 mills and 311 bakeries activates in the country. They employ 1.2 thousand and 7.0 thousands persons respectively. Nowadays in the sub-sector of mills and bakeries can be observed a concentration of producers, grouped around the large bread-baking plants that have a market share of about 65% from one side and the group of small and medium scale bakeries that have a market share of circa 35%. As main leaders in this sub sector can be mentioned Franzeluta SA located in the capital city, the bread baking plant from Balti in the North region and the bread baking plant CahulPan SA in the South.

**Fruit and vegetable processing.** Fruit and vegetable processors are divided into two main groups: the first comprise a small number of large firms, focused on export markets and producing about 80 percent of the total output of the sub-sector; and almost one hundred of small and medium canneries mainly serving the domestic marketplace. Together these firms process from 150,000 to 200,000 tons of raw material, mainly apples and plums. Main products are concentrated apple juice, fruit and tomato paste, canned fruits and vegetables. However, the potential of the fruit and vegetable processing industry is used at only one third of its capacity.

**Meat processing.** Moldova's meat-processing industry is highly consolidated, while official statistical data indicate there were 195 meat processing enterprises and production units in the year 2010. "Carmez" in Chisinau and "Basarabia Nord" in Balti dominate the domestic and export markets. A handful of small and medium scale manufacturers supply sausage and smoked meats to supermarkets, while other meat processors deliver their products to small shop outlets in cities and villages.

The production of the meat processing industry is exported mainly to CIS states, particularly because Moldova has not qualified for the status needed to export meat products to the EU.

**Dairy production.** The dairy industry is based primarily on the supply of raw milk from small producers from company-owned collection centres and from dairy cooperatives with collection centres financed by the dairy companies or through donor programs. While overall milk supply is adequate and animal productivity has been increasing slowly, dairy processors have seen only marginal improvements in the quality of milk.

Foreign investment in the sector has been relatively strong in past years due to the potential for import substitution, but these investors are beginning to question the viability of the sector's dependence on the household milk production.

**Table 2 Total numbers of enterprises and average annual number of staff employed, in the food processing industry, 2005-2010**

|                                       | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---------------------------------------|------|------|------|------|------|------|
| <b>Manufacture of wine</b>            |      |      |      |      |      |      |
| Number of enterprises                 | 174  | 166  | 159  | 136  | 132  | 130  |
| Employees, thou pers.                 | 13.4 | 10.5 | 7.8  | 7.4  | 6.2  | 6.1  |
| <b>Mills</b>                          |      |      |      |      |      |      |
| Number of enterprises                 | 319  | 326  | 320  | 295  | 301  | 293  |
| Employees, thou pers.                 | 1.6  | 1.6  | 1.4  | 1.3  | 1.2  | 1.2  |
| <b>Bakeries</b>                       |      |      |      |      |      |      |
| Number of enterprises                 | 295  | 296  | 297  | 285  | 306  | 311  |
| Employees, thou pers.                 | 6.8  | 6.8  | 6.9  | 7.1  | 6.9  | 7.0  |
| <b>Fruit and vegetable processing</b> |      |      |      |      |      |      |
| Number of enterprises                 | 110  | 113  | 101  | 94   | 105  | 106  |
| Employees, thou pers.                 | 5.1  | 5.0  | 4.5  | 4.3  | 3.1  | 3.2  |
| <b>Meat processing industry</b>       |      |      |      |      |      |      |
| Number of enterprises                 | 178  | 179  | 177  | 182  | 189  | 195  |
| Employees, thou pers.                 | 2.4  | 2.5  | 2.9  | 3.0  | 3.0  | 3.3  |
| <b>Dairy industry</b>                 |      |      |      |      |      |      |
| Number of enterprises                 | 56   | 54   | 47   | 47   | 51   | 46   |
| Employees, thou pers.                 | 2.9  | 2.9  | 2.9  | 2.7  | 2.4  | 2.6  |

Source: National Bureau of Statistics of the Republic of Moldova, 2011

The industrial facilities supply dairy products that require quick consumption (pasteurized milk) and low storage space (sour cream, yogurt, curds, soft cheeses). However, the bulk of the population is served by dairy products produced in small household operations in rural areas for local consumption. Thus the utilization rate of existing large scale plant capacity is very low.

Furthermore food business operators, specialized in dairy production, currently are not in a position to ensure that potential exports to the EU fulfil the relevant EU requirements.

In the Republic of Moldova vertical coordination among primary agricultural production, food processing and trade, had undergone dramatic changes in the midst of 90th. Rapid liberalization of prices and external trade, privatization of farms and enterprises without relevant institutional framework, caused the collapse of vertical coordination within the existing food value chains.

In a short time, the new system of vertical integration had started to develop in the agri-food sector. The process was led mostly by food business operators and traders. At the first stage the pace of new structure's development was very slow. In order to enhance drivers, of value chains creation, the Law on organization and functioning of agricultural and agri-food markets had been elaborated and approved by the Parliament on July 27, 2006.

This law establishes the legal framework for the organization of agricultural and agri-food markets by individuals and legal entities that produce, store, process and / or sell these products at the national or international level.

Regulation of agricultural markets and agri-food ensure mainly the following objectives:

- the organization and functioning of agricultural and agri-food markets on competitive effective and stable principles;
- cover of the domestic consumption and reduce the trade deficit;
- ensuring the quality and safety of food products;
- increasing income from farming and agri-food activities;
- the sustainable growth of economic performance and competitiveness of the agriculture and food industry;
- increasing exports of agricultural products.

An important provision of the present law represents the existence of the Council on product chain - a body established by participation of partners from the product chain and representatives of public authority. [4]

The activity of the Councils on products was focused mostly on interventions rather than on the broader and more comprehensive commodity chain development. Due to this, the impact of the law on vertical integration promotion was insignificant. The further intervention of the Government was needed to improve the value chain efficiency.

The following challenges and constraints are affecting the value chain development in the agri-food sector in the Republic of Moldova:

*Low productivity.* Cultivation methods among peasant farms and household plots remain traditional, with low levels of mechanization and low productivity. The agricultural sector is heavily dependent on rain-fed cultivation. Inefficient agricultural systems, weak market structure, small land holding sizes determine insufficient potential for sustainable delivery of primary agricultural commodities within the value chain. The absence of more productive agricultural technologies has resulted in land degradation due to continuous cultivation, soil erosion, deforestation and limited technology adaptation to changing climate.

*Food processing.* At present in the food processing and beverage industry activates several hundreds of companies and specialized units. Most of them are concentrated in urban areas. Small-scale food processing emerges in rural localities but it remains rather limited. Many large factories were built using industrial designs from the 1940s and 1950s and consequently have outdated processing and packaging lines. The equipment is not energy efficient, and packaging does not meet modern standards. Many enterprises lack modern management practices, investment capital, and the financial resources to compensate skilled labour adequately.

*Provision of appropriate education and training* opportunities is vital to ensure a strong foundation for the sector. Ensuring knowledge transfer and dissemination of research from organizations to sector is an area for development, as is ensuring Moldova food processing industry needs are addressed in research programs going forward.

**Table 3. The share of households and farms in the total volume of crop production 2001-2010, %**

| Cultures          | Average 2001-2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|-------------------|-------------------|------|------|------|------|------|------|
| Autumn wheat      | 34,1              | 33,9 | 31,8 | 23,6 | 29,7 | 33,0 | 28,7 |
| Barley            | 32,7              | 34,1 | 31,1 | 26,3 | 26,8 | 30,5 | 36,0 |
| Corn              | 83,5              | 84,3 | 88,8 | 91,3 | 83,8 | 89,9 | 84,5 |
| Leguminous        | 56,6              | 54,1 | 56,6 | 53,9 | 56,9 | 51,4 | 58,9 |
| Sunflower         | 45,5              | 42,0 | 38,9 | 33,4 | 31,7 | 33,2 | 30,2 |
| Soy               | 34,3              | 27,1 | 24,4 | 32,9 | 26,0 | 31,3 | 22,3 |
| Sugar beet        | 23,2              | 17,6 | 19,7 | 14,8 | 9,6  | 12,1 | 13,5 |
| Tobacco           | 23,5              | 3,0  | 16,7 | 19,4 | 17,9 | 13,6 | 19,7 |
| Potatoes          | 96,4              | 96,3 | 96,1 | 88,6 | 90,7 | 88,9 | 83,4 |
| Field vegetables  | 81,6              | 83,6 | 83,5 | 80,2 | 78,9 | 84,5 | 83,9 |
| Cucurbits         | 87,2              | 94,4 | 96,0 | 96,6 | 96,7 | 97,5 | 97,8 |
| Fruit and berries | 52,7              | 52,3 | 58,2 | 52,1 | 50,5 | 57,9 | 59,8 |
| Grapes            | 73,3              | 76,3 | 80,2 | 80,0 | 77,8 | 79,7 | 85,7 |

Source: Developed by the author based on the NBS data

*Business performance* has to be improved in response to changing market conditions, environmental requirements and efficiency in energy use. The need to comply with changing legislative requirements is of particular concern to the sector, especially the on-going series of changes to EU Food Safety regulations in general and pesticide in particular, and its impact on primary producers.

*Access to technical advice and guidance* is vital to protect and grow the sector that is currently not effective. Key focus opportunities for development of more sustainable and efficient practices are related to resource management and organic production.

By common effort of the Ministry of Agriculture and Food Industry of the Republic of Moldova and Agricultural Competitiveness and Enterprise development Project (USAID) three commodity chains have been analysed, namely on table grape, apple and tomato. [2, 8, 9]

The process included meetings and discussions between project experts and representatives from the Ministry of Agriculture and Food Industry, the Moldovan Producers Association and Exporters and the Institute of Applied Science in Horticulture and Agri-food Technology. The key informants for the analysis were private companies, family farms, public institutions and associations. While government data collection has improved significantly, there is still doubt expressed over the reliability and accuracy of official figures, particularly in relation to crop production and imports and exports. In the case of costs, import and export data, where possible, official figures were corroborated with traders to determine accuracy of quantities.

Finally, the disclaimer needs to be made that a value chain approach only provides an overall picture of underlying costs, profits, and trade competitiveness. Scarce information used for value chain diagnosis does not always allow extending quantitative assessment upon individual producers, local traders, processors, and distributors. Very often, they use their own cost and pricing structures that can vary significantly from the overall estimates. Therefore, the results of the analysis should be considered as providing indicative distribution of the value added along the chain of actors.

For the proactive approach regarding the vertical integration in agri-food sector, the horticulture has been selected. The working group created within the Ministry of Agriculture and Food Industry continued discussing the Program for Horticulture Sector Development. The reason of creation of such a group represented by stakeholders from research institutes, primary



production, food industry and trade, was that the subsector is still undeveloped in spite of being given a priority. The horticulture sector in Moldova faces a number of challenges related to post privatization period, as well as to transition to market economy, in order to achieve continuing sustainability and profitability whilst meeting the evolving and complex demands of consumers and the environment. Changes in the increasingly global market and the pressure to mitigate the worst effects of climate change are influencing agricultural policy direction in Moldova, like in many other countries.

Moldova horticulture is a beneficiary of support provided by international organizations in such areas as infrastructure development (roads, irrigation systems, transfer of modern technologies and innovations, provision of training on postharvest handling and organization of business trips to learn modern technologies, provision of market intelligence.

Cluster and sub-cluster needs assessments and market studies prepared by international projects in Moldova are the basis for the developing a Program as they contained recommendations based on the latest analysis of horticulture sector in Moldova as well as benchmarking and best world practices and experience. They give advice on how to strengthen the capacity of Moldova growers and producers to meet export market demands, to improve income generation from horticultural activities, develop agribusiness capacity to identify and diversify export markets and meet demand.

It is also recognized that there is a need for more Moldova-specific baseline data to provide an evidence base from which to develop, benchmark and monitor the sector and to raise the profile of horticulture in Moldova and the contribution it makes. So far the lack of the horticulture baseline statistics hindered to make reliable forecast.

The Program will include the following high value agricultural products that will be categorized into three main groups:

- Fruits (including berries) and nuts, including fresh/chilled, frozen and dried fruits;
- Vegetables, including fresh/chilled, frozen and dried vegetables;
- Processed fruits and vegetable products, including juices and canned fruits and vegetables.

The current task for Moldova is to develop the export potential, new products and find new market niche and to meet the needs of the internal market. The Program will be a sequence of concrete operations, which serve as a tool for policy implementation, containing clearly defined objectives, resources required, pre-defined target groups and deadlines.

## **CONCLUSIONS**

- Moldovan agri-food sector is characterized by weak linkage between primary agriculture, processing and trade.
- The specific feature of the large scale food industry of the Republic of Moldova is underutilization of its production capacities and lack of investments.
- Recently, a new system of vertical integration had started to develop in the agri-food sector.
- The main drivers of the agri-food chain revitalization are mostly food business operators and traders
- Producers associations have demonstrated limited abilities to develop efficient agri-food value chains
- Diagnosis of the agri-food value chains is at the initial stage in the Republic of Moldova
- More Government and donors implication is needed to foster the elaboration of policy documents based on value chain diagnosis

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# EVALUATION OF REALIZED INVESTMENTS IN AGRICULTURE IN THE CARPATHIAN REGION IN SERBIA<sup>1</sup>

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## Summary

*Central transition phase, in which there is Serbia, represents a radical turning point in the future development, not only agriculture, but the overall national economy and all of its participants. Consequently, investment in new economic subjects (companies and farms), recapitalization of existing subjects (companies and farms) and the consolidation of the financial system can greatly accelerate the development of a market economy in our country. However, a large number of economic subjects (companies and farms) have negative business performance, reflected in the reduction of market share and profitability, growth of indebtedness, inadequate investment and increased volume of diversified business activities at the expense of the primary job. Also, although the upward trend registered investments, macroeconomic indicators of investment trends indicate a high risk investment, both in agricultural estates, as well as companies from other industries. Imposes a dynamic investment risk reduction, which would increase the attractiveness of investment and stimulate domestic and foreign investors to evaluate various combinations of risk and return. Given the perspective of the enlargement of the European Union, resulting in Serbia, as well as the fact that in the future development of our farm investment activity to occupy a crucial place, the survey focused on the evaluation of investments in agriculture in the Carpathian region in Serbia.*

**Keywords:** *investments, agriculture, Carpathian region, Serbia.*

## INTRODUCTION

*Sustainable use of agricultural land, based on the traditional system of mountain agriculture, which provides a high degree of ecological rationality, presents an excellent basis for development of integral and organic production in protected area of the Carpathian region in Serbia.*

*Rural areas, which are characterized by ecologically safe locations in the Carpathian region in Serbia, are suitable for the establishment and development of small and medium enterprises for the processing of agricultural raw materials and finished products getting (specific or higher-quality, protected geographical indications).*

*Sustainable tourism and development of cross-border and regional cooperation, related to protected areas and development initiatives, providing additional impetus to sustainable agricultural and rural development in the Carpathian region in Serbia.*

*Investments represents main physical factor of economical and social development of any country, region and local community. The extent, structure and efficiency of investment mostly depends how and to what level will be solved and the basic issues of sustainable development of agriculture in the Carpathian region in Serbia.*

The commitment of our country to European integration requires a new definition of the role and importance of the agricultural sector, as well as making a very clear conceptual framework and strategies that will answer the key questions in the field of sustainable development. In the EU accession process is expected to adopt numerous of new reform legislation, and for investors the most important are laws concerning land and construction, and regulation of industrial and technological parks [6].

One of the classifications adopted in the literature, all investments are shared in economic and non-economic. The basic function of economic investment is that it assures the continuity of the

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production process at the same level, ie. simple reproduction. Consequently, they have a role to play in providing replacement of worn-out fixed assets allow the replacement of the production process. Also, business investment serve to allow the reproduction of the social process of production at a higher level, ie. expanded reproduction. Investment activity is a necessary part of the process of reproduction and the basic prerequisite for efficient performance of material production in the long run [5].

In order to create a realistic picture of the progress so far achieved a total investment in fixed assets, a chart showing the investment in the Republic of Serbia, Central Serbia<sup>5</sup> and the Carpathian area. The analysis covers the period of ten years (2001-2010.), For all of these areas (Table 1).

**Table 1. The realized investments in the economy \* (000 RSD)**

| Year  | Republic Serbia** | Central Serbia |   | Carpathian region |   |
|-------|-------------------|----------------|---|-------------------|---|
|       | RSD               | RSD            | % of total investment in the Republic of Serbia | RSD               | % of total investment in the Republic of Serbia |
| 2001. | 55.188.399        | 41.840.003     | 75,81   | 300.205           | 0,54  |
| 2002. | 102.860.663       | 79.557.972     | 77,35   | 528.014           | 0,51  |
| 2003. | 115.662.223       | 89.976.409     | 77,79   | 679.740           | 0,59  |
| 2004. | 152.929.464       | 123.445.066    | 80,72   | 961.752           | 0,62  |
| 2005. | 163.549.507       | 133.776.108    | 81,80   | 1.076.931         | 0,66  |
| 2006. | 340.795.050       | 246.477.735    | 72,32   | 888.768           | 0,26  |
| 2007. | 482.340.888       | 366.865.027    | 76,06   | 1.521.450         | 0,32  |
| 2008. | 472.746.680       | 360.307.995    | 76,33   | 1.554.482         | 0,33  |
| 2009. | 369.438.089       | 280.898.157    | 76,03   | 2.393.200         | 0,65  |
| 2010. | 425.400.001       | 325.375.393    | 74,49   | 4.278.232         | 1,11  |

\* Investments in capital assets.

\*\* Without data for Kosovo and Metohia (with the exception of 2010.).

Source: Statistical Office of the Republic of Serbia. *Municipalities in Serbia 2002-2011*; Statistical Office of the Republic of Serbia. *Investments of the Republic of Serbia 2002-2011*.

At the Republic Serbia level in general, as well as Central Serbia in the period until 2008., there has been a positive trend of investments (with emphasis on increased investment activity 2006th compared to 2005., or 2007. compared to 2006.year). Under the impact of the global economic crisis, initially weakened investment flow (2008. year), Followed by a significant decline (2009. year). Progress of legislative reform in accordance with the regulations of the European Union (EU), has led to the ease of operation and safety of investments (ie, until the investment growth in 2010., respectively).

With the exception of the 2006th year, total gross fixed capital formation in the Carpathian area are in constant growth (especially the 2010th in the respective 2009.), with an average annual growth rate of 34.34%. However, throughout the period, the total realized investment in this area, compared to the total realized investment in Serbia as a whole, is extremely low (ie, reflecting an average annual share of barely 0.56%). At first glance, it can be said that the area of the Carpathian area has a very good flow of economic development, but it should be recognized that such a high average annual growth rate of overall investments due primarily low base in the initial observation period (the period 2001-2003. year).

Taking into account the EU enlargement process, it can be said that in the future development of agricultural holdings in Serbia belong to an important place investments in the fixed assets. They play an important role in realizing the goals and priorities of the agricultural and rural development, primarily because they are the driving instrument of quantitative and qualitative growth of total agricultural production and factors of production (crop and livestock), but also to create conditions for a better life in villages. The growth of investment in agriculture is the

<sup>5</sup> Carpathian region in Serbia administratively includes areas of Municipalities Golubac, Kučevo, Majdanpek, Kladovo and Negotin.

condition of its technical and technological modernization, but also an important factor of economic and social stability of the country [5].

Without adequate size and designed the structure of investments can provide growth for the primary and permanent working capital, job growth, raising the performance of the work equipment, better productivity, diversification of production and so on., In any regional agricultural and rural level, and or at the national [4].

When it comes to gross fixed capital formation in agriculture, it is evident that those at the level of Serbia in general reflect the periodic variations are most pronounced in 2003. ( decrease of 37,38% compared to 2002.), and 2006. year (an increase of 163,49% compared to 2005.). Central Serbia, also follows the cyclical flow of investments in agriculture, which is particularly prominent 2002nd (reflecting an increase of 101,53% compared to 2001.) and 2010. year (reflecting a decrease of 42,06% compared to 2009.). Throughout the analyzed period (2001-2010. year), in the Carpathian area was recorded very uneven trend of investments in agriculture, which is the strongest growth in 2005. (5.432,03% over the previous year), while the most noticeable decline in 2008. year (77,45% compared to the previous year). On the other hand, in some years is the realization of investments recorded in the agriculture sector, a fact that can significantly slow down the implementation of the goals of sustainable agriculture and rural development in the Carpathian region (*Table 2*).

**Table 2. The realized investments\* in agriculture\*\* (000 RSD)**

| Year  | Republic Serbia** | Central Serbia |   | Carpathian region |   |
|-------|-------------------|----------------|---|-------------------|---|
|       | RSD               | RSD            | % of total investment in the Republic of Serbia | RSD               | % of total investment in the Republic of Serbia |
| 2001. | 3.146.845         | 998.683        | 31,74   | 13.817            | 0,44  |
| 2002. | 5.206.654         | 2.012.596      | 38,65   | 33.669            | 0,65  |
| 2003. | 3.260.612         | 1.219.717      | 37,41   | 0                 | 0,00  |
| 2004. | 3.721.166         | 1.702.354      | 45,75   | 256               | 0,01  |
| 2005. | 5.028.793         | 2.881.800      | 57,31   | 14.162            | 0,28  |
| 2006. | 13.250.369        | 5.170.798      | 39,02   | 0                 | 0,00  |
| 2007. | 14.384.811        | 5.736.605      | 39,88   | 55.735            | 0,39  |
| 2008. | 21.357.929        | 5.306.541      | 24,85   | 12.566            | 0,06  |
| 2009. | 14.174.921        | 4.376.208      | 30,87   | 0                 | 0,00  |
| 2010. | 9.219.328         | 2.535.698      | 27,50   | 0                 | 0,00  |

\* Investments in capital assets.

\*\* Agriculture, hunting, forestry and water management.

\*\*\* Without data for Kosovo and Metohia (with the exception of 2010.).

Source: Statistical Office of the Republic of Serbia. *Municipalities in Serbia 2002-2011*; Statistical Office of the Republic of Serbia. *Investments of the Republic of Serbia 2002-2011*.

In this case also, using the absolute value of actual investments in agriculture, can get to the average annual growth rate in the project area. In the Republic of Serbia, as well as at the level of Central Serbia, the average annual growth rate of investments in agriculture are positive (slightly higher in the first: 12,69% compared to the second case: 10,91%). Given the lack of investments in agriculture at the level of the Carpathian area in the last two years of the period, determined by the average annual growth rate for the time interval 2001-2008. years, which amounts to a negative value (-1,35%).

## MATERIALS AND METHODS

In the implementation phase the subject of research, it is necessary to identify the data / information from multiple sources (scientific and statistical publications) that are primarily related to the following topics: investment, economy, agriculture and demography.

In order to assess the actual investment in agriculture in the Carpathian region in Serbia, applied a methodology to calculate the volume of financial means (financial) investment in capital assets based on the following indicators [7]:

- realized investments in agriculture per agricultural inhabitant;
- realized investments in agriculture per active farmer;
- realized investments in agriculture per per individual farmer;
- realized investments in agriculture per person employed;
- realized investments in agriculture per agricultural unit;
- realized investments in agriculture per unit of arable land;
- realized investments in agriculture per unit of ploughland;
- realized investments in agriculture per head of cattle.

A way that follows the research scope of investments in the Carpathian area, can be useful for each area of the Danube region in Serbia (*Metropolitan area Belgrade-Novı Sad*, which make cities: Belgrade, Novi Sad, Pančevo, Smederevo, and local governments with the status of municipalities: Beočin, Irig Sremski Karlovci, Indija, Ruma, Pećinci and Stara Pazova<sup>6</sup>; *Special Nature Reserve Upper Danube*, which includes administratively municipalities: Sombor, Apatin, Bač and Bačka Palanka) and of significant benefit in making management decisions at the macroeconomic level.

## RESULTS AND DISCUSSION

In order to obtain a more realistic assessment of realized investments in agriculture in the Carpathian region in Serbia, were used indicators for both regional and national levels (*Table 3*).

Based on these results, it can be said that of all the observed maximum indicator value obtained in actual investment in agriculture per person employed<sup>7</sup>, while the lowest value was obtained with actual agricultural investment per unit of agricultural land, and in the following proportions:

- Republic Serbia (102,84:1);
- Central Serbia (159,99:1);
- Carpathian region (351,61:1).

Largest investments per person employed are realized in the Republic of Serbia, while the lowest value of these investments received in Carpathians. The largest volume of investment per unit of agricultural land was also made in the Republic of Serbia, while the lowest value of this magnitude was in the Carpathians.

At the level of the Carpathian area, and at all observed categories achieved significantly lower values than is the case with the level of Serbia in general and the level of central Serbia. Accordingly, the weakest comparative results were obtained with the actual investment in agriculture per unit of agricultural land (0,02:1 than in the first case and 0,05:1 compared to the second case), the best results were registered with the actual investment agriculture per agricultural inhabitant (0,27:1 than in the first case and 0,52:1 compared to the second case).

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<sup>6</sup> For this area often uses the term Middle Danube.

<sup>7</sup> The participation of employees in agriculture in the total number of employed persons is considerably lower than the share of the agricultural in total population (regardless of the observed area).

**Table 3. Score of realized investments\* in agriculture \*\***

| Indicator  | Unit of issue | Territory          |                |                   |
|--|---------------|--------------------|----------------|-------------------|
|  |               | Republic Serbia*** | Central Serbia | Carpathian region |
| Realized investments in agriculture per agricultural inhabitant **** | RSD           | 6,37               | 3,34           | 1,73              |
| Realized investments in agriculture per active farmer ****           | RSD           | 9,84               | 4,98           | 2,48              |
| Realized investments in agriculture per individual farmer ****       | RSD           | 10,68              | 5,20           | 2,58              |
| Realized investments in agriculture per person employed *****        | RSD           | 431,23             | 244,51         | 26,12             |
| Realized investments in agriculture per unit of arable land *****    | RSD           | 4,19               | 1,53           | 0,07              |
| Realized investments in agriculture per unit of ploughland *****     | RSD           | 5,058              | 1,96           | 0,09              |
| Realized investments in agriculture per head of cattle *****         | RSD           | 6,47               | 2,93           | 0,15              |

\* Investments in capital assets.

\*\* Agriculture, hunting, forestry and water management

\*\*\* Without data for Kosovo and Metohia (with the exception of 2010.).

\*\*\*\* The data were taken in 2002. year (according to the census).

\*\*\*\*\* The data were taken in 2008. year (as in the period 2009-2011. was not year of realized investments in agriculture Carpathian area).

Source: Statistical Office of the Republic of Serbia. *Municipalities in Serbia 2002-2011* [1]

Statistical Office of the Republic of Serbia. *The 2002 census. (Total and agricultural population in Serbia)* [3]

Statistical Office of the Republic of Serbia. *Investments of the Republic of Serbia 2002-2011* [2]

Looking at the first three indicators, the results also point to the fact that the Carpathian area does have drastically increased variation in the level of the Republic Serbia and level of Central Serbia. However, when it comes to values obtained for the other parameters, the results of this area are dramatically lower compared to the other two areas.

## CONCLUSIONS

Drawing on concrete results, obtained in the course of the assessment of investments in agriculture, summary we can conclude the following:

- strikingly lower investments have caused less economic growth Carpathian area in the relation to economic development, Central Serbia and the Republic of Serbia in general;
- the average annual growth rate of gross fixed capital formation in agriculture, which was obtained on the basis of the absolute values shown, only at the level of the Carpathian area is negative (the fact that in the analyzed period of time in 40% of cases there was no cash investment);
- agriculture evaluated from multifunctional aspect, provides a very weak contribution to the maintenance of economic and social security of citizens in the Carpathian region in Serbia;
- as a result of reduced investment in the field of agriculture, there is still lack of presence of foreign capital, and the efforts of the majority of finance channeled to other sectors of the economy in order to establish balance and ease of valuation of all available areas of

comparative advantage, gross fixed capital formation in the agriculture in the Carpathian area, exhibit markedly low economic effects.

On the other hand, should give place to identify and implement new methods for the evaluation of investments in agriculture at the macroeconomic level, and the possibility of free choice in the realization of the concept of sustainable agriculture and rural development.

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# PEOPLE'S APPROACH TOWARDS AGRICULTURAL FUNDS IN THE GHEORGHENI REGION

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## Abstract

*After five years of Romania's accession to European Union, there have taken part several changes in Romanian economy, especially in agriculture. All participants of agriculture and food industry have to exist in a new, changing environment. There are numbers of applications opened for agricultural producers, but many of them are not able to obtain, they are unsuccessful often, and there are serious problems in calling the financial budget pro-rata. In this study we examined the activity of producers for European Union's subsidies in Harghita County between 2007-2011, which priority goals were identifiable, that will show the characteristics of the future's development of agriculture for the coming years. We focused on the role of vocational training and the role of qualification among the applicants. We assumed that in the second half of the CAP period, it will increase – not only the numbers of submitted applications – but the demand for those trainings, that give such qualifications and knowledge that are requirements of the authorities. We carried out a structured deep interview personally the notoriety of the subsidy projects, the qualification, the background of applicants, their intentions why they took part in the projects in Gyergyó Region et cetera.*

**Keywords:** Rural area; Agriculture; Funds; Adult Education; Self-sufficiency

## INTRODUCTION

According to Law No. 351/2001, in Romania rural areas take up 207,3 km<sup>2</sup>, that is 87 percent of the country's territory. 45 percent of the country's population lives in these rural areas. The average population density is relatively low, 47 inhabitants/km<sup>2</sup>, about one-half of the country's overall population density. According to OECD, rural areas in Romania cover 94 percent of the territory, and the rural population accounts for 48 percent of the country's total population [7]. The significant disparities between rural and urban areas represent a specific social problem for the rural areas. About 10,1 million inhabitants represent the rural population, this being the total population of the 13. 000 villages organized in around 2.700 communes. The percentage of poor people residing in rural areas makes 2/3 of the country's poverty rate. About 70 percent of the workforce is employed in primary agriculture (compared with the country's average of 40 percent). In general, income in agricultural activities is relatively low and the employment structure of the poor is advantageous for employment in primary agriculture. Thus, 25 percent of the poor population is employed in primary agriculture. The majority of them work on self-supplying farms that are managed mostly by pensioned people. Only 1 percent of the rural population holds a college degree, compared with the 9 percent of the urban population; over 7 percent has little or no formal education, compared with the 2 percent of the urban population. Social indicators show considerable regional disparities [6]. Considering the country's regional character, it is justifiable to analyze rural people and population.

Earlier several studies carried out and analyzed the human resource situation in rural areas, and stated that the level of education is lower than in urban regions and must be developed. [3, 2, 5, 1, 4, 8].

Taking into account both the rural-urban disparities, and the low rate of the social and human indicators, this study sets out to answer the following research question: After Romania's accession to the European Union, how far do agricultural funds for rural development help rural population?

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## MATERIALS AND METHODS

The study was conducted between May and July 2012. As member of the Caritas Alba Iulia Rural Development staff one has the opportunity to see the huge demand for vocational education and training in the field of animal husbandry as well as the large number of applications for agricultural funds for rural development and this made possible to formulate the present research's question: „In this region, what is people's approach towards agricultural funds?“ Searching for answers to my research question, with the help of anonymous surveys and deep structured interviews such people were addressed who took advantage of one of the above mentioned organization's services, may it be adult education or professional consultation. By the evaluation, both the fact that I conducted the interviews personally and that I used the method of structured interviews has proven to be useful. At the same time, the answers to the open-ended interview questions revealed many new interesting areas.

