"Agricultural Economics and Rural Development - realities and perspectives for Romania"

Ana Ursu

The Research Institute for Agriculture Economy and Rural Development, Bucharest

24 November 2016

Agrarian Economy and Rural Development Realities and Perspectives for Romania

International Symposium

The 7 th Edition

November 2016

7th Edition of the International Symposium

AGRARIAN ECONOMY AND RURAL DEVELOPMENT
REALITIES AND PERSPECTIVES FOR ROMANIA

Organizer:

**Research Institute for Agricultural Economy
and Rural Development**

November 2016
Bucharest

THE RESEARCH INSTITUTE FOR AGRICULTURE ECONOMY AND RURAL DEVELOPMENT
Bucharest, Romania

7th Edition of the International Symposium

AGRARIAN ECONOMY AND RURAL DEVELOPMENT REALITIES AND PERSPECTIVES FOR ROMANIA

in collaboration with

INSTITUTE OF AGRICULTURAL ECONOMICS
Romanian Academy, Bucharest, Romania

UNIVERSITY OF AGRONOMIC SCIENCES AND VETERINARY MEDICINE
Faculty of Management, Economic Engineering in Agriculture and Rural Development, Bucharest, Romania

INSTITUTE FOR ECONOMIC RESEARCH, FINANCE AND STATISTICS
Chişinău, Republica Moldova

BUCHAREST UNIVERSITY OF ECONOMIC STUDIES
Agrifood and Environmental Economics, Bucharest, Romania

INSTITUTE OF AGRICULTURAL ECONOMICS
Belgrade, Serbia

under the patronage of

ACADEMY OF AGRICULTURAL AND FORESTRY SCIENCES
"Gheorghe Ionescu Şişeşti"

SCIENTIFIC COMMITTEE

President:

ALECU IOAN NICOLAE, *Prof., PhD., President of Section "Agrarian Economy and Rural Development", ASAS, Bucharest*

POPESCU AGATHA, *Prof., PhD., Faculty of Management, Economic Engineering in Agriculture and Rural Development, Scientific Secretary of the Research Institute for Agriculture Economy and Rural Development, Bucharest, Romania*

HERA CRISTIAN, *Academician, Vice President of Romanian Academy - Bucharest, Romania*

SIN GHEORGHE, *Prof., PhD., President of Academy of Agricultural and Forestry Sciences "Gheorghe Ionescu Şişeşti" – Bucharest, Romania*

GAINĂ BORIS, *Academician of the Academy of Sciences, Technical University of Moldova*

TABARĂ VALERIU, *Prof., PhD., Vice President of Academy of Agricultural and Forestry Sciences "Gheorghe Ionescu Şişeşti" – Bucharest, Romania*

NICOLESCU MIHAI, *Prof., PhD., Vice President of Academy of Agricultural and Forestry Sciences "Gheorghe Ionescu Şişeşti" – Bucharest, Romania*

ALEXANDRI CECILIA, *PhD., Director of The Institute for Agrarian Economy, Romanian Academy - Bucharest*

ISTUDOR NICOLAE, *Prof., PhD., Rector of the Bucharest Academy of Economic Studie, Bucharest, Romania*

FÎNTÎNERU GINA, *Prof., PhD., Pro-rector of University Of Agrarian Sciences and Veterinary Medicine , Bucureşti, Romania*

TAKÁCS ISTVAN, *Department Director of Faculty of Economy and Social Sciences, College Karoly Robert, Gydngyds, Hungary*

BEGALLI DIEGO, *Prof., PhD., Faculty of Economy University from Verona*

DINU TOMA ADRIAN, *Prof., PhD., Dean of Faculty of Management, Economic Engineering in Agriculture and Rural Development - The University Of Agrarian Sciences and Veterinary Medicine, Bucharest, Romania*

STRATAN ALEXANDRU, *PhD., Director of The Institute for Economy, Finance and Statistics, Chisinau, Republic of Moldova*

SUBIC JONEL, *PhD., Director of Institute of Agrarian Economy, Belgrade, Serbia*

BOBOC DAN, *Prof., PhD., Dean of the Faculty of Agroo-food and Environmental Economics, The Bucharest Academy of Economic Studies, Bucharest, Romania*

POPESCU GABRIEL, *Prof., PhD., Director of Department of Agroo-food and Environmental Economics, the Bucharest Academy of Economic Studies, Bucharest, Romania*

DRAGHICI MANEA, *Prof., PhD., Faculty of Management, Economic Engineering in Agriculture and Rural Development - The University Of Agrarian Sciences and Veterinary Medicine, Bucharest*

GAVRILESCU CAMELIA, *PhD., Associate Member – Academy of Agricultural and Forestry Sciences*

BOHATERET MIHAI – VALENTIN, *PhD., Associate Member – Academy of Agricultural and Forestry Sciences, Bucharest*

ANDREI JEAN, *Prof., PhD., Faculty of Economic Sciences, University "Petrol-Gaze" – Ploiesti, Romania*

TUDOR VALENTINA, *Prof., PhD., Faculty of Management, Economic Engineering in Agriculture and Rural Development - The University Of Agrarian Sciences and Veterinary Medicine, Bucharest, Romania*

ION RALUCA ANDREEA, *Assoc. Prof. the Faculty of Agro-food and Environmental Economics, The Bucharest Academy of Economic Studies, Bucharest, Romania*

STOIAN ELENA, *Prof., PhD., Faculty of Management, Economic Engineering in Agriculture and Rural Development - The University of Agrarian Sciences and Veterinary Medicine, Bucharest*

TEMOCICO GEORGETA, *Prof., PhD., Faculty of Management, Economic Engineering in Agriculture and Rural Development - The University of Agrarian Sciences and Veterinary Medicine, Bucharest*

IGNAT ANATOLIE, *PhD., Head of Department of Economics Agroo-food and Rural Development, The Institute for Economy, Finance and Statistics, Chisinau, Republic of Moldova*

ANA URSU, *PhD., Director of The Research Institute for Agriculture Economy and Rural Development, Bucharest*

CONTENTS

SECTION 3 "RURAL DEVELOPMENT AND AGRICULTURAL POLICIES"

SECTION 4 „MODELS OF DEVELOPMENT OF THE SHORT CHAINS FOR CAPITALIZING ALONG THE PATHWAY SERVICE – PRIMARY PRODUCTION – STORAGE – PROCESSING – SALES MARKET"

SECTION 1

"THE CONCEPTS, EVALUATIONS AND STRATEGIC DIRECTION IN RURAL AND AGRI-FOOD ECONOMY"

EVALUATION OF RURAL COMPETITIVENESS
- CASE STUDY ROMANIA -

MONICA MIHAELA TUDOR[1]

Abstract: *Regional competitiveness, understood as the ability of regions to promote, attract and sustain the economic activity, so that their population can reach and maintain a high living standard, is the object of the present analytical approach. The results of the study reveled that the economy of the predominantly rural regions is less competitive than the economy of the intermediate regions. The factors that mainly contribute to widening the territorial disparities in rural competitiveness are the following: i) size of RDI staff that provides the comparative advantage of the access to innovation and ii) value of exports, both in the non-agricultural and in the agri-food economy, certifying the competitive advantage of regional economies on the international markets.*

INTRODUCTION

For the purpose of the present analytical approach, *regional competitiveness* is understood as the *ability of regions to promote, attract and sustain the economic activity so that their population can reach and maintain a high living standard*. According to this definition, a region is competitive when it has a highly accessible business environment, which produces and/or is attractive for the mobile production factors (highly qualified labour, innovative entrepreneurship, etc.), thus generating economic growth. The success in attracting these factors creates positive externalities, such as the benefits generated by concentration and localization, resulting in the increase of the economic welfare of a region.

The ***objective*** *of the present study is to evaluate regional rural competitiveness, more exactly a comparative analysis between the competitiveness of the predominantly rural NUTS III regions (counties), on one hand, and the intermediate regions, on the other hand, in order to identify the parameters that facilitate / constrain competitiveness growth at the level of each of these categories of regions in Romania.*

Using a model that measures regional competitiveness developed in Croatia in the year 2012, the present study attempts to determine the rural competitiveness level in the development region South-East and by its component counties. The selection of this development region for the analysis of regional competitiveness is motivated by its balanced structure from the point of view of the types of NUTS III regions (counties) defined by their rurality level. Thus, this region consists of six counties, out of which three counties are included in the category of "predominantly rural" regions according to the OECD methodology (counties: Buzău, Tulcea şi Vrancea), the other three counties being considered "intermediate" regions (counties: Brăila, Constanța, Galați).

Two ***working hypotheses*** were formulated and tested throughout the analysis, namely:
1. the predominantly rural regions are less competitive than the South-East region average;
2. the weak development of the RDI sectors at regional level significantly impacts competitiveness.

MATERIAL AND METHOD

There is a relatively rich literature referring to the economic competitiveness of the sectors of Romanian national economy as a whole or across the development regions. In Romania, the

---

[1] PhD, scientitific researcher II – Institute of Agricultural Economics, Romanian Academy, Bucharest, e-mail: monik_sena@yahoo.com

predominantly rural (PR) regions and the intermediate (INT) regions have a significant socio-economic importance compared to the other European Union (EU) member states. Thus, the rural regions in Romania, accounting for 60% of the country's territory where 45.6% of the country's population is living, contribute by 32.7% to the gross value added (GVA) and by 14.8% to labour employment; these add to the intermediate regions, which in their turn have significant contributions to the descriptive parameters of our country, making Romania be the most rural EU member state. However, the research on the rural competitiveness evaluation in Romania and on the factors determining is relatively modest, mainly referring to the competitiveness of the main sector of rural economy, i.e. agriculture (Sarris et al, 1999; Bojnec & Fertő, 1999; Fogarasi, 2008).