## RESULTS AND DISCUSSIONS

Romania joined the EU in 2007. Following Romania's accession to the EU, various sources of agricultural subsidies became available. From the point of view of the analyzed region, the following funds are relevant: funds for lawn farmers; Measure No 141: funds for semi self-supplying farms; Measure No 112: setting up of young farmers. In point of presenting the results of in-depth research, the present report takes into consideration the importance of rural development funds. One can benefit from rural development programmed grants by writing a project proposal according to the criteria that have been announced in the call for proposals. In the case of rural development measures, at the time of application, farmers do not have to prove their expertise in the given field. Nevertheless, they have to assume responsibility that during the implementation period (5 years) they acquire professional knowledge within this field. These vocational qualifications may be obtained both in educational institutions and in adult education programmes, but the qualification title must correspond to the field listed in the project. After analyzing the country's application activity for rural development grants, one can affirm that 45.722 grant applications are submitted amounting to 18.272.019.588 RON. In Harghita County 1.595 applications were submitted amounting to 529.644.902 RON. In the Central region, Alba County was over-represented concerning submitted applications and granted amounts. Alba County is followed by Harghita with 1.595 submitted applications and more than 529 million RON [8].

### **Anonymous survey questionnaire results**

23 people, who recently has participated in any kind of adult education programme, were questioned (16 people took part in vocational training for dairy operators and 7 participants in introductory courses in animal breeding). Half of the respondents possessed a high school diploma, while the other half had certificate of secondary education. The majority of the people being questioned were males (12), there were also a few females (4) as well as some respondents who did not mark any of the given answer concerning their gender. Two of the questioned were living in urban areas, the others were from one of the city's rural area. Most questioned possess pasture, this being followed by meadow and then ploughland. Principally, the ploughland is used for production of forage (wheat, oat, barley, rye), or potatoes. Only a few of the questioned marks corn, grass or sweet pea. The 23 questioned persons have in total 677 animals, at least this was the total sum they found worth mentioning. Most of the people being questioned have cattle (288), fowl (191), sheep (112) and pigs (86). Concerning the questioned persons' agricultural equipment, in general, one can talk about a normal condition. Most questioned marked to be in the possession of agricultural equipment in the following order: tractors, soil cultivating machine and milking-machine. Those in the possession of 10 - 15 cattle have in general one tractor, while those owning 15 – 20 – 70 cattle have two or three tractors. From the 23 questioned 5 were interested in agricultural funds, 8 have

already submitted applications and 4 were being implementing their projects. One person noted that „I have not get any information about funds, yet”; 4 respondents did not answer the question at all. From the 14 respondents 6 were satisfied while 4 were rather dissatisfied with the system of agricultural funds. At the same time 4 had various opinions, such as „yes and no”, „it is slightly bureaucratic”, „it is acceptable”. The raw materials produced on one’s own farm is used by the people of this region in their own household, for trade or for processing products for themselves and for trade. From the 16 questioned persons 5 answered that they use the raw milk for processing dairy products (cheese, cream cheese). The majority of the people questioned uses the processed products in the own household (10), 7 sell it to wholesalers, 4 sell their products directly.

### **Results of Semi-Structured Interviews**

After the anonymous survey questionnaires, semi-structured interviews followed which were conducted with persons who were interested in agricultural funds, who have submitted an application or who have heard about these grant opportunities, but did not submit any application. Among the 7 persons that were questioned, there were 2 females and 5 males. From the point of view of their age, the youngest was 32 and the oldest one was 49. From the 5 male interviewees 3 indicated agricultural work as their main occupation, without having an official job title. Those having full-time jobs are either specialists (carpenter) or enterprisers. The female interviewees’ main occupation besides domestic work and child rearing is agricultural work. However, none of them is officially employed. The people being questioned had at least a minimum educational qualification (8th grade), respectively the highest educational degree they possessed was second bachelor’s degree. Each interviewee has already taken part in a kind of adult education course, the types of courses varying from animal breeding to selling agent. None of the questioned acquired agricultural knowledge in educational institutions. Most of them (7) participated in adult educational programmes with the desire to acquire this knowledge. Concerning the size of farms, one can say that those people whose main occupation is agriculture hold a larger number of animals (15 – 22 cows, 39 pigs), while those for whom farming is a secondary occupation have less animals and process products for their own household only. The results suggest that there are significant differences between the two female interviewees: one of the two women is not completely involved in the farm work, but only helps on the farm that has 40 sheep, 40 chickens and 5 goats, while the other one does the majority of work on the farm, taking care of a cow, two pigs and 10 chickens. Concerning agricultural equipment, most of the questioned possessed at least a tractor. Other agricultural equipment that they frequently have are hay making and soil cultivating machines. To the question concerning the quality of agricultural equipments all the questioned answered by marking the category: used. The objective of this research was to analyze people’s approach towards agricultural funds. From the 7 interviewees 3 did not submit any application and are not interested anymore in doing it; 3 persons did submit an application which are now under evaluation and one person would like to submit an application in the near future. One can say about those who did not submit any application, that they definitely do not want to apply for a grant; they were both actually over the age (40) at which one can apply for a larger amount of funding. The third person, who is not applying for a grant anymore, would have liked to do it in 2011, but because of family matters decided not to assume the responsibilities that would occur with the implementation of a project. From those who did submit an application, two applied for the grant that supports the setting-up of young farmers and one for grants supporting self-supplying farms. „Seeing that there are good opportunities, I said to myself why to struggle on one’s own. I saw that without financial support we would only remain with our plans” (E.V. interviewee). On the basis of those said in the interviews, one might think, that the questioned are afraid more to miss the opportunity of receiving a given amount of money, rather than to consider how the agricultural fund system functions and how to apply for such grants purposefully. To the questions about farmers’ objectives with the obtained agricultural funds many responded that they would buy agricultural equipments which would help them above all in hay making. „We are getting old, we are all growing old, thus we

*need to ease up on work,”* says farmer B.B., thus explaining the reason for the demand for agricultural equipment. The respondent who would like to submit an application affirmed that *„one needs financial support because without it one cannot come along. We would be able to develop (...), so that we do not have to ask others for help.”* It is rather interesting that, while in the past smallholder farms relied on mutual help, in the present farmers do not want to rely on the community help anymore, they want to be independent, they want to have their own agricultural machines and are even ready to pay all the costs for those. Most of the questioned people think that mutual cooperation hardly exists anymore. The respondent, who lives in the city, supposes that mutual cooperation exists only in the country. The interviewee from the country claims that *„mutual cooperation is barely functioning as today anyone who would help you in agricultural work would expect in return some money. Sometimes, it does function, but only in case of very close friends; if you need them they come to help and you go and help them as well.”* The following quotation might reflect well the farmers’ approach: *„Why not to take use of this opportunity when you can get it? (...) One can renovate the stables, or maybe buy some agricultural equipment. So why not? According to my theories, there is no agriculture without subsidies. Thus, nowhere in Europe can agriculture function without subsidies”* (J.P. interviewee). The above mentioned quotation confirms, that the farmer does not want to miss the opportunity and that is why he/she submits an application. At the end of my interviews, I wanted to find out which family member is going to take over the operations on the family farm. I can affirm that none of my interviewees was able to say with conviction, that his/her child is going to continue to farm. *„Well, where does today’s youth like to work? They somehow like animals, but they have no idea what does animal husbandry mean, as they are not obliged to work on the farm”* (G.CS. interviewee).

## CONCLUSIONS

In the researched region there is a large number of farmers whose main occupation is farming and animal breeding. However, officially, these people’s main occupation is farming only when, as a consequence of an agricultural grant application, they have to register their enterprise. The interviewed male and female farmers have low educational levels, but there is a high participation rate in adult education programmes, independent of the fields of study. From the point of view of agricultural equipment, the rate of used tractors is rather high. In most cases, the reason for an application is to purchase further agricultural equipment which would help farmers’ work. One can say, that in most cases the interviewees submit an application, if they possess the land and livestock needed to guarantee the adequate number of points required. Those who are decided not to apply for a grant, do this because of being afraid of the consequences or because of not finding the system safe. In general, people write a project proposal in order not to miss the opportunity of obtaining a given amount of money, rather than to consider how the agricultural fund system functions and how to apply purposefully for such grants. They are mostly informed about grant opportunities from a close acquaintance, who had already submitted an application. That the acquaintance submitted an application functions as a motivational factor. Most farmers consider that these grants are a form of financial security as due to it they can become independent and do not have to rely anymore on other farmers’ help and agricultural equipment. This is also confirmed by the fact that the idea of mutual cooperation is vanishing, as nowadays people go to places where they receive some money for the work they have done.

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# ANSWERS OF A RUMANIAN VILLAGE TO THE ECONOMIC AND SOCIAL CHALLENGES

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## Abstract

*Economic and social changes that took place in Eastern Europe in the 1990's, created a particularly difficult situation for the rural population, especially for those who pursue agricultural production. Those developmental differences that previously characterized the regions, settlements are not moderated significantly after the EU accession of Romania either. However, after the accession numerous positive changes have happened, that help the livability of rural areas. The developed land structure, the production structure of agriculture does not serve the economy effectively, it cannot or it can produce real commodities at a limited extent. An economic survey had been conducted at Mezőmadaras in 2002 and with the partial repetition of the development proposal based on the survey in the summer of 2012 the research looking for answers to the questions, to what extent and in which direction the changed the economy of the village examined, what elements of the development concept achieved. The article shows that how the development, creation of the settlement's infrastructure background (road network), the agricultural, sales information, contribute to some farmers' development to commodity producer, and point out that the cooperation is not typical, the tender activity is very low, despite that the rate of livestock farmers is high.*

**Keywords:** rural development, interview,

## INTRODUCTION

The determined direction of development of the European Union for the future is the rural development, the reduction of rural areas lag, the improvement of livability of sub regions between 2013-2020. The countryside can not be imagined without agriculture, the agriculture in rural areas - not only as an economic sector, but as the employer of the rural areas – have a great importance [4].

The rural development strategy consider to the rural tourism as an important component. [13, 6]. In our opinion, this can be a true break point if there will exist a solvent domestic demand beside the foreign tourists, however the present and expected economic situation will give less possibility. Other authors express their doubt, pointing out that the rural tourism, without the existence of productive economy, is not able to produce the number of jobs and income itself, which can supply all the people of a community. Tyran deduces with a Poland example that the services' level provided by rural tourism has become dominant in terms of sales after the accession [12]. All the activities, agricultural and non-agricultural, are important on those settlements that can be characterized by low level of employment, that provide workplace and income for the inhabitants. The primary processing based on agricultural production, the forming of marketing channels, the short-term rural tourism (2-3 days), teleworking, elderly care, leisure can be matched to the aims of rural development, but it requires capital, expertise and willingness. The sale of agricultural commodity is an opportunity for producers with appropriate farm size and organization, a number of requirements must be met for market access. [1, 7].

Fieldsend and Kerekes reported a successful English (Chelmsford and Braintree) example and a Romanian view (Bistrita Năsăud County) is added in their comparative study, noting that basically the agriculture is employing in Romania [3].

The education, communication and any other form of cooperation, individuals, NGOs, and governments, that strengthen civil society in rural areas, and promote national and international cooperation have necessary role in rural development. LEADER and LEADER + programs have a

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decisive role in strengthening community life. Immediately after the Millennium the civil society organizations at Romanian rural areas was not typical, and the community cohesion was low. [13]. At the end of the first decade of the Millennium the Romanian National Rural Development Program (NRDP) was mentioned as a positive example by Voicilas and his colleagues [15]. Hungarian authors ascribe similar role to institutionalized forms of cooperation, focus on cross-border forms Cross-Border Rural Network (CBRN) [2]. Kacprzak examined the economic aspects of collaboration, producer organizations' role, rural development in Poland (Wielkopolska province) between 2000 and 2010 [5]. He stated that the tender activity was significantly higher at Rural Development Program, on those settlements that were covered by the examined 122 producer organizations.

In order to be able to meet the expectations above, a viable, holdings must be formed that be able efficient agriculture production in a small settlements.

The purpose of this study, to show those economic and social changes that have taken place in a nearly ten-year period (2002-2012) by means of the example of a small town in Transylvania, which includes the period before the EU accession of Romania as well. The knowledge of changes requires, being able to answer the question of what kind of response options can be a rural, isolated small settlement.

## **MATERIAL AND METHODS**

Before the EU accession of Romania there was a questionnaire carried out in a small Transylvanian village, Mezőmadaras/Madaras. This village lies in the center of Transylvania, not too far from Marosvásárhely/Tirgu Mures (15 km). [14, 8]. The aim of the research was to examine the economic situation of the habitants and of the society at the same time. To find the way out for the farmers in a small village it is important to know more about the reality. It is important to find those specific tasks that could develop both the local community and the economy as well.

The results of representative survey conducted in 2002 were reported in several publications. [9, 10, 11]. The questionnaire was carried out during the spring of 2002 among inhabitants. There were three questioners. The questionnaires were filled out by them at the farms. The asked families belonged to a random sample, every 6<sup>th</sup> family was asked in that way. We got 120 appraisable questionnaires back. 443 persons belonged to the inquired families, 34.5% of the total number of habitants (approximately 1300 persons). From them 6% work on farms. In the questionnaires there were more than 30 closed and open, simple or combined questions on property size, its conditions (soil quality, features of the terrain etc.), production structure (plant production, animal husbandry), used inputs, equipments, yield level, post harvest activity, the aim of production and sales possibilities. In the evaluation of the results of the survey we calculated average values, dispersions, medians, minimum and maximum values as well. Over it some of the farmers were interview personally, too. Based on the given results a SWOT analyses of the village was drawn up from economic and agriculture points of view.

Ten years later, during the summer of 2012 twelve deep interviews were made in Madaras among some former interviewed farmers and we compared their economic situation ten years ago with the actual, and try to verify the realization of former recommendations. We made an interview with the leading persons living in village: the priest and his wife (Szabó Andor and Szabó (Ábrahám) Izolda). She is the motive person in the community, organizes several programs not only for the children but for example for farmers, too (visit farmers outside Romania).

We had no opportunity to repeat the whole representative questionnaire, but the deep interviews we carried out personally. The focus of the questions was the agricultural activities in the farms (cultivated area, production structure, animal husbandry, yields, investment, subsidies, etc.) Based on the answers we checked the realization of our former recommendations and finally a comparative SWOT analyses was made of the village to define new opportunities and strategies.

## RESULTS AND DISCUSSIONS

The habitants' number is about 1300 from the able-bodied persons about 30 have a job. The others are farming their lands. Most of the young people do not continue their studies after the primary school. As they are undereducated they lose the possibility to get a job in the nearest bigger town, so they have to make earnings from agriculture. The village has very bad road conditions, especially in autumn and in winter. This causes that the milk produced in the village cannot be sold to the milk industry in the region, there is a small cheese farm, which buys a part of the milk but the producers suffer from sales difficulties.

### *Results and statements of the 2002 survey*

The total agricultural area of the examined 120 holdings was 542 ha. The average farm size is very low compared with characteristic farm sizes of the most European countries. The average is 4.5 ha, the smallest one is only 0.12 ha and the largest one is not larger than 75 ha. The sectoral distribution of the holdings' area: 77.0% arable land, 18.9% pasture, 2.0% garden and 1.1% forest of the total area. The main problem with these farm sizes is that the incomes of agriculture give the only basis of the life of the people in Mezőmadaras. Less than 5% of the residents have non-agricultural activity as well, mainly outside the village, in the regional centre. The qualification of the adults is very poor. Less than a quarter of the people have any skills. This is the reason why any development project requires the training of the farmers.

The quality of the arable lands is not too good. More than 75 percent of the lands are less than 20 AK (golden crown). The quality of the arable land is typically medium 67% of it is 14-20 GC and 23% of it is 20-30 GC value. The pastures have lower quality, the ratio of 14-20 GC is 57.4% and below 14 GC the ratio is 23.6%. In terms of crop production is not favorable that the two-thirds of the arable land take place on a slope, while in case of pasture, the ratio is above 90%. These circumstances, along with the low level of inputs (fertilization etc.) determine the low yields and the insufficient nutrition quality of the fodders.

The main deals of farming are usually arable land and animal husbandry at the same time. Unfortunately their level is significantly low and contemporaneously the production structure does not meet the production aims. It has to be mentioned to understand this, that the assortment and the quality of the grown fodders do not meet the requirement of adequate animal husbandry. For example the main kept animal species are ruminants but succulent fodders have not been produced on farms yet, pasturage is the characteristic. Because of these facts the yields of the animal husbandry is much lower than in else.

Some other facts characterizing the situation of farms were the following:

- 98 percent of farms produce maize, it is the main plant on the farms, and the average yield of it is 4.9 t/ha.
- 88 percent of farms grow wheat and the average yield of it is 3.2 t/ha.
- Because of the low outputs only a few of the farms are able to produce commodities. More than 90 percent of the outputs of plant production are used in the farms and the households. Tobacco, potato and spring wheat are the main commodity plants, but the rate of them is only 7.2 percent of the arable lands.
- A total of 64 farms (53.3%) say they use fertilizer. 42.5% of the farms use pesticides, typically to the protection of winter wheat and corn, and in lower rates as a herbicide.
- 83 percent of farms keep cow, and the average number is 1.8 cows/farm.
- Livestock production was on a self-produced food base and grazing (cattle and sheep) was important. All holdings kept sorts of hens, but most of them (98.3%) for the supply of their own.



- From the point of view of the animal husbandry, in which dairy is the main activity, the silage production is missed. It causes that the average yield of milking is only a little higher than 3000 litres/year/cow, which is very low.
- The quality of the milk (because of low fat rate, high number of bacteria, dust etc.) usually is insufficient, so the milk is generally inadequate to the purpose of food-industry.
- 87 percent of the milk is sold, mainly to cheese manufacture operated in the neighbouring village.
- There is no food processing activity in the village. Every commodity leaves it as a raw material.
- The mechanization of the farms is low. Only every 10<sup>th</sup> farm has a tractor and a few sorts of its tools. 32 percent of farms have horses for land cultivation. About 60 percent of farms are based on the own manual work and/or the hired machine work. This low level of equipment is one of the reasons of low plant production level.
- Co-operation among farmers is at a low level. The relatives or sometimes the neighbours hang together. The farmers have bad experiences with co-operation because of the kolkhoz type co-ops, but most of them are ready to try other forms of cooperation, mainly the producers' organization or the machinery and farm helping rings.

### ***Proposal for the economic development of the village***

Based on the results of the economic survey of the village, we proposed the development of the settlement's holdings along the following principles:

- the economic structure cannot transform considerably on the settlement, the economic development of a significant number dwarf holdings get happened with the (primarily the quality and quantity of nutrition and feed supply) increase of inputs, and creating group mechanization and sales organization;
- developing a pilot project is proposed to farms with larger land area, which, with the possibility of area concentration, result different specialization, which consequence the production can be continued in greater efficiency;
- taking into account the released labor, the already existing, hidden unemployment, the multifunctional agriculture principles within the economy, we propose the development of the activities integrated to agricultural activities in longer term (rural tourism, crafts, etc..)
- the quality of production, the processing stage (primarily the sale of milk to creamery that operating in the neighbour village) in the markets improve by the change of boundary conditions of the economic development.

### ***SWOT-analysis of the village***

We can state that the unemployment was very high in the village, the farm structure was very fragmented: The level of input use in agriculture was very low because of the lack of financial sources. Most of the farmers dealt with agriculture in order to make their own living and the commodity production was only the second reason. From the point of economy of the village that meant no tax-income, no new jobs. As there were no real alternatives for the able-bodied aged persons to get job either in the village or in the neighboring towns they needed to find new strategies. The SWOT-analyses could help in building new strategies for this rural community. (Table 1)

Analyzing the main resources of this small rural community it could be found that the low level of inputs and production once seemed to be strength and in other cases weakness as well. Ecological crop and milk production can be one opportunity for the farmers.

### *Experiences of the Survey 2012*

Visible positive changes took place in Romania as an organic result of integration generating general development in 2012.

#### *Local, measurable changes in the village, the village communities*

- The electricity was installed the Szénáságy part of the village, both school has been completely renovated, the Protestant and Orthodox churches got new roof, the road was done from Bánd, the water was installed, although the lack of sewage none of a household were attached to the water system;
- Emigrants from the village remained dominant characters and the Reformed pastor couple, who create a living community with organizing programs continuously, with the emphasis of education and care for each other, the engines of the development;
- The 5-6% of the village houses have been renovated over the past ten years, more emigrated from Marosvásárhely, mostly retired, settled down in the village;
- Pro Ruris Society (formerly Foundation for Mezőmadaras) organizes events and programs (folk music, art, literature and history camps, competitions for children, commemorative meetings of art, historical persons, trainings etc.).
- Information Centre under construction (85% FEADRE subsidy, 15% national subsidy), a building (planning) of a pension has just begun;
- A retired teacher, a teacher couple and a support teacher living habitually except the priest couple.

**Table 1 SWOT-matrix of the village from the point of view of agriculture, rural development in 2002**

| Strengths  | Weaknesses  |
|--|---|
| <ul style="list-style-type: none"> <li>• <b>relatively good agro-ecological environment</b></li> <li>• <b>good facilities for extensive animal husbandry (ecological production)</b></li> <li>• manure production and use in the community, low level of artificial inputs</li> <li>• good environment (low level of contamination)</li> <li>• <b>beautiful landscape</b></li> <li>• <b>leading persons</b></li> </ul>   | <ul style="list-style-type: none"> <li>• <b>too fragmented property structure, low average farm size</b></li> <li>• <b>lack of capital, creditability</b></li> <li>• lack of machinery / old machinery</li> <li>• low rate of commodity production</li> <li>• <b>low rate of employment, under-education</b></li> <li>• lack of infrastructure, public transport (surfaced street to Tirgu Mures)</li> <li>• lack of educated intellectuals (except the priest and his wife)</li> <li>• <b>low willingness for cooperation among farmers</b></li> </ul> |
| Opportunities  | Threats   |
| <ul style="list-style-type: none"> <li>• <b>increase production of silo-corn, alfalfa – increase of yield in diary</b></li> <li>• diversification of production structure: poultry, pig, increase the rate of industrial plants</li> <li>• EU or/and national subsidies</li> <li>• <b>to strengthen the village community's activities</b></li> <li>• to form Producers' Organizations / Machine Rings</li> <li>• growth of the market of the ecological products</li> <li>• join to special agro-turistical routes</li> </ul> | <ul style="list-style-type: none"> <li>• <b>strict requirements of quality of commercial products</b></li> <li>• <b>strengthen of multinational food chains / quantity demand</b></li> <li>• ageing – migration from the village</li> <li>• <b>lack of the extension background</b></li> <li>• increase of diary sector in the neighboring settlements</li> </ul>   |

**Remark: bold what we recognize as same**

#### *Economic changes*

- The personally contacted holdings - which had been productive ten years before - the change clearly mean the increase of size and assets, beside the individual shape and distribution channel as well, without primary product processing.
- The forage production had changed, the knowledge of ensiling (farmer training, farm visits) increased milk yield (4800-5000 litres/year/milked cows that means a 1000 l/year milk surplus and it sold to the neighbouring village creamery (Theresia Ltd);

- There is still no proper distribution channel for products except milk, which at the appropriate commodity constitute an obstacle for the development for both at the level of individuals and the village community, and the Romanian agricultural sector, in EU context;
- The diversified production structure is not typical and the alternative activities (eg rural tourism) did not appear;
- In each farms visited, the number of livestock increased (such as 35 to 132 or 2 to 14), new buildings and renovated barns with a semi-automated milking systems are typical.
- The surveyed holdings continuously developing and mechanizing. The improvement in machinery accomplishes by individual investments, do not consult with other farmers, the credit-free operation is typical. They have not resort either the investment or the restructuring available EU tender opportunities except the single area payment.

### ***Community Tendering Activity***

The tendering activity was examined in reference to the community, by the effectiveness, the aims and sources. The tenders were filled out by the pastor and execute the programs, her enthusiasm formed a vibrant cultural life in the village. Our experience that is successful.

**Table 2 Aims of village community tendering activity, effectiveness**

| <b>Year</b> | <b>Number of winning/submitted tenders</b> | <b>Main tender's goals (winning tenders)</b>  |
|-------------|--|---|
| 2002        | 2/2  | support for pupils commuting, school accessories (installing electricity, TV)                                 |
| 2003        | 4/8  | art camp, support for pupils commuting, rural development training  |
| 2004        | 9/15                                       | social care, historical camp (Rákóczi war of independence memory) art camp, farmers' club village visit,      |
| 2005        | 13/26                                      | memorial camp (József Attila, informatic training, E-Hungarian point), art camp, social care                  |
| 2006        | 21/36                                      | support for pupils commuting, art camp, folk-dance camp, native camp, rural development training, social care |
| 2007        | 13/23                                      | Kodály Zoltán, Batthyány Lajos memories, folk art, car subsidy  |
| 2008        | 9/21                                       | Karácsony Sándor, Kodály Zoltán, Ungár Mátyás memories, , art camp, personal computer                         |
| 2009        | 5/19                                       | Karácsony Sándor memory, art camp   |
| 2010        | 6/12                                       | folk-dance camp, national anniversaries   |
| 2011        | 15/20                                      | phisycs camp, art camp, literature camp, folk-dance camp  |

Source: Szabó (Ábrahám) Izolda, reverend

The funding sources, except the information center and the pension, are primarily a national foundations, Maros County Council, and foundations from abroad. Among the main goals, the knowledge spread and social functions are the most typical beside the art training. The number of submitted and winning tenders gradually increased, however, the financial, economic crisis, began in 2009, can be detected within the reduction of profitability and the sum awarded. (Table 2)

## **CONCLUSIONS**

Break-out points of the farms are determined by their sizes, the variety of products, the flexibility of production, the market opportunities, the quantity and the quality of the human resources as well. Based on the survey these topics were analyzed in connection with Mezőmadaras and its farms. At first it had been mentioned that the farm structure gives a massive base to the local economy, which determines the feasibility of alternatives on a crucial way. The fact that a settlement for which project and by which amount competes from the opportunities, depends

basically on those, charismatic persons, who take care of all the difficulties and problems of competition for money, besides the information

The EU accession had a positive economic impact of the village, the daily livability improved in every respect. The structure of the economy has not changed, it was not expected, but in many holdings the size increases started, asset quality and production efficiency improved. The primary product processing, the sales channels, the lack of co-production still remains a problem. The farmers do not tender other forms of subsidy except the single area payment scheme (due to the negative experiences of the previous agricultural survival aid). In point of the village community as a whole, the obtaining activity of funding sources is better, although the effectiveness were variable.

However, the results that can be achieved by a settlement depends on many factors. It should be noted that, the development primarily depends on the EU grants existence and its effectiveness, at Community level. The fact that a settlement tenders, for what purpose, on which amount, depend on the charismatic person who take care of all application methods beside the information. In our opinion, the key to the development within a community collaboration is the individuals' attitudes and motivation.

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# COOPERATION AMONG FARMERS FOR COST SAVING MACHINERY

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## Summary

*The agriculture of the Central-Eastern European countries were considerably transformed during the 1990s. The property structure became fragmented, arable land and means of farming were privatized by different methods in different countries and – as a consequence of this – the hegemony of large-scale farming was wound up but to different degrees. Most of the newly formed small farms had no appropriate equipment and power machines for performing competitive production. The integration of these countries into the European Union has brought significant changes which further strengthened the need for competitiveness. Producers in the agriculture of Western European countries represent major market power due to the cooperation models (cooperative movements, machine and farm ring movement, producer organisations, etc.), but requirements of productivity, efficiency and profitability are also highlighted within these cooperation arrangements. The paper focuses on cooperation arrangements for joint machinery use and examines the factors affecting their expansion. The starting point of examinations is a former situation analysis made about the equipment supply of agricultural plans of a Romanian settlement and the cooperation willingness of producers. The survey which was carried out in 2002, was complemented by primary research through deep interviews in 2012, during which the observable changes and the impacts of access to the European Union were explored.*

**Keywords:** agriculture, efficiency, trust, risk, competitiveness

## INTRODUCTION

During the transition the ownership and property structure of arable land was basically transformed in most of the Central Eastern European countries [21]. In addition to the changing of ownership the farm structure has also changed and the property structure diversified [20]. The new property structure resulted significant changes in land use [4]: many small-scale, divided farms were set up. The restrictions of land market [8] conserve or permanently maintain the diversified property structure. Ensuring the technical background for these farms is quite a challenge for both the farmers and the governments.

The economic-social processes and evolving economic and social tensions point out that new structures should be formed to treat the new problems [9] and – as a new challenge in the countries of the region – the economic, social and environmental interests and sustainability of local communities should also be considered.

In the countries of the region, the cooperation willingness between producers is significantly different. It is affected by historical and cultural impacts as well as the socialization of farmers and new scientific explanations should be found for the attitudes of local communities regarding cooperation [12].

The presentation – considering the widely cited thoughts well-known – focuses on those aspects of the issue which help to reveal the reasons of machinery sharing arrangements (and needs) of farmers – who are in the centre of the present research – or the non-cooperation (and economic rationality behind decisions).

One of the key questions of machinery sharing cooperation is the moral risk which can be either moral risk of labour or moral risk of equipment [1]. We speak about moral risk of equipment when the user of the equipment does not consider the interests of the owner because he is not interested in preserving the long-term value of the equipment in use, since it is not his or only partly [6], which means imperfect supervisory rights above the equipment (in case of joint ownership, lending or leasing machinery).

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According to the experiences the machinery sharing arrangements can lead to losing or forced giving up of independence, loss of face, sometimes professional jealousy or envy which is often also due to generation gap and farmer pride [5]. The Hungarian experiences prove that the dark side of machine sharing is the growing dependence of individual and the force for coordination in case of decisions or actions [14, 11, 15].

## MATERIAL AND METHODS

The research was carried out in two phases: the first phase was a questionnaire survey in 2002. The questionnaire survey was performed with sampling among the farmers of Madaras (Mures county). The following questions can be related to the issues of present paper:

- Size of farms, features and traditions of production (area, qualities of land, sowing structure, size and composition of livestock, product output, yields);
- Utilization of products produced in farms (own consumption, sales, volumes);
- Features and methods of sales, present and potential markets;
- Technical supply of farms, features of technical supply and level of development;
- Current forms of cooperation between farmers, survey of cooperation willingness (with whom they would cooperate, with whom they would not);
- Development reserves of farms (savings), bank relations;
- Quality of farm management.

The survey was made with open and closed questions. The interviewers were the students of Szent István University, Faculty of Economics and Social Sciences, Correspondence Course in Mircurea Ciuc.

The questionnaires were completed for families. 120 families were interviewed in the settlement. Altogether 443 persons belonged to the interviewed families, they represent 34.5% of the total number of citizens and 65% of them work for the farm. Thus about one-third of families were asked. The respondents were random selected.

The total agricultural area of the examined 120 farms is 542 ha. 9.2% of the farms used rented land. 39.6% of the total land of these farms was rented.

The *average size* of farms is 4.5 ha (in case of tenants it is 11.0 ha). The smallest farm was 0.12 ha, the largest was 74.8 ha. The dispersion is 7.67, indicating that the number of median farms is relatively big.

Several papers were published about the outcomes of representative survey made in 2002. [13, 18, 19]. Ten years later, during the summer of 2012, based on a structured question list, twelve deep interviews were made in Madaras (Mures county) among some of the former interviewed farmers. We compared their economic situation ten years ago with the actual, and try to verify the realization of former recommendations.

## RESULTS AND DISCUSSION

### Technical supply of examined farms

The technical supply and the quality of equipment on the farms of the settlement was low in 2002. There was at least one tractor on every tenth farm (1.46 on average), horse used as draught, on another 32% of farms. (Table 1) The remaining 57.5% used cattle as draught animal or external services for crop production activities and transportation. The equipment stock was based mostly on basic equipment (plough, harrow, sowing machine, truck or trailer, spraying machine in case of farms with tractors, inter-row cultivator).

The farms were obviously arranged for livestock: 91% of them had stables, 93% had shed or sheds, almost half of them had barns or hay barns.

**Table 1: Draught force and tractor supply in farms**

| Title         | Measuring unit | Total sample | Weighted average | Number of farms | Lowest value | Highest value | Dispersion |
|---------------|----------------|--------------|------------------|-----------------|--------------|---------------|------------|
| Draught force | (pcs)          | 44.00        | 1.16             | 38              | 1.00         | 3.00          | 0.437      |
| Tractor       | (pcs)          | 19.00        | 1.46             | 13              | 1.00         | 4.00          | 1.127      |

Source: own work

In 2012, the farmers whom were visited for deep interviews reported that they made some major investments during the last ten years, purchased power machines or high-performance machines. The investments were typically financed from own savings. Most of them abstained from taking out a loan and did not apply for government subsidies considering it too complicated. The interviewed farmers and those who had proper knowledge of their activities declared that farmers reluctantly applied for grants except for normative subsidies.

As the result of investments – according to the estimations of farmers – the hauling power of tractor pool increased by 30-50% at the level of the settlement and the role of animal draught force decreased. As regards machine investments, the share of purchasing second-hand machinery was still considerable. New farm buildings were built and seemingly up-to-date livestock sheds were made in the farms we visited. The renewal of equipment and the extension of modern production technologies was obvious. For example, one of the key conclusion of the survey of 2002 was that dairy farms did not produce silage fodder at all, and – as a consequence – the quantity of milk was lower, the quality was worse than it could be under given conditions. During the past period the farms started silage production, created the necessary technical conditions and thus they reached obvious milk yield increase and the nutritional value (including fat as a key parameter) improved significantly and permanently. The milk quality is also affected by the milking technology but we got very mixed experiences in this issue. Many farms with great cow stock invested in milking equipment but some of them did not implement it and went back to the traditional milking by hand.

In spite of these investments, however, the situation was still the same: major part of farms had no appropriate machinery for performing all the technological steps of field crop production but the well-to-do farmers, who already had adequate equipment, further increased their capacity surplus. Thus some forms of the machinery sharing cooperation have become necessary. These already work, although according to the experiences, farmers prefer those arrangements which result the lowest trust level and the lowest dependence (primarily rented machinery services), undertaking even the higher fees for rented services – as opportunity cost.

### **Cooperation willingness among the examined farmers**

Former research projects clearly confirmed that the low level of equipment supply raises the necessity of cooperation, which improves the equipment effectiveness and reduces the capital investment need [14].

In 2002, the deep interviews which were performed for basing the questionnaire survey made it clear that, on the one hand, the equipment supply on the farms of the settlement is not adequate, on the other hand, the willingness to cooperate with fellow farmers is low. Therefore one of the main targets of questionnaire survey was to explore the existing forms of cooperation and review the awareness of prospective forms of cooperation.

According to the survey, 39% of farmers regularly help others or get help from others. Mostly they cooperate with relatives and friends, which is the continuation of social traditions. 60% of farmers used to be a member of a producing cooperative and practically none of them intends to become the member of a similar organization. 36% of them mentioned that there are some particular fellows with whom they would not cooperate at all. Out of the possible cooperation arrangements, the producer organizations (56%) and machinery rings (33%) were mentioned the most. (Table 2)

The cross table analyses show a very unfavourable picture. As regards the question about the existence of cooperation and the possibility of a future cooperation, negative responses were similarly overwhelming in general as well as among farmers who need cooperation the most.

**Table 2 Cooperation willingness, farm size and cooperation of farmers (2002)**

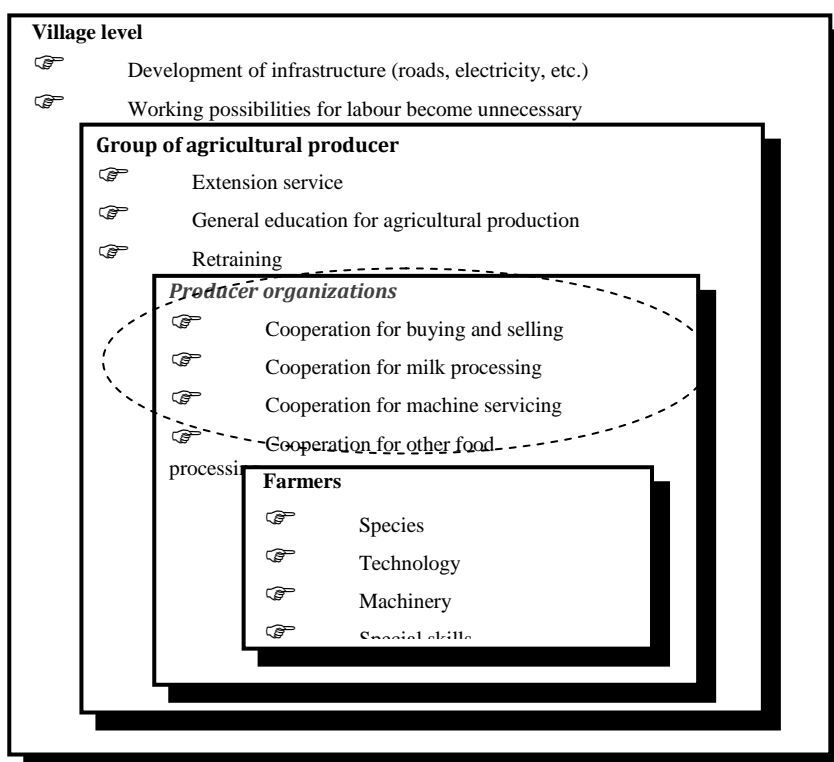
| Question<br>(‘Yes’=1; ‘No’=0)                         | Ratio of ‘yes’<br>replies<br>(%) | Denomi-<br>nation     | Cultivated<br>area<br>(ha) | Count and<br>% within Farm size<br>category | Do you have<br>cooperation? |        | Total  |
|---|----------------------------------|-----------------------|----------------------------|---|-----------------------------|--------|--------|
|   |                                  |                       |                            |   | No                          | Yes    |        |
| Is there any cooperation?                             | 39.2                             | Farm size<br>category | 0-3                        | Count                                       | 49                          | 22     | 71     |
| Is there anybody with whom you would later cooperate? | 36.7                             |                       |                            | %   | 69.0%                       | 31.0%  | 100.0% |
| Is there anybody with whom you would not?             | 35.8                             |                       | 3-6                        | Count                                       | 13                          | 14     | 27     |
| Do you have savings for individual purchase?          | 10.0                             |                       |                            | %   | 48.1%                       | 51.9%  | 100.0% |
| Do you have any savings for joint purchase?           | 6.7                              |                       | 6-9                        | Count                                       | 4                           | 6      | 10     |
| Were you member of a cooperative?                     | 60.0                             |                       |                            | %   | 40.0%                       | 60.0%  | 100.0% |
| Have you ever applied for loan?                       | 0.8                              |                       | 9-12                       | Count                                       | 3                           | 3      | 6      |
| Have you heard about: Cooperative                     | 50.0                             |                       |                            | %   | 50.0%                       | 50.0%  | 100.0% |
| Machinery cooperative                                 | 14.2                             |                       | 12-15                      | Count                                       | 1                           | 1      | 2      |
| POs   | 55.8                             |                       |                            | %   | 50.0%                       | 50.0%  | 100.0% |
| Machinery sharing arrangement                         | 16.7                             |                       | 15-                        | Count                                       | 3                           | 1      | 4      |
| Machine ring  | 33.3                             |                       |                            | %   | 75.0%                       | 25.0%  | 100.0% |
| Rented services                                       | 11.7                             | Total                 | Count                      | 73  | 47                          | 120    |        |
|   |                                  |                       | %                          | 60.8%                                       | 39.2%                       | 100.0% |        |

Source: own work

The recommendations drafted on the basis of the outcomes of research made in 2002 (Figure 1) gave high priority to the development of cooperation arrangements.

Considering all the above, the key question of deep interviews performed in 2012 was the identification of changes in the state of cooperation. The interviews made it clear that obvious progress was reached only in the organization of milk collection yet not in the form of cooperation but an enterprise coordinate the producers. In case of field crop production – which requires the most machinery – large farms with adequate machines provide rented services. None of the farmers has adapted the formerly suggested German sample that is to set up a machinery and farm-assistance ring model. They also rejected all kinds of cooperatives.

**Figure 1 Connection among the main areas of the development and the role of the improvement of cooperation among the main goals**



Source: Based on Takács & Takács-György, 2003



The possible forms of cooperation among agricultural firms (Table 3) have different advantages, but the disadvantages paired with advantages also mean risks for the farmer. Our recommendation was to implement the machinery and farm assistance model owing mainly to the advantages which are detailed below [10]:

- The purchase expenses can be reduced by harmonizing machine investments.
- The utilization can be improved and thus the operational costs can be decreased by the coordinated operation of equipment owned by the members.
- The organized use of machinery will result that appropriate machine capacities will be available for all the tasks within the cooperation.
- The knowledge and expertise of members will concentrate thus the implementation and development of technical-mechanical background is based.
- Beyond machinery use, the cooperation can be extended on almost all the fields of activities among the members thus improving the conditions of farming. .
- By applying unified internal fee system, the services provided by the members to each other can be accounted, but the price of services will stay within the group which creates and operates the cooperation arrangement and thus it does not withdraw sources from the local communities.

According to the German experiences, the model of machinery and farm ring is an adequate form of cooperation for the farmers of Madaras-like villages because the farmers can preserve their independence and – at the same time – their capacity surplus and capital need is decreased due to the coordinated investments and machinery use. The return on asset is also ensured owing to more efficient utilization, as well as profitability is improved because lower specific fixed costs are built in the production costs.

It is also confirmed by the data of Haag [5]. Haag collected the experiences on his own farm and in the frames of a machinery and farm assistance ring, a machinery sharing arrangement in which he participated. Prior to a coordinated development, investment, the value of machine pool owned by the members of the cooperation was 3324 EUR per hectare in 1993. It was reduced to 620 EUR/ha by 2004 due to the purchase of new machines and sale of unnecessary equipment made by joint decision and participation of members.

During the deep interviews performed in 2012 we also tried to find out why no steps were made to adapt the organizational model in spite of the advantages well-known by most of the farmers. We came to the conclusion during the research that the reasons should be searched in the relation of farmers to risk and in the level of general and actual trust they feel.

According to the experiences, the attitude of interviewed farmers towards risk is different. It can be due to a lot of factors, especially cultural and sociological factors can have major impact in the attitudes. Many respondents mentioned the unfavourable experiences obtained in former producer organizations or a picture made on the basis of information from hearsay.

The outcomes of the research correspond to the Hungarian experiences, according to which the expansion of cooperation arrangements requiring lower trust levels and dependence (Figure 2) is typical. International experiences offer some examples to this, too. While in the Scandinavian countries, those forms of cooperation are frequent which need higher trust levels and closer dependence [7, 2], in Germany, for example, there are some provinces where the machine and farm assistance rings involve almost all the farms (e.g. Bavaria). In other provinces (e.g. Hessen) the machinery services offered by entrepreneurs are more typical [17].

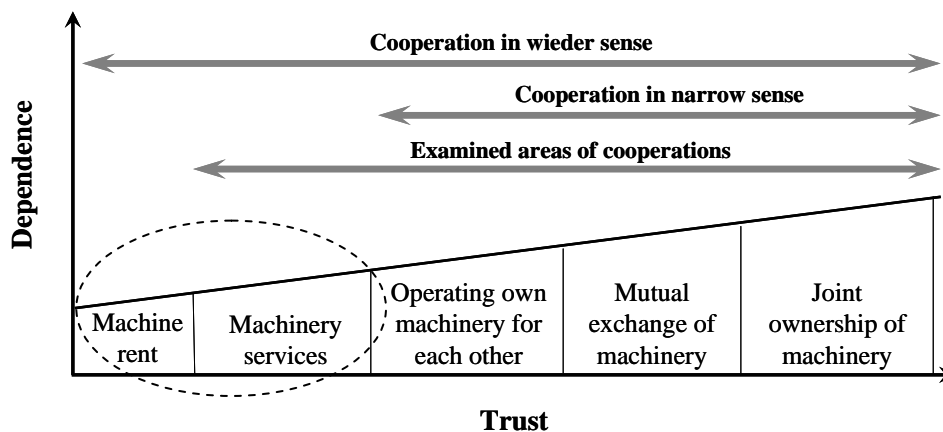
According to the experience of the previous research, the successful cooperation has some staff conditions, too. In addition to recognizing the interests, at least one farmer is needed who undertakes the extra tasks connected with organization and in the first times often without any financial compensation. It is also important that the fellows approve those who undertake leadership.

**Table 3 Cost-efficient, joint machinery use arrangements which can be applied in agricultural firms**

| Joint ownership, joint machine use  |  | Private ownership, coordinated (joint) machine use  | Private ownership, private machine use and using rented services                             |  |
|---|--|---|--|--|
| Machinery sharing   | Machine cooperative  | Machinery ring  | Service providing  | Machine rent   |
| <b>Main characteristics</b>   |  |   |  |  |
| - Joint purchase.<br>- Joint use.   | - Cooperative purchases.<br>- Members share.   | - Private machine investments with specialization.<br>- Surplus capacities sold within a closed group.                | - Machinery owned by entrepreneur.<br>- Machine work service provided for fee.               | - Machinery owned by entrepreneur.<br>- Machine lending to farmers.      |
| <b>Advantages</b>   |  |   |  |  |
| - Machine investment and operational costs are divided in ratio to operation.<br>- Expertise of members is cumulated. | - Advantageous in case of special equipment or production line.<br>- Smaller specific investment and machine operation costs.<br>- Adequate machine use and operation. | - Divided investment and operational costs.<br>- Machine can be selected for all types of tasks.<br>- Clear accounts. | - High quality job with modern machinery.<br>- Cost saving.<br>- Less capital employed.      | - Investment and operational cost saving.<br>- No commitment to utilize. |
| <b>Drawbacks</b>  |  |   |  |  |
| - Competency and use can be disputed.<br>- Difficult to dissolve the partnership.                                     | - Difficult to solve optimum exploitation.<br>- Higher administration and organizational costs   | - Greater organization needed.<br>- Does not work without cooperation willingness.                                    | - Difficulties in organization and coordination.<br>- Optional machinery solutions are less. | - Greater risk in machine use.<br>- Unknown machine – changing quality.  |

Source: Based on Takács et al. (1996) 8. p. and Nagy (2004)

**Figure 2 Partnership of farmers in machine use, in the space of trust and dependence levels**



Source: Based on Takács & Baranyai 2010, 180. p.

During the deep interviews it was indirectly examined, whether there is somebody among the leading farmers of the settlement who would perform such an organizational role and whether there is a person who is trusted enough, who would be approved as the head of such cooperation arrangement, like the machine and farm assistance ring.

On the basis of the replies it can be concluded that most of the farmers recognizes the necessity of cooperation but personally they do not want to participate in the organizational work and there is nobody who has that kind of a general acceptance which would make him suitable to successfully manage such an organization.

## CONCLUSIONS

The new situation created by the social-economic changes required new responses from the participants. The transformations that proceeded in Central-Eastern Europe in the 1990s have significantly affected the agriculture of the countries in the region. That sector of the national economy which has considerable role in the life of rural population is almost the only source of livelihood for the population of many settlements.

The countries of the region joined the European Union in the 2000s and thus the agricultural producers became part of the unified market where the farmers of the more developed member states have significant competitive advantages. Growing up – among others – to the outstanding technical and technological advantage is very difficult for the agricultural producers of the new member countries.

Among the factors hampering the convergence, the lack of capital have highlighted role, because it prevents the creation of a modern machine pool, which can be efficiently operated and meets the criteria of the environmental-economic-social sustainability of the 21st century.

The lack of capital is – on the one hand – absolute, and – which is even worse on the other hand – it is also relative. It means that more equipment is needed from the less efficient ones (which requires more capital, too). The efficiency, however, can be improved by the means of organization and thus the relative capital needs can be decreased, too.

The ownership structure that was set up in the frames of the transition in the early 1990s, and the developing and somehow concentrating agricultural farm structure on the basis of this has a typical feature: large number of farms below viable economic size unit. Many cooperation models have proved in the 20th Century in Western Europe that through them the farmers could improve their competitiveness and give adequate economic-social responses to the changing circumstances.

The most comprehensive response can be given by the machine and farm assistance model through which – besides cost efficient machine use arrangements – the community can also offer support to the individual in case of personal crisis, and opens possibilities for the urban population (e.g. holidays, vacation) as natural part of their life. In addition to this, they participate in the organization and performance of community services in the local living environment (e.g. looking after public areas, joint marketing of rural tourism services, etc.) thus they reduce both the community and the individual financial expenses.

One of the main obstacles of implementing cooperation models is the lack of trust among farmers, and owing to this, those solutions are primarily expanding in the region which result less dependence and can be operated at a lower trust level.

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# ROMANIAN AGRICULTURE STRUCTURAL PROBLEMS

ȚÎNȚARCU GABRIEL<sup>1</sup>

## Abstract

*The strategies and measures for agriculture development must be preceded by an analysis of factors involved in agriculture, of causes which affects the development of agriculture in conditions of performance. At present, this sector of major importance for the economy is facing, among others, with several structural disadvantages on: the consequences of how privatization was done, the share of subsistence farms and their influence on semi-subsistence farms and on agriculture sector performance, the age structure of people working in agriculture, deficiencies concerning the processing and the valorization of agricultural products, agricultural producers training necessity, insufficient development of non-agricultural activities, etc. The new orientation of European rural development policy aims to improve quality of life in rural areas through diversification of rural economy, sustainable economic development of farms and forestry farms, agriculture and forestry increasing competitiveness and adapting supply to market requirements, promoting local initiatives, ensuring sustainable fisheries and aquaculture development.*

**Keywords:** agriculture, structural, subsistence, holding, agricultural policy

## INTRODUCTION

Agriculture is one of the most important sectors of the economy. For reducing and removing problems affecting its development at the new demands, are required concerted efforts of state institutions and business community. Proposals for developing agriculture must be determined by an analysis of factors involved in agriculture, of causes that affect the development of agriculture in conditions of performance and of the advantages resulting from natural and commercial conditions. Agriculture is extremely important, because in this field work a large part of population, conditions are favorable and this domain also has a significant contribution to gross domestic product formation.

In many cases, agriculture is at the limit of subsistence, labor productivity in agriculture is low and the competitiveness of the products on market is not advantageous.

## MATERIAL AND METHOD

The paper proposes to highlight the structural problems of our country's agriculture, in the context of several years have passed since joining the European Union and agricultural activities must continue to face a competition with products of other countries on the community market. At present, this sector of major importance for the economy is facing, among others, a series of structural disadvantages on: consequences of how privatization has been achieved; the share of subsistence farms and their influence on semi-subsistence farms and on agriculture sector performance; the age structure of people working in agriculture; shortcomings in the processing and valorization of agricultural products; necessity for agricultural producers training; insufficient development of non-agricultural activities, etc.

## RESULTS AND DISCUSSION

Romania's agricultural area decreased slightly from one year to another.(Table 1) The transfer of land areas to forestry and construction sector was the main cause of reduction in agricultural surface in the last twenty years. Reducing the land areas by including in urban area, is a phenomenon found in zones with higher productivity, while changing agricultural land use category in the forestry occurs mainly in the disadvantaged areas.

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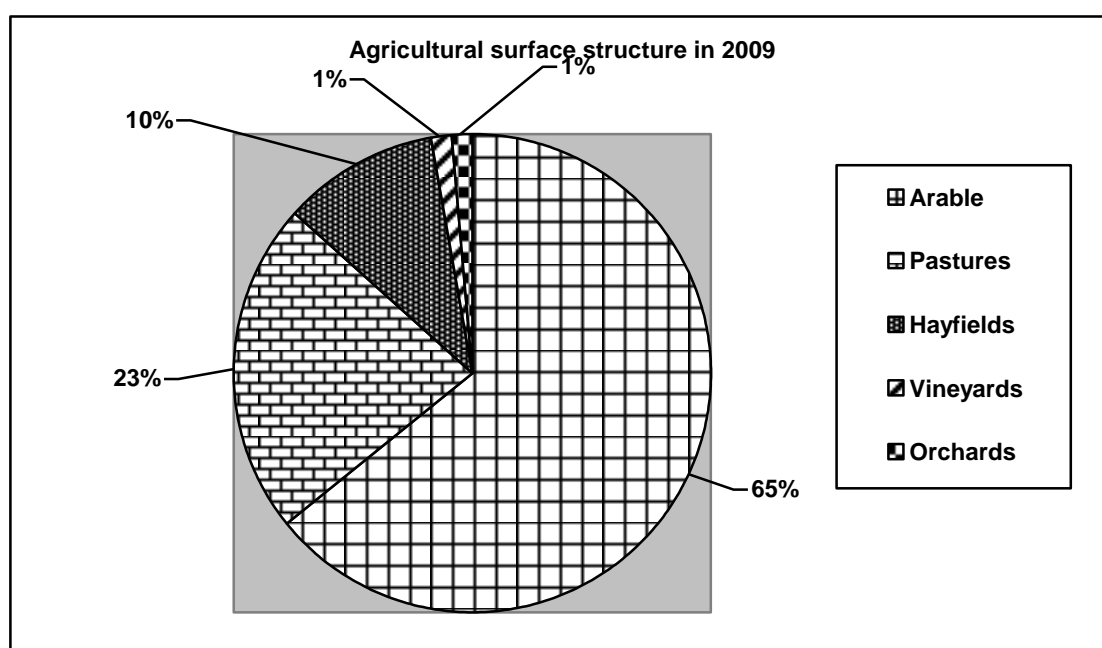
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**Table 1 The land fund surface by use type (ha)**

| Specification           | 2000     | 2001     | 2002     | 2003     | 2004     | 2005     | 2006     | 2007     | 2008     | 2009     |
|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Total surface           | 23839071 | 23839071 | 23839071 | 23839071 | 23839071 | 23839071 | 23839071 | 23839071 | 23839071 | 23839071 |
| Agricultural            | 14856845 | 14852341 | 14836585 | 14717426 | 14711552 | 14741214 | 14730956 | 14709299 | 14702279 | 14684963 |
| Arable                  | 9381109  | 9401471  | 9398518  | 9414341  | 9421892  | 9420205  | 9434542  | 9423255  | 9415135  | 9422529  |
| Pastures                | 3441667  | 3421383  | 3423925  | 3354970  | 3346860  | 3364041  | 3334375  | 3329984  | 3333028  | 3313785  |
| Hayfields               | 1507190  | 1510067  | 1513574  | 1490384  | 1498346  | 1514645  | 1524922  | 1531491  | 1532342  | 1528046  |
| Vineyards and nurseries | 272252   | 267434   | 259644   | 230527   | 223315   | 224082   | 223701   | 217968   | 214463   | 215382   |
| Orchards and nurseries  | 254627   | 251986   | 240924   | 227204   | 221139   | 218241   | 213416   | 206601   | 207311   | 205221   |

Source: INSSE

**Chart 1**



Privatization of agricultural land has determined in our country agriculture two main structural disadvantages: large land surface and many small farms; large land area owned by too many elderly farmers, especially in smaller farms. Currently, almost half of the total surface and livestock is in the subsistence farms, which are defined as below 2 economic dimension units (EDU), ie the standard gross margin of the holding is less than 2400 EUR. In terms of area, mostly are within the segment of 0-5 ha, with an average of 1.63 ha. Most of these subsistence exploitations are not considered farms.

Subsistence farms slow the performance of the agricultural sector. Both agricultural land and labor are used under their economic potential. In addition, subsistence farms they lack capital and appropriate training of farmers, which results in obtaining low income. Therefore, farmers from subsistence farms are not sufficiently motivated and not have ability to comply with European standards, including those related to environmental quality, animal welfare and food safety.

An important aspect concerns the livestock sector, as the animal disease typically occurs in these small farms and the impact can be felt in the entire sector competitiveness.

According to the latest agricultural census, the average used agricultural area per one farm has not changed significantly. (Table 2)

**Table 2 The average agricultural surface on farm**

| Specification                        | M.U. | 2002 | 2005 | 2007 | 2010 |
|--------------------------------------|------|------|------|------|------|
| Average agricultural surface on farm | ha   | 3,11 | 3,27 | 3,50 | 3,45 |

Source: INSSE

Thus, the average utilized agricultural area, in 2010, on a farm was 3.45 ha, compared to 3.11 ha in 2002. On categories of farms, the average utilized agricultural area on a farm without legal status was 1.95 ha, compared with 1.73 ha in 2002; the average utilized agricultural area per one farm with agricultural legal status was 190.84 ha, compared to 274.43 ha in 2002.

On the main categories of the used agricultural land, there were on average per farm 2.15 ha of arable land, compared to 1.96 ha in 2002 and 1.17 ha of pasture and hayfields compared to 1.04 ha in 2002.

Due to the fact that a share of 45% of Romania's agricultural area is worked in subsistence farms, whose activity is far below the potential, these keep at a low level the efficiency of the agricultural sector. The existence of an important agricultural land patrimony in a poorly performing agricultural sector represented by subsistence farms diminishes performance of larger holdings.

The segment of semi - subsistence farms remain small and unsatisfying. It represents 9% of all farms and about 16% of agricultural land. To become viable and competitive commercial units, the semi-subsistence farms will have to face many challenges and market circumstances.

Therefore, the public support has a major role in determining this transformation and restructuring process in Romanian agriculture. Land market transactions should be improved so that the semi-subsistence farms to consolidate and take over lands from the subsistence farming sector, either by lease or by purchase or through other forms, such as farmers association. Technical and advisory services will play an important role in improving intermediary farms capacity so that they become competitive. Semi-subsistence farms shall better integrate on the market, particularly through membership in an associative form.

Another structural feature of Romanian agriculture is that the share of associations, societies and agricultural cooperatives reduced for trading companies that reach to administer, in 2010, 54.2% of the agricultural area of the country. (Table 3)

**Table 3 Agricultural area, according to the types of farms**

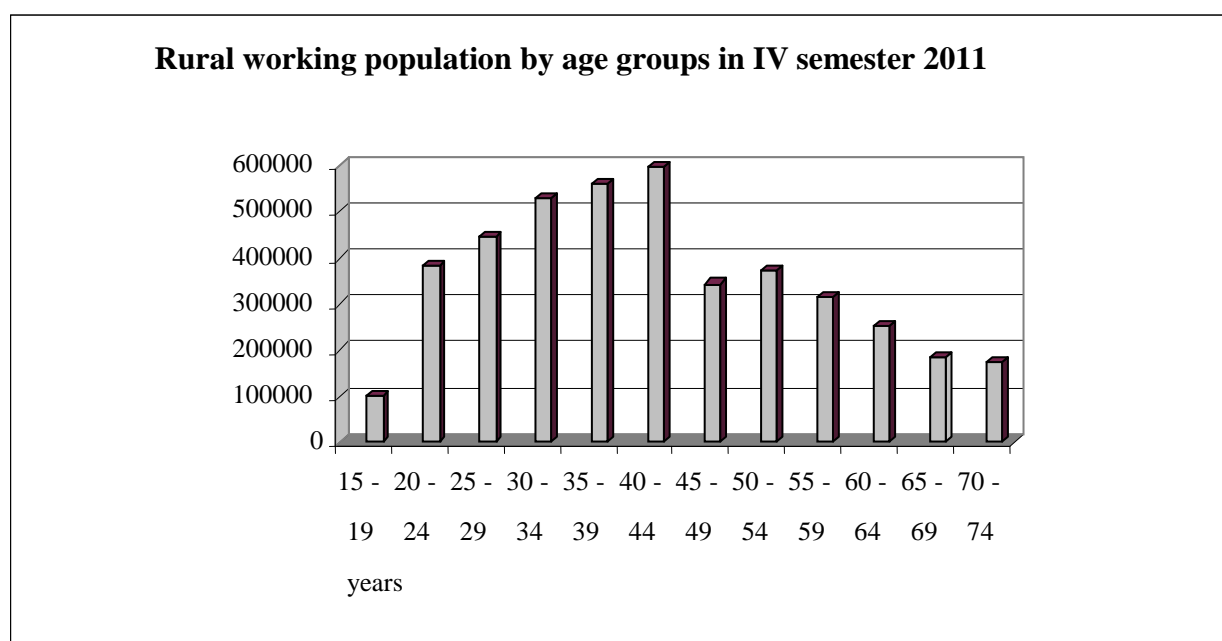
| Agricultural area - ha   | 2002           | 2005           | 2007           | 2010           |
|--|----------------|----------------|----------------|----------------|
| Societies/agricultural associations  | 975564         | 742065         | 615897         | 556786         |
| Trading companies  | 2168792        | 1780788        | 1951115        | 3172972        |
| Units of public administration/other public institutions   | 2867368        | 2124737        | 1872194        | 1598810        |
| Cooperatives   | 2365           | 3246           | 15088          | 8176           |
| Other types (foundations, religious settlements, schools, autonomous administrations, research institutes) | 207863         | 153847         | 332445         | 516110         |
| <b>TOTAL</b>   | <b>6221952</b> | <b>4804683</b> | <b>4786738</b> | <b>5852854</b> |

Source: Institute for Social Economy - after the 2010 agricultural census provisional results

The subsistence farms lack the capital and appropriate training of farmers, something that results in low income from work performed. They are usually run by private individuals who have either passed or are approaching retirement. Most of these people have no level of training or have a limited level of skill or knowledge.

A relatively high percentage of young people aged between 24 and 44, are employed in agriculture. (Chart 2). This is due to the fact that no other sources of income, rural youth remain in the communities they belong, to help carry out agricultural activities.

Chart 2



Source: INSSE

Regarding the age structure of management in the individual farms of more than 1 EDU, it appears that a high share of 71% is represented by the farms heads of age 55 and over, compared to the percentage of aged between 35 and 55 years, 25%, and young people under 35, only 4%. Aging trend of the heads of farms can be noticed on farms with legal status (under 35 only 11% and 66% over 45). (Table 4)

**Table 4 Age categories of farm managers, depending on the farm size**

| Age          | 0-2 EDU          | 2-8 EDU        | 8-40 EDU      | 40-100 EDU   | Over 100     | TOTAL            |
|--------------|------------------|----------------|---------------|--------------|--------------|------------------|
| ≤34          | 210.056          | 13.902         | 1.983         | 185          | 100          | 226.226          |
| 35-39        | 246.853          | 20.962         | 2.436         | 267          | 151          | 270.669          |
| 40-54        | 905.500          | 81.394         | 9.785         | 1.602        | 1.050        | 999.331          |
| 55-64        | 849.094          | 90.505         | 5.939         | 762          | 532          | 946.832          |
| ≥65          | 1.659.739        | 147.554        | 5.398         | 268          | 135          | 1.813.094        |
| <b>Total</b> | <b>3.871.242</b> | <b>354.317</b> | <b>25.541</b> | <b>3.084</b> | <b>1.968</b> | <b>4.256.152</b> |

Source: INSSE

The number of tractors and agricultural machinery in Romania decreased at the beginning of transition period, then began to rise, but gradually. At present, the number of tractors is only 40% of 1989 level, while at the combines is at 77%. In 2010, the number of tractors increased by 12.7%, but the number of combines decreased by almost 10%. Note that over 98% of the total number of tractors and combines belong to private. (Table 5) Nevertheless, the actual the park of agricultural machinery is largely overcome, and this leads to big losses of harvest and does not resolve the problem of long harvesting campaigns.