The present research attempts to bring a methodological and applicative contribution to the study of rural competitiveness at county level. It focuses on the development of an evaluation methodology of the ***rural competitiveness index*** on the basis of available statistical information and on testing the functionality of this analytical model in a case study, at the level of one development region, i.e. the South-East Region and by its component counties.

In order to evaluate the *rural competitiveness index* at the level of South-East development region and by its component counties, a statistical model developed by O. Mikuš, R. Franić and I. Grgić (2012), in order to measure the territorial disparities in regional competitiveness in Croatia, was adapted for the purpose of our present research. The Croatian model was adapted to the statistical data available in Romania.

For the model adapted to the county level in Romania, the data were extracted from statistical sources of secondary data at the level of the year 2012, having in view the concrete limitations imposed by certain indicators for which the latest available year was 2012. The only indicators for which the data were extracted at the level of previous years are *population with higher education* (source: Census of Population and Dwellings, 2011) and *average size of agricultural holding (farm)* (source: General Agricultural Census 2010).

Table 1. Adapted competitiveness evaluation model at county level

Group / Indicators	
Group – Human resources	
Employed population (thou. pers.)	Young population 0-20 years (pers.)
Population with higher education (pers.)	Population density (pers./km^2)
Group – Situation of the non-agricultural sector economy	
Turnover (thousand euro)	Density of active local units (no. of active local units /1000 inhabitants)
Value of exports (thou. euro)	Net average wage (euro)
Group- Situation of primary sector economy	
Average farm size (ha UAA /farm)	Density of active local units (no. of active local units /1000 inhabitants)
Turnover (thousand euro)	Net average wage (euro)
Value of exports (thousand euro)	
Group – Specialization and innovation	
Share of population employed in non-agricultural sectors	Share of crop production value in total agricultural production value
RDI employees in 10000 civilian employees	

The calculation formula for the competitiveness indicators (rural competitiveness index components) was the following:

$$X_i = 100(x_i/X)/(p_i/P)$$

where:
- the small letters are the values at county level/of the NUTS III region category, while the capital letters are the values at regional level;
- x_i represents the variable selected for county / NUTS III region category and X for region;
- p_i represents the population at county level / NUTS III region categories, and P at regional level.

Each indicator was assigned a specific weight equal to that of the other indicators in the group, and for each group an intermediate index value (SI), using the arithmetic mean; the values

that result for each group of indicators (SI) were used to calculate the value of the *rural competitiveness index (RCI) at county level and by NUTS III regions (predominantly rural or intermediate regions,* according to OECD classification*),* resulting from the calculation of the arithmetic mean of the SI values – it was considered that all the components are equally important for expressing competitiveness.

RESULTS AND DISCUSSIONS

The development region South-East was on the penultimate place in the year 2013 among the 266 NUTS II regions of the European Union as regards the Regional Competitiveness Index calculated according to the EUROSTAT methodology, which was the lowest rank that a Romanian region had in this hierarchy (JRC, 2013).

As the specialty literature signals out the existence of significant disparities in the territory as well as the absence of competitiveness homogeneity of the national and/or regional national economic blocks, the present study proposes the analysis of the competitiveness level of the administrative-territorial subdivisions of the development regions, i.e. the counties. As none of the six counties of the investigated development region is included, according to the OECD typology, in the category of the predominantly urban NUTS III regions, we consider it opportune to determine the rural competitiveness level in order to measure the capacity of the county economies to be competitive. Considering the fact that the six counties of the South-East region are equally classified in the categories: i) predominantly rural regions (counties Buzău, Tulcea and Vrancea) and ii) intermediate regions (counties Brăila, Constanța and Galați), the analysis of the rural competitiveness level will try to highlight the differences between these two categories of regions in order to determine whether the rurality level is associated with a lower competitiveness level.

1.1. General characteristics of the South-East region

In the preamble to the regional competitiveness analysis in the area selected for the case study, we consider it useful to present a brief review of the main parameters that describe this development region from the perspective of parameters included in the competitiveness index determination model.

Human resources

The population of the development region South-East accounts for 12.6% of Romania's total population, 12.7% of the young population (age group 0-20 years) and 10.4% of the population with higher education nationwide. The economy of the investigated development region provides jobs to 11.8% of total employed population nationwide. The analysis of the human resource distribution in the SE region reveals that the majority (about 60%) of total population, of the young population and of the employed population of the region are living or working in the three counties classified in the category "Intermediate" regions from the rurality

Figure 1. Distribution of human resources by rural-urban typology of counties

Source: NIS, tempo on-line, www.insse.ro

perspective. 70% of the inhabitants of the region with higher education are also living in the above-mentioned counties. Hence, it is expected that the performance of the economy of these category of counties is higher due to their higher capacity to attract highly-skilled labour resources.
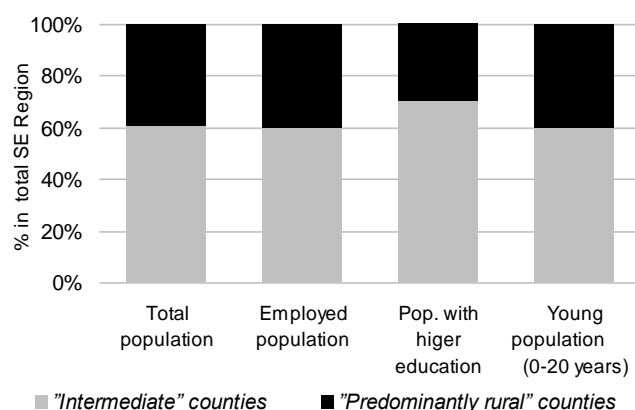
The situation of the non-agricultural sector economy

11.5% of the active local units from the secondary and tertiary sectors of national economy are operating in the development region South-East. The contribution of the economic operators from the SE region to the turnover created nationwide by the enterprises from industry, constructions and services is 8.8%. Similarly, out of total value of exports from the non-agricultural sector at national level, 9.7% is the share of exports by the economy of the SE region. As the contribution to the turnover and value of the non-agricultural sector exports in the SE region is lower than its proportional share in the number of active economic operators at national level, we can remark that the size of non-agricultural enterprises in the investigated region is lower than the national average and their market share is lower than that of their competitors from other development regions.

Figure 2. Distribution of non-agricultural sector parameters by rural-urban typology of counties

Source: NIS, tempo on-line, www.insse.ro

The analysis across counties of the non-agricultural economy parameters in the SE region reveals that 67% of the active local units in industry, construction and services are operating in three counties that are considered "intermediate". The active economic operators in the counties Brăila, Constanța and Galați contribute by 74% to the turnover of regional non-agricultural economy and they export commodities and services whose value amounts to 77% of the total value of non-agricultural exports of the investigated region.

Situation of the primary sector economy

The primary sector of the economy in the SE region is much more developed than the secondary and tertiary sector and its competitiveness, mainly in exports, is relatively high. Thus, 18.1% of the local active units in agriculture, forestry and hunting nationwide are operating in the development region South-East. These economic operators produce 17.5% of the turnover obtained in the primary sector of our country's economy and their exports account for 20.1% of the total value of national agri-food exports. One of the explanations for the comparative advantage of agriculture in the region SE as compared to the national average resides in the higher concentration level in the operation of land resources. Thus, the average farm size in the region SE is 4.94 ha utilized agricultural area (UAA), higher by 40% than the national average, i.e. 3.57 ha, according to the last agricultural census.

The comparative analysis of the primary sector performance between the predominantly rural counties and the intermediate counties in the region SE reveals that the export competitive advantage is held by the active local units in the primary sector from the counties classified in the "intermediate" category, these contributing by 79% to the total value of agri-food exports of the region.

The export availability is higher in the case of active local units in the primary sector of the counties Brăila, Constanța and Galați due to the higher turnover obtained by these economic operators (55% of total turnover of active units in the primary sector of the economy in the SE region), which can be partly explained by the almost double size of the agricultural land area operated by an
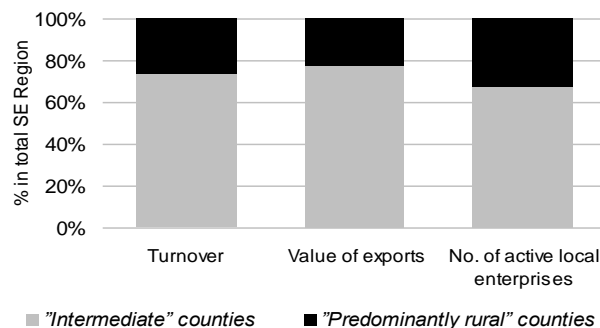
Figure 3. Distribution of primary sector parameters by rural-urban typology of counties
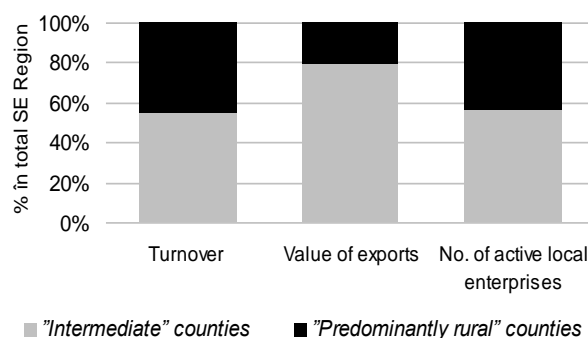
Source: NIS, tempo on-line, www.insse.ro

agricultural unit; 6.72 ha UAA/farm is the farm average size in the three intermediate counties, while in the predominantly rural counties the average farm size is only 3.68 ha UAA.

Specialization and innovation

The complexity of an economy increases with the increase of labour input allocated to the secondary and tertiary sectors. In this context, the SE region economy has a lower complexity level than the national average, as only 66% of the labour force is working in the non-agricultural sectors, compared to 70.7% at national level. As the economic complexity level increases, the vertical and horizontal integration between the economic branches and sub-branches is amplified and diversified, with specialization in production and services emerging into increasingly narrow niches, incorporating increasingly advanced technologies. For setting into motion and development of complex economies, applied research is also needed, besides highly skilled labour, which should identify innovative modalities to increase the economic performance of producers of goods and services; briefly, a research-development-innovation (RDI) sector is needed, extended and integrated in relation to the final users of innovations. With only 16.4 RDI employees / 10000 civilian employees, the SE region is much below the national average, with 49.8 RDI employees / 10000 employees. As a result, the innovative capacity, support to competitiveness growth, is deficient in the case of the region SE.

Figure 4. Distribution of specialization and innovation parameters by rural-urban typology of counties

Source: NIS, tempo on-line, www.insse.ro

The specialization in crop production, as revealed by the share of crop production value in total agricultural production value, is higher in the SE region (65.7%) than the national average of 62.5%. This specialization can create higher export availabilities, yet at the same time it generates low value added in agriculture compared to the livestock raising sector.

The comparison between the specialization and innovation indicators across counties in the region SE reveals that in the "predominantly rural" regions (counties Buzău, Tulcea and Vrancea), the development level of the non-agricultural sectors is much lower than in the case of the "intermediate" NUTS III regions, the share of population employed in the non-agricultural sectors being 57.3% and 72.3% respectively. The innovative potential of the NUTS III predominantly rural regions is also low; with only 6.8 RDI employees in 10000 employees, the capacity to concentrate specialized labour in the research sector is three times lower than in the intermediate regions.

The specialization level in agricultural production is lower in the case of predominantly rural NUTS III regions, which results in lower agri-food export availabilities.

1.2. *Rural competitiveness in the South-East region*

We shall next present the results obtained with regard to rural competitiveness evaluation at the level of county categories (predominantly rural and intermediate counties) in the development region South-East, which were determined by the application of the previously described methodology. We must specify that these calculations are not definitive and they can be prone to changes according to data availability at NUTS III level and the progress of socio-economic research in measuring competitiveness.

A first result of the proposed methodology application for determining the rural competitiveness index reveals that the South-East development region is by 3.63% less competitive

that Romania's average. This first conclusion is meant to validate the functionality of the model proposed in this study for competitiveness analysis, this being convergent with the conclusions of the Eurostat analyses of competitiveness across regions.

Rural competitiveness was determined for the two categories of NUTS III regions of the development region South-East, categories defined according to the rurality level, in order to test the previously formulated hypothesis by which the rurality level influences regional competitiveness. *The rural competitiveness level of the predominantly rural counties (PR) and intermediate counties (INT) was determined in relation to the South-East development region average, using the Rural Competitiveness Index (RCI) developed in the study.* The results of the application of the rural competitiveness index calculation model are presented in the table below, both for the predominantly rural regions (counties Buzău, Tulcea and Vrancea) and for the intermediate regions (Brăila, Constanța, Galați).

Table 2. Rural competitiveness index in the predominantly rural and intermediate regions
in the South-East development region

Group / Indicators	Region South-East (P=2538949)	INT* (p_i=1538117)	PR** (p_i=1000832)	Rural competitiveness indicators (X_i) for:	
				INT*	PR**
Group – Human resources					
Employed population (thou. persons)	1011	604.7	406.3	98.73	101.95
Population with higher education (pers.)	268348	187323	81025	115.23	76.60
Young population 0-20 years (pers.)	540895	323496	217399	98.72	101.96
Population density (pers./km^2)	70.8	94.1	512	132.91	72.32
Average of indicators in Group 1 (SI_1)				*111.40*	*88.21*
Group – Non-agricultural sector economy situation					
Turnover (thousand euro)	21982843	16236579	5746264	121.92	66.31
Value of exports (thousand euro)	4129817	3186764	943053	127.37	57.93
Density of local active units (no. of local active units / 1000 inhabitants)	21.34	23.55	17.95	110.34	84.10
Net average wage (euro)	330	337	301	102.22	91.30
Average of indicators in Group 2 (SI_2)				*115.46*	*74.91*
Group – Primary sector economy situation					
Average farm size (ha UAA /farm)	4.94	6.72	3.68	136.03	74.49
Turnover (thousand euro)	1305893	717871	588022	90.74	114.23
Value of exports (thousand euro)	542293	430585	111708	131.07	52.26
Density of local active units (no. of local active units /1000 inhabitants)	1.17	1.10	1.29	93.82	110.03
Net average wage (euro)	233	236	238	101.21	102.07
Average of indicators in Group 3 (SI_3)				*110.57*	*90.62*
Group – Specialization and innovation					
% employed pop. In non-agricultural sectors	66.28	72.30	57.30	109.08	86.45
No. of RDI employees in 10000 employees	16.40	22.80	6.80	139.02	41.46
% crop production value in total agricultural production value	65.67	67.84	62.90	103.30	95.78
Average of indicators in Group 4 (SI_4)				*117.14*	*74.56*
Rural competitiveness index (RCI)				**113.64**	**82.07**

*INT – NUTS III regions considered "Intermediate" regions according to the rurality level
** PR – NUTS III regions considered "Predominantly rural" according to the rurality level

According to these data, we can draw the conclusion that in the year 2012, the predominantly rural NUTS III regions were by 17.93% less competitive than the overall South-East development region, while the counties considered as intermediate from the rurality level standpoint are by 13.64% more competitive than the regional average. Hence, the first hypothesis advanced in

our study has been confirmed, proving the fact that the *increase of the rurality level of a region has a negative influence upon rural competitiveness.*

The analysis of the four components (groups) of the Rural Competitiveness Index, as well as of their indicators highlights the strengths that support the competitiveness of the two categories of NUTS III regions as well as the weaknesses that make the predominantly rural regions have a lower competitiveness level than the regional average. Thus:

- For all the groups of indicators included in the analysis, the intermediate NUTS III regions have higher competitiveness performances than the regional average, the reverse of this statement being true for the predominantly rural counties for which the intermediate competitiveness indices, for each of the four groups, are lower than the regional average;

- The comparative analysis of all the model parameters reveals that the predominantly rural regions have the lowest competitive performance for the group of indicators *Specialization and innovation* for which the capacity of the economy of the counties Buzău, Tulcea and Vrancea to face competition is by 25.44% lower than the South-East region average. On the other hand, in the case of counties from the "intermediate" category, the intermediate competitiveness indicator for the group *Specialization and innovation* (SI_4) has the highest value (as compared to the regional average) among all the groups of indicators from the model (by 17.14% higher than the regional average);

- Significant competitiveness disparities between the categories of regions are found for all the groups of indicators in the model; however, after *Specialization and innovation,* the greatest differences are quantified for the indicators that describe the *Non-agricultural economy* for which the predominantly rural NUTS III regions have performances by 25.44% lower than the regional average, while for the three intermediate counties together (Brăila, Constanța and Galați) the non-agricultural economy competitiveness is by 15.46% higher than the South-East region average;

- The only parameters of the model for which the predominantly rural regions have a competitive performance closer to the regional average are those of the *Primary sector economy* for which the competitiveness level of the counties Buzău, Tulcea and Vrancea together is by only 9.38% lower than the regional average;

- In the case of predominantly rural regions, the factor that mainly affects in a negative way the competitiveness of both the primary economy sector and the non-agricultural economy sector is the *Value of exports* for which the intermediate competitiveness indicators (Xi) account for only 52.26% and 57.93% respectively of the regional averages. On the other hand, in the case of the group of the three intermediate counties of the South-East region, the exports of both segments of the economy have a significant contribution to the improvement of their general competitiveness parameters;

- Among all the indicators included in the model, the greatest disparities between the predominantly rural regions and the intermediate regions are found between the intermediate indicators of rural competitiveness for *Innovation,* more exactly in the case of the *number of RDI employees / 10000 civilian employees*. Thus, while for the predominantly rural NUTS III regions, the intermediate competitiveness indicator account for only 41.46% of the regional average, for the other category of counties, the competitiveness level in innovation represents 139.02% (higher by 39.02% than the regional average). Hence, the innovative capacity is the factor for which the competitiveness disparities across the categories of regions are the highest and it can be considered the main comparative advantage that leads to competitiveness increase in the investigated regions and makes the difference between the predominantly rural and the intermediate regions. Thus, the second hypothesis launched in this study according to which the *poor development of RDI sectors at regional level significantly influences the competitiveness level,* has been affirmatively validated.

CONCLUSIONS

The current study, with the goal to evaluate the rural competitiveness level, developed a first methodological approach to propose and validate the functionality of a theoretical model to measure the competitive advantages of regional economies with different rurality levels. This theoretical-methodological approach was materialized into the adaptation of a rural competitiveness evaluation model that was developed in Croatia in the year 2012; the model was adjusted according to the available statistical information at the level of NUTS III regions from Romania and to the recent theoretical approaches in competitiveness evaluation advanced by well-reputed international forums such as the World Economic Forum and Eurostat.

The area selected as case study for this research was the development region South-East, due to its balanced componency from the perspective of the rurality level of the component counties. According to this, out of the six counties of the region, three counties belong to the "predominantly rural" category and the other three belong to the "intermediate category".