**Table 5 Evolution of the number of tractors and combines for cereals harvesting**

| Specification    | Machinery type                  | 2000   | 2001   | 2002   | 2003   | 2004   | 2005   | 2006   | 2007   | 2008   | 2009   | 2010   |
|------------------|---------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Total            | Tractors                        | 160053 | 164221 | 169240 | 169177 | 171811 | 173043 | 174563 | 174003 | 174790 | 176841 | 180433 |
|                  | Combines for cereals harvesting | 28084  | 25784  | 25315  | 25048  | 24653  | 25055  | 24975  | 24656  | 24769  | 24900  | 25285  |
| Private property | Tractors                        | 146042 | 154592 | 163711 | 165375 | 168947 | 169184 | 171056 | 170755 | 172494 | 174505 | 178187 |
|                  | Combines for cereals harvesting | 26018  | 24563  | 24755  | 24730  | 24410  | 24539  | 24547  | 24267  | 24520  | 24686  | 25075  |



Valorization of agricultural products and marketing channels, which integrates the large number of small and medium farms in the food economy are underdeveloped and faces the following problems:

- lack of standardized cultural lots, large and homogeneous, especially in the agricultural commercial segment of medium level;
- lack of modern storage facilities;
- the presence of numerous intermediaries;
- inadequate information systems concerning market price situation, supply and demand on individual markets.

Storage facilities for agricultural products, especially cereals, are facing high costs of storage and conditioning, many silos can not guarantee the standard storage conditions imposed by national legislation. Strengthening the link between producers and processing plants, by long-term contracts and the establishment of producer groups to provide uniform quality raw materials to industry, in parallel with the technical and management consulting services support, could help overcoming these problems. A better integrating them into the food industry would increase and stabilize farmers' incomes.

## **CONCLUSIONS**

In conclusion, the Romanian agriculture has some structural problems such as:

- Romania's agricultural surface decreased from one year to another;
- excessive fragmentation of property;
- almost half of the total surface and livestock is in subsistence farms;
- the subsistence farms slow the performance of the agricultural sector;
- the share of associations, companies and agricultural cooperatives decreases in favor of trading companies;
- inadequate training of farmers, that results in low income;
- aging trend of the heads of farms;
- low productivity and high self-consumption in farms;
- the existing park of the agricultural machinery is largely overcome and this leads to big losses of harvest;
- valorization of agricultural products and marketing channels, which integrates the large number of small and medium farms in the food economy are underdeveloped;
- inadequate market information systems.

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# OPPORTUNITIES AND ADVANTAGES OF THE ASSOCIATIVE FORMS IN AGRICULTURE

ȚÎNȚARCU GABRIEL<sup>1</sup>

## Abstract

*Setting up of agricultural producers in associative forms open up opportunities for the economic development of their activities, by attracting local or regional advantages and using collective power to increase the prosperity of members, their families and communities they belong to. Associative forms are founded to function on democratic principles valid for all members. The first forms of association in the rural areas in Romania have arose while introducing the modern cooperative principles materialized by Ion Ionescu de la Brad (1818 - 1891), economist, statistician, agronomist, prominent representative of Romanian agricultural sciences and famous politician from that time. The members of associative forms, in any form of organizing they belong to (associations, cooperatives or producers groups), have established democratic rights. Agricultural cooperative is an autonomous association of individuals and / or legal persons, with private legal entity status, established on the freely expressed consent of the parties, to promote the interests of cooperative members. Producer groups can be established for marketing of vegetable, animal, or forestry products. The association is the legal entity consisting of three or more persons, who according to an agreement, put together without the right to return the material contribution, knowledge and their contribution to labor, for the achievement of activities for the public, community, or personal interest.*

**Keywords:** agriculture, associations, cooperatives, producers groups, advantages

## INTRODUCTION

Increasing competitiveness in agriculture is conditioned by the market capitalization of some agricultural products suitable qualitatively and quantitatively. The key is in the hands of farmers who can join. Thus, adapting production to market requirements can be significantly accelerated.

Joining of farmers into associative forms opens up opportunities for economic development of their activities, by attracting local or regional advantages and use of collective power to increase the prosperity of members, their families and communities they belong. Due to concentration or development strategies, farmers must choose how to act better to make viable agricultural holdings, profitable, resistance to competition with markets and efficiency in accessing financial funds.

The first forms of association in rural areas from Romania have emerged with the introduction of modern cooperation principles materialized by Ion Ionescu de la Brad (1818 - 1891), economist, statistician, agronomist, prominent representative of Romanian agricultural sciences and famous Romanian politician from that time.

## MATERIAL AND METHODS

This paper studies the opportunities and advantages of associative forms in agriculture, meaning agricultural associations, cooperatives and producers groups.

Association is the legal entity, consisting of three or more persons, who according to an agreement, put together without the right of restitution the material contribution, their knowledge and contribution in work, for making activities in the public interest, community, or, where appropriate, for their personal interest, non-patrimonial. Associations of producers in the agriculture of our country establish and function according to G.O. 26/2000.

Agricultural cooperative is an autonomous association of individuals and / or legal, by case, as a legal private person, formed on freely consent expressed by parts to promote the interests of cooperative members.

Producer groups may be set up for marketing vegetal, animal or forestry products.

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## RESULTS AND DISCUSSIONS

Romania has the largest number of subsistence farms in Europe and most of the farms in our country, 99.2% of the total, are individual subsistence farms (individual agricultural holdings, freelancers, individual or family businesses). Only 31,000 (0.8%) are agricultural holdings with legal personality (autonomous administrations, companies or agricultural associations, trading companies, institutes or research stations and agriculture schools, local councils and other public institutions, cooperatives and other units ). The 31,000 farms with legal personality own however 44% of the agricultural area of the country.

Foreign investors already hold more than 700,000 hectares of arable land, about 8% of total arable land of Romania; in the top of European countries which own land in our country are Italy – with 25% of the over 700,000 hectares, Germany - 15% and Austria and Spain, with 6% each.

Associative forms with character of enterprise of social economy - companies, associations and agricultural cooperatives exploited 15.7% of the agricultural area of the country in 2002. After joining the European Union, their share dropped to 13.2%, according to agricultural census from 2010.

Extreme fragmentation of agricultural land in our country - divided into more than 3.8 million separate agricultural holdings, of which most of the areas under 1 ha - has transformed Romania in the country with the most agricultural holdings in the EU. (Table 1)

**Table 1 The main indicators at national level, following the legal status of agricultural holdings**

| Indicators  | Years | M.U.  | Total agricultural holdings | Agricultural holdings without legal status | Agricultural holdings with legal status |
|---|-------|-------|-----------------------------|--|---|
| Agricultural holdings   | 2002  | th    | 4485                        | 4462                                       | 23                                      |
|   | 2005  | th    | 4256                        | 4238                                       | 18                                      |
|   | 2007  | th    | 3931                        | 3914                                       | 17                                      |
|   | 2010  | th    | 3856                        | 3825                                       | 31                                      |
| Total area  | 2002  | th ha | 15708                       | 8454                                       | 7254                                    |
|   | 2005  | th ha | 15442                       | 9886                                       | 5556                                    |
|   | 2007  | th ha | 15265                       | 9591                                       | 5674                                    |
|   | 2010  | th ha | 15867                       | 8488                                       | 7379                                    |
| Utilized agricultural area(UAA) (including resting arable land)     | 2002  | th ha | 13931                       | 7709                                       | 6222                                    |
|   | 2005  | th ha | 13907                       | 9102                                       | 4805                                    |
|   | 2007  | th ha | 13753                       | 8966                                       | 4787                                    |
|   | 2010  | th ha | 13298                       | 7445                                       | 5853                                    |
| The average utilized agricultural area per one agricultural holding | 2002  | ha    | 3,11                        | 1,73                                       | 274,43                                  |
|   | 2005  | ha    | 3,27                        | 2,15                                       | 263,08                                  |
|   | 2007  | ha    | 3,50                        | 2,29                                       | 270,45                                  |
|   | 2010  | ha    | 3,45                        | 1,95                                       | 190,84                                  |

Source: INSSE

According to the Ministry of Agriculture data, in agriculture there were, in June 2012, 1192 associative forms (producer groups, associations, cooperatives).

Members of associative forms, whatever form of organization they belong to (associations, cooperatives or producer groups), have democratic rights and may permanently promote traditional and cultural values, helping to improve local and regional heritage. Belonging to an associative form helps reduce production costs (the most important advantage that a member of a group of producers has - for example, the group may purchase machinery and equipment that are shared by all members).

Exploitation of land located in an associative form allows application of modern, competitive production technologies, and waste management, in order to comply with environmental standards and biodiversity conservation that we have to keep accounting as member of the European Union. There is also the possibility of planning and changing the production

according to quantitative and qualitative demand of the market and easier access to European funds and bank borrowing.

Whatever form of association, it facilitates communication between farmers, on the one hand, and between their representatives and government institutions, on the other hand, the association representing a forum for discussion, exchange of opinions, solving problems of members, it provides possibilities for help each other, access to information; also, representatives of associative forms are a relevant partner for dialogue with the Ministry of Agriculture, in making decisions concerning farmers and their interests.

In the case of associative forms, negotiating capacity is increasing, in order to obtain better prices, both in the joint buying of inputs needed for production, as well as to sell products, by offering bigger quantities in high quality conditions. There is also an opportunity to promote more efficient the production, both in the internal market and on foreign markets.

These issues, on which of course can be added others, may result in conditions of highly competitive environment, the increase incomes of farmers, as well as awareness of them to their responsibilities which they have as factors with rights and obligations on the market.

The difficulties faced by small farmers, which justifies the need to associate, are determined by the difficult cooperation with providing services units, especially when the holding area is reduced, as well by the lack or poor development of marketing structures. Relations of association and cooperation are diversified by the variety of connections that are established between agriculture and other branches of national economy, as well as within the agriculture, among economic producers of agricultural inputs (seeds and planting material, animals, etc.) and storage, processing and selling agricultural products units.

Concentration of production in farms of optimal size, as well as diversification and specialization of agricultural production are closely related to the development of relations of association and cooperation over technology flows of production of raw materials, but also on the processing and marketing agricultural products.

### **Advantages of agricultural associations**

In terms of establishing an agricultural association advantages, they relate to:

- facilitating the access to private and public resources;
- facilitating partnerships between public authorities and associations;
- sustainable agricultural production;
- correlation between production level and products quality in line with market requirements, increasing production;
- improvement of the system information on supply and demand;
- development of food markets;
- promoting food products on national and international markets;
- ensuring equal rights for all members;
- protection of members' interests in their relations with government bodies and state administration;
- promoting practices and technologies that ensure environmental protection;
- providing advisory for association, management and marketing.

The law 566 of December 9, 2004 (with amendments) establishes the legal framework of the organizing and functioning of cooperatives in Romanian agriculture. The agricultural cooperative develops an economic, technical and social activity, for the provision of goods, services and employment exclusively or mainly for its members.

Domains and branches of activity of agricultural cooperatives are:

- provision of services;
- purchases and sales;
- processing of agricultural products;
- manufacturing and small agricultural industry;

- agricultural, forestry, fisheries land and livestock exploitation and management;
- financing, mutual assistance and agricultural insurance;
- other domains and branches of activity.

The agricultural cooperatives carry out with priority commercial activities, being producer of goods and services for their members.

The agricultural cooperatives are based on modern principles of cooperation, relating to voluntary and open association, democratic control of cooperative members in the cooperative, members economic participation, guarantee the autonomy and independence of agricultural cooperatives, guarantee education, training and information of members, provide cooperation among cooperatives, at national and international level, concern for sustainable development of communities.

### **Advantages of agricultural cooperatives**

- the function mechanisms of cooperatives are based on modern cooperation principles, with a strong democratic character;
- fiscal facilities provided by state: agricultural tax exemption for agricultural cooperatives for the first 5 after establishment; access to subsidies and public funds as well as to external funds provided by the support program of Romanian agriculture; exemption from custom duties for the imports of tractors, cars and agricultural machinery, irrigation equipment and other such equipment used by agricultural cooperatives; agricultural cooperatives recognizing and assimilation by the Ministry of Agriculture as producer groups, to benefit of all rights provided by law;
- contribution to rural development by creating new jobs;
- engaging young people in a form of organized activity.

The economic advantages of farmers forming a cooperative are:

- reduce the number of intermediaries in the distribution chain of products;
- reduce the risk of not selling products;
- increase the influence of producer pricing in relation to buyers;
- ensure timely supply of raw materials necessary to produce quality at a reasonable price;
- ensures also timely, high quality raw material at reasonable cost;
- open new perspectives for producers, who can adopt new technologies (mechanization, planting material, etc.) that allow to move from traditional practices, to more productive.

Regarding producers groups, as required by law, membership of a group of producers may be acquired by any agricultural or forestry producer which meets the following conditions:

- legally owns a production base;
- declares in writing its intention to sell its own agricultural or forestry production within the group;
- sells, through the producer group, at least 75% of production for sale;
- respects and applies the rules adopted by the producers group on production and environmental protection measures;
- pay the financial obligation to the producers group.

Producers groups must ensure the planned production adapted to market demand, particularly in terms of quality and quantity. Also need to promote the supply and the marketing of products obtained by its members. Also the groups have the task of optimizing production costs and set prices to producer, but also to promote the use of cultivation practices, production techniques and waste management practices do not harm the environment.

### **Advantages of producer groups**

- the possibility of reliable commercial contracts;
- providing large quantities of homogeneous quality products;
- increase negotiating power and obtain better financial terms;
- ensuring products marketing;
- economic and technical advice provided by qualified staff engaged within the group;
- possession of the necessary equipment for sorting, packaging and storage of products;
- production planning, appropriate marketing, pricing by the producer;
- financial support provided by the European Fund for Agriculture and Rural Development (EFARD) in the National Rural Development Programme of Romania over 2007-2013;
- for the endowment with modern warehouses, sorting and packaging lines of products, producer groups can draw projects for financing.

### **CONCLUSIONS**

Romania has an important agricultural potential. Compared with the countries of the European continent, Romania is the ninth in the agricultural area, in the arable surface on the seventh, seventh place in the surface of the pastures and hayfields, fourth in population employed in agriculture. Given the size of agricultural area and its structure, soil and climatic conditions, the share population working in agriculture and agricultural potential available, Romania can be situated among European countries with the most attractive perspectives in the sector. Therefore, an important role must have, among others, the promoting of associative forms and partnerships.

There is a reluctance of farmers in the accession to association forms (associations, producer groups, cooperatives). The main reason is the lack of information, lack of involvement of local authorities, lack of awareness government programs for agricultural development, the measures by which to access grants, on the one hand, and a feeling of mistrust that generates disinterest, on the other.

Through the National Rural Development Programme, under Measure 142 on the establishment of producer groups, encouraging the setting up of producer groups in agriculture and forestry, to obtain quality products that meet EU standards by applying unitary production technologies and supporting market access of their members.

Setting up agricultural producers in associations form opens opportunities for economic development of their activities by attracting local and regional advantages and use the collective power to increase prosperity of the members, their families and communities they belong.

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# THE INFLUENCE OF VAT ON AGRICULTURAL PRODUCERS THEORETICAL CONSIDERATIONS AND PRACTICAL MEASURES FOR ECONOMIC CRISES EFFECTS DECRISIS

TOMA MIRCEA <sup>1</sup>

## Abstract

*The purpose of this paper is to highlight the effects of lack of liquidity in the financial system and profit from uncontrolled migration pathway (in relation producer, processor, merchant bankers, concentration and profit growth in the last links in the chain from producer to end - the consumer). In this variant is proposed adjustment method value added tax on the three sectors of the national economy: the primary, secondary and tertiary education in the size of enterprises. The proposed measures, there is a "movement" to collect VAT payable to the tertiary sector (trade), which is closer to cashing the value of goods to the end user, the consumer, and exerting pressure on operators in hiring costs by making the assumption VAT cost. with VAT reduction proposed variants are accelerating state budget revenue collection from this source while reducing the amounts returned operators with the right and the radical version increase the recovery of VAT payable on the branch of from 14.9 to 16.26% share of 24%, providing additional potential income of about 600 000. lei (150,000 euro) at no additional cost (VAT collected on a budget estimated at 40 billion lei annually).*

**Keywords:** *agriculture, financial crisis, profit, VAT, agricultural producers*

## INTRODUCTION

Compared with the crisis of 1929-1933, but with other intensity, the crisis of this beginning millennium retains the same general characteristics with the first crisis from 1825: cash money disappear from the market, loaning stop, trade stagnated, growing stocks of certain goods (now automobile and real Estate), the production of goods is reduced, multiply bankruptcies and forced sales, increase unemployment, and so on, and "abundance becomes a source of misery and deprivation" as noted by FM Charles Fourier (1772-1837).

By replacing etatist regime and accession to the values of capital and private initiative, Romania (including eastern Europe countries) are facing one of the most complex paradoxes: in 1992, the European Union (EU-15) begins an accelerated process of reforms following inefficiency recognition model of development; after integration, since the end of 2007, the entire capitalist system is comprised of financial and economic crisis with the prospect of a real recession.

Agriculture can not be analyzed outside of these phenomena more so as humanity faces on one side with an acute global food crisis, and on the other side with overproduction. However, the World Trade Organization (WTO) exerts a strong pressure to liberalize agricultural trade, elimination of subsidies and protectionist measures and ultimately lower prices and hence incomes of farmers, in terms of allocation of substantial funds in the financial system, of the crisis, have increased proven cases of fraud, oversized salaries and bonuses, compared with agricultural production subject of climate change.

In the current context, in addition to the economic crisis, agriculture faces with climate change, accelerated reduction of biodiversity, degradation processes, soil erosion and pollution, reducing freshwater resources, etc..

## MATERIAL AND METHODS

The research method used is qualitative analysis that follows, by studying literature documents, and so on, highlighting both the economic crisis and the presentation of opportunities that may counteract the effects of the crisis.

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For the second part of the paper, we propose some practical solutions as possible measures to be adopted to overcome the crisis, to support the Romanian agriculture and with effects on agriculture producers in particular. The working hypothesis is another approach to adjustment system of the VAT in the three sectors of the national economy: the primary, secondary and tertiary compared with the size of enterprises. To adjust the value added tax there are used two variants: variant moderate (progressive increase in the VAT rate by sector, from 15% to 24%) and radical version (determining the percentage of sectors: primary, secondary and tertiary 9% while maintaining 24% share of the tertiary sector).

## RESULTS AND DISCUSSION

From present financial crisis derives at least two questions:

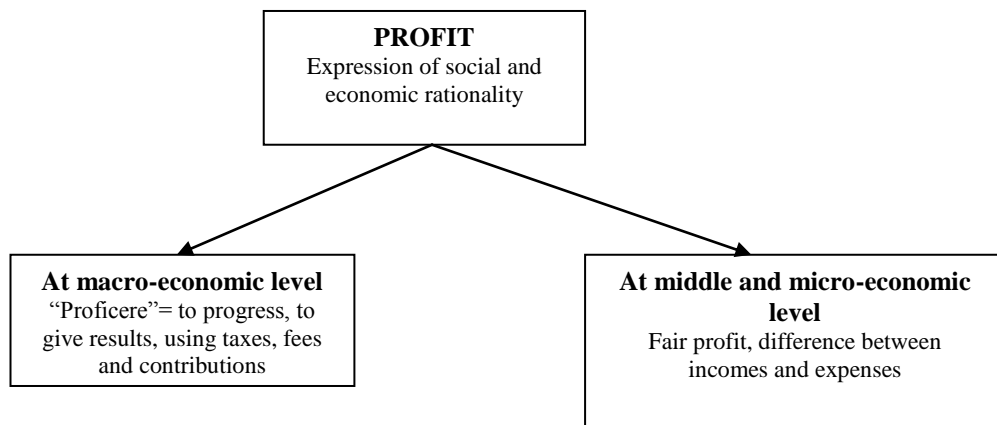
1. Where are the profits of the capitalist model of development over the years? How it's explained "sovereign debt"?
2. What are the current sources for the establishment of funds, global and regional, for support the announced programs, if there is a cash shortage so acute?

The current crisis has shattered once again, the illusion of continuous economic growth, based on neo-liberal theories and models, according to the principle "laissez faire, laissez passer".

In essence:

- Lack of liquidity is the tip of the iceberg, and
- Profit is the Gordian knot.

**Figure 1. Profit representation – expression of social and economic rationality**



**Source: The author**

When production of a society it's expressed and traced only in value, in terms of maximizing profit, without tracing the content and the real destination of goods and services, the history confirms, loses its ability to self-regulation and ends with the crisis.

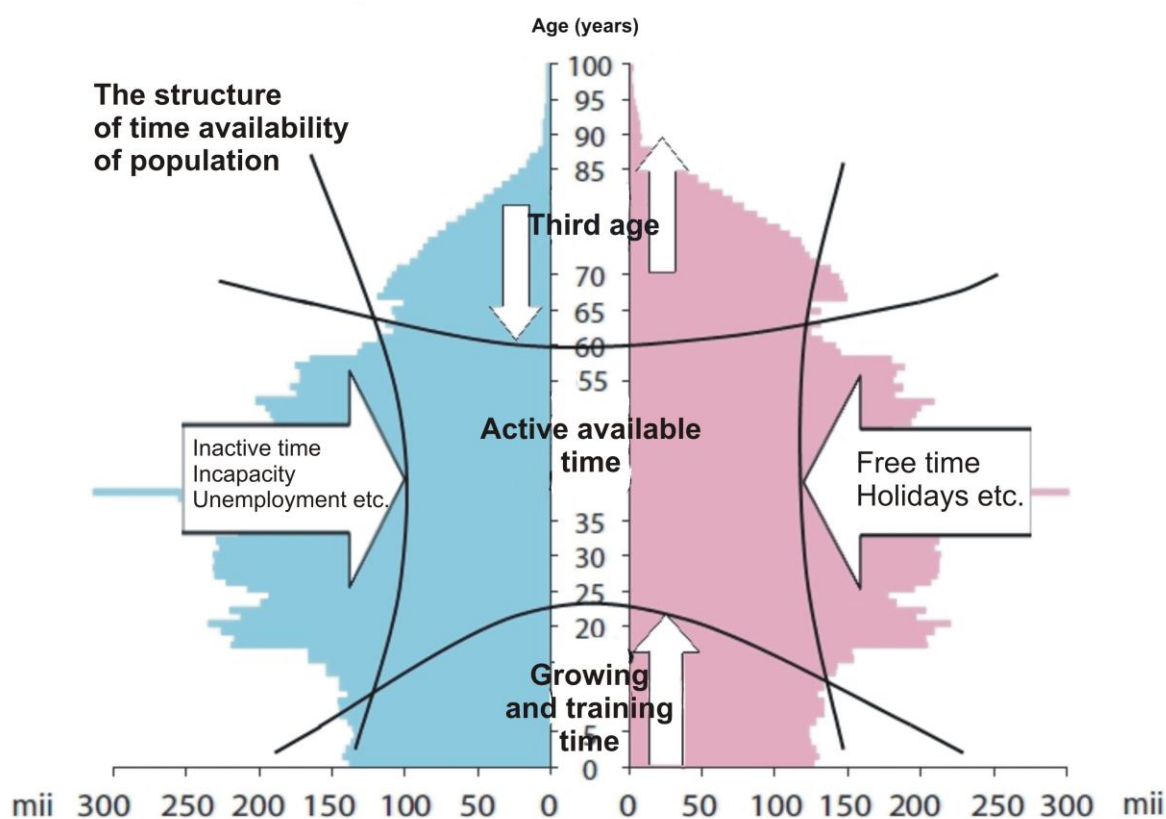
The share of tertiary sector increasing to 60% and changing the place with the primary sector which represent only 10-15% (with agriculture) in Gross Domestic Product (GDP) and gross value added (GVA) has determined the inequitable obtaining and redistribution of profit on the channel.

It has and still having an uncontrolled migration of profit on the relationship producer - process - trade - bankers, profits concentration and increasing in the last links of the chain until the final payer - the consumer.

As following of economic progress, determined by the industrial society that has brought standardization, specialization, synchronization, concentration, maximization, centralization has been a continuous release of labor from primary and secondary sectors. Partly, labor force was absorbed by the tertiary sector.



**Figure 2: The structure of availability time of population**



Source: The author

Progress in knowledge and technology has led to a changing of occupational structure of active labor between the primary, secondary and tertiary in G.D.P. and G.V.A. realization.

**Agriculture – opportunity for overcome the crisis**

Agriculture is more than a production volume. All advanced economies of the world have reached their present level of economic development on the basis of a competitive agriculture.

High share of agriculture (13-14% as in Romania) in GDP can become an opportunity to increase the general welfare in terms of the role change "peasant" and the State in the development of society, but without becoming dependent on technology and technology agricultural importance.

**The main constraints of farmers in the European context**

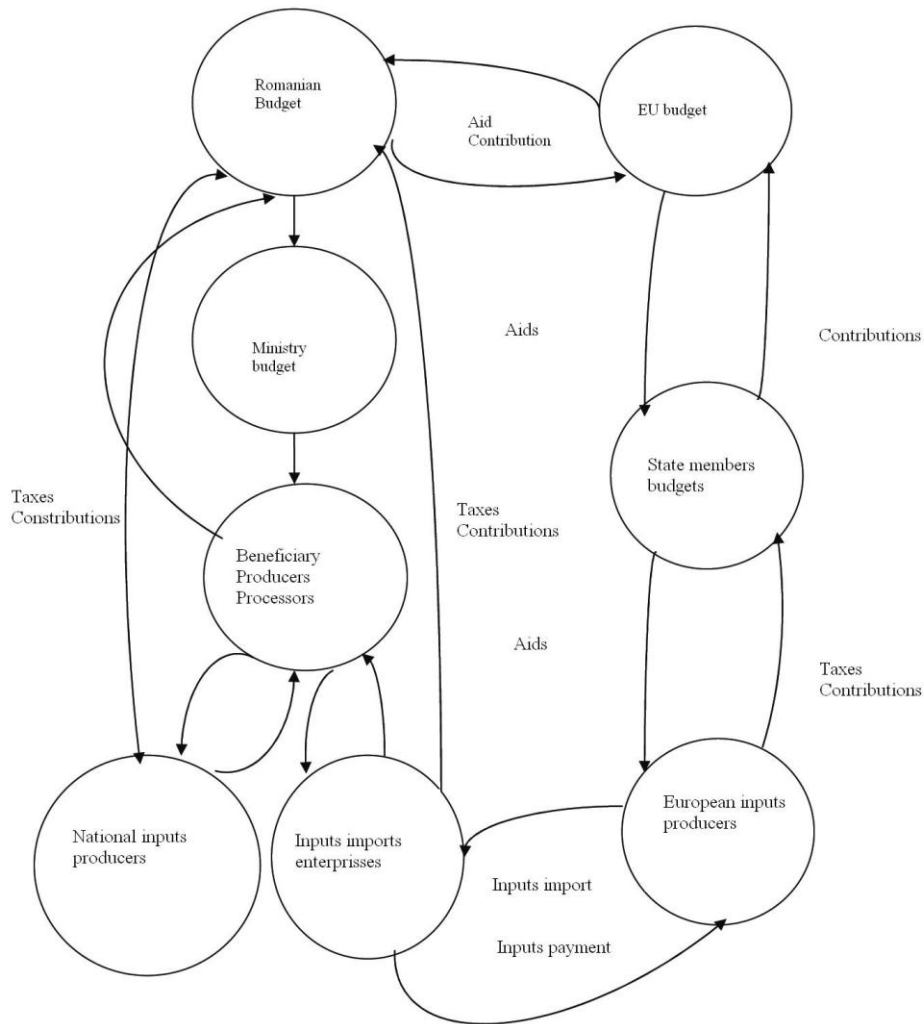
No matter of the type of ownership (public, mixed or private) and organizational (public institution, directing, or national company, firm or association agricultural family business or individual producer - with or without legal personality) farmer faced and will face partially or totally, with constraints at European level, that are related to productivity, efficiency, effectiveness, free movement of agricultural products, elimination of customs duties, agricultural taxation, changing mechanisms to support agricultural production, reducing and then eliminating subsidies agricultural production services for the preservation and conservation of nature and rural development; euro - as instrument of comparable food products with competitive prices.

**EU funds absorption - Risks and Vulnerabilities: Who helps you free?**

Funding schemes of various programs supported by the EU are generally known: the EU budget, national budget and beneficiaries in various proportionality.

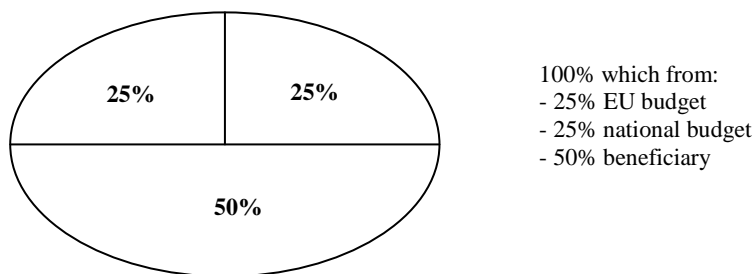
Synthetic circuit proportionality of grant funds and state payable are:

**Figure 3 European funds circuit in Romania**



Source: The Author

**The standard matrix of projects financing**



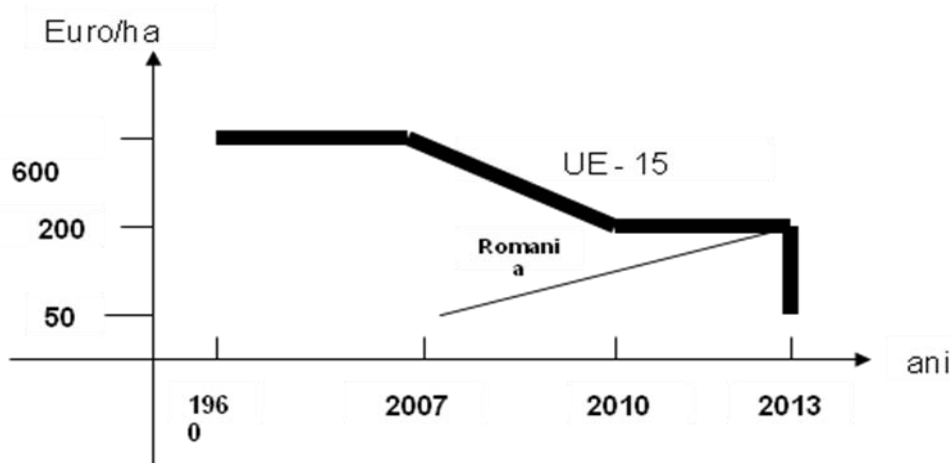
The 32 billion euro grant from the EU, anesthetized many of us. In fact, Romania contributes 1% of GDP annually (about 1 billion / year) plus other contributions (such as sugar, in 2008 almost 30 million Euros in OCM) contributions and inter-professional associations.

In conditions of ensuring the inputs from import, it's increasing the current account deficit, stimulate production and achieve added value (profit) in EU countries, the domestic employment market it's shrinking and its imported unemployment, the need for funds and/or loans for the funds from the state budget and the EU budget beneficiaries it's increasing.

The condition for efficient use of EU funds is:

***The value for inputs import ≤ Sums received from EU***

**Figure 4 – Comparative evolution of subsidies in EU and Romania**



| Year    | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---------|------|------|------|------|------|------|------|------|------|
| %       | 25   | 30   | 35   | 40   | 45   | 50   | 55   | 60   | 65   |
| Euro/ha | 50   | 60   | 70   | 80   | 90   | 100  | 110  | 120  | 130  |

Source: Own calculation

Compared to 200 euro / ha envisaged by the EU in 2013 - Romania will receive 110 euro / ha (only 55%), the difference will be provided from internal resources.

### **The VAT influence on agricultural producers**

Value Added Tax (VAT) is an indirect tax supported by the final consumer of the goods/service. VAT is a tax charged in cascade from each economic operator participating in the economic cycle to manufacture a product or provide a service covered by the tax.