Following the application of the model for rural competitiveness evaluation at the level of the two categories of NUTS III regions, it results that the economies of the predominantly rural regions are less competitive than the economies of the intermediate regions. The results of the same model reveal the fact that the factors that contribute to the greatest extent to the amplification of the territorial disparities with regard to rural competitiveness between the two categories of NUTS III regions are the following: i) size of staff empoloyed in RDI activities, which contributes to the comparative advantage of the access to innovation and ii) the value of exports, both in the non-agricultural economy and in the agri-food economy, certifying the competitive advantage of regional economies on the international markets.

In order to increase rural competitiveness, measures are needed to improve the performance parameters of the predominantly rural counties in the first place, with a priority focus on the transfer of innovation in all the economic sectors, which will lead to the increase of labour productivity, of the quality of products and services, of turnover and of export availabilities implicitly.

REFERENCES

Bojnec, Š., & Fertő, I. (2009). *Agro-food trade competitiveness of Central European and Balkan countries,* Food Policy, 34(5), pp. 417-425.

Fogarasi, J. (2008). *Hungarian and Romanian agri-food trade in the European Union,* Management, 3(1), pp. 3-13.

Mikuš, O., Franić R. & Grgić I. (2012). *The evaluation of rural competitiveness in creating a policy of rural development in Croatia,* Journal of Food, Agriculture & Environment, ISSN: 1459-026, Vol. 10, Issue 2, pp. 962-969, Publisher: WFL, http://world-food.net/the-evaluation-of-rural-competitiveness-in-creating-a-policy-of-rural-development-in-croatia/

Sarris, A. H., Doucha, T., & Mathijs, E. (1999) - *Agricultural restructuring in central and eastern Europe: implications for competitiveness and rural development*, European Review of Agricultural Economics, 26(3), pp. 305-329, http://erae.oxfordjournals.org/content/26/3/305.short

*** Joint Research Centre (2013) - *EU Regional Competitiveness Index* (RCI 2013), http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/6th_report/rci_2013_report_final.pdf.

*** National Institute of Statistics (NIS) (2013). *Census of Population and Dwellings, 2011.*

*** NIS (2013). *General Agricultural Census, 2010.*

*** NIS, e-Demos database, http://edemos.insse.ro/portal/

*** NIS, TEMPO on-line database, http://statistici.insse.ro/shop/

CHALLENGES, CHANCES, ALTERNATIVES FOR SMES (AND THE THEORY OF „DEGROWTH")

TAKÁCS ISTVÁN[1] – TAKÁCS-GYÖRGY KATALIN [2]

Abstract*: To find and adopt those products, solutions, technologies that are suitable for profitable production and ensure viability at the same time is one of the basic tasks of sustainable economy. Viable enterprise means to earn enough revenue to cover all the costs, including the costs of investment and innovation, to operate in an effective way, to "balance" (equilibrate) with the limited resources, (natural, renewable) notwithstanding the limitation of growth. In the study the new paradigm of "degrowth" is examined along the potential alternatives opened for SMEs, based on thoughts of Serge Latouche. In the paper it is summarized the main characteristics of innovative strategies for SMES in agriculture, too. The new values (Réévaluer – reappraise) suggest the intent of preserving the nature at least in the nowadays condition. Precision agriculture is a tool in this and allows the efficient use of natural resources (Restructurer – restructuring factors of production). Each farming strategy in which the farmers' cooperation is the base of an efficient machinery use (Restructurer – restructuring of social relationships), each technology that reduces the human-health risk (Réduire – reduction) shows into the direction of degrowth. We believe that we will not be able to carry out sustainable economy without strengthening the SMEs, helping them to find their successful way/strategy on development, being innovative and to cooperate with each other. Values, attitudes, networks, trust, openness are important to both individual and social utility coincidence that promotes the sustainability of being viable, competitive in wider meaning: future orientation, ability to renew (development, imitation, synthesis), economic/social cooperation.*

Keywords: *sustainable economy, innovation, SMEs*

Jel: M29; Q01; Y50

INTRODUCTION

It is frequently mentioned the role of small enterprises (SMEs) in economy, in employment, in rural development ensuring viability for local habitants. The role of agricultural farms, enterprises interested in food industry is not to be questioned when we are dealing with sustainable rural life but several questions have to be answered on the way, how the SMEs can operate, reach the viable economic size and further on, how they can be a profitable participant of the (local) economy.

The definition of sustainability of environment comes from the Burtland Report (1987). According to Pearce and Atkinson's (1995) understanding, is that the natural resources and man-made capital are complementary to each other in the production process, so that natural resources are creating the limiting factors to increase production, and at the same time, they should be used rationally during the production. By the turn of the millennium, sustainability has a broader interpretation. The new paradigm of agricultural research and development has been built on the interaction of three factors: ecological sustainability, economic efficiency paired with equal opportunities, and mutual assistance of governmental and non-governmental sectors in order to improve the performance and profitability of farming systems. The term "sustainable development" includes the current and long-run sustainable production and the controversies of environmental protection that assurance the right quality of life, and hard-preventable, but rather tolerated conflicts. In the realization serious regional, national, social (and of course, political) interests, momentary, short and long-run visions clash, they often confront. (Chilinsky, 1998; Behnassi et al., 2011; Turek, 2013; Valkó et al., 2013) Social sustainability includes the necessary food production, industrial based energy production, also from the farmer's point of view, compliance with the profitability criteria, and the responsibility of sustaining the environment. (Figure 1) It should be emphasized that both ecological and social sustainability can only be realized if economic sustainability is reached during farming, and also on every level of human needs. So the question for the enterprises (farms) is

---

[1] Prof. Dr. Takács István, Óbuda University, Keleti Faculty of Business and Management, Institute of Economics and Social Sciences, e-mail: itakacs1957@outlook.hu

[2] [1]Prof. Dr. Takács-György Katalin, Óbuda University, Keleti Faculty of Business and Management, Institute of Management and Organization, e-mail: takacsnegyorgykatalin@kgk.uni-obuda.hu

how to operate efficiently, over the viable size. Under the viable size we consider that farming size (at certain production structure and yield level) when the given economic environment allows to reach at least such income that covers all the production costs, including the necessity investment and ensuring the standard living for the farmer. (Takácsné, 1994)
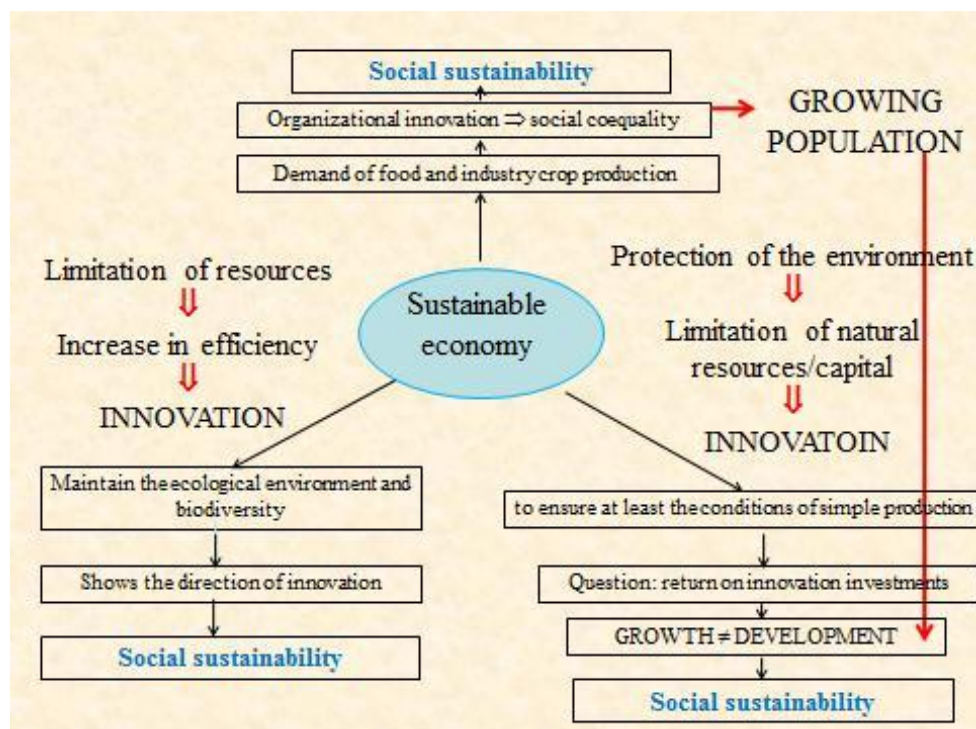
Source: Own construction, based on Burtland Report; 1987; Chilinsky et al., 1998; Ryden, 2008; extended by
    Takács-György – Takács, 2016
Figure 1. Sustainable economy in the context of innovation

In sustainable agriculture and rural development, the security of natural resources and the security of food – taking into consideration the growing number of humanity – appear together by presuming and reinforcing each other. The responsible behaviour of all participants (producer – consumer – society) have to find a degree of intensity and technology of production matched with a form of farming technology that is appropriate for the environment (such as organic, conventional, integrated and precision (a further developed form of integrated) farming strategies. (Mawapanga – Debertin, 1996; Caffey et al., 2001; Stull, 2004; Takács-György – Takács, 2011)

The aim of the paper is to summarise the "degrowth" theory from the point of view of small participants of economy, to highlight some new farming strategies (like technology of site-specific crop production, to summarize and define its characteristics from the point of view of thoughts of Serge Latouche). Furthermore it was also in focus to highlight the role cooperation as one of the key factors of further success of farming.

MATERIAL AND METHODS

The paper summarizes the thoughts of sustainable economy in connection with the new theory of "degrowth" from the point of view of agricultural SMEs. Based on literature and on our former research results, a content analysis was carried out and some new farming strategies were examined from the point of view of sustainable economic behavior.