In Romania, VAT was introduced and implemented on 1 July 1993 as a form of harmonization with EU tax system used. Currently there are applied three rates: the standard rate of 24% (from 1 July 2010) and two reduced rates of 9% and 5%. Also a number of goods and services are exempt from VAT. Exit also the optional possibility to pay VAT for operators conducting a turnover of up to 35,000 Euros, and from 1 January 2013 up to 60,000 Euros.

Besides the fact that agriculture has faced and is facing serious problems in both the upstream input prices and prices of its products as expressed by "price scissors" individual farmer also face some disadvantages created by laws that not held and not keep up with the changes that have taken their ownership structure and economic conditions of agriculture development processes.

In this context a special aspect it's represented by the value added tax.

Although since it's introduction as modern form of consumption tax, both, the base and the tax rate had suffered several changes, VAT did not solve the issue of received price (cash) by the individual producer compared with the legally organized one, creating more parallel markets: the peasant market as direct relationship between farmers and consumers and market of products that run on organized farmers legal relationship - wholesalers - processors - traders, and less on individual producer relationship - processors, and a speculative market on individual producer relationship - wholesalers (retailers of agricultural products in their natural state) - the consumer.

Individual agricultural producer (associate), without legally personality, through the methodology adopted for VAT regulation is obliged to bear on costs related value of all inputs used in agricultural production (seeds, fertilizers, pesticides and herbicides, fuels, lubricants, mechanical works and other services and so on.).

VAT acted and acts inhibitory, introduced and maintained fiscal inequity, has lost its neutrality and exclude a great mass of agribusiness products from regulated market circuit, with negative effects on producer - industrialist - trader - consumer – domestic budget.

In a stabilized market economy, all participants in a product chain must win fairly:

**Financial institutions ⇒ Inputs suppliers ⇒ Agriculture producer ⇒ Wholesaler ⇒ Processing Industry ⇒ Trader ⇒ Consumer ⇒ State**

It must be avoided uncontrolled migration of profits from one sector to another by establishing of interdependence between partners that participate in chain manufacture a product based firm contracts.

### Influence of VAT on agricultural producers

a. The influence on costs and economic results

| Specification  | Company | Individual agricultural producer. |      | Differences |       |
|--|---------|-----------------------------------|------|-------------|-------|
|  |         | P.I.-S.C.                         |      | a           | b     |
|  |         | a                                 | b    |             |       |
| Invoice price (received) (2+3)                         | 124     | 100                               | 100  | -24         | -24   |
| VAT – collected  | 24      | -                                 | -    | -24         | -24   |
| Negotiated production price                            | 100     | 100                               | 100  | -           | -     |
| Other price elements included the profit               | 40      | 26,5                              | 40   | -13,5       | -     |
| VAT afferent inputs-deductible                         | -       | 13,5                              | 10,5 | +13,5       | +10,5 |
| Costs of inputs and materials, services subject to VAT | 60      | 60                                | 49,5 | -           | -10,5 |

Source: Own calculations

b. The influence on received sums by the producer and paid by the user

| Specification        | Company | Individual producer | Average price |
|----------------------|---------|---------------------|---------------|
| Invoice price (paid) | 124     | 100                 | 110,5         |
| VAT collected        | 24      | -                   | 13,5          |
| Production price     | 100     | 100                 | 100           |

Source: Own calculations

### Some measures to counter the crisis:

1. VAT adjustment on sectors;

a) Moderate option: setting the VAT rate to 15% in the primary sector and agriculture, 19% in the secondary sector (manufacturing) and 24% in the tertiary sector.

**Tabel 1: Setting the VAT share in a progresiv mode**

| Specification                                     | Activities sectors |               |              | Total flux |      |
|---|--------------------|---------------|--------------|------------|------|
|   | Primary (1)        | Secondary (2) | Tertiary (3) |            |      |
| VAT proposed share                                | 15%                | 19%           | 24%          |            |      |
| Cumulated share of the sectors in the final price | 40%                | 75%           | 100%         | 124        |      |
| VAT chargeable                                    | a) present         | 3,50%         | 6,65%        | 4,75%      | 14,9 |
|   | b) proposed        | 1,10%         | 6,05%        | 7,75%      | 14,9 |
|   | c) differences     | -2,40%        | -0,60%       | 3,00%      | 0    |

Source: Own calculations

b) Radical option: set quota for sectors 1 and 2, and the movement of goods between them to the level of 9% and 24% share for tertiary sector.

**Table 2 VAT share established to 9%**

|                                   |      |       |       |        |
|-----------------------------------|------|-------|-------|--------|
| VAT collected                     | 6,76 | 19,00 | 24,00 | 124,00 |
| VAT deductible                    | 3,60 | 6,75  | 9,94  | 2,04   |
| VAT chargeable                    | 3,15 | 12,25 | 14,06 | 16,26  |
| Diference from the present share. | 3,50 | 7,50  | 8,75  | 2,60   |

Source: Own calculations

c) As a complementary measure, order the operators of retail food products for the payment of a part of the VAT payable as advance form during the month (from to 20 or 25) and regulation to 25 of the next month.

2. a) granting the right to deduct VAT rate of 15.966 (equivalent rate of 24%) of the price paid by the users individual producers of agricultural products as:

- Agribusiness manufacturing products for human consumption (except for the manufacture of grain alcohol), represented by the milling and baking industry, meat and milk, oil and sugar etc.
- Complex breeding (cows, fattening cattle, pigs, sheep) and poultry fodder cultivation (barley, corn, alfalfa etc.).
- Wholesale markets, buying centers and storage of agricultural produce (vegetables and fruits, cereals and technical plants and so on).

b) Negotiation and circulation of agricultural products purchased from individual producers at prices including VAT.

c) Generalization "procurement slip" as document of special regime for regulating and monitoring income tax farmers.

3. Support agricultural producers with subsidized interest loans grace period until they obtain the production (harvest) and to finance approved projects to collect amounts outstanding from the national budget and EU agriculture by establishing a bank (by APIA structure);

4. Up a temporary fund to support producer groups by giving a rate of 2% of the price charged by individual producers as "assigned revenue" (EU model);

5. Review of the current conversion factors of major agricultural products in one wheat kg (barley 1.10 / kg / wheat, corn, 1.30 kg / wheat, sunflower 0.40 kg / wheat, sugar beets 7 kg / wheat) as part of orientation in determining the structure of crops and price negotiation;

6. Establishment of agricultural intervention stocks mandatory in nature for rent collected from public land leased by MARD;

7. Supporting agricultural research funding from the state budget;

8. Increasing the advances for R&D projects won in a competitive system from 30% to 60%.

9. Domestic support for agricultural and industrial inputs for agriculture, the processing industry of agricultural products as raw materials, with subsidized interest loans;

10. Introduction of *partnership agreement* for the development of economic activities between *representatives of the state* (MARD through the Farm Registry) and farmers to traders.

11. change the methodology for determining and income tax

12. Reconsideration of the tax and contribution burden sharing between employees and operators

### **Expected effects**

- Accelerate and streamline of cash flow, reducing the demand for loans and increasing the economic efficiency of farmers - operators.
- Increasing individuals farmers' income (with 10 to 13%) without affecting the cost of raw materials or extra budgetary efforts, raising living standards, and / or funding sources to purchase inputs, provision of mechanical etc..

- Stabilizing of agricultural products markets by: stimulating producers association, increasing the role of economic contracts and developing a civilized trade chain, reducing intermediaries and speculation in markets and ensure security of food supplies at competitive prices.
- Reduce the pressure on MARD budget for agricultural subsidies and increasing their economic effect on individual farmer and/or the associated increase agriculture's contribution to the formation of state budget resources.
- Comparability cost structure and prices with manufacturers in EU countries.

## CONCLUSIONS

Counter the crisis, theoretically, but practically can not ignore its effects, both directly and subsidiary effects (collateral) that may be more important on chain:

*Financial institutions ⇒ Inputs suppliers ⇒ Agriculture producer ⇒ Wholesaler ⇒ Processing Industry ⇒ Trader ⇒ Consumer ⇒ State*

Solutions require transparency, solidarity, equity, social justice in the distribution of efforts and usufruct (profit) on chain of all participants to achieve useful goods and services to human society.

An orderly adjustment of tax and contribution system may lead to the adoption of those measures that will stimulate domestic consumption, increase domestic production and rotation speed of the capital, and to reduce the budget deficit, uncontrolled growth of prices, inflation, unemployment, in a word economic life imbalances.

Crises, whether financial or economic, past and recent history demonstrates, ends with changing systems (models) for the organization of society or violent (revolutions, coups, wars) or peaceful (velvet revolution in Czechoslovakia) in agreement with the intensity and affordability of people.

Therefore the current crisis should be managed with greater accountability and transparency in the spotlight reinstatement rights and human personality, in which social development can not be left to chance, market forces as regulator.

Without claiming to exhaust the topic discussed, duties, taxes and contributions should be regarded not only as mere budgetary resources, as well as effective tools to guide operators through the tax and mechanisms that can promote competent state institutions in stabilizing market goods and services, as part of a functioning market economy. Reforms in the Romanian economy must accumulate and "burn" but also to avoid some mistakes in the steps already developed countries. These goals can not be achieved without scientifically analyzes tailored to Romanian realities.

Free enterprise combined with the use of capital, be it their own or borrowed, to obtain a product or a service, is based on state mandates given by the relevant institutions in order to meet the requirements of goods and services to society, communities or individual.

In exchange for a fair profit "initiator-employer" shall comply with rules and regulations socioeconomic stated by law, to ensure quality goods and services at affordable prices. And inter-professional bodies have the task of establishing the strategy, delivery and purchasing, receiving and payment based firm agreements and commercial contracts concluded on track.

State institutions are required to develop and adopt legislation that would lead to harmonization as equitable interests and the application of the criteria and mechanisms for production, processing, transformation and marketing of agricultural products so as not to cause imbalances in the market and the creation of monopolies, distortion of competition within the domestic and European competition.

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# "LEADER APPROACH" - AN OPPORTUNITY FOR RURAL DEVELOPMENT

TUREK RAHOVEANU ADRIAN<sup>1</sup>

## Summary

*The rural development programs that are developed with the active involvement of local citizens have a long tradition in the European Union. From 1991 until 2006, Leader I, Leader II and Leader + have been designed as a laboratory to encourage the emergence and testing of new approaches to integrated and sustainable development, rural development policy in the Community. In this way, the initiative Leader, after had experience in three programming periods, has reached a level of maturity that allowed the competent authorities to implement the Leader approach more widely in national rural development programs. For this reason, Council Regulation no. 1698/2005 of the European Agricultural Fund for Rural Development (EAFRD) for the period 2007-2013, contains a fourth axis called LEADER axis. The main focus of the paper is given to the implementation of LEADER in Romania in the period 2007-2013. The paper has three parts. The first part presents the general characteristics of the LEADER approach and the measures that are performed within the Rural Development Programme 2007-2013. In the second part is presented the list of local action groups and their spatial-demographic characteristics.*

**Keywords:** Rural development, agricultural policy, LEADER approach, Local Action Group, local development strategies

## INTRODUCTION

The acronym LEADER (Liaison Entre Actions de Développement Rural) means "Links between actions for rural development" represents an innovative approach for the implementation of rural development policy. The specific objectives of the Leader approach are: participation of local communities members in the local development process and encourage innovative activities, encouraging local actors to work together with representatives of other communities within and outside the country, fostering partnerships, preparing and ensuring the implementation of local development strategies. Leader approach through its specific actions will lead to achieving the strategic objectives of Axis 4: improving local governance and promoting endogenous potential of territories.

In the 2007-2013 programming period, the Leader approach has been integrated within the overall EU policy for rural development. This means that Leader is included in the national and regional rural development programs supported by the EU, along with a number of other rural development axes.

The eligible area for implementation Leader axis is the rural area defined by the legislation of Romania (municipalities and cities) plus a total of 206 towns (not exceeding 20,000 inhabitants). Including cities in the eligible territory Leader will ensure territorial coherence, the critical mass in terms of human, financial and economic resources, to support a viable local development strategy. Thus, the area eligible for Leader covers a population of approximately 11.7 million, of which about 2 million are from cities and eligible area for implementation of the Leader Axis is 227,000 km<sup>2</sup> (207,000 km<sup>2</sup> rural area defined under the national definition, plus about 20,000 km<sup>2</sup> area owned by cities with up to 20,000 inhabitants). Thus, 17% of the eligible area Leader can come from small towns and about 9% of the eligible area will be owned by small towns of up to 20,000 inhabitants [1].

Thus, we observe that Leader is a tool for developing a territorial approach at micro-regional level concerning the diversity of rural areas. The real advantage of the Leader approach lies in its ability to embrace the complexity of territorial system, meaning the rural infrastructure, common goods, local and cultural heritage, organizational capacity, knowledge transfer.

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## MATERIALS AND METHODS

The LEADER approach involves strengthening territorial coherence and implementation of integrated actions that can lead to the diversification and development of the rural economy for the benefit of communities. Another goal is the institutional building for developing and implementing integrated strategies that will enable the rural actors, representatives of different fields to work together and interact for the benefit of rural communities.

The paper presents shortly the theoretical arguments for introducing LEADER and analyzes the implementation of the support measures in agricultural policy. The main objectives of the paper are:

- Presenting the general characteristics of the LEADER approach and the measures that are taken in the Rural Development Programme 2007-2013
- Presentation of local action groups, the main emphasis being given by the space-demographic characteristics.

This paper is based on analysis activities, from literature, legislation and existing strategic documents and other available studies.

## RESULTS AND DISCUSSION

Encouraging local participation in developing and implementing sustainable development strategies, the Leader approach proved to be a valuable resource in the EU rural policy. There were three generations of Leader: Leader I (1991-1993), Leader II (1994-1999) and Leader + (2000-2006). In the 2007-2013 programming period, Leader was integrated ("embedded") in all national / regional programs of rural development. Because of this, it was possible to apply a Leader approach more widely and in a much wider range of rural development activities.

**For the programming period 2007-2013**, the Council approved Regulation no. 1698/2005 of the European Agricultural Fund for Rural Development (EAFRD) which emphasized more Leader-style approach. During this period, each rural development program must have a Leader component for implementing local development strategies "bottom-up". Member States and regions can select the local action groups (LAGs) based on local development strategies proposed by them. Each program can finance capacity building and encouragement necessary to prepare these local strategies, the operating costs of LAGs structures and implementing local development strategies and cooperation projects between LAGs.

The Leader fundamental concept is that, given the diversity of rural areas, the development strategies are more effective if they are decided and implemented at local level, by local actors. The difference between Leader and other rural policy measures is that it indicates "how" to do and not "what" to do [2].

Leader approach can be summarized in seven key features: elaborating the local development strategies focused on the area, the approach and implementation strategies "bottom up" local public-private partnerships: local action groups, integrated and multi-sector actions, innovation, cooperation, establish contacts in the network. Each feature completes the others and interacts with them in a positive way, with lasting effects on the development of rural areas and their ability to solve their own problems.

### *Feature 1. Local development strategies focused on area*

An area-based approach takes into account an area with low size, homogeneous and socially cohesive, characterized by tradition and common identity, common needs and expectations, must have sufficient coherence and a critical mass in terms of human, financial and economic resources, to support a viable local development strategy.

### *Feature 2. Approach and implementation strategies "bottom up"*

In a "bottom up" approach, the local actors participate in taking decisions on strategy and in the selection of priorities to be pursued in their local area. The rural policies following this approach are designed and implemented in the manner best adapted to the needs of the communities they serve. This can be achieved by involving all local actors. Involvement of local actors includes population as a whole, the economic and social interest groups and representative public and private institutions. Capacity building is an essential component of the 'bottom-up', which involves: awareness, education, participation and mobilization of the local population for identification of the strengths and weaknesses of the area (analysis); participation of various interest groups in the elaboration of the local development strategy; establishing clear criteria for selecting, at local level, appropriate projects to implement strategy.

#### *Feature 3. Public-private partnerships: Local Action Groups (LAGs)*

Establish a local partnership "local action group" (LAG) is an original and important feature of the LEADER approach. LAG is responsible for identifying and implementing a local development strategy, make decisions on the allocation of financial resources and manage them. These groups can effectively stimulate sustainable development because they: gathers and combines human and financial resources available in the public sector, private sector, civic and voluntary sector; associate the local actors around common projects and multi-sector actions, in order to generate synergies, joint ownerships and critical mass to improve the area's economic competitiveness; strengthen dialogue and cooperation between different rural actors, who often have little experience of collaboration, by reducing potential conflicts and by facilitating negotiated solutions through consultations and discussions; facilitating through the interaction of various partners, processes of adaptation and change in the agricultural sector (like quality products, food chains), integration of environmental concerns, diversification of the rural economy and quality of life.

The rural actors most active in the initiatives of local action groups are: professional organizations and unions, professional associations, citizens, residents and their local organizations, institutions and local governments, environment associations, cultural and community service providers, associations of women, youth.

#### *Feature 4. Facilitating innovation*

Leader can play an important role in stimulating new and innovative approaches to rural development. Innovation can relate to introduce a new product or process, a new organization or new markets.

#### *Feature 5. Integrated and multi-sector actions*

A local development strategy must be a multi-sector approach that integrates different sectors. Actions and projects contained in local strategies should be linked and coordinated as a whole.

#### *Feature 6. Establish contacts in network*

Establishing contacts in the network is a mean of transferring good practices, disseminating innovations and building based on lessons learned from the local rural development. Establishing contacts in the network include the exchange of ideas, experiences and knowledge between Leader groups or between different rural areas whether or not they are beneficiaries of Leader. Establish networking lead to the strengthening of relations between people, projects and rural areas, thus exceeding the isolation faced by some rural areas.

#### *Feature 7. Cooperation*

Cooperation involves a local action group engaged in a joint project with another Leader group or with a group taking a similar approach, in another region, in another Member State or in a third country. Cooperation projects are not simply experience exchanges. They must involve a

concrete joint project, conducted under a common structure. In the Leader approach, there are two possible types of cooperation: inter-territorial cooperation: cooperation between different rural areas within the same Member State. May take place between Leader groups and is also open to other local groups that have a similar participatory approach, trans-national cooperation: cooperation between Leader groups of at least two Member States or with groups of third countries, following a similar approach.

Measures under LEADER - Axis IV of National Program for Rural Development 2007-2013 are [4, 5]:

- Implementation of local development strategies (Measure 41). By Measure 41, the Local Action Groups can implement integrated local development projects, that may cover several axes. Implementation of these projects is done as described in the Local Development Plan. Strategies should materialize in concrete projects aimed at increasing the competitiveness of agriculture and forestry, improve the environment and countryside, improving quality of life and diversification of economic activities in rural areas, developed by local actors, individuals or legal person operating within the Local Action Group territory. Beneficiaries can be also outside the Local Action Group territory, with the condition that provided projects meet the strategic objectives and be implemented on its territory.
- Implementing cooperation projects (Measure 421). By Measure 421, the cooperation projects should have the effect of improving local strategies by encouraging local actors to undertake experiences expansion projects, stimulating and supporting innovation, acquiring skills and their improving both inter-territorial and trans-national.
- By Measure 431 aims fostering partnerships, preparing and ensuring the implementation of local development strategies through: local institution building, providing human, financial and technical support to Local Action Groups activities, training of Local Action Groups to develop and implementation of local development strategies; animating the territory. This measure is divided into two sub-measures, the first available before the LAGs selection and the second after the selection of LAGs.
- Building public-private partnerships (sub-measure 431.1). Sub-measure 431.1 supports the construction of public-private partnerships, local development strategies and local development plan preparation to participate in the selection of Local Action Groups (LAGs). This sub-measure is implemented in three successive phases, as follows:
  - Phase 1 – In this phase is carried out the awareness of local actors on LEADER approach through information sessions and training on the National Rural Development Programme;
  - Phase 2 - This phase is the training of potential LAGs representatives on local development strategies (making diagnosis and SWOT analysis, strategy development, program activities, partnership formation, etc.);
  - Phase 3 - This phase provides financial support for the preparation of local development plans for the selection of LAGs based on a draft prepared by the partnerships involved. This will include objectives, duration of achievement, action, the budget for preparation of strategy and local development plans for the selection of LAGs. The final product of this project will be the development local plan for the selection of LAGs.
- Local Action Groups operation, acquiring skills and animating the territory (sub-measure 431.2). Sub-measure 431.2 provides support for Local Action Groups for: operating expenses, animation and skills. 431.2 Sub-measure has two components, namely: a component - Operation of the Local Action Group, b component - Training and territory animation after selecting LAG.

**For the programming period 2014-2020** Draft Regulation on the future CLLD (Community Led Local Development) is based on the LEADER approach and refers to all funds covered by the Common Strategic Framework (CSF): European Regional Development Fund (ERDF) European Social Fund (ESF), European Agricultural Fund for rural Development (EAFRD), the European Fund for fisheries and Maritime Affairs (EMFF) and the Cohesion Fund (CF).

CLLD is a specific tool, usable at sub-regional level, which is complementary to other forms of support for local development. CLLD can mobilize and involve the local communities and organizations to contribute to achieving the Europe 2020 strategy objectives of smart, sustainable and favourable to inclusion growth, stimulating the territorial cohesion and policy objectives achieving.

In the programming period 2014-2020, the more explicit support in the form of a common legal framework and harmonized rules for the five funds CCS will increase consistency and encourage local strategies funded multiple, placed under the responsibility of the community. Several common characteristics of CSF funds provisions are intended to simplify and implementation of local development under the responsibility of the community in favour of beneficiaries:

- The unique methodology for CLLD will be applicable within all funds and regions, enabling all territories to benefit from EU support for capacity building, local public-private partnerships and their strategies, networking and exchange of experiences.
- CCS funding contribution will be consistent and coordinated. This approach will facilitate among the beneficiaries creation of multiple strategies multiple funded, better adapted to the needs and areas, for example, in an area that contains both rural and urban elements. This shall in particular ensure the coordination of capacity building, selection, approval and financing of local development strategies and local action groups.
- In the case of strategies financed by multiple funds, there would be funding the operating costs and the organization of local development strategy from a single fund (ie fund principal).
- In terms of cohesion policy, for those operational programs that objectives of a whole priority axis are made by CLLD, the maximum rate of co-financing from ERDF and / or ESF at a priority axis level will increase by 10 percentage points. In the case of EAFRD, depending on the circumstances, the maximum rate of co-financing for CLLD can vary between 80% and 90%, and for EMFF, the maximum rate of co-financing is 75%.

Formulation, implementation and management of rural development projects require participating processes that induce a collective action. These processes require new social structures involving the organized civil society, the so-called local action groups (LAGs) in the context of the Leader initiative.

Local Action Groups are entities that are public - private partnerships, consisting of representatives of public, private and civil sectors appointed from a homogeneous rural territory that will have to meet a number of requirements on the composition, territory covered and will implement an integrated strategy for development planning.

After the first selection of local action groups (LAGs) currently exists and operates a total of 81 LAGs, approved in 2011 by the Ministry of Agriculture and Rural Development (table 1, fig. 1).

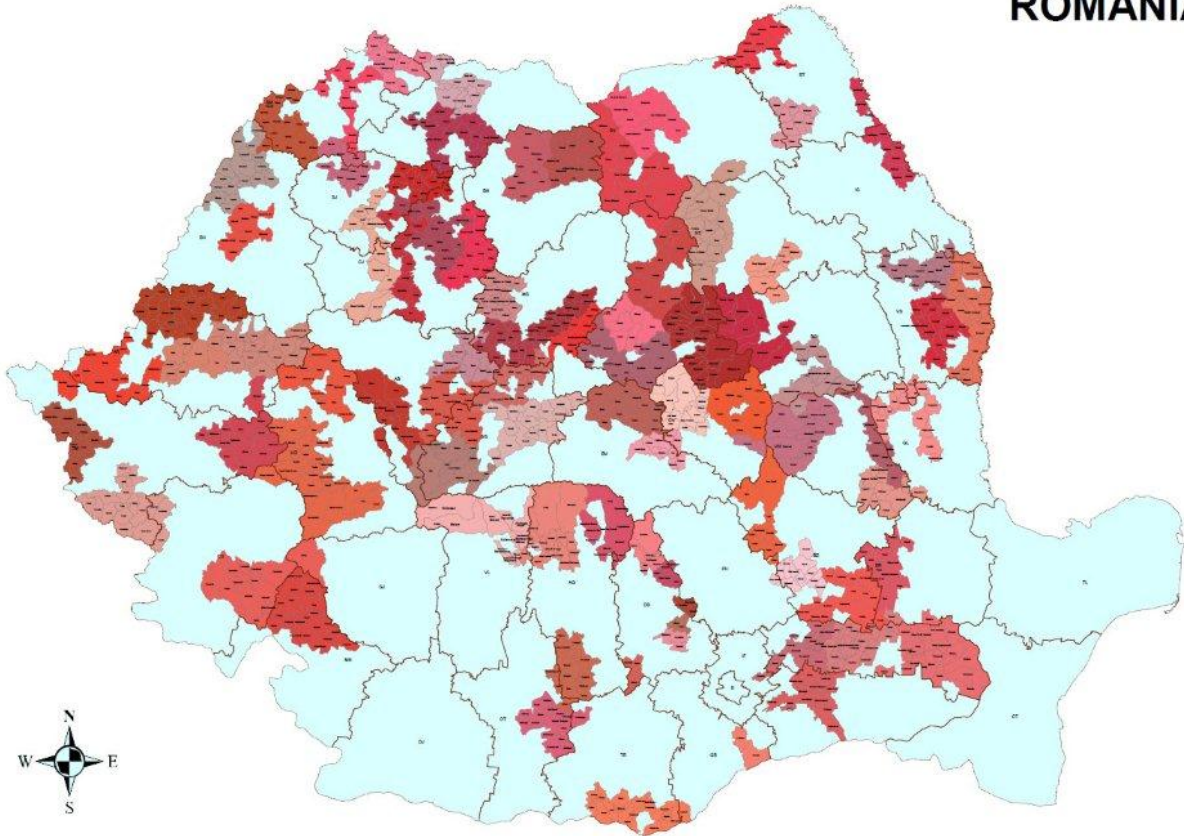
**Table 1: Local Action Groups - number and spatial-demographic characteristics**

| County          | Existing GAL (No.) | The total area (Km2) | Population (No. inhabitants) |
|-----------------|--------------------|----------------------|------------------------------|
| Alba            | 3                  | 13025.01             | 117249                       |
| Arad            | 4                  | 5376.5               | 202958                       |
| Arges           | 3                  | 3494.5               | 136547                       |
| Bacau           | 2                  | 2,371                | 117539                       |
| Bihor           | 2                  | 1976.84              | 105578                       |
| Bistrita Nasaud | 2                  | 2085.76              | 96497                        |
| Botosani        | 2                  | 1415.45              | 110213                       |
| Brasov          | 2                  | 1685.76              | 72681                        |
| Braila          | 1                  | 848                  | 35169                        |
| Buzau           | 3                  | 2954.93              | 131184                       |
| Caras Severin   | 1                  | 2,011                | 39980                        |
| Cluj            | 4                  | 4123.04              | 153319                       |
| Calarasi        | 1                  | 937.13               | 37699                        |
| Covasna         | 2                  | 2196.92              | 78912                        |
| Dambovita       | 6                  | 1287.67              | 99632                        |
| Galati          | 1                  | 991.04               | 68712                        |
| Giurgiu         | 1                  | 279.86               | 11833                        |
| Harghita        | 4                  | 5,606                | 184320                       |
| Hunedoara       | 2                  | 3832.24              | 79393                        |
| Ialomita        | 3                  | 3428.04              | 156795                       |
| Iasi            | 1                  | 736.96               | 45861                        |
| Maramures       | 2                  | 1985.97              | 105332                       |
| Mehedinti       | 1                  | 1572.23              | 49142                        |
| Mures           | 4                  | 2516.67              | 153203                       |
| Neamt           | 2                  | 2544.01              | 112182                       |
| Olt             | 1                  | 902.44               | 48323                        |
| Satu-Mare       | 3                  | 2488.55              | 143242                       |
| Salaj           | 2                  | 1363.59              | 58967                        |
| Sibiu           | 3                  | 3477.72              | 131147                       |
| Suceava         | 2                  | 3767.08              | 71393                        |
| Teleorman       | 1                  | 1,032                | 42469                        |
| Timis           | 3                  | 3971.95              | 134179                       |
| Vaslui          | 3                  | 3200.82              | 164755                       |
| Valcea          | 1                  | 1545.36              | 32623                        |
| Vrancea         | 3                  | 3032.79              | 152984                       |
| TOTAL LAG       | 81                 | 94064.83             | 3482012                      |
| Total Romania * | -                  | 238391               | 21413815                     |

Source: [www.rndr.ro](http://www.rndr.ro), \*[www.insse.ro](http://www.insse.ro)

Analyzing the number and spatial-demographic characteristics of the existing local action groups observe the following:

- The local action groups existing in Romania are very heterogeneous in terms of size and administrative-territorial structure.
- The 81 LAGs are spread almost all over the country, except the counties of Constanta, Dolj, Gorj, Ilfov and Tulcea.
- In county Dambovita work the most LAGs, in number of 6, followed by Arad, Cluj, Harghita, Mures with 4 each.
- The area occupied by the 81 LAGs represents 39.45% of the total area of Romania and comprise 16.26% of the total population.



**Fig.1 LAGs Map**

Source: [www.leader-romania.ro](http://www.leader-romania.ro)

## CONCLUSIONS

Rural development policy is an important component of the Common Agricultural Policy (CAP). It promotes the sustainable development of rural areas in Europe, approaching economic, social and environmental problems. More than half of the EU population lives in rural areas, which cover 90% of EU territory.

Leader is an innovative approach within EU rural development policy, is a method of mobilizing and promoting of the rural development in local rural communities. Experience has shown that Leader can bring significant changes in the daily life of people in rural areas.

Leader encourages rural territories to explore new ways to become or remain competitive, to maximum value the assets and to overcome the difficulties they may face, such as an aging population trend, low levels of services or lack of employment opportunities. Thus, Leader improve the quality of life in rural areas, both for farm families and for wider rural population.

The Leader approach is based on links between citizens, activities and territories. Local partnership is established as local action groups and their establishment allows practical application of the concept of local partnership. Being a member of this partnership is to take part - you join, be a part – assume responsibilities, take action and participate in the interchange [3].

LAGs in accordance with European standards must be a balanced and representative ensemble of members from different socio-economic areas of the territory. At the decision level, the economic and social partners and representatives of civil society, such as farmers, women, rural youth and their associations must represent at least 50% of the local partnership.

LAGs approach the rural problems from a global perspective based on development strategies. Besides local partnership, the strategy is an essential element. This should take into account sustainable development issues and is based on endogenous potential development of the selected area. The main aim of the strategy is to create long-term development policies and each strategy is based on a detailed analysis of the state of the area in which the potential and development opportunities should be clearly identified. Each strategy should include:

- The characteristics of the area (geographic, economic, demographic, sociological, and description of previous actions).
- SWOT analysis (development potential of the area).
- Vision of area development (theme chosen and the objectives, priorities, target groups, expected results).
- The operating strategy (bottom-up approach, timeline, innovative actions, transferability of actions and activities).
- The harmonization with other LAGs development programs.

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- [5] [www.apdrp.ro](http://www.apdrp.ro) Payment Agency for Rural Development and Fisheries
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# AREA AND PRODUCTION OF THE MAIN CROPS IN ROMANIA 2007-2011

TUREK RAHOVEANU PETRUTA<sup>1</sup>

## Summary

*Agriculture is one of the important sectors of the Romanian economy. The contribution of agriculture to gross domestic product stands around 6%, while in EU Member States it stands at around 1.7%. yields relate directly to the agricultural development and competitiveness of this sector. However, yields in 2011 were much reduced by unfavourable natural conditions of this year, further highlighting these gaps.*

**Keywords:** yield, vegetable products

## INTRODUCTION

In Romania, crop production in 2011 has decreased or increased depending on the evolution of cultivated areas and yields in various crops.