RESULTS AND DISCUSSION

Sustainable economy and innovation

Sustainability includes sustainable economy itself: without higher income than costs sustainable life cannot be expected. But why for the earnings? – The answer is rather development than growth. But what is growth? Formerly we thought "the growth means higher profitability, increasing result after taxation for an enterprise, increase in GDP, in GDP/capita for a country." One part of the result from economy went for investment, development of the business but the other part went as dividend to the owners for personal consumption. Of course an increase in consumption will increase the business, but how long? Today we knew that is a dead end. In further economy, the growth should not mean the growth of the profit of the owners.

The term "sustainable development" goes further on the future: it includes the current and long-run sustainable production and the controversies of environmental protection that assurance the right quality of life, and hard-preventable, but rather tolerated conflicts. The literature background of the question of limited natural resources and the growth is very wide, the scientists, economist, politicians are not on the same platform. There can be differentiated two opposite groups. One can be considered as pessimists (most of the ecologists, those scientists, economists who do not believe that the earth can support more people. They are convinced the number of population is over the capacity of earth, see the concept of foot print, water print and somehow the question of embodied energy also belongs to here). Others believe in innovation in positive future development. They think that humanity is adult enough to develop and implement new technologies, new market incentives and appropriate policies, to change costumer habits (less consumption, share resources), to use substitutive products, to re-use waste, to innovate into new technologies. Due to their opinion the present need can be satisfied without depleting the future's demand for limited resources. Here appears the role of innovation for sustainable development. (Kerekes – Szlávik, 1996; Hartwick – Olewier, 1998; Caffey et al., 2001; Mensah – Castro, 2004; Behnassi et al., 2011)

Theory of 'degrowth' and business

There occurred a new theory connecting to the question of sustainable future in economy at the very beginning of the XXIst century: the theory of 'degrowth'. The main meaning of 'degrowth' is not unknown for the society, it is a movement towards the sustainable future, combining ecological economics, anti-consumerist and somehow anti-capitalist thoughts. The roots of the movement go back to the antecendents: the report of Club of Rome in 1971 titled "Limits to Growth" report. The estimations expect over 9.2 billion the population till 2050 so it is projected to increase demand for food production by 50-70%, also the inside structure of the consumption is under changes into towards high quality food. The Earth's growing population generates increasing demand not only for the limited natural and artificial resources, especially food, energy, drinking water but for the livable areas. It must be added the question of the migration due to climate changes. For agriculture the main task is not only to ensure the food safety but the safe food and the viable rural areas as well. In maintaining the above mentioned aims economy, agriculture and environment management have a significant role. (Mészáros, 2011; Ryden, 2008, Popp et al., 2013; Takács-György – Takács, 2016)

Serge Latouche (2011) summarised the principles of degrowth which is necessary to autonomy society ('8R') in the book of 'Farwell to growth' (first published in French: Petit traité de la décroissance sereine). According to these principles the population growth is not the only causer of the ecological problems. The allusion of this hides the ethical and moral questions which need common society action. In opinion of Latouche the revolution in culture and behaviour is need to degrowth. Some of the latest economic trends content to these principles. The necessary steps for degrowth are the following:

- Re-evaluate: in our age the individualist megalomania, a rejection of morality, a liking for comfort, and egoism is agreed and we feel it normal. [Belpomme 2007 p. 220] It is necessary to go back to the old 'bourgeois' values of honour, public service, the transmission of knowledge, 'a good job well done', frankness and mutual trust, the respects for human rights,

and nature and society. It is necessary to re-evaluate the idea of poor or rich and developing or developed.

− Reconceptualised: 'We must for instance and redefine the concepts of wealth and poverty; deconstructing the infernal couple of scarcity/abundance on which the economic imaginary is based, is a matter of urgency.' [LATOUCHE 2011 p. 50, in Hungarian]

− Restructure: adapt the productive apparatus and social relations to changing values. Make equitable policies in production tools and social sources. For example the some care factories need to be converted into product for recuperating energy through cogeneration. The question is how much does it cost and who will pay for it.

− Redistribute: it mean the redistribute of access of natural heritage in global, social, generational and individual levels. Direct effects of redistribution weak the power of 'world consumer class' and especially the power and wealth of the big predators. [LATOUCHE 2011 p. 51] It helps to solve the problem of distribution between North and South and pay back the earlier ecological dept. Thanks to the redistribution the developed countries can give an example and avoid the resistance of North countries.

− Relocalize: producing on a local basis. Relocalization is an economic, political, culture issue. Fortunately there are more and more positive examples for growth of local economic. For example: direct marketing, short supply chain and local service net. The free movement of ideas are not restricted but it is necessary to minimize the movement of physical sources. All production needs should be carried out at the local level. [LATOUCE 2011] The 'Think global- Act local' philosophy is match to relocalize principle.

− Reduce: Reduce our habitual overconsumption and the incredible amount of waste. [LATOUCE 2011] Think the products which goes together a social demand and artificial enkindle needs. Need to reduce the health risk and the prevention need to be place in the foreground. Recommended to change the 'mass tourism' to regional travel.

− Re-use: we have to reduce conspicuous waste, fight the built-in obsolescence of appliances, and recycle waste that cannot be re-used directly. Olympic Stadium of Basketball in London (2012) gave a good example because it was the biggest temporary building and after the Olympic Games it dismantled and sub-divided for reuse elsewhere.

− Recycle: recycling is part of our everyday life. There are lots of good examples for it. For example refurbishing part program for Peugeot. In this program the parts planned to be able to renew so the price of service will be low but the quality is the same. Other example is the waste-cloth which made by paper waste. The secondary use of biomass energy is also a good example for it.

− These principles could lead our life for another society where free cooperation and self-imposed rules are not an utopia. The re-evaluation is emphasis because this is the base for the other seven principles. Co-operation should be exchange the competitive methods in the business and everyday life too. Although Latouche do not use the phrase of 'coopetion' but the idea what he wrote is equal with this. The egoism need to change for the altruism, the hedonism need to change for chivalry. It is necessary to change the aim of our life. The new aim will be the share of assets and not the getting property. The tone could be on the social links and not on the consumption. To realize the degrowth very important is to reduce consumption, reasonable production recapture, increased free time (and intelligent activities under the free time). According to Latouche the localisation is a very important issue. His aim is to spread the ideology of local production and local consumption all over the world.

Due to the limitation, the concept of "Consume less share more" is mentioned only, without any discussion.Telling the truth, decades before the (re)appearance of the moral economists an etologist, Konrad Lorenz wrote his novel: Die acht Todsünden der zivilisierten Menscheit (1973, in English: (1974 Civilized man's eight deadly sins). The environmental, ecological and social processes the Author is speaking have some economic consequences for the business life: degradation of biodiversity, decrease in agricultural and rural areas have huge effect on the individual enterprises, on production structure, technology, direction of innovation, etc. To be successful participant of the

business life they need to give appropriate answers, trying to reach their optimal behavior. On the other hand, the increase in consumption (the over-consumption itself) can be a leading force of the economic development, but the question is: why to increase the use of limited resources for, what is the limit of the nowadays usage? The limitation will increase the production cost, so lots of enterprises will get of the market if they will not meet the acceptance of the consumers. To be accepted, to keep them, trust is also an important factor. Business must change some moral attitudes (like being altruist, paying more attention on environment and social responsibility, etc.) All the thoughts, questions are beyond themselves and in strong connection with innovation, with the capability to be renewed.

The main conclusions of the First International Conference on Economic Degrowth for Ecological Sustainability and Social Equity of Paris in 2008 and the so called, Barcelona Conferece from 2010 must be added to the question of "degrowth". At first it was discussed the financial, social, cultural, demographic, environmental crisis caused by the deficiencies of capitalism, and the main principles of the "degrowth", at the second the main focus was how to implement the „degrowth" theory into the society, into the daily life. Some practical solutions are the followings (not listed all): promotion of local currencies, reforms of interest; transition to non-profit and small scale companies; increase of local commons and support of participative approaches in decision-making; reusing empty housing and co-housing; elimination of mega infrastructures, transition from a car-based system to a more local, biking, walking-based one. Some suggestions came into practice, like the solutions of sharing economy (Uber, Airbnb, etc.), local currencies (like Soproni Kékfrankos, Balatoni Korona in Hungary) or the increase of local communities, but the conclusion of the conference after 6 years is that the society has not have big influence on the responsible economists, politicians.

Other authors highlight the importance of learning the new principles of economic cooperation. (Fukuyama, 2007; Sedlacek, 2012) The base of cooperation is moral economy instead of benefit economy. (Georgescu-Roegen, 1972, Daly 1991; Tóth, 2014) Transition from the economy of even more to the economy of enough is utmost necessary. The role of cooperation, to share of resources, strengthen the market position with concentrated products is important element of the nowadays agriculture, farming. In those countries, where it is characteristic the fragmented farm structure (not only the concept of local production – local consumption) should be implemented, but needed is the cooperation. The need of cooperation, need of trust among the business participants sector-neutral, but has important role in agribusiness. (Wilson, 2000; Andersson at al., 2005; Szabó, 2010; Takács, 2012; Baranyai et al., 2014)

Solutions for SMEs - **potential strategies: Innovation vs. Imitation**

Here only one direction of the future's development of SMEs is discussed, from a business point of view the progress can be accomplished basically four strategies:
- innovation (product development) find out new things, with different content compared to the existing products, services;
- imitation, accomplish good solutions, meanwhile further developing, additional value add (not simply the act of copying someone or something (something, that is made or produced as a copy of the final function, but the way is individual);
- open innovation (mass innovation), for stakeholders (actors) the integration of internal and external knowledge is important; knowledge sharing; (innovating with partners by sharing risk and sharing reward);
- integration (synthesis), the ideas are integrated in the existed system, combined with the existing ones and making it appear with the new features in the market. (Table 1.)