Also domestic grain production increased by 24.3% in 2011 compared to 2010, Romania ranking fifth in the European Union to wheat and second, after France, to corn.

## MATERIAL AND METHOD

For this work, data from the Romanian Statistical Yearbook have been used, time series 2007-2011. Comparison method was used to highlight the differences between the areas and productions of the main vegetal products in Romania.

## RESULTS AND DISCUSSION

The area planted to wheat in 2007-2011 fluctuated mainly due to changing weather conditions (from droughts to floods), but also due to market conditions (prices, insolvent demand, imports). Cultivated area in 2011 decreased slightly from the previous year, but total production increased by about 22%, following the substantial increase in yield.

Wheat production totalled 7,131.600 thousand tons in 2011 to 3,044.500 thousand tons in 2007, obtained from an area of 1974.0 thousand hectares, almost equal to that of 2007, which means a significant increase. (Table 1)

**Table 1 Wheat – area, production (2007-2011)**

| Item                             | 2007   | 2008   | 2009   | 2010   | 2011   |
|----------------------------------|--------|--------|--------|--------|--------|
| Area (thousand ha)               | 1975.0 | 2110.3 | 2207.3 | 2189.4 | 1974.0 |
| Yield (kg/ha)                    | 1541.0 | 3403.0 | 2421.0 | 2688.0 | 3663.0 |
| Total production (thousand tons) | 3044,5 | 7181,0 | 5170,5 | 5811,8 | 7131,6 |

Source: INS

Romania thus stood fifth in the EU, both in terms of cultivated area and production of wheat obtained, and the ninth in terms of efficiency.

As for grain maize, production is 11,717.600 thousand tons in 2011, compared to slightly over 9042.0 in 2010, and it is obtained on 2,589.700 thousand ha (Table 2).

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**Table 2 Corn – area, production (2007-2011)**

| Item                             | 2007   | 2008   | 2009   | 2010   | 2011    |
|----------------------------------|--------|--------|--------|--------|---------|
| Area (thousand ha)               | 2524.7 | 2449.6 | 2267.5 | 2098.4 | 2589.7  |
| Yield (kg/ha)                    | 1526.0 | 3215.0 | 3409.0 | 4309.0 | 4525.0  |
| Total production (thousand tons) | 3853.9 | 7869.9 | 7491.8 | 9042.0 | 11717.6 |

Source: INS

Sunflower is considered by farmers as the crop with the simplest cultivation technology, which does not involve large inputs (small amount of seed for sowing, little use of herbicides) and is one of the traditional cultures in Romania.

Sunflower production also increased to 1,789.300 thousand tons in 2011 compared to 546.900 thousand tons in 2009. Output in 2011 allowed Romania to rank second after France, due to lower yields by 5.3% compared to the EU average return (Table 3).

**Table 3 Sunflower – area, production (2007-2011)**

| Item                             | 2007  | 2008   | 2009   | 2010   | 2011   |
|----------------------------------|-------|--------|--------|--------|--------|
| Area (thousand ha)               | 835.9 | 813.9  | 787.2  | 790.8  | 995.0  |
| Yield (kg/ha)                    | 654.0 | 1437.0 | 1433.0 | 1597.0 | 1798.0 |
| Total production (thousand tons) | 546.9 | 1170.0 | 1112.5 | 1262.9 | 1789.3 |

Source: INS

Sunflower production in 2011 is a record, increasing by about 47% over the previous year.

Rape is considered by farmers a culture that does not require high costs and that uses soil moisture very efficiently, allowing good yields even in dry years. In the future, due to the increasing demand for rapeseed, irrigation should be increased by investing in rehabilitation and modernization of irrigation systems, which are currently functional only on small areas (Table 4).

**Table 4 Rape – area and production (2007-2011)**

| Item                             | 2007  | 2008   | 2009   | 2010   | 2011   |
|----------------------------------|-------|--------|--------|--------|--------|
| Area (thousand ha)               | 364.9 | 365.0  | 435.6  | 537.3  | 392.7  |
| Yield (kg/ha)                    | 991.0 | 1844.0 | 1357.0 | 1755.0 | 1882.0 |
| Total production (thousand tons) | 361.5 | 673.0  | 573.5  | 943.0  | 739.0  |

Source: INS

Although the areas planted with rape in 2007 and 2008 were approximately equal, yield in 2008 - a year with normal temperatures and precipitation - was about 2 times higher than in 2007, a particularly dry year. In 2009, the area cultivated with rape experienced a new record of 435.600 thousand hectares, but yield decreased by 500 kg over the previous year.

Sugar beet - in terms of acreage, trended upwards in 2009-2010, with the exception of 2011, when due to unfavourable conditions, it showed only a minimal 18.800 thousand ha.

Sugar beet production declined by 22.4% in 2011, mainly due to reduced cultivated area (-13.6%) and yield (-10.2%) (Table 5)

**Table 5 Sugar beet – area and production (2007-2011)**

| Item                             | 2007  | 2008  | 2009  | 2010  | 2011  |
|----------------------------------|-------|-------|-------|-------|-------|
| Area (thousand ha)               | 28.7  | 20.4  | 21.3  | 22.0  | 18.8  |
| Yield (kg/ha)                    | 26065 | 34564 | 38296 | 38036 | 35103 |
| Total production (thousand tons) | 748.8 | 706.9 | 816.8 | 837.9 | 675   |

Source: INS

In the period under review, year 2011 marked a historic low in terms of acreage and yields.

## CONCLUSIONS

Romania's cereal production increased to 20.78 million tons in 2011 corn production stood at 11.7 million tons, while that of wheat at 7.1 million tons, which made Romania a leading corn and wheat producer in Europe.

Analysis of the cereal area structure in 2009 shows that 45% of the area was occupied by corn, 44% was cultivated with wheat, the most important crops in agriculture.

Prices increased due both to the relatively low yields and to the trends recorded on the global market.

In 2007, harvested area and yield in spring crops - corn, sunflower and soybean - were significantly reduced by drought and imports doubled because of the low domestic supply.

Instability of Romanian wheat production generates instability of the domestic supply for a product of major importance for the population's food security, being the cause of price volatility and speculation on the wheat market. These realities can not be overcome without implementing appropriate technologies for the cereal crops adapted to Romania's climate and without extensive use of irrigation and inputs carrying technical progress (selected seeds, fertilizers, pesticides), as it happens in the other European countries.

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# TECHNICAL - ECONOMIC ANALYSIS IN AN INDIVIDUAL FARM IN OLT COUNTY

TUREK RAHOVEANU PETRUTA<sup>1</sup>

## Summary

*In Romania, the small subsistence farms proved to be very durable. Structural changes led to the multifunctional development of this household, to vegetable marketing, input supply, investments and agricultural works, storage of products. Gradually, the number of subsistence farms will decrease in favour of forming a viable commercial sector and economic diversification in Romanian rural area.*

**Keywords:** average production, commodity production, revenues, expenses, economic size

## INTRODUCTION

A farm of small economic size is undercapitalized, which does not ensure a high degree of mechanized technologies, growers appealing to low capacity machines or manual work. Manpower usually consists in family members and temporary staff used to meet the needs at the best time.

## MATERIALS AND METHOD

Research methodology consisted of a documenting survey conducted with a questionnaire. Farm internal records were the information sources. Inquiry was the data collection method. Structural survey based on a questionnaire was used as investigation technique, by direct interview. The questionnaire contains questions about different aspects of economic activity of the household.

## RESULTS AND DISCUSSION

The household has a mixed vegetable production, characterized by cultivation of cereals, oilseeds, pulses, vineyards. The choice for these crops is given by the need to ensure family vegetable products from its own production and to sell an important part of the products obtained.

**Table 1 Land use**

| Item                        | Ha  | % of total |
|-----------------------------|-----|------------|
| Agricultural, out of which: | 7.8 | 100        |
| -Arable                     | 7.7 | 98.7       |
| -Vineyards                  | 0.1 | 1.28       |

Source: author's calculations

Of the agricultural land, 98.7% is arable land and vineyards 1.28% (Table 1). The terrain consists of 5 parcels, located 3 km away from the farm. Soil type is brown chernozem with pH 6.3 to 6.7. No negative aspects were reported for environment quality. The entire surface of 7.8 ha belongs to the farm leader, who has ownership title.

**Table 2 Main technical equipment**

| Item                      | 2008 | 2009 | 2010 |
|---------------------------|------|------|------|
| U-650 tractor             | 1    | 1    | 1    |
| PP4-30 plow               | 1    | 1    | 1    |
| GS 1,2 star-shaped harrow | 1    | 1    | 1    |
| RM-2 trailer              | 1    | 1    | 1    |

Source: author's calculations

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The equipment is maintained in good condition. Culture establishing, maintenance and mechanical harvesting are done by a third party service.

Agricultural production. There is a decrease in the share of cereals from 67.5% in 2008 to 59.7% in 2010. Wheat holds the largest share over the three years. Oilseeds (sunflower) hold 22.0 to 20.7%; in pulses (beans), the surface is 0.8 to 1.5%, so there is a slight increase in area (Table 3).

**Table 3 Agricultural area**

| Item                          | 2008 |       | 2009 |      | 2010 |      |
|-------------------------------|------|-------|------|------|------|------|
|                               | ha   | %     | ha   | %    | ha   | %    |
| Cereal total, out of which:   | 5.2  | 67.5  | 4.9  | 63.6 | 4.6  | 59.7 |
| Wheat                         | 3.20 | 41.5  | 2.90 | 37.6 | 2.80 | 36.3 |
| Corn                          | 2.0  | 25.9  | 2.0  | 25.9 | 1.80 | 23.3 |
| Oilseeds total, out of which: | 1.7  | 22.07 | 1.6  | 20.7 | 1.6  | 20.7 |
| Sunflower                     | 1.7  | 22.07 | 1.6  | 20.7 | 1.6  | 20.7 |
| Pulses total, out of which:   | 0.8  | 10.3  | 1.2  | 15.5 | 1.5  | 19.4 |
| Beans                         | 0.8  | 10.3  | 1.2  | 15.5 | 1.5  | 19.4 |
| Arable total                  | 7.7  | 100   | 7.7  | 100  | 7.7  | 100  |

Source: author's calculations

**Table 4 Yield and production**

| Item        | 2008  |      | 2009  |      | 2010  |      |
|-------------|-------|------|-------|------|-------|------|
|             | Kg/ha | tons | Kg/ha | tons | Kg/ha | tons |
| Wheat       | 1938  | 6.2  | 1690  | 4.9  | 1786  | 5.0  |
| Corn        | 1900  | 3.8  | 2400  | 4.8  | 2611  | 4.7  |
| Sunflower   | 1765  | 3.0  | 1875  | 3.0  | 1563  | 2.5  |
| Beans       | 625   | 0.5  | 1250  | 1.5  | 1267  | 1.9  |
| Wine grapes | 6000  | 0.6  | 6000  | 0.6  | 6000  | 0.6  |

Source: author's calculations

Yields have a trend of decreasing throughout the period of three years, due to the fact that some factors had a less favourable influence. Total production follows the trend of average yields, which is a determinant element of it, coming from the cultivated area.

**Table 5 Commodity production**

| Item        | 2008 |        |      | 2009 |        |      | 2010 |        |      |
|-------------|------|--------|------|------|--------|------|------|--------|------|
|             | tons | lei/kg | lei  | tons | lei/kg | lei  | tons | lei/kg | lei  |
| Wheat       | 6.2  | 0.58   | 3596 | 4.9  | 0.46   | 2254 | 5.0  | 0.55   | 2750 |
| Corn        | 3.8  | 0.69   | 2622 | 4.8  | 0.44   | 2112 | 4.7  | 0.54   | 2538 |
| Sunflower   | 3.0  | 1.10   | 3300 | 3.0  | 0.80   | 2400 | 2.5  | 1.10   | 2750 |
| Beans       | 0.5  | 1.80   | 1800 | 1.5  | 1.92   | 1920 | 1.9  | 2.01   | 2010 |
| Wine grapes | 0.6  | 0.80   | 480  | 0.6  | 0.85   | 510  | 0.6  | 0.95   | 570  |

Source: author's calculations

Of the total wheat largest share was 41.8% in 2008 compared to 31.9% in 2010; in maize production sold on market varied by 36.05% - 34.9%. Sunflower and bean yields were recovered 39.05% - 32.54% and respectively 31.4% - 35.07% of total production. Significant weights of the production are held by wheat, maize, sunflower and beans.

**Table 6 Revenues, expenditures, financial results**

| Item                  | UM  | 2008  | 2009  | 2010  |
|-----------------------|-----|-------|-------|-------|
| Total farm expenses   | lei | 11150 | 10925 | 13010 |
| Total farm revenues   | lei | 13306 | 12769 | 15713 |
| Profit margin on farm | lei | 2156  | 1844  | 2703  |
| Product margin / farm | lei | 13306 | 12769 | 15713 |

| Item                  | UM       | 2008  | 2009  | 2010  |
|-----------------------|----------|-------|-------|-------|
| Total grants / farm   | lei      | 2408  | 2613  | 3286  |
| Standard gross margin | euro     | 2178  | 1779  | 2240  |
| Economic size         | category | I     |       |       |
| UDE                   | no.      | 1.8   | 1.5   | 1.9   |
| Turnover              | lei      | 13306 | 12769 | 15713 |
| Net profit/farm       | lei      | 1811  | 1549  | 2271  |
| Net profit/ha         | lei      | 232   | 199   | 291   |

Source: author's calculations

**Table 7 Evolution of costs, prices and profitability of products sold**

| Item          | UM      | 2008 | 2009 | 2010 |
|---------------|---------|------|------|------|
| Wheat         | to      | 6.2  | 4.9  | 5.0  |
| Average cost  | RON/ton | 500  | 390  | 450  |
| Average price | RON/ton | 580  | 460  | 550  |
| Profit/ton    | RON/ton | 80   | 70   | 100  |
| Profit rate   | %       | 16.0 | 17.9 | 22.2 |
| Corn          | to      | 3.8  | 4.8  | 4.7  |
| Average cost  | RON/ton | 600  | 390  | 490  |
| Average price | RON/ton | 690  | 440  | 540  |
| Profit/ton    | RON/ton | 90   | 50   | 50   |
| Profit rate   | %       | 15   | 12.8 | 10.2 |
| Sunflower     | to      | 3.0  | 3.0  | 2.5  |
| Average cost  | RON/to  | 1000 | 720  | 999  |
| Average price | RON/to  | 1100 | 800  | 1100 |
| Profit/ton    | RON/ton | 100  | 80   | 101  |
| Profit rate   | %       | 10   | 11.1 | 10.1 |
| Beans         | to      | 0.5  | 1.5  | 1.9  |
| Average cost  | RON/ton | 1560 | 1700 | 1820 |
| Average price | RON/ton | 1800 | 1920 | 2010 |
| Profit/ton    | RON/ton | 240  | 220  | 190  |
| Profit rate   | %       | 15.4 | 12.9 | 10.4 |
| Wine grapes   | to      | 0.6  | 0.6  | 0.6  |
| Average cost  | RON/ton | 730  | 760  | 860  |
| Average price | RON/ton | 800  | 850  | 950  |
| Profit/ton    | RON/ton | 70   | 90   | 90   |
| Profit rate   | %       | 9.6  | 11.8 | 10.5 |

Source: author's calculations

All products marketed at that time, prices exceeded production costs, achieving profit; low prices for wheat and corn do not provide high rates of return; sunflower is more cost-effective, providing a distinctive competence of the farm and it is capitalized at higher prices.

Management activity is performed by the farm leader, who holds primary bookkeeping, while selling the products on the market is done by other family members. Permanent staff consists of the farm leader and his wife. When manual hoeing and harvesting of corn, wine grapes and beans are performed, 3-4 daily workers are employed.

**Table 8 Labour productivity**

| Item   | 2008  | 2009  | 2010   |
|--|-------|-------|--------|
| Farming revenues                                     | 10898 | 10156 | 12427  |
| Farm staff   | 2     | 2     | 2      |
| Operating income per person (lei/capita)             | 5449  | 5078  | 6213   |
| Dynamics of operating income per employed person (%) | 100   | 93.19 | 114.02 |

Source: author's calculations

Operating income per full time employed person is Lei 6213 in 2010. Labour productivity is increasing, the index of operating income per employed person being 93% in 2009 and 114% in 2010.

Farm management is considering obtaining the most favourable prices for the capitalized products and to do that, periods of high demand are chosen. The sale is made by family members, without intermediaries.

There is storage room on the farm, so marketing is made when it provides the best prices. Only the quantities of wheat, corn and beans necessary for farm consumption are held.

Marketed production and price trends are highlighted within their evolution. Sale prices had a positive recovery, which allowed revenues to increase in 2010 compared with 2009.

## **CONCLUSIONS**

There is an increasing trend of revenues, profits and labour productivity in the analyzed farm. Due to good technical equipment, the structure of cereal crop is growing compared to previous years. Rates of return are higher for corn and wine grapes. Due to the existence of a single administrator, and therefore one-man decisions, issues may result when decision options are substantiated.

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# RESEARCH ON THE ASSOCIATION BENEFITS FOR THE AGRICULTURAL PRODUCER MARKET MANIFESTATIONS

TUREK RAHOVEANU MARIA MAGDALENA<sup>1</sup>, ZUGRAVU GHEORGHE ADRIAN<sup>2</sup>,  
CRISTEA LUIZA<sup>3</sup>

## Abstract

At the current stage, agricultural producers joining in association forms opens up new opportunities for economic development by attracting local, local or regional advantages and using collective power to increase prosperity of members, their families and communities to which they belong. The work is part of the rural development priorities of CAP reform 2014-2020 on the competitiveness of agriculture and farm viability. The new concept of rural development includes actions relating to: a) facilitating restructuring of farms facing major structural problems, particularly farms with low market participation and farms that need agricultural diversification; b) facilitating generations renewal in agriculture. The paper aims to identify the benefits of agricultural association through a survey conducted in 10 counties of Romania in several representative beekeeping cooperatives.

**Keywords** Advantages, cooperation, association, producers group

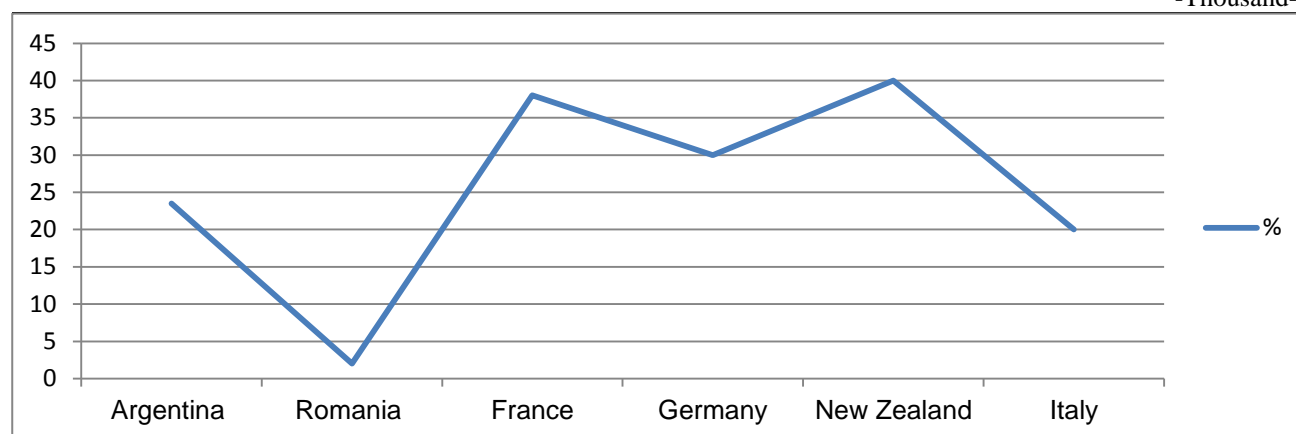
## INTRODUCTION

Global, the cooperatives activities demonstrated the functionality both inside them and in the community. Statistics recorded by the International Cooperative Alliance show that they provide over 100 millions jobs worldwide, 20% more than multinational companies.

**Figure 1**

**Cooperative members share in total population in 2008**

-Thousand-



Source: [www.ica.coop.com](http://www.ica.coop.com)

In **Argentina** 23.5% of the population work in cooperative, in Quebec region 70% of the population is a member of the cooperative. Cooperatives producing maple sugar in **Canada** hold 35% of the world production.

38% of the **French** population are members of cooperatives. 75% of farmers are members of a cooperative.

30% of the **German** population are members of cooperatives, 8106 cooperatives exercise their activity here.

In **New Zealand**, 40% of the adult population is a member of the cooperative and mutuality. Cooperatives produce 22% of GDP, holding 95% of the dairy market, 70% of the meat market, 62% of the grocery market, 75% of the pharmaceutical market, 70% of the agricultural fertilizer.

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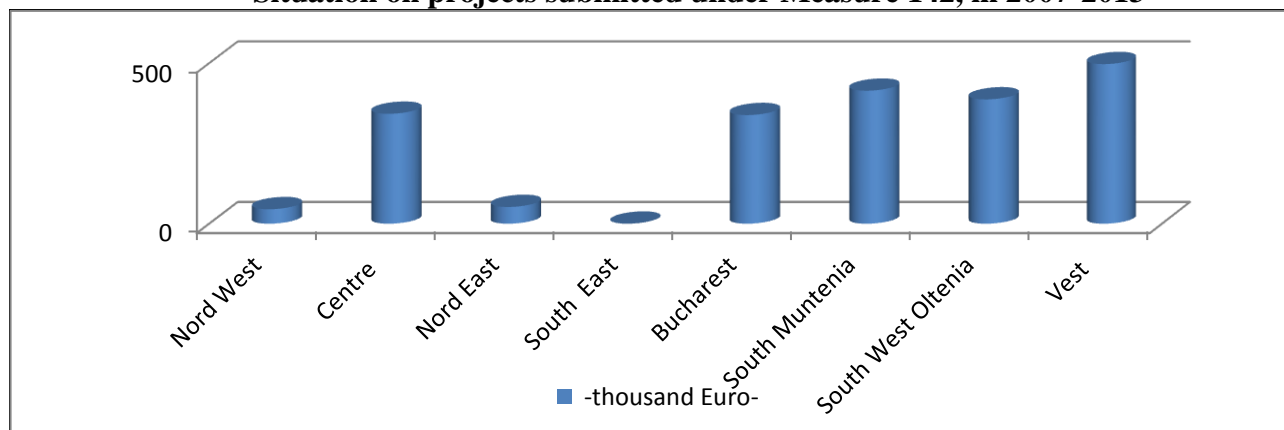
**Spain** has 15% of the population as member in cooperatives (in 2008). In 2007 the cooperative has provided jobs for 21.6% of employment.

**Italy** had employed persons in 2005 about 1 million individuals in 70,400 cooperative societies

In 2007, **Romania**, of the total number of 4,256,152 agricultural holdings, 90.96% were of subsistence, 7.55% of semi-subsistence and only 1.49% of commercial, situation that shows the lack of awareness on the benefits of cooperation and association in agriculture.

**Figure 1**

**Situation on projects submitted under Measure 142, in 2007-2013**



Source: [www.rndr.ro](http://www.rndr.ro)- Present and future in the rural development policy in Romania Dr. Vincze Maria, Professor Emeritus, University Babes-Bolyai University, Cluj-Napoca

In 2007-2013 the total value of contracted projects for setting up producer groups was 2.074 thousand Euro, representing only 8.4% of the funds for the measure. Number of projects submitted for the measure 142, in 2012 was 45 of which 40 selected for funding and only 34 accepted for payment. This situation shows the little interest and even reluctance for associative forms. They come from poor awareness and lack of information to farmers regarding benefits from association. Another cause could be caused by the different degree of training of persons involved in implementing associative forms, different understandings of the purposes and principles of their operation, but also mentality on compulsory association linked to the old CAPs.

## MATERIAL AND METHODS

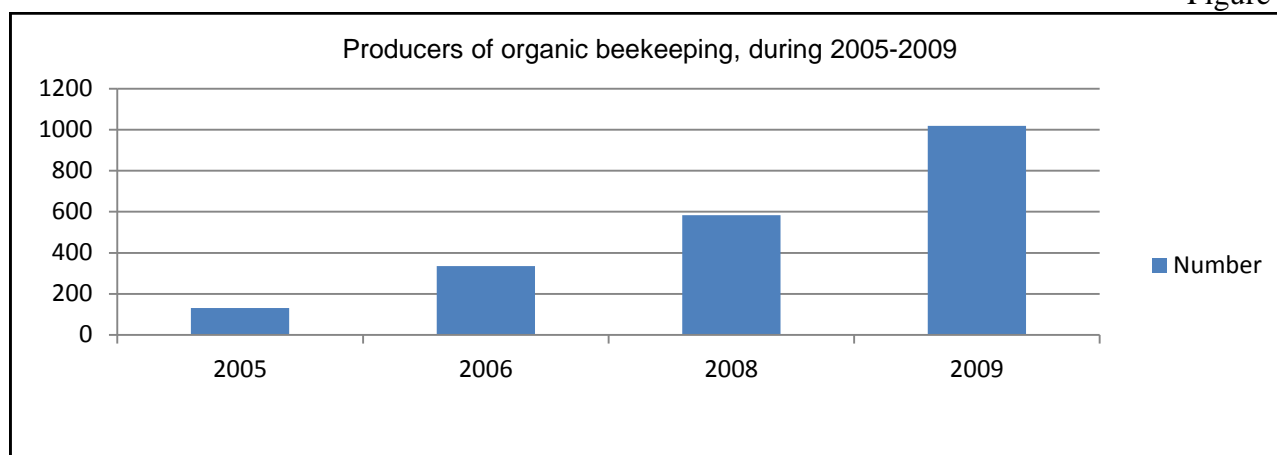
The study is conducted among bee farmers, processors of honey and bee products organized in associations, cooperatives, producers groups formed under the laws.

We aim to identify the advantages and disadvantages of association, starting from the favourable development of the sector (Figure 1). In 2011, Romania had 39,000 beekeepers enrolled in association forms and 5346 beekeepers which requested financial support from the National Beekeeping Programme. Thus, in 2005 there were 132 producers certified for organic beekeeping, and in 2009 the number of organic beekeepers increased to 1018. In 2009 in Romania were registered eight exporters of honey and bee products (Figure 2).

Research technique used: the questionnaire survey and structured interviews. The questionnaire consisted of 31 questions, most of which were closed questions (with answers). The sample is represented by cooperative members aged between 35 and 65 years in 10 counties. Period in which the survey was conducted: 16 June 2012 - 31 July 2012.

Members were asked questions about the establishment way, organization and associative group size. Also included a few questions about the group associative relationship with the external environment and with the community to which it belongs and how it engages in local development processes.





Source: [www.madr.ro](http://www.madr.ro)

## RESULTS AND DISCUSSION

In support of the association and agricultural cooperation the work is based on the following assumptions:

- Romania, currently in a position to adapt to new EU regulations, has an agriculture in which approximately 37% of the population develop their activity, with about 3 millions parcels whose average area is 1.5 ha, which requires organizing farmers in association forms, in order to modernize this important economic sector.
- Currently, only 7% of farmers up to 40 years are owners of farms under 2 EDU and benefited from SAPS. Thus, the young farmers are considered guarantors of the future of agriculture, in that they can bring new energy and new ideas to this sector.
- Small farms have a special contribution to the diversification of products, habitats conservation, etc.
- Mountain areas provide special products and attractive ecosystems. However, the mountainous areas may face special challenges, related to climate and isolation;
- Short supply chains can bring economic, social and environmental benefits (by providing a greater share of added value for farmers, by reducing carbon footprint, by promoting food distribution and fostering face-to-face contact between producers and buyers). It may be helpful to bridge the gap from producer to consumer.

The survey results are summarized in two dimensions (physical and economic) and provide an initial assessment of their size and their economic and social impact in the territory:

- average size of the associative structures under study is 30 members, aged between 45-48 years. Women presence in beekeeping associations is quite low, less than 5%. The level of training of members is secondary school.
- from an economic perspective, the results of the study show that high costs of equipment and biological material needed to start a beekeeping business may not be supported by one beekeeper. A hive costs about 800 lei, a family of bees on 10 frames, 650 lei, an extractor 3.5 thousands lei, a bee pavilion 50-60 thousands lei. Under such conditions it is difficult to initiate a bee business alone. Working organized and not random. This leads to time saving, increase productivity and profitability. There are created conditions for the work division, releasing the bee farm family of some functions, resulting in simplification of production structure.
- following discussions with members of beekeeping associations, pastoral beekeeping is profitable only for large numbers of bee colonies. If organizing collective apiary many costs can be shared. The rapid dissemination of information and technologies.

- associations provide optimal conditions for beginner beekeeping practice and improve job performance. In current conditions, to practice an intensive and profitable modern beekeeping, is mandatory the continuous training and information both for beginners and professionals. Honey is obtained in big parties allowing it ranking on quality and creates easy market possibilities and for good prices both on domestic and foreign markets, by removing intermediate links.
- the large farms creates diversifying conditions of beekeeping production, the products higher processing generates the exchange of relationships and intern and extern values.
- thus beekeeping association and cooperation is a means of avoiding bankruptcy, maintaining as profitable apiary keeping on its market segment. In associative conditions is easier to cope with risk factors, and can be effective the marketing of apiculture products.
- beekeeping associations have a discipline regarding treatment technologies used for bees, quantity and quality of delivered products, standards etc.
- the practice of beekeeping association also provides social benefits. There are possibilities of collaboration between professional and amateur scientists. Beekeeping profession collectively offer a friendly environment to relax and avoid stress. Finally, working in nature, possibility to benefit from organic products are positive factors for physical and psychological health. Cooperatives provide social stability, favourable conditions for preserving and developing job, develop a healthier behaviour of young generation on working.

## **CONCLUSIONS**

The survey results showed that advantages in beekeeping association can be summarized as follows:

- The most important advantage for a member of an associative group is production costs reducing. For example, the group may purchase machinery and equipment to be shared by all members.
- Ability to plan and modify production, in accordance with the quantitative and qualitative demand on market.
- Obtain better selling prices, due to bigger quantities negotiated and documents on demand;
- Selling a centralized production, optimizing transportation costs during acquisitions;
- Getting input at producer prices, for group members;
- Acquisition of group equipment used by all group members is an advantage in financial terms;
- Easier access to EU funds and bank borrowing.
- Facilitate communication between farmers, such as between their representatives and government institutions, the association representing a forum for discussion.
- Increasing the capacity of negotiation, in order to obtain better prices, both the inputs and market products on domestic or foreign markets.

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# RESEARCH ON AGRICULTURAL PRODUCER BEHAVIOUR IN TERMS OF COOPERATION AND ASSOCIATION

TUREK RAHOVEANU MARIA MAGDALENA<sup>1</sup>, ZUGRAVU GEORGE ADRIAN<sup>2</sup>  
LUIZA CRISTEA<sup>3</sup>

## Summary

*The work is part of the CAP reform in Europe after 2013, by which Romania will have to undergo a series of transformations including: promoting and encouraging cooperation and association in agriculture; stimulate the development of alternative economic activities such as organic farming, ecologic tourism, development and promotion of local products labelled; specialized human capital development and collaboration and sharing of best practices with experts from other EU Member States.*

*The European and global cooperative sector is a powerful economic and social actor within these societies, with significant results which can be both summarized as market shares and their work contribution to GDP, and the number of members and the welfare of citizens offered through job creation.*

**Keywords:** *cooperation, association, agricultural cooperatives*

## INTRODUCTION

This paper is based on a comprehensive qualitative research undertaken in rural areas of Romania who wants to answer a series of questions on the current stage of Romanian agriculture: is the agricultural cooperative a viable alternative for the farm? What is the economic and social impact of cooperatives in the next stage? Through agricultural cooperatives, the agricultural products can penetrate on better markets, closer to the consumer? What is the specific model of cooperation for Romanian agriculture?