Table 1. Innovating strategies: advantages and disadvantages

FEATURES	INNOVATION	IMITATATION	OPEN INNOVATION	INTEGRATION
Time to market	Unpredictable as any innovative work.	Slow, but predictable, if not many hidden pitfalls or adaptation problems are encountered.	Quick (considering the whole innovation life cycle)	Fast, if effort to integrate with other system components is low.
Cost	Unpredictable.	More expensive and depends on complexity and adaptation effort.	Sharable and can be reduced	Low, if components are reasonably priced and not much integration work needed.
System integrity (with system architecture and environment)	Solution is built to match core architecture and customer needs.	Good, if developers adapt ideas to existing architecture.	Business processes, structures and systems integration: special, but requires synchronization between the partners	Acceptable if new components do not screw and over-complicate core architecture.
Expertise Required	High level expertise, creativity and specialized knowledge are required for good innovative solution.	Good developers can effectively adopt good ideas that are explained well.	Expertise, knowledge sharing	Not much specialized expertise is required, usually external support is available for integration.
Control over code and future development	Full control.	Good control if ideas are applied well and not over-engineered.	Shared and give opportunity to ramification	Little control and you are on mercy of external developers.
Competitive advantage and uniqueness	Innovation is an excellent opportunity to gain advantage.	Depends on quality and creativity in adaptation	Greater bargaining power due to the combined market entry, larger risk owing to the lack of trust	Not much for the standard solution that many can use.
Maintenance, support and improving capabilities	Completely your own effort.	Your effort is supported in original source of ideas if you are lucky.	Multi-player, teamwork required	Work is outsourced to dedicated external developers who fix, support and improve the product.
Learning curve, tacit knowledge, help	Should be covered by you to enable effective support and future development by existing and new developers.	Partially supported by original source, however can drift far as the result of internal implementation.	Highest outcome, synergy	Usually supported by help, tutorials, training and community involvement.

Remarks:
advantageous, applying a positive, low risk
favourable, relatively low cost, can be risky
depends on individual and circumstances
need resource surplus, more attention and risky
high risk, costly, time-consuming

Source: Own construction, based on of Segestrom, 1991; Jarjabka-Lorand, 2010; Huizing, 2011, Takácsné, 2013

Innovation is expensive and risky to solve the problems, faces unique challenges, good solutions help to serve the consumers better, economically successful, reducing the costs and more reliable. It is highly risky, needs more time, result depends on the competitive participants' behaviour. Through imitation can be built/developed the solutions the business itself, needs less money, but must be differed from copying by adding some new to the „copied" solution. Open innovation is a platform of knowledge sharing, shorten the process, the diffusion of the novelty, but requires trust among the participant. Integration – based on cooperation –is the most effective way of product, technology innovation, of development a new system with lowest risk, effort and minimal future support. (Here must be mentioned innovation clusters, spin off businesses).

CONCLUSION

Answering the question in the title: *Challenges, chances, alternatives for SMEs (and the theory of „degrowth")* can be stated that for all participants of economy the sustainable operation means today: appropriate answers to changes, focusing on future, finding new solutions, ways to reach and keep the consumers, at viable size. That is nothing new these were expectations of the successful business in the last centuries. But what have to be changed is: turning to moral economy from profit (owners) orientation, to consciously select the business' place and role in local economy, not only in the development and innovation process.

Based on the "degrowth' theory it means: task is to find new solutions with sharing the resources and knowledge by cooperation. In agriculture site-specific plant production is a relatively new technology, but its diffusion is not so fast and wide could be due to its cost and environmental advantages. The new values (Réévaluer – reappraise) suggest the intent of preserving the nature at least in the nowadays condition. Precision agriculture is a tool in this and allows the efficient use of natural resources (Restructurer – restructuring factors of production). Each farming strategy in which the farmers' cooperation is the base of an efficient machinery use (Restructurer – restructuring of social relationships), each technology that reduces the human-health risk (Réduire – reduction) shows into the direction of degrowth.

For the SME sector's actors one of the possibilities for the future is monitoring, adopting and/or adapting (imitation) the sector's best practice. The imitation is more important in terms of the company growth than the product, service or process innovation. The copying of innovators, sharing knowledge can achieve significant results with minizing cost and risk (technology and market). It is important to find ideas worthy of imitation, and be in time and rapidly available for production and market access.

BIBLIOGRAPHY

Andersson, H. – Larsen, K. – Lagerkvist, C.J. – Andersson, C. – Blad, F. – Samuelsson, J. – Skargren, P. (2005): Farm Cooperation to Improve Sustainability. Ambio. 34(4/5), MAT 21 / Food 21 - A Sustainable Food Chain. pp. 383-387.

Baranyai Zs, Szabó G G, Vásáry M. (2014): Analysis of machine use in Hungarian agriculture - Is there any future for machinery sharing arrangements? Annals of the Polish Association of Agricultural and Agribusiness Economists 16:(3) pp. 24-30.

Behnassi M., Shahid S.A., D'Silva, J. (Eds.) (2011): *Sustainable Agricultural Development*. Recent Approaches in Resources Management and Environmentally-Balanced Production Enhancement. Springer. p. 278.

Belpomme D. (2007): Avant qu'il ne soit trop tard Paris Fayard 302. o

Caffey, R.H.; Kazmierczak, R.F.; Avault, J.W. *Incorporating Multiple Stakeholder Goals into the Development and use of Sustainable Index: Consensus Indicators of Aquaculture Sustainability*. Staff Paper, Department of AgEcon and Agribusiness of Louisiana State University: Eunice, LA, USA, 2001-8, 40 p.

Daly, H.E. [1991]: Steady-State Economics. Island Press, Washington, D.C

Chilinsky, G. – Heal, G. – Vercelli, A. (1998): Sustainability: Dynamics and Uncertainity. Kluwe Academic Publication. Drodrecht – Boston – London. 249 p.

Fukuyama. F: (2007): Bizalom - A társadalmi erények és a jólét megteremtése. Európa Könyvkiadó. 616 p.

Georgescu-Roegen, N. [1972]: Energy and Economic Myth; in. N. Georgescu-Roegen [1976]: Energy and Economic Myths: Institutional and Analytical Economic Essays; Pergamon Press, New York, 3-36. o.

Huizing, E.K.R.E. (2011): Open innovation: State of the art and future perspectives. Technovation. 31. 2-9 pp.

Jarjabka Á. - Lóránd B. (2010): *Az innováció alapjai és megjelenési területei*. Pécs. 129 p.

Latouche, S. (2011): A nemnövekedés diszkrét bája. Szombathely. Savaria University Press 138. p [Latouche, S. (2007): Petit traité de la décroissance sereine. Fayard]

Lorenz K. (2001): A civilizált emberiség nyolc halálos bűne. IKVA Könyvkiadó. Budapest. p. 133

Mawapanga, M.N.; Debertin, D.L. Choosing between alternative farming systems: An application of the analytic hierarchy process. *Rev. Agric. Econ.* 1996, *18*, 385-401.

Mensah, A.M. – Castro, L.C. (2004): Sustainable Resource Use & Sustainable Development: A Contradiction?! Working paper. (ZEF) Center for Development Research University of Bonn. 22 p. http://www.zef.de/fileadmin/downloads/forum/docprog/Termpapers/2004_3b_Mensah_Castro.pdf

Mészáros S.(2011) Gazdálkodás 3. szám: Nemnövekedés: egy új gazdasági paradigma európai fejleményei p. 259-265

National Research Center (2010): *Toward Sustainable Agricultural Systems in the 21st Century*. by NRC. Kindle Edition. The National Academic Press. Washington. 2010. www.nap.edu. pp. 598.

Popp, J – Pető, K – Nagy J (2013): Pesticide productivity and food security. Agronomy for Sustainable Development. 33(1) pp 243-255

Ryden (2008) Education for global responsibility V Sustainable Development. http://www.bup.fi/BUPfilm/Lars_film_site/texts/sustainable_text.pdf Letöltés: 2011. 12. 03.

Sedlaček, T. (2012): A jó és a rossz közgazdaságtana. A Gilgames-eposztól a Wall Streetig. HVG Kiadó. 400 p.

Segerstrom, P. S. (1991): Innovation, imitation, and economic growth. *Journal of Political Economy, 99*(4). pp. 807-829.

Stull, J.; Dillon, C.; Shearer, S.; Isaacs, S. Using precision agriculture technology for economically optimal strategic decisions: The case of CRP filter strip enrollment. *J. Sustainable Agric.* 2004, *24*, 79-96.

Szabó, G. G. (2010): The importance and role of trust in agricultural marketing co-operatives. MTA – AKI, Budapest: Studies in Agricultural Economics. 112. 5–22.

Takács I. (2012): Games of farmers – to cooperate or not? Annals of the Polish Association of Agricultural and Agribusiness Economists. 14:(6) pp. 260-266.

Takács-György, K. – Takács I. (2011): Risk Assessment and Examination of Economic Aspects of Precision Weed Management. Sustainability. 2011:(3) pp. 1114-1135.

Takács-György, K. – Takács I. (2016): Some ideas about site specific crop production and theory of degrowth. Növénytermelés. 65:(2016. Suppl) pp. 67-70.

Takácsné György K. (1994): A családi gazdálkodás méretére ható tényezők modellvizsgálata I.. Gazdálkodás XXXVIII:(4) pp. 65-69.

Takácsné György K. (2013): Innovációs formák, elterjedésük és szerepük a mezőgazdaságban. Kecskemét. 1060-1064 pp.

Tóth G. (2014): Kelet-nyugat átrendeződés? Journal of Central European Green Innovation. 2 (4) pp. 163-170

Turek R. A. (2013): *Sustainable Technologies, Policies and Constraints in the Green Economy - Sustainable agriculture - between sustainable development and economic competitiveness,* IGI Global Publishing, 978-1-466-64098-6, p. 219-235

Valkó G. – Tóth R. – Vinogradov Sz. – Fekete-Farkas M. (2013): Measurement of Sustainability of Agriculture. *VADYBA* 23:(2) *pp. 141-148.*

Wilson, P.N. (2000). Social capital, trust, and the agribusiness economics. Journal of Agricultural and Resource Economics, 25 (1): pp. 1-13.

World Commission on Environment and Development (WCED) (1987). Burtland Report. United Nations. New York.

FARM SIZE AND PROFITABILITY
- THE VILLAGE AS COLLATERAL FACTOR -

CRISTIAN C. MERCE[1], EMILIAN MERCE[2], CRISTINA BIANCA POCOL[3]

Abstract: *The goal of the study is to analyse and compare agrarian structures in several EU countries, analysed separately according to their degree of economic consolidation. The study points out that, in order to characterize the agrarian structures of a country, is not sufficient to determine the average size of farms. Such averages are the result of different distributions of farmland according to size categories, which are valuable sources of analysis in terms of the impact of agricultural structures on the modernization of production processes as well as for achieving substantial economic performance. An important objective of the paper is to evaluate the numerical influence of farm size on the economic results, using regression and correlation methods. The study reveals that size is a necessary condition for the achievement of economic performance, but it is not sufficient. A causalities comparison between countries with a consolidated economic situation and the ones economically precarious confirm this fact, concluding also that, in addition to size, farms must provide a substantial capitalization as well as modern technical equipment. The paper underlines also the fact that the precarious capitalization of farms, along with feudal agrarian structures, causes paradoxal situations, the economic effect being found in an inverse relationship to size.*

Keywords: *farm size, economic effects, causality, paradoxal situations.*

INTRODUCTION

Historical sources confirm that the world has always been divided between the few and the many, between the rich and the poor. In other words, according to Russian terminology between Mensheviks and Bolsheviks.

The two poles constitute a discriminatory ordination of subordination relations, both between individuals and between countries, reality explicitly confirmed by the great personalities of the contemporary world. *"21th century Europeans gave a simple, racist answer to this question. They concluded that they have acquired cultural advantage because they were, undoubtedly, more intelligent, which is why they were intended to conquer, to banish and to kill inferior people. [...] Technological differences thus created led to the greatest tragedies in the last five hundred years, and their inheritance, the inheritance of colonialism and conquest of other nations still have great influence in the world today. [...] All these factors were crucial for whom got colonizer and whom colonized"*(Diamond, 2015).

In the modern world, the colonizer retains the advantages through competition laws and by canceling any protectionist regulation. "*In Western European countries, optimizing organizational framework for land exploitation was made under specific conditions of the market-based economy on competition law"* (Merce *et al.,* 2007).

Such polarization fundamentally influenced also the nature of rural settlements. In countries with a poorly-developed economy, rural settlements are survival subsistence formulas, the household reuniting humans and animals in a mixture reminiscent of the beginnings of human history. In countries with a strong economy, the village developed a different structure, a bedroom-type structure with the utilities and household structures located outside the central area. Villages classified as such represent the effects of oppression by dominators. In time, the two villages have become causes: cause of perpetuating poverty among the premise dominated and economic prosperity for those dominating.

[1] Associate Professor, PhD, UASVM Cluj-Napoca
[2] Professor, PhD, UASVM Cluj-Napoca
[3] Associate Professor, PhD, UASVM Cluj-Napoca, cristina.pocol@usamvcluj.ro, corresponding author

MATERIALS AND METHODS

The process of property growth was generally tough and long lasting in all countries, which have today a modern agriculture. It is useful to remember that, in England, this process has been triggered ever since the 16th century, when England began the process of industrialization. The process was very well characterized by T. More, who called England: **'The country where sheep eat peasants**". This is because the wool processing industry demanded a modernization of the agriculture sector and, thus the elimination of small farmers. This way, in England, in 1901 only 9% of the active population was occupied in agriculture. Such a strategy on modernizing the framework for land exploitation is no longer a valid option for Europe and would be a utopia for Romania.

An overpopulated agriculture, as the Romanian one is, cannot perform, cannot become competitive and efficient for the simple reason that, everywhere in time and space, it has been verified the direct correlation: **"many peasants ⇒ more poverty"**, the massive presence of peasants being a brake in the modernizing of the organizational framework for land exploitation. And yet, with all the primitivism of agrarian structures in Romania, the brightest Romanian minds praised the peasantry and the Romanian village peasantry: In *In Praise of the Romanian Village*, Romanian poet Lucian Blaga notes that: *" To live in the village means to live in the cosmic horizon and in the conscience of a destiny born from eternity (…). The pride of the village to be in the centre of the world and of a destiny has held us and saved us as a people over **centuries of misfortune***" (Blaga, 1937).

The most important Romanian intellectuals were entitled to praise the village as it represented the source of demographic growth for the Romanian ethnicity, contributing fundamentally to the continuance and growth of the Romanian people on ancestral lands. This continuance meant, unfortunately, the enduring and the preservation of primitive agrarian structures, which still characterizes Romanian agriculture today. Promoting a strategy of merging land ownership in Romania by lease is justified by the relative low growth possibilities of the property under the presence, yet massive, of the population employed in agriculture and that will last, certainly still one or two generations. Very relevant in this sense, it is the comparative analysis of the dynamics of land ownership in Denmark, the Netherlands and Greece (Table 1).

Table 1

The average size farm in Denmark, Netherlands and Greece (hectares)

Specification	1990	1993	1995	1997	2000	2003	2005	2007	2010	2013
Denmark	34.3	37.2	39.8	42.8	45.9	55.1	54.1	60,2	65,3	70,1
Netherlands	16.5	17.2	18.0	18.9	20.3	23.8	24.4	25,5	26,5	28,1
Greece	4.3	4.3	4.5	4.3	4.4	4.8	4.8	5,2	7,2	6,9

Source: EUROSTAT, *Date of extraction: Thu, 23 Feb. 2016*

Information sources are those regarding agrarian structures, areas and number of farms in some European countries, grouped by economic size classes (Table 2 and Table 3).

Table 2

Agricultural areas and number of farms in Austria, Denmark, France, Germany and Netherlands

Economic size class (thousands euros)	Austria		Denmark		France		Germany		Netherlands	
	Ha	No. farms	Ha	No. farms	Ha	No. farms	Ha	No. farms	Ha	No. farms
0-2	54640	15050	9190	740	193070	29310	7750	930	30	40
2-4	70670	12570	9100	940	212090	23640	37440	6070	690	490
4-8	163110	19770	17920	2360	370160	34170	167720	22470	19100	5870
8-15	250280	19520	51950	5130	498010	35160	358950	33930	35110	6180
15-25	268470	15570	71790	4560	640070	30980	464510	29060	44140	4800
25-50	510490	23290	168910	6080	2024720	56730	949980	39360	88810	6260
50-100	660340	19910	236300	4710	4633330	79040	1665580	44290	125590	6120
100-250	573300	11760	395220	4360	10853770	114410	3810240	58610	381460	12520
250-500	120440	1730	364250	2680	6208780	45720	3369970	30470	652480	13990
over 500	54730	390	1289200	5460	2097690	13670	5861110	16450	500170	9540

Source: EUROSTAT, *Date of extraction: Thu, 23 Feb. 2016*

Table 3

Agricultural areas and number of farms in Bulgaria, Czech Republic, Poland, Romania and Hungary

Economic size class	Bulgaria		Czech Republic		Poland		Romania		Hungary	
	Ha	No.	Ha	No.	Ha	No.	Ha	No.	Ha	No.
0-2	83640	134880	6140	1560	729130	369070	1987270	2381540	130320	285820
2-4	75770	49570	15090	2480	1001750	283010	1332600	570740	115830	52490
4-8	95140	26360	35060	4600	1567070	261100	1388550	373250	187150	36030
8-15	118920	13120	61980	4500	1770150	182660	812710	113770	257860	24220
15-25	131490	6600	72520	3000	1573510	112390	474110	33550	277930	14000
25-50	228330	5710	126850	2850	2364740	107970	677020	18610	445600	11870
50-100	323550	3110	192570	2420	2017660	50850	875390	7740	521080	6570
100-250	677520	2350	356210	1960	1400980	18250	1495090	4950	764860	4260
250-500	974090	1250	347080	830	682000	4000	1399870	2050	420930	1140
over500	1913040	1130	2777070	1700	1217240	2250	2269700	1350	1524170	1240

Source: EUROSTAT, *Date of extraction: Thu, 23 Feb. 2016*

For processing the databases were used various types of statistical methods. Among these, very important are the statistical indicators as absolute values, average values and relative values. Also, for a high degree of statistical processing, the regression and correlation methods were used, according to established literature methodology. Being stochastic-type causalities, it is important to take into consideration the recommendations found in specialty literature regarding data processing. *"Under stochastic relations enter those consequences formed under the influence of both essential and under the action of unsystematic factors (random), forming - in statistics - the main content of **regression and correlation**. [...] The fact that the externalization of need is accompanied by the action of random factors does not exclude the causality, but only confirms the essence of a particular type of causal relations; **statistical causal relations**, where the lawfulness does not occur individually, but only for the total average population and for a large number of investigated cases investigated"* (Merce & Merce, 2009).

RESULTS AND DISCUSSIONS

"It is widely accepted that modern agricultural structures imply an extensive use of mechanization in agriculture and the promotion of modern farming technologies in land exploitation. This hypothesis requires a thorough scientifically confirmation, both for academics and for entrepreneurs in agriculture. In the end, it is all about the quantitative assessment of the causal relationship between the agricultural dimension and the economic effect achieved per unit area." (Merce & Merce, 2015). Such quantitative information can be very useful for shaping development strategies in the future of agriculture for various European countries (Table 4 and Table 5).

Table 4

Technical and economic size of farms in Romania (2013)

Economic size class (euro)	Average economic class	Area		No. farms		Average area	Economic impact
		ha	%	No.	%		
0-2000	1000	1987270	15,63	2381540	67,898	0,83	1198,4
2000-4000	3000	1332600	10,48	570740	16,272	2,33	1284,9
4000-8000	6000	1388550	10,92	373250	10,641	3,72	1612,8
8000-15000	11500	812710	6,39	113770	3,244	7,14	1609,9
15000-25000	20000	474110	3,73	33550	0,957	14,13	1415,3
25000-50000	37500	677020	5,33	18610	0,531	36,38	1030,8
50000-100000	75000	875390	6,89	7740	0,221	113,10	663,1
100000-250000	175000	1495090	11,76	4950	0,141	302,04	579,4
250000-500000	375000	1399870	11,01	2050	0,058	682,86	549,2
over 500000	925000	2269700	17,85	1350	0,038	1681,26	550,2

Source: Processed data

Table 5

Technical and economic size of farms in Austria (2013)

Economic size class (euro)	Average economic class	Area		No. farms		Average area	Economic impact euro/ha
		ha	%	No.	%		
0-2000	1000	54640	2,00	15050	10,78	3,63	275,4
2000-4000	3000	70670	2,59	12570	9,01	5,62	533,6
4000-8000	6000	163110	5,98	19770	14,17	8,25	727,2
8000-15000	11500	250280	9,18	19520	13,99	12,82	896,9
15000-25000	20000	268470	9,85	15570	11,16	17,24	1159,9
25000-50000	37500	510490	18,72	23290	16,69	21,92	1710,9
50000-100000	75000	660340	24,22	19910	14,27	33,17	2261,3
100000-250000	175000	573300	21,03	11760	8,43	48,75	3589,7
250000-500000	375000	120440	4,42	1730	1,24	69,62	5386,5
over 500000	760000	54730	2,01	390	0,28	140,33	5415,7

Source: Processed data

The fact is eloquently highlighted using graphics (Figure 1 and Figure 2).
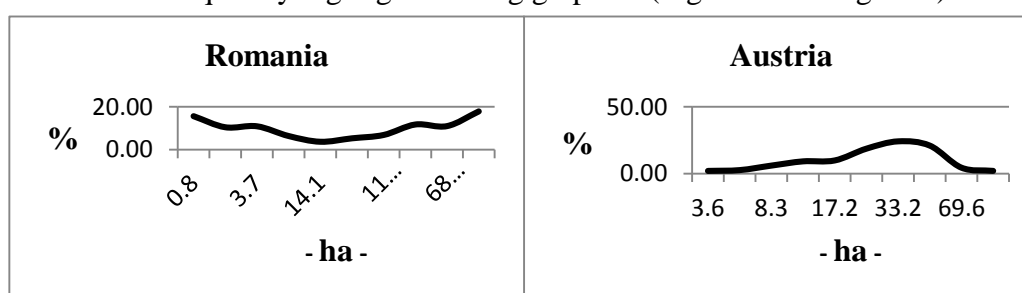
Fig. 1 – Areas distribution depending on the agricultural size of farms in Romania and Austria

Unlike the structure of agricultural holdings in Austria, in Romania the structure lacks "core", is a feudal structure, similar to those from boyars times. In this sense, it is important to notice also the farm size amplitude (from 0.8 to 1681.3 in Romania and from 3.6 to 140.3 in Austria). However, it is well known the fact that the objective and vector competitive spirit of progress is achieved by the presence of medium classes; the small ones don't have decision-making power, and those too large can practice arbitrarily monopoly policy. It is one of the major brakes in promoting progress in Romanian agriculture, difficult to overcome because this country has deep historical roots, namely the lack of policies to stimulate medium-sized properties.

The normal distribution of areas depending on the average size of farms in Austria, however, is less common. In many developed countries in Western Europe can be seen a polarization of areas in medium farms with the drastic tendency to reduce small ones, but a lack of feudal properties (Table 6, Table 7 and Figure 2).

Table 6

Technical and economic size of farms in Denmark (2013)

Economic size class (euro)	Average economic class	Area		No. of farms		Average area	Economic impact euro/ha
		ha	%	No.	%		
0-2000	1000	9190	0,35	740	2,00	12,42	80,5
2000-4000	3000	9100	0,35	940	2,54	9,68	309,9
4000-8000	6000	17920	0,69	2360	6,37	7,59	790,2
8000-15000	11500	51950	1,99	5130	13,86	10,13	1135,6
15000-25000	20000	71790	2,75	4560	12,32	15,74	1270,4
25000-50000	37500	168910	6,46	6080	16,42	27,78	1349,8
50000-100000	75000	236300	9,04	4710	12,72	50,17	1494,9
100000-250000	175000	395220	15,12	4360	11,78	90,65	1930,6
250000-500000	375000	364250	13,94	2680	7,24	135,91	2759,1
over 500000	660000	1289200	49,32	5460	14,75	236,12	2795,2

Source: Processed data

Table 7

Technical and economic size of farms in the Netherlands (2013)

Economic size class (euro)	Average economic class	Area		No. of farms		Average area	Economic impact euro/ha
		ha	%	No.	%		
0-2000	1000	30	0,00	40	0,06	0,75	1333,3
2000-4000	3000	690	0,04	490	0,74	1,41	2130,4
4000-8000	6000	19100	1,03	5870	8,92	3,25	1844,0
8000-15000	11500	35110	1,90	6180	9,39	5,68	2024,2
15000-25000	20000	44140	2,39	4800	7,29	9,20	2174,9
25000-50000	37500	88810	4,81	6260	9,51	14,19	2643,3
50000-100000	75000	125590	6,80	6120	9,30	20,52	3654,7
100000-250000	175000	381460	20,65	12520	19,02	30,47	5743,7
250000-500000	375000	652480	35,32	13990	21,26	46,64	8040,5
over 500000	445000	500170	27,07	9540	14,50	52,43	8487,7

Source: Processed data
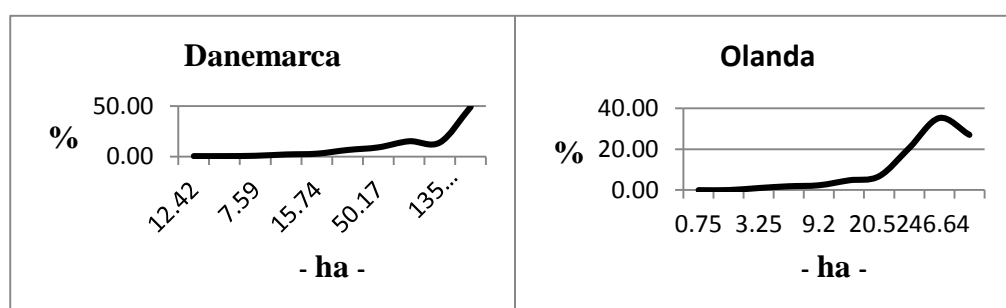
Fig. 2 – Areas distribution depending on the agricultural size of farms in Denmark and Netherlands

The very different agricultural structures represent the effects of centuries of world division into dominant and dominated nations. The villages themselves, in their archaic or modern form, are the result of this division. For those dominated, the village survived as tribal structures with primitive and impoverished households where people lived together with the few animals they possessed. Dominators villages where settlements that evolved around the center of the village and with household structures outside the main living area, on the surrounding properties. Thus, crystallized over centuries, the villages have become in time causes of economic stagnation for the needy ones, namely prosperity and economic progress for dominators. These consequences are eloquently illustrated by the causal relationship between the farm size (households) and business results achieved in euro / ha (Table 8; Table 9; Figure 3; Figure 4, Figure 5, Figure 6 and Figure 7).

Table 8

Correlation between farm size and economic performance in Austria, Denmark, France, Germany and Netherlands

Economic size class (euro)	Austria		Denmark		France		Germany		Netherlands	
	D. A. *)	Euro/ha	D. A.	Euro/ha	D. A.	Euro/ha	D. A.	Euro/ha	D. A.	Euro/ha
0-2000	3,63	275,4	12,42	80,5	6,59	151,8	8,33	120,0	0,75	1333,3
2000-4000	5,62	533,6	9,68	309,9	8,97	334,4	6,17	486,4	1,41	2130,4
4000-8000	8,25	727,2	7,59	790,2	10,83	553,9	7,46	803,8	3,25	1844,0
8000-15000	12,82	896,9	10,13	1135,6	14,16	811,9	10,58	1087,0	5,68	2024,2
15000-25000	17,24	1159,9	15,74	1270,4	20,66	968,0	15,98	1251,2	9,20	2174,9
25000-50000	21,92	1710,9	27,78	1349,8	35,69	1050,7	24,14	1553,7	14,19	2643,3
50000-100000	33,17	2261,3	50,17	1494,9	58,62	1279,4	37,61	1994,4	20,52	3654,7
100000-250000	48,75	3589,7	90,65	1930,6	94,87	1844,7	65,01	2691,9	30,47	5743,7
250000-500000	69,62	5386,5	135,91	2759,1	135,80	2761,4	110,60	3390,6	46,64	8040,5
over 500000	140,33	5415,7	236,12	2795,2	153,45	2802,2	356,30	3648,6	52,43	8487,7
Correlation coefficient