From the agricultural producer point of view, the study aims to identify: Which is the reason to join the cooperative? What are the rights and obligations for members? Is the cooperative an institution to ensure business continuity for the agricultural producer in return for a membership fee? What is cooperative strategy in attracting new members?

## MATERIAL AND METHODS

Research technique used: the questionnaire survey and structured interviews. The questionnaire consisted of 31 questions, most of which were closed questions (with answers variants).

Sample is represented by cooperative members aged between 35 and 65 years from 10 counties. Period in which the survey was conducted: June 16, 2012 - July 31, 2012.

Indicators followed in interviewing producers were:

- indicators of initiative (organizational capacities of life, free private initiative);
- indicators of existential framework (natural, social environment and of available resources of income / capita, level of schooling);
- descriptive indicators (types of occupations and economic activities)
- objective and subjective indicators (preference for certain specialties, the idea of a future association);
- social indicators of situation (encouraging / discouraging by the authorities, quality of advice);

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- indicators of consumer price increase in May 2012;
- number of registered unemployment by level of education - May 2012;
- the number of registered - unregistered unemployed persons - May 2012;
- unemployment and vacancy rates, by economic activities;
- natural movement of population;

Data processing methods were statistical modelling, graphical method and statistical tables.

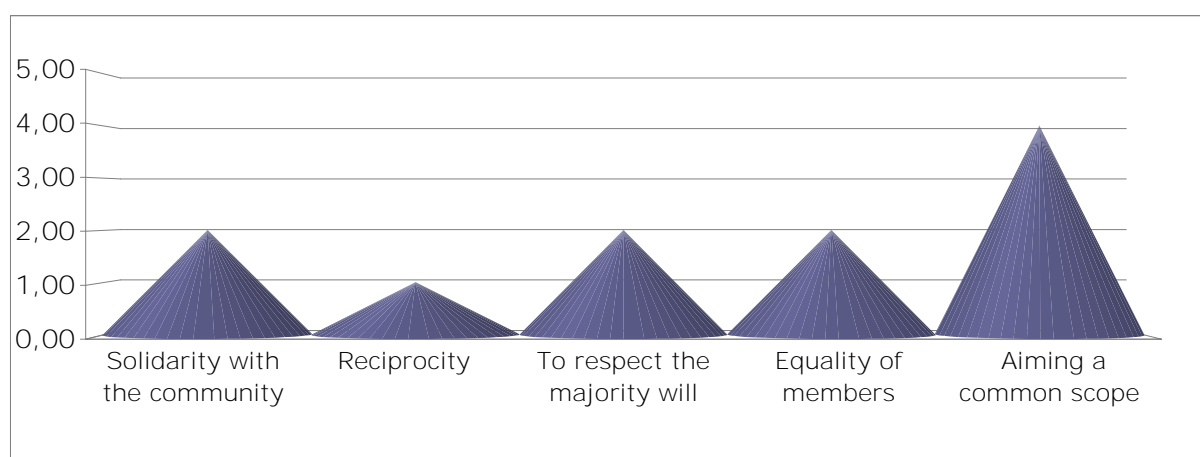
## RESULTS AND DISCUSSION

In the quantitative survey conducted difficulties arose in transmitting information. The survey results are presented in the following way:

- The cooperative members and presidents of cooperative respondents from different areas and counties of Romania: Alba, Botosani, Bihor, Brasov, Buzau, Constanta, Cluj, Olt, Teleorman. We have identified a preference for the profile choice for beekeeping cooperative in 90% cases, being justified by the easily association and investment recovery time for this type of agricultural enterprise.
- The beekeeping cooperatives surveyed have three since are on Romanian market, are composed of at least 5 founding members and without employees. The data show that, first, most of the founding members have not followed a specialization in the field of beekeeping before joining cooperative and were employed in organizations of different profiles, or they had unemployed status. Cooperative members have mostly secondary education, married and average household income of £ 3000.

The associative forms in beekeeping experienced a favourable evolution, given their growing numbers. In 2012 there are approximately 100 beekeeping associations (cooperatives, associations and bee federations, producers groups) compared to 10 in 2010.

**Figure 1: Principles of organization and functioning of the cooperative**



Source: Own processing the investigation data conducted by PACT

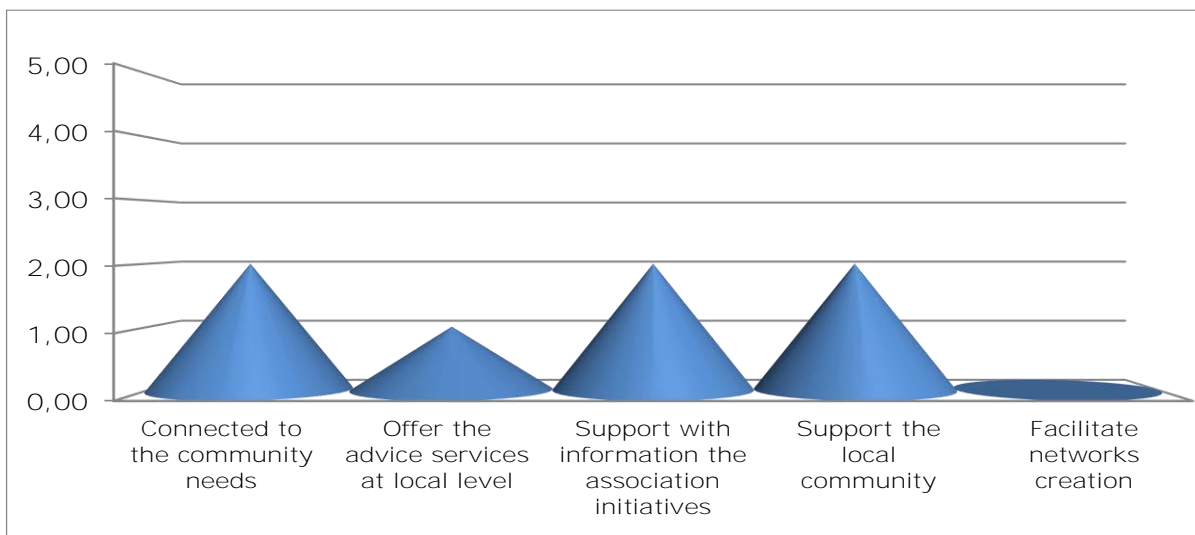
We can conclude from Figure 1 that they begin to operate and are built on cooperative principles, due to encouraging organizational and economic performances. Statistics show that the number and structure of agricultural cooperatives reflect the rapid process of their setting. But the cooperative structure on production activities reflects a very different degree of diversification and covering: nationally, only 36 producers groups in vegetable production and no association form of cooperation in Neamt, Tulcea, Hunedoara, Vaslui.

Some cooperatives representatives confirmed the lack of perspective of the existing organizational forms. They met an unclear and disincentives legislation of agricultural cooperatives,

not based on cooperative development need, more based on speculation generated by the permanently changing in agricultural policies.

Survey results show the farmers reserves seem to be related both to the period of the communist agricultural cooperatives and to some practices since 1990, when the newly established associations have brought benefited particularly to their originators, and very little to associated members. Since 2009 we have seen an increase in association and cooperation initiative determined by the existence of funding programs within NRDP measures, and less due to a reason. In Romania for small farms and without technical and financial support, the only viable alternative to the current situation is the agricultural cooperative.

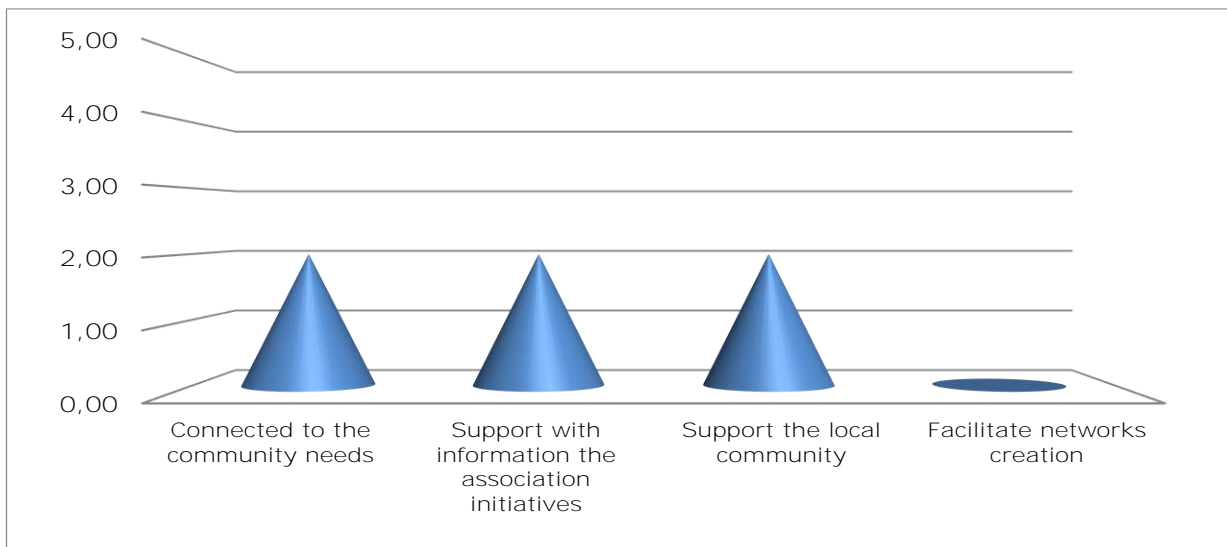
**Figure 2: How much support and advice you received from the agricultural chambers?**



Source: own processing based on the investigation conducted by PACT

From Figure 1 and Figure 2 we consider that with the involvement of local and county administration (directly interested in the development of agricultural cooperatives) should be initiated communication programs through agricultural chambers that to know the new tools of NRDP in the direction of the association and cooperation in rural area.

**Figure 3: How evaluate the local authorities involvement in agricultural cooperation problem?**



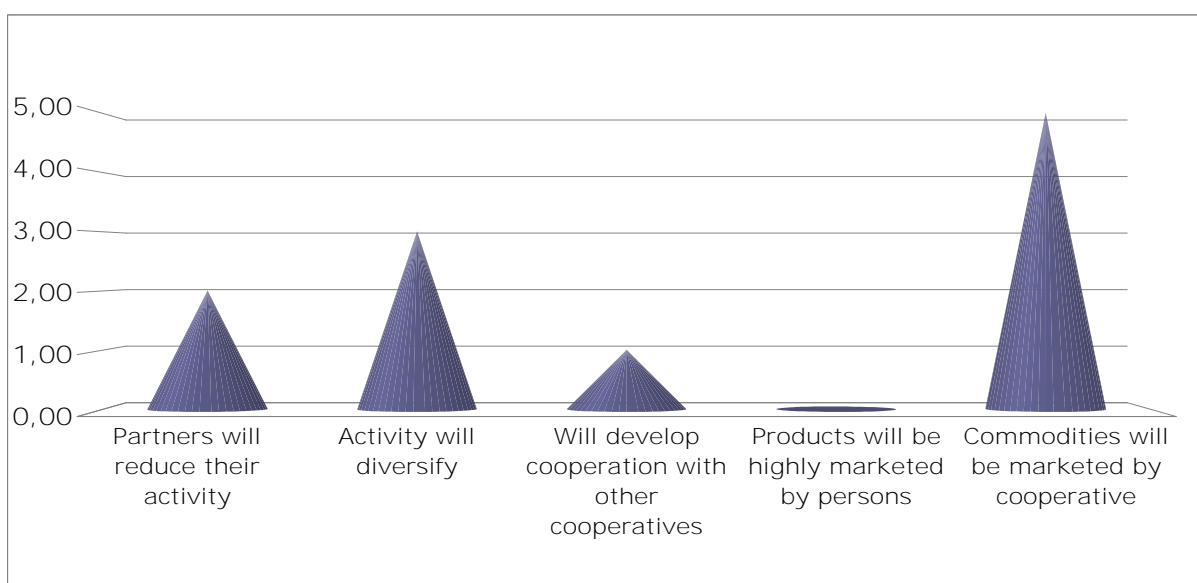
Source: own processing based on the investigation conducted by PACT foundation

In this way there will be a better integration of farmers on the food chain, can benefit in this way of a better organization and new ways to increase revenue.

On the development and future of their cooperative, members have realized that this is the only way to develop activities with opportunities for the revenue growth, for a better life. In the new phase of CAP reform 2014-2020, with the main measure 142, NRDP also consider other measures that can generate positive synergies to promote the producers groups (sub-measure 4.2.1. from LEADER axis, measure 121, measure 123, measure 141). The producers organizations in the new measure can be supported based on the own business plan both for marketing their production and for the development of management and marketing skills and innovative processes.

Discussions with representatives of the cooperatives have shown the need to improve the lending forms for association and agricultural cooperation and the need to establish vocational schools for young farmers who want to carry out agricultural activities or to initiate business in this area.

**Figure 4: How do you assess the future of associative forms in your community?**



Source: own processing based on the investigation conducted by PACT Foundation

## CONCLUSIONS

From data obtained both from a questionnaire survey, as well as from discussions with employees and directors of cooperatives has developed a SWOT analysis of the current situation in terms of cooperation and association in Romanian agriculture.

| Advantages   | Weaknesses  |
|--|---|
| <ul style="list-style-type: none"> <li>• Prioritizing cooperation and association under the new CAP reform 2014-2020.</li> <li>• The new rural development measures are particularly important factor to the development of cooperation and association in rural areas.</li> </ul> | <ul style="list-style-type: none"> <li>• Suspicions on association and cooperation in agriculture</li> <li>• To make functional entities would be the main objective, must solve the taxation then specify criteria for identification of members.</li> <li>• Producer associations appeared only to access financing programs</li> <li>• One of the big problems against association is taxes are discouraging when association occurs.</li> </ul> |

| Opportunities   | Risks   |
|---|---|
| <ul style="list-style-type: none"> <li>• Cooperation and association should occur due to a reason, which not necessarily should be the financing programs support. EU cooperatives occurred when one single producer failed on the market.</li> <li>• Romanian legislation should introduce a differential tax rate in terms of association and cooperation. An association or cooperative should have a longer life than a commercial society.</li> <li>• A better perception of rural actors on forms of association and cooperation</li> </ul> | <ul style="list-style-type: none"> <li>• Specialized labour force migration</li> <li>• Lack of competitive on economic market</li> <li>• High costs</li> <li>• Global crisis</li> <li>• Small farms don't have their own accounts and lead to the development of the underground economy</li> </ul> |

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# THE EVOLUTION OF ACCOMMODATION CAPACITY OF AGOTOURIST GUESTHOUSES IN THE PERIOD 2005-2011 IN THE NEAMŢ COUNTY - ROMANIA

URSUIANU NICOLAE-GABRIEL<sup>1</sup>, DRĂGHICI MANEA<sup>2</sup>

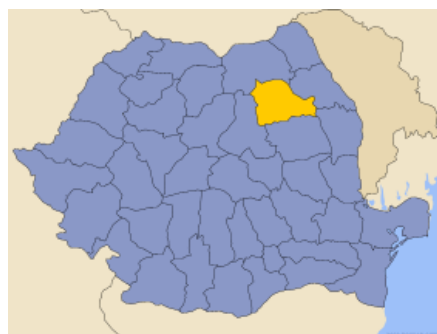
## Abstract

*This paper considers the analysis and development capacity of tourist accommodation among agro tourist guesthouses in Neamţ County during 2005-2011. There were taken into account and analyzed indicators such as agro tourist guesthouses in the total accommodation structures, available capacity within agro tourist guesthouses in the total accommodation structure (in number of seats), accommodation capacity in operation in agro tourist guesthouses in all structures of accommodation in Neamţ County (expressed in number of seats-days). Thus it appears that during 2005-2011 the highest rate of agro tourist guesthouses was in 2009 where from the total of 187 accommodation units agro tourist guesthouses had a total of 115 respectively 61.49%; the existing accommodation capacity within agro tourist guesthouses in the total accommodation structures in Neamţ County during 2005-2011 (expressed in number of seats) has also peaked in 2009 through a number of 1709 agro tourist guesthouses from a total of 5446 accommodation structures; the highest value in the number of places-days within agro tourist guesthouses is met in 2009 where from a total number of 1,563,148 seats-days in the county, agro tourist guesthouses represented 30.12% of these namely 470,885. There are analyzed the ways of implementing the local Plan for sustainable development of Neamţ County for 2007-2013.*

**Key words:** *tourism, agro tourist guesthouses, Neamţ County, annual growth rate.*

## INTRODUCTION

Neamţ County is located in the northeastern part of Romania and is a part of the North-Eastern development region of the country with a total land area of 5.896 sq km (representing 2.47% of total country land). County has a huge tourism potential characterized by geographically diverse landscape that attracts thousands of visitors every year, the varied landscape that includes altitudes from the plains to the mountain, through dense river network, but also features a rare ethnographic and folklore Beauty, natural and human tourism resources the latter contributing to increasing the number of tourists each year [1]. With regard to tourism and agro tourism development, an important role in Neamţ County is occupied by tourist accommodation capacity in rural areas, represented by agro tourist guesthouses [2]. In this respect, the present study is an analysis of tourist accommodation capacity in agro tourist guesthouses during 2005-2011 within the Neamţ County in order to highlight the effectiveness it has in the development of tourism and agro tourism in this part of Romania [3].



## MATERIAL AND METHODS

The following indicators were used: total number of tourist accommodation structures in Neamţ County during 2005-2011, the total number of agro tourist guesthouses in the total tourist accommodation structures, accommodation capacity expressed in number of seats both for Neamţ County and in tourist guesthouses, accommodation capacity expressed in number of seats within

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agro tourist guesthouses in the total of accommodation structures in the Neamț County during 2005-2011. The average annual growth rate was also calculated,  $r = \sqrt[n-1]{\prod (p1/p0)} - 1$ ; where:  $\prod p1/p0$  = chain growth indicators [4]. The analyzed period was 2005-2011 and the data were collected from the Neamț County Statistical Summary 2011 edition, statistically processed and interpreted on the ways to implement sustainable local development plan for 2007-2013 in Neamț County.

## RESULTS AND DISCUSSIONS

In the analyzed period, i.e. 2005-2011, on the number of agro tourist guesthouses in the total accommodation in Neamț County, the highest rate in the number of guesthouses was registered in 2009 of 61.49% where of the total of 187 accommodation units, agro tourist guesthouses included a number of 115. In contrast, the lowest share of the total accommodation structures in the county was registered in 2005 where 42 of 94 accommodation structures consisted of 44.68% of agro tourist guesthouses. Average annual growth for agro tourist guesthouses had a value of 16.10% (table no. 1).

**Table no. 1: Number of agro tourist guesthouses in total accommodation structures in Neamț County during 2005-2011**

| Specifications                    | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | Rate (%) |
|-----------------------------------|------|------|------|------|------|------|------|----------|
| Total in Neamț County             | 94   | 109  | 122  | 128  | 187  | 186  | 163  | 11,07    |
| Of which: agrotourist guesthouses | 42   | 54   | 63   | 69   | 115  | 106  | 88   | 16,10    |

Source: Tourism Breviary of Neamț County 2011 – data were processed

In figure no. 1 can be observed the evolution of accommodation structures in all the County and also the evolution of agro tourist guesthouses for the period 2005-2011.

**Figure no. 1: The evolution of accommodation structures in the Neamț County and the number of agro tourist guesthouses during 2005-2011**

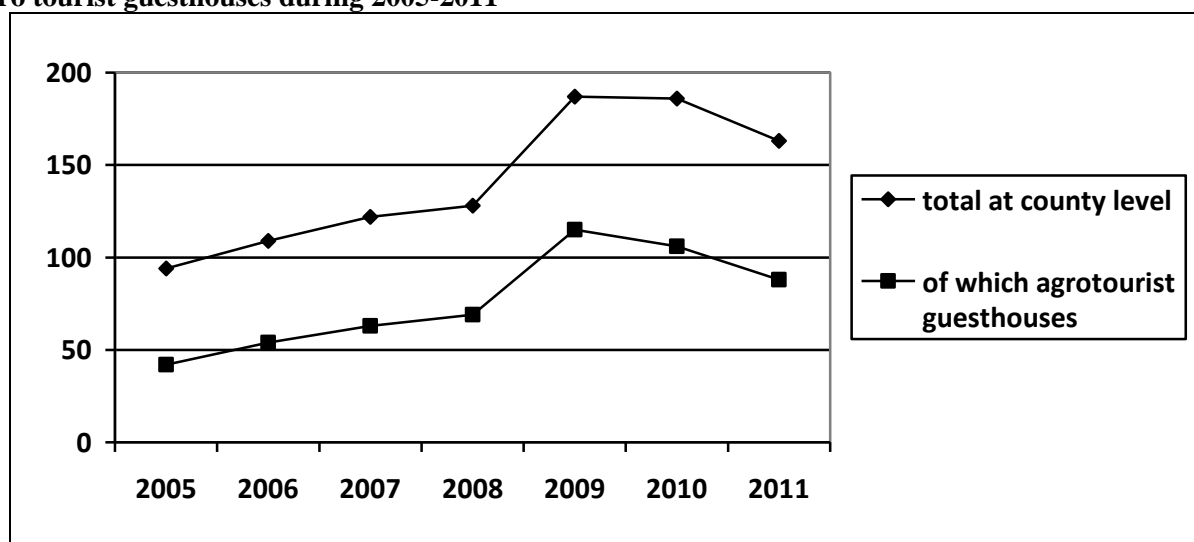


Table. 2 shows for the period 2005-2011, the accommodation capacity in the Neamț County of agrotourist guesthouses in all accommodation structures at the county level expressed in number of seats. The highest figure of agrotourist guesthouses is met in 2009, of 1709 in a total of 5446 accommodation structures at the county level. It was also calculated the average annual increase

rate and for the agrotourist guesthouses, this recorded a value of 17.75% while for the Neamț County it was much smaller with a value of 4.11%.

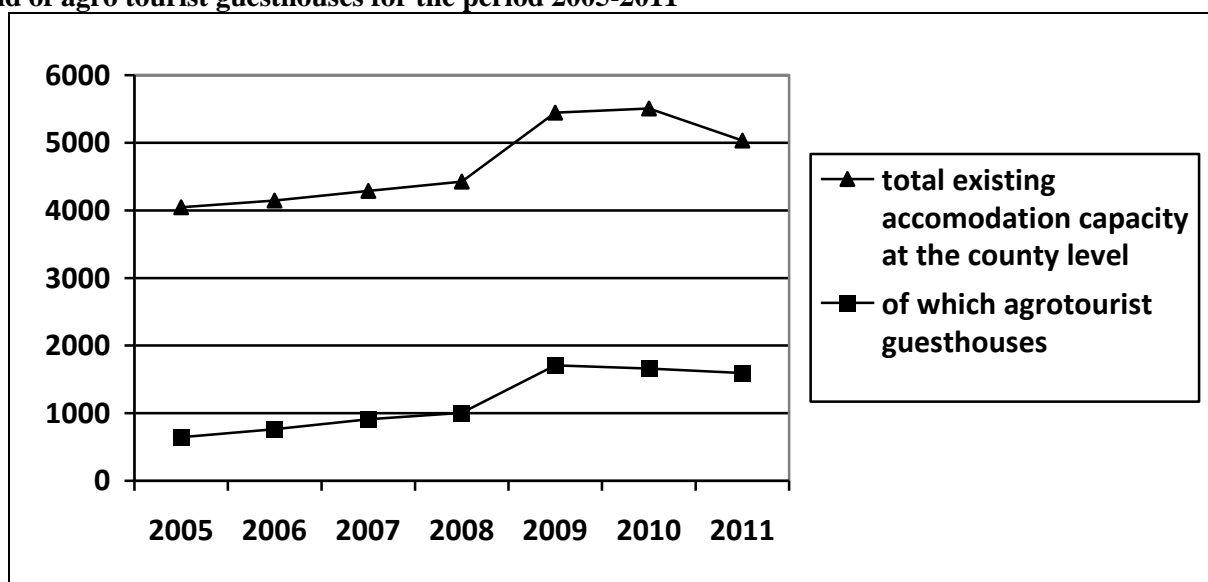
**Table no. 2: Operating accommodation capacity for agro tourist guesthouses in the total accommodation structures in Neamț County during 2005-2011 (expressed in number of seats)**

| Name                              | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | Rate (%) |
|-----------------------------------|------|------|------|------|------|------|------|----------|
| Total in Neamț County             | 4045 | 4145 | 4289 | 4424 | 5446 | 5506 | 5033 | 4,11     |
| Of which: agrotourist guesthouses | 645  | 766  | 909  | 1005 | 1709 | 1659 | 1594 | 17,75    |

Source: Tourism Breviary of Neamț County 2011 – data were processed

In figure no. 2 we can see the evolution that the existing accommodation capacity had for the Neamț County expressed in number of seats as well as the evolution of agrotourist guesthouses for the analyzed period 2005-2011.

**Figure no. 2: Evolution of accommodation capacity in Neamț County expressed in number of seats and of agro tourist guesthouses for the period 2005-2011**



In table below (no. 3) can be seen evolution of operating accommodation capacity for agrotourist guesthouses in the total accommodation structures in the Neamț County during 2005-2011 (expressed in number of seats-days). The highest values were recorded in 2009 where from a total of 1.563.148 number of seats-days at the county level, agrotourist guesthouses represented 30,12% of this, namely 470.885. The average annual growth calculated for the two situations has recorded a value of 3,59% at the county level while for the agrotourist guesthouses it reached 26,30%.

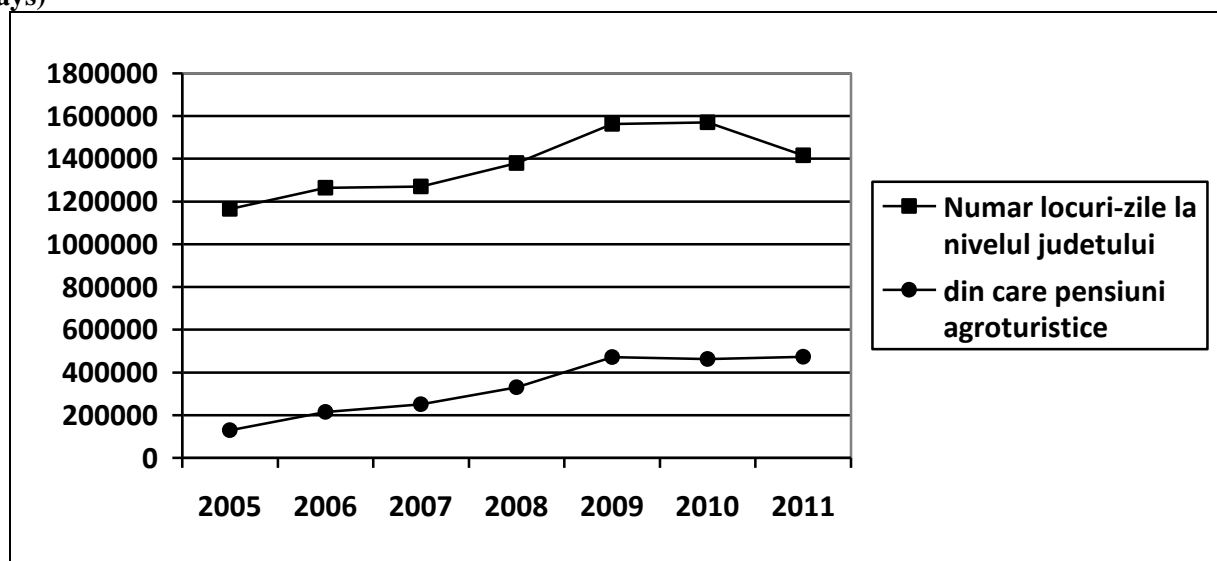
**Table no. 3: Operating accommodation capacity for agrotourist guesthouses in the total accommodation structures in Neamț County during 2005-2011 (expressed in number of seats-days)**

| Name                              | 2005      | 2006      | 2007      | 2008      | 2009      | 2010      | 2011      | Rate (%) |
|-----------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|
| Total in Neamț County             | 1.164.661 | 1.263.552 | 1.269.877 | 1.379.014 | 1.563.148 | 1.570.397 | 1.415.637 | 3,59     |
| Of which: agrotourist guesthouses | 129.102   | 214.113   | 250.351   | 330.257   | 470.885   | 462.532   | 473.296   | 26,30    |

Source: Tourism Breviary of Neamț County 2011 – data were processed

In the figure below (no.3) we can observe the evolution of operating accommodation capacity for the agrotourist guesthouses in the total accommodation structure in the Neamț County during 2005-2011 (expressed in number of seats-days).

**Figure no. 3: Evolution of operational accommodation capacity for agrotourist guesthouses in the total accommodation structure in Neamț County during 2005-2011 (expressed in number of seats-days)**



## CONCLUSIONS

1. Evolution of accommodation structures at the county level and the evolution of agro tourist guesthouses for the period 2005-2011 reached its highest value of 115 agro tourist guesthouses in 2009 representing 61.49% of the total of 187 accommodation units in the county.

2. Analysis reveals that the largest number of existing accommodation capacity of agro tourist guesthouses in the total of accommodation in Neamț County during 2005-2011 (expressed in number of seats) was found in 2009 where from a total of 5446 accommodation units at the county level, the guesthouses occupied 1709 number-seats, with an annual growth rate of 17.75% for the period 2005-2011.

3. The highest values in terms of accommodation in operation capacity for agro tourist guesthouses of all accommodation structures in the Neamț County for the period 2005-2011 (expressed in number of seats-days) was recorded in the year 2009, where from a total of 1,563,148 number of seats-days in the county, the agro tourist guesthouses represented 30.12% of that these, namely 470,885.

## AKNOWLEDGEMENT

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# ANALYSIS OF PRODUCTION AND CONSUMPTION OF A GIVEN HOLDING CROP

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## Summary

*Agriculture in its evolution, particularly in the last 20-30 years, marked increases in production and increases energy consumption. Compared with the national economy in general or with industry, energy consumption in agriculture is reduced. There was an alarming situation in the energy needs of agriculture, due to the fact that some forms of energy, direct or embedded in the materials used for the flow of technology, become pollutants in some cases heavily polluting. Energy use in conventional agricultural production can be reduced because it continually receives free, unconventional energy in various forms, from the Sun and soil.*

**Keywords:** *sustainable agriculture, energy, energy consumption,*

## INTRODUCTION

Energy conservation requires increasing energy efficiency and reducing specific energy consumption, which is achieved through changes in ecosystem structure, mutations in the use of options for those unconventional fuels and practice less intensive technologies. Energy conservation is a key issue in the development of an industry strategy and sustainable agriculture growth and that is why you need to put back on fuel consumption. In agriculture energy produced is higher than is consumed, the quantity of energy from plant products is conditioned by cultivated plant, applied technology and ecological area, which can change the ratio between the energy of the primary energy used and the amount of food produced. Energy conservation means and storage but also getting its ecosystem. Ecosystems are very large quantities of energy in different forms: solar radiation, wind energy, organic matter of plant and animal husbandry, mineral matter from chemical fertilizers, animal organic matter in the soil and insects. The main objective of the effective leadership of the ecosystem is to be able to calculate at least theoretically, all entries.

## MATERIAL AND METHOD

In this paper the criterion for analysis of agricultural production is the energy. Energy criterion is as universal as the criterion in value as it allows converting all production costs and produced in a joint energy equivalent and thus energy consumption and production may be subject to energy analyses, on the basis of its own analysis of this criterion. It may be considered that, in general, any means material including biological has built into it in one form or another, a certain amount of energy.

As it manages to consume less energy in various forms and produce more energy in the form of products, agriculture contributes to increased energy use throughout the economy.

In assessing energy efficiency of crop plant technologies that we can use the following indicators:

a) Total consumption of energy per hectare and per tone of the product: direct energy active (Ead), indirect energy active (Eai) and passive energy (Eap), so:

$$Ct/ha = Ead + Eai + Ep$$

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For the determination of these types of energy, calculations shall be carried out on the basis of costs in obtaining the product technology and transforming those coefficients for materials in energy units.

b) The energy produced for the determination of specific energy consumption, energy efficiency and finally the energy balance can be determined as follows:

$$PE/ha = q \times k$$

where:  $q$  = Physical average yield / ha

$k$  = energy factor

c) Specific consumption. For the determination of these indicators can be used by multiple relationships, as follows:

$$Cs = \frac{\text{the energy consumed}}{\text{energy produced}}$$

Specific consumption determined thus highlights how many units of energy is consumed for a unit of energy produced. This indicator reflects the efficiency of energy use.

2.  $Cs = \frac{\text{the energy consumed}}{\text{the area of culture}}$

Determine how many units of energy consumed per unit of area (ha).

3.  $Cs = \frac{\text{the energy consumed}}{\text{the quantity of product obtained}}$

It can show how many units of energy consumed per unit of product (kg/t)

d) Energy efficiency-as the energy produced and consumed energy. This indicator shows how many units of energy-producing unit consumed.  $RE = PE/ha : Cte/ha$

e) Energy balance represents the difference between the energy produced and consumed energy:

$$BE = PE/ha - Cte/ha$$

There is a great variety of units for quantifying energy use and the products in agriculture, are used as a unit of measure, kWh, joule calories, etc.

In order to assess the amount of energy produced in the form of the whole production is expressed in the same units of energy, with the commensurate and power consumption.

Agricultural products contain potential gross power, or energy forms as to be harvested and consumed either in the raw state or after processing of physical or even chemical nature.

In the present, to the analysis of energy products has taken into consideration the gross energy, i.e. the primary energy of the product.

## RESULTS AND DISCUSSION

Vegetable crops technologies are highlighted all the appropriate papers. For each work unit is used, its energy consumption in human man-hours, consumption of diesel fuel or electricity, all the elements for the calculation of energy assets. Are highlighted and materials consumed, the elements necessary for the determination of the energy consumption of indirect assets. Passive energy can be calculated from the sum of the aggregates and the duration of each aggregate on the works.

Thus, holding framed in economic size class I, in 2010, had 4 plant crops (wheat, corn, sunflower, beans, wine grapes) in non-irrigated system, earned a total of energy production on the holding of 100.243 kWh and consumption on the farm, the total energy of 38.111 kWh (table 2). Energy production per hectare is influenced directly by the main production (wheat, maize, sunflower, beans, and wine grapes) and secondary level of production (wheat straw, maize straw, haulm). Total energy production per hectare is 59.998 kWh with a total consumption of energy per hectare of 26.267 kWh (table 1).

In total energy consumption structure of energy/ha per holding, the largest share was an active indirect energy consumption – 80%, followed by direct energy consumption – 18% of active and passive energy consumption by 2% (Figure 1). Direct energy assets within main power consumption are at 98% with the fuel-energy consumption of human being only 2% (table 1).

In the total of active indirect energy consumption/ha, chemical fertilizers exerts great influence, representing 83% of total consumption of energy hold about 74%.

For the calculation of passive energy consumption is taken into account the weight of the machine, agricultural equipment, and length of service in years, working time and hours per year in a technological process, every culture.

Assessment of working time is equal for all equipment is a pretty cursory knew that, for example, the tractor does not carry out the same number of hours as drill or combine, whose annual working time is much more limited.

In order to execute the same number of hours of service during the year drills should be 5-6 times higher than that of tractors, but it is known that the replacement of means of production is not only conditioned by his physical wear, but also moral.

Theoretically a tractor or a car could not run unlimited number of years if ever replace parts as the wear, from the smallest to the engine block, the tractor remained continuously in operation. This continuous replacement parts and refurbishing no place for obsolescence occurs that requires disposal of the asset.<sup>1</sup>

Thus, economic size class I, total passive energy holding is 586kWh which represents 1.5% of the total energy consumption of the holding, and only 3% of total consumption per hectare. Passive energy consumption has a very small percentage due to the lack of irrigation system.

Energy balance shows us that at the level of the farm you can get additional energies equivalent to almost 62 thousand kWh, and the yield is 2, 63 (table 3).

The balance and energy efficiency are high, which is explained by the fact that the energy consumed is very low.

**Table no. 1 Structure of energy consumption and production per hectare, farm economic size I**

| Culture     | KWh/ha                  |                          |                  |                      |                        |                       |                        |                        |                       |                    |                |                          |
|-------------|-------------------------|--------------------------|------------------|----------------------|------------------------|-----------------------|------------------------|------------------------|-----------------------|--------------------|----------------|--------------------------|
|             | Total energy production | Human energy consumption | Fuel consumption | Direct energy active | Fertilizer consumption | Pesticide consumption | Consumer with the seed | Indirect energy active | Consumption materials | Consumer equipment | Passive energy | Total energy consumption |
| Grey        | 10.562                  | 2                        | 822              | 823                  | 3.809                  | 175                   | 1.115                  | 5.099                  | 16                    | 55                 | 71             | 5.994                    |
| Corn        | 17.455                  | 9                        | 806              | 815                  | 2.966                  | 635                   | 114                    | 3.715                  | -                     | 34                 | 34             | 4.563                    |
| Sunflower   | 13.606                  | 5                        | 854              | 859                  | 2.965                  | 161                   | 21                     | 3.147                  | -                     | 55                 | 55             | 4.061                    |
| Beans       | 11.175                  | 3                        | 1.129            | 1.132                | 1.367                  | 529                   | 514                    | 2.409                  | 16                    | 103                | 119            | 3.660                    |
| Wine grapes | 7.200                   | 96                       | 1,352            | 1.448                | 8.427                  | 745                   | 84                     | 9.255                  | 454                   | 126                | 580            | 11.283                   |
| Total       | 59.998                  | 115                      | 4.963            | 5.077                | 19.534                 | 2.245                 | 1.848                  | 23.625                 | 486                   | 373                | 859            | 29.561                   |

Source: own calculation

**Table No. 2 Structure of the consumption and production of energy in total holding**

| Culture     | Nr. Ha | KWh                     |                      |                        |                |                          |
|-------------|--------|-------------------------|----------------------|------------------------|----------------|--------------------------|
|             |        | Total energy production | Direct energy active | Indirect energy active | Passive energy | Total energy consumption |
| Grey        | 2.8    | 29.573                  | 2.306                | 14.276                 | 200            | 16.782                   |
| Corn        | 1.8    | 31.418                  | 1.466                | 6.686                  | 61             | 8.214                    |
| Sunflower   | 1.6    | 21.769                  | 1.374                | 5.036                  | 87             | 6.497                    |
| Beans       | 1.5    | 16.762                  | 1.698                | 3.614                  | 179            | 5.490                    |
| Wine grapes | 0.1    | 720                     | 145                  | 926                    | 58             | 1.128                    |
| Total       | 8      | 100.243                 | 6.989                | 30.538                 | 586            | 38.112                   |

Source: own calculation

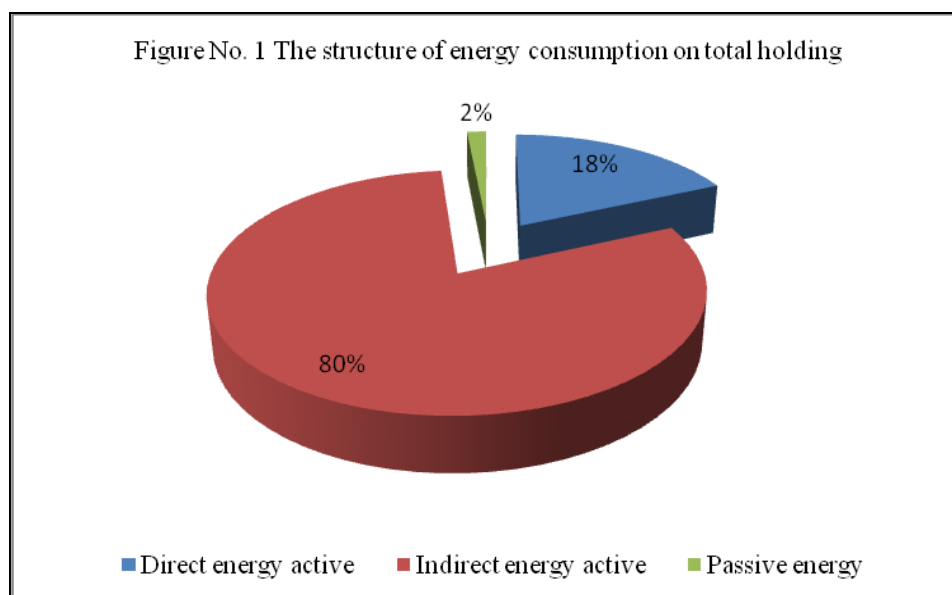
<sup>1</sup> Energy and agriculture, Ion Teșu, Vasile Baghinschi, Ed. Ceres, 1984

**Table No. 3 The main energy indicators on their economic dimension**

KWh

| Indicator                       | Symbol | Value   |
|---------------------------------|--------|---------|
| energy production / farm        | PE     | 100.243 |
| Total energy consumption / farm | Cte    | 38.111  |
| Energy balance                  | BE     | 62.132  |
| Energy efficiency               | RE     | 2,63    |

Source: own calculation



## CONCLUSIONS

Analysis of a single culture and single technological variants provides sufficient information about the main aspects: energy production, energy consumption, energy efficiency and balance.

When analyzing the consumption of energy in different cultures within the exploitation seen in some cultures as direct energy consumption are the same, regardless of the production. This category includes works of fertilization, soil preparation and planting. Irrigation does not appear, and the harvesting of the main and secondary product consumption are proportional to the volume of production.

To activate the energy consumptions are hung with proportional dosing quantity of fertilizers and pesticides and herbicides are used, but the same seed for conventional. In terms of passive energy consumption are the same at fertilization, soil preparation and planting are proportional with the number of treatments at maintenance works and volume of works from the collection.

Structure of its energy consumption reveals that, in order to reduce their it is necessary to pay attention not only to rationalize fuel consumption, but also for use with maximum effect of fertilizers and herbicides, and in particular through the preparation of appropriate pesticides, soil, plant prior to the election, fighting diseases, integrated pest and weeds, in order to minimize the use of chemicals to maintain crops.

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# THE SAFETY OF FISHERY PRODUCTS

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TUREK RAHOVEANU ADRIAN<sup>3</sup>

## Abstract

*The paper follows two main objectives: to understand consumers' perception and image of fishery products and to identify communication levers in order to improve the perceived image of fishery products. Orientations in terms of communication are product-focused and aim at enhancing the reputation of products, consequently with impact on product consumption. The present research is focused on the fishery products, regardless of their presentation – fresh, frozen or processed. This paper conducted a questionnaire survey of Romanian consumers' perception toward fishery products. The empirical study with brands indicated that consumers are different awareness to domestic and foreign safety fish products. National fishery products got more attention from the consumers. Foreign fishery products had higher perceptive price, but Romanian fishery products acquired higher safety perceptive value, and got a better rank in the preference list and in the purchase intention of the consumers.*

**Keywords:** *fishery products perception, perceptive price, image of fish products*

## INTRODUCTION

The safety and quality of fishery products has been of particular concern in recent years. Fish food quality has always been very hard to quantify. The two main parts of overall quality are safety and freshness. A food is considered unsafe when a person eats a product and has an unpleasant physical side effect. A safe food should cause no unwanted physical side effects. Freshness is an individual opinion; it is how the consumer feels about the product based upon their senses. While there are basic sensory guidelines to follow when choosing fishery products, it usually comes down to how the consumer feels about the product's general appearance and/or odor. Consumers normally examine color, flavor, odor and texture when evaluating fishery products (Brockman, 2006). This research will help fishery providers ensure their product will be both safe and fresh for the consumer.

The quality of fishery products has always been hard to define, and is typically based on the general perception of the consumer evaluating the product.

Expiration dates serve as a guide, but the sensory appeal of a fishery product is generally the deciding factor as to whether a product is deemed acceptable or not by the end consumer.

The fishery products represent a kind of important producer goods as it plays a significant part in agricultural production market. With the development of aquaculture, there are rapidly growing demands for fishery products from consumer, so fishery products farms will face increasing fierce competition in the market [1]. In the modern market economy, consumers are the main body of fishery products market, their attitude, perception and preference toward a brand will largely influence the sales volume of this kind of products, and even the survival and development of the fishery farm.

This paper purpose is to investigate and analyze consumers' fishery products awareness, purchasing behavior, based on an empirical survey.

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## MATERIAL AND METHODS

### Conceptual framework

The market share of any product is highly determined by the purchasing behavior of the consumers. Following study is conducted by the researcher to find out the behavior of the consumers, to analyze the preference of consumers, consumer awareness. Descriptive research design was adopted and the data is collected through primary and secondary sources. The method adopted for conducting survey is questionnaire; Simple random sampling technique was adopted for selecting the consumers.

Perception is a mental process, whereby an individual selects data or information from the environment, organizes it and then draws significance or meaning from it.

Product class knowledge is a measure of consumers perceptions of how much they know about a specific class of products.

Attitudes cannot be seen; they can only be inferred from the manner in which an individual behaves. Nevertheless it is crucial that attitudes are measured. This is because an individual with a positive attitude towards a product/service offering is more likely to make a purchase. Attitudes can be measured by observation, qualitative studies and quantitative techniques (or rating scales).

**Observation:** As has been mentioned above, attitudes can be inferred from the manner in which an individual behaves. By making observations of behavior, a marketer can infer a consumer's attitudes. For example, if a person patronizes Colgate toothpaste and buys it, it can be inferred that he likes that brand.

Observation as a process of measuring attitudes, has both pros and cons. Advantages are that on the basis of past experiences, market researchers can make quick inferences. Disadvantages are that the process is expensive in terms of time and money; further findings may not always be reliable and valid. Thus, the method is used to complement other tools and techniques in research, and is generally not used as the sole method of research.

**Qualitative studies:** Attitudes can also be measured through qualitative tools and techniques that help identify consumer opinions and beliefs as well as their feelings, by getting them involved in open discussions. Such techniques could take the forms of focus groups, depth interviews, and psychological tests.

**Quantitative techniques, Rating scales or Attitude scales:** Commonly used methods for measuring attitudes is via attitude scales. Consumer survey questionnaires based on rating scales are used to measure attitudes quantitatively. The most commonly used attitude scale is the Likert scale, which measures consumer reactions on a five point or on a seven point scale based on degrees of agreement and disagreement, or liking and disliking. Another scale that is commonly used is the one that uses a bipolar scale comprising opposite adjectives at each extreme; this is known as a Semantic differential scale. While collecting responses may be time consuming, rating scales provide a means for quantitative analysis, and thereby lead to reliable and valid findings. However, care should be taken to choose a sample representative of the sample.

### Questionnaire

Research methodology is the process of solving the problem systematically by research. The objective of the study is to solve the problem by using available data. Descriptive research can be either quantitative or qualitative. It can involve collections of quantitative information that can be tabulated along a continuum in numerical form, such as scores on a test or the number of times a person chooses to use a-certain feature of a multimedia program, or it can describe categories of information such as gender or patterns of interaction when using technology in a group situation. Descriptive research involves gathering data that describe events and then organizes, tabulates, depicts, and describes the data collection. It often uses visual aids such as graphs and charts to aid the reader in understanding the data distribution. Because the human mind cannot extract the full import of a large mass of raw data, descriptive statistics are very important in reducing the data to manageable form. When in-depth, narrative descriptions of small numbers of cases are involved, the

research uses description as a tool to organize data into patterns that emerge during analysis. Those patterns aid the mind in comprehending a qualitative study and its implications.

Sample is the fraction of the population; sampling is a technique or a method of selection of samples. The researcher in carrying out this research adopted the most appropriate sampling technique for research that is the simple random technique.

Simple random sampling method, it is assumed that each and every unit in the population has equal chance of occurrence or equal probability of occurrence. In other words the sampling units are selected randomly. An unbiased random selection of individuals is important so that in the long run, the sample represents the population. However, this does not guarantee that a particular sample is a perfect representation of the population. Simple random sampling merely allows one to draw externally valid conclusions about the entire population based on the sample. Conceptually, simple random sampling is the simplest of the probability sampling techniques. It requires a complete sampling frame, which may not be available or feasible to construct for large populations. Even if a complete frame is available, more efficient approaches may be possible if other useful information is available about the units in the population. The researchers have taken 200 samples randomly from the total population. Primary sources of data collected through questionnaire, magazines, journals and website are referred as a secondary source.

Personal interview is the method of contact used with the respondents. Personal interviewing method is used because sample size is relatively small and interviewer can ask more questions. For collecting primary data, method used is questionnaire. It is the most popular method used when the population and sample size are large. A questionnaire includes a number of questions, printed in proper sequence, for presenting to respondents for their answers. Each question is contributing to research objectives. Questionnaire was designed with most of closed ended questions and only few open ended question. It was designed to cater to all areas and aspects of the study.

The data has been collected with the help of questionnaire. And it has been analyzed and interpreted with the help of tables along with relevant descriptions. Appropriate treatment has been done to the raw data and logical conclusions are drawn based on the findings.

A questionnaire about fishery products consumers' perception was designed based on conceptual framework. The questionnaire have following sections:

- consumer demographic (gender, age, education level, labour number and annual income of household);
- farmers' purchase behaviour of fishery ecological products (purchase experience, money source, information source);
- fishery products perception (familiarity, perceptive price, value).

### **Survey**

The questionnaire survey was conducted with consumers from Braila, Galati, Tulcea, Constanta, Vrancea and Buzau, all being counties of South East Romania's development region, were chosen as the respondents. 200 questionnaires were distributed in above 6 counties and returned 134. After eliminating the validity of the returned questionnaire, 26 questionnaires that incomplete and with logical mistakes were deleted, 106 valid questionnaires were obtained; the effective response rate was 53%. From 106 respondents 82 expressed the intention to buy fish products.

### **Statistical methods**

All the data obtained from the responses at the questionnaires were transformed into statistics variables and then processed. Descriptive Statistics method was mainly adopted to calculate the mean with standard deviation of each variable, and to examine the different levels of consumers' awareness.

The index values of product familiarity were the ratio between each product's familiarity value and the average value. The same calculation method was adopted in perceptive price and perceptive value.

## RESULTS AND DISCUSSION

### Consumer characters

The questionnaire survey gained a total of 106 valid samples and 82 with intention to buy fish products. Table 1 shows the demographic characters of respondents.

**Table 1 Demographic description of fishery products consumers**

| Demographic variables     | Categories      | Subjects no. | Percent % |
|---------------------------|-----------------|--------------|-----------|
| Gender                    | Male            | 31           | 37.80     |
|                           | Female          | 51           | 62.20     |
| Age                       | 18-30           | 24           | 29.27     |
|                           | 31-40           | 29           | 35.37     |
|                           | 41-50           | 19           | 23.17     |
|                           | 51-60           | 6            | 7.32      |
|                           | Above           | 4            | 4.88      |
| Educational level         | <primary school | 1            | 1.22      |
|                           | primary school  | 5            | 6.10      |
|                           | junior school   | 18           | 21.95     |
|                           | senior school   | 20           | 24.39     |
|                           | ≥college        | 38           | 46.34     |
| Labor number of household | <3              | 41           | 50.00     |
|                           | 3               | 19           | 23.17     |
|                           | 4               | 21           | 24.39     |
|                           | 5               | 2            | 2.44      |
|                           | >5              | 0            | 0.00      |

Samples are mostly female (62.20%). They are more inclined to interest in fishery products. Women show a higher sensitivity in health and a greater propensity than men to follow the recommendations for nutrition. This does however not always reflected by a high consumption of fish higher in women than in men in Western Europe.

Age is often presented as an important determinant of demand for food in general and more specifically the consumption of fish. However, the demographic determinants such as age will also be correlated with other determinants such as interest and knowledge of nutrition topics (including aspects so beneficial to health) or health status of person. The interest in issues related to health and nutrition, for example increases with age. The most common age group was 31-40; educational level college (46.34%). Less than 3 persons had accounts for 50% in the labour number of household.

The education level is correlated positively to the image of fish as food easy to prepare. The higher the education level increases, the consumer sees the fish as a food easy to prepare.

Place of residence (and more specifically its coastal or continental character) is an important factor in explaining the consumption of different seafood and is linked to historical and current availability of fresh fish.

### Purchase behavior

Consumer behavior is stated as the behavior that consumer display in searching for, purchasing, using, evaluating, and disposing of products, services and ideas that they expect will satisfy their needs. The study of consumer behavior is concerned not only with what consumers buy, but also with why they buy it, when and how they buy it, and how often they buy it. It is concerned with learning the specific meanings that products hold for consumers. Consumer research takes places at every phase of consumption process, before the purchase, during the purchase and after the purchase. According to Philip Kotler defined consumer behavior as “all

psychological, social and physical behavior of potential customers as they become aware of evaluate, purchase, consume and tell other about products and services". The scope of consumer behavior includes not only the actual buyer and his act of buying but also various roles played by different individuals and the influence they exert on the final purchase decision. Individual consumer behavior is influenced by economic, social, cultural, psychological, and personal factors. A decision is the selection of an action from two or more alternative choices. Consumer decision to purchase the goods from the available alternative choice is known as "consumer purchase decision". The various options of the consumer may be classified into five main types of decisions. They are what to buy, how much to buy, where to buy, when to buy, how to buy. The participants in the buying decisions may be classified as the initiator, influencer, decider, buyer and users. The marketing people should initiate the participants in the purchase decision to make the purchases of the product at different marketing strategies. There are number of reasons why the study of consumer behavior developed as separate discipline. Marketers had long noted that consumer did not always act or react, as marketing theory would suggest.

Consumer behavior has been always of great interest to marketers. The knowledge of consumer behavior helps the marketer to understand how consumers think, feel and select from alternatives like products, brands and the like and how the consumers are influenced by their environment, the reference groups, family, and salespersons and so on. A consumer's buying behavior is influenced by cultural, social, personal and psychological factors. Most of these factors are uncontrollable and beyond the hands of marketers but they have to be considered while trying to understand the complex behavior of the consumers. In this study, the researcher emphasizes the importance of lifestyle and its impact on the buyer behavior.

There are two factors mainly influencing the consumers for decision making: Risk aversion and innovativeness. Risk aversion is a measure of how much consumers need to be certain and sure of what they are purchasing. Highly risk adverse consumers need to be very certain about what they are buying. Whereas less risk adverse consumers can tolerate some risk and uncertainty in their purchases. The second variable, innovativeness, is a global measure which captures the degree to which consumers are willing to take chances and experiment with new ways of doing things. The shopping motivation literature is abound with various measures of individual characteristics (e.g., innovative, venturesome, cosmopolitan, variety seeking), therefore, innovativeness and risk aversion were included in this study to capture several of these traits [7].

Purchase intention is widely believed that directly interrelated with purchase behavior, it is the main index to forecast whether consumer will purchase [9], so the organic fish products intention could imply the familiarity of whether consumer will choose a fish product in the future. Among the respondents, 82 described that they considering purchase a fish.

Price, risks of contamination (microbiological and chemical), sustainability aspects such as environmental risks (damage of the ecosystem, animal cruelty, etc.) and risks of depleting fish stocks are the main barriers to eating fish in general for the consumers.

Barriers vary a lot depending on the levels of processing (for example, price is no longer the main barrier for eating frozen fish products).

In general, consumers would eat more fishery and aquaculture products if: there was a quality label, prices were more affordable and they had a better knowledge of the quality of these products.

Guarantee of the European origin of fish encourages consumers to eat fish in general, all the more so in Southern European countries. Consumers have a positive overall image of fishery and aquaculture products. In general, they think they are good for health, and that they are fresh products.

With Hazard Analysis and Critical Control Point (HACCP) based regulations that require companies to monitor their processing operations (both in the US and the EU), the likelihood of consumers purchasing seafood of questionable quality should, in theory, decrease. But with imports increasing, economically viable methods for rapidly determining safety and quality need to be developed to protect consumers and providers, and ensure that proper processing standards are

followed. For most fishery products, critical control points are hard to define and monitor. The different quality measurements are usually defined by examining microbial count, sensory panel scores, and chemical indicators. Although these methods all show some overlap, there are differences between the quality levels that each one indicates.

Fresh fish received the most positive overall image score and the most positive image with regard to health (Table 2).

**Table 2. Image scores for fish production method in South East**

|               | Health | Quality/Price | Fresh | Environment |
|---------------|--------|---------------|-------|-------------|
| <b>Wild</b>   | 1,26   | 2,51          | 1,68  | 1,86        |
| <b>Farmed</b> | 1,63   | 2,34          | 1,59  | 1,85        |

Thus, the image of fresh fish is very similar to the image of fish in general. However, this kind of product obtains a poorer image in terms of quality/price ratio (mostly due to its price, since its quality is considered as good). With regard to health benefits, frozen fish has a less positive image than fresh fish, but its quality/price ratio is considered to be good and its availability to be higher. Preserved fish has a poorer image in terms of quality, but its quality/price ratio is more positive. This product is also considered by all respondents to be the most available.

When buying fish, a quality and/or food safety label is the most important expectation of consumers in terms of information on fishery and aquaculture products. Nutritional information as well as information on the geographic origin of production is among the most important pieces of information consumers are looking for. However, fishing zones as defined by FAO is ranked last by consumers [3]. Consumers are also interested in information relating to the production method and its environmental characteristics.

Most safety concerns in food products are from microbial and chemical contamination. Both of these hazards have to be measured and controlled in order to increase the safety of the food supply. Hazard Analysis and Critical Control Point (HACCP) processing limits these concerns. Processors using HACCP must identify possible hazards and make detailed plans on how to detect and deal with these hazards. A primary goal of HACCP involves keeping a record of control points and making sure that these points are kept within the desired range.

Since 1995, the EU had implemented the HACCP principles by stating that a hazard analysis must be performed, but there were no laws regarding writing down the steps used in each hazard analysis. The US, which had used HACCP-based guidelines since the 1970s to regulate canned foods, followed suit in 1995 by also establishing HACCP guidelines regarding the processing of fishery products. To continue doing business after December 1997, U.S. seafood processors and importers had to have a written HACCP plan on file and an employee certified through FDA approved HACCP training [4]. As of January 2006, the EU issued a new directive stating that "Food safety is a result of several factors: legislation should lay down minimum hygiene requirements; official controls should be in place to check food business operators' compliance and food business operators should establish and operate food safety procedures based on the HACCP principles" ((EC) No 852/2004). In addition, the new EU guidelines emphasize that it is the "primary responsibility of food business operators to produce food safely" [5]. From 1988 to the present day, HACCP principles have been promoted and incorporated into food safety legislation in many countries around the world. The purpose of these regulations is to ensure safe processing and importing of food products, including fish and fishery products. This program arose because of growing public concern about seafood-borne illnesses and seafood safety as well as from industry requests for a practical, cost-effective solution. Microbial contamination is of major concern in almost all food products but is especially important in low shelf-life foods such as meat.

The most popular sources of information used by Europeans are labels and sellers in retail and in supermarkets. These two types of information it was directly gathered by consumers at the time of purchase. The media (Internet, television, advertising followed by written media) also plays an important role in the information of consumers [10]. Non commercial sources of information like

scientific reports, consumer associations, institutional campaigns and information are less popular. However, this remark should be qualified by the fact that the question asked within the survey implied an active investigation by consumers.

For the retail sector, farmed fish offers major advantages. On a general level, retailers perceive farmed fish as a product much easier to market than wild fish. Regularity in terms of supply, taste, quality and freshness are the main arguments put forward. One disadvantage of farmed fish for the retailers has to do with the somewhat negative image that can be associated with the aquaculture sector. Still, in most cases, the aquaculture product does not possess any specific image in the mind of the consumer. There is henceforth no distinct link in the mind of the consumer between the aquaculture sector and its image on the one hand and the aquaculture product on the other hand. This is reflected in the behavior of the consumer, who does not differentiate between farmed and wild products when purchasing fish.

Freshness is more of a nebulous concept. Ultimately the quality of a product is going to be determined by the consumer buying it. Therefore any quality measurement should correlate to sensory changes in the product. Two of the main senses that customers use are sight and smell. Most quality measurements performed in industry use trained personnel to get a sensory score for a product. These personnel are trained as to what to look for and smell for as product quality deteriorates.

The absence of image of the aquaculture sector is still seen as a risk by some managers of the retail sector. Indeed, the image can then still be developed and hence be hijacked. To fill this gap in terms of image should therefore be considered as a strategic priority for the aquaculture sector. The consumer places a high level of trust in the retailer. He/she has the tendency to transfer the responsibility of some of his/her consumption decisions to the retailers, what leaves these later as unmistakable partners in any communication action.

Fish is generally considered as a healthy product by consumers. Any type of communication on fishery and aquaculture products should capitalize on this image of “healthy” product, and put “health” at the centre of the message conveyed. Communication on fishery and aquaculture products should mention the efforts made to guarantee their healthiness to the consumers (quality and food safety labels, standards of production used). The other side of the coin is that fish products in general are considered to be expensive. Proposing special offers may thus be a relevant manner to appeal to new consumers.

Consumers have a confused and slightly negative image of the aquaculture sector. The image of aquaculture products derives from the image of the sector, although consumers generally do not distinguish wild fish products from farmed fish products. They generally consider that the products they buy are wild fish products. Thus, the issue at stake is to understand whether to promote farmed products as such or to promote them as “fish products” [8].

If a specific promotion of farmed products were to be preferred, it should base itself on the positive but often unknown attributes of these types of products: o an affordable price, freshness and guaranteed nutritional characteristics, optimum traceability along the production process. Beyond the product in itself, filling in this information gap will benefit the image of the sector as a whole. Indeed, improving the image of aquaculture products should be a priority of the aquaculture sector, as it will contribute to improving market acceptance of this type of product, on the long term.

Consumers place environment amongst their first preoccupations and declare to be ready to pay the price requested for a guarantee of quality.

## CONCLUSION

The research results show fish consumers have different perception of fishery products. The information channels of brand are mainly from friends, relatives and neighbors, so word of mouth spreading is very important for a brand. The higher perceptive price of foreign fishery brands may reduce consumers’ perceptive value and purchase intention to them.

The research results show safety of fish products has different perception in case of organic fishery products. The information channels of brand are mainly from friends, relatives and neighbors, so word of mouth spreading is very important for a brand.

A problem very "acute" refers to the transportation of fish catches in the inland market is not local. Recommend, in this respect, improved conservation of fish products on board. The quality of their products before selling, improving distribution channels and promotion of products from inland fishing are goals to be achieved for a local fish market development and reducing imports of similar products.

Regarding Aquaculture fish production, it is real potential for benefiting the Romanian consumer survey conducted in humanitarian resulting in increased domestic demand for these products. Aquaculture allows local growth, high value species (sturgeon, turbot) and is a real potential for rural tourism and ecotourism. Also, water quality, available in mountainous areas, infrastructure and trained personnel can ensure long-term, high demand satisfaction and business development to lead to Romanian producers.

In conclusion, although this paper is an empirical study based on 106 valid samples, it provides a chance to understand consumers' awareness to different fishery products brands in Romania. A further quantitative research with wider samples will be necessary in the future.

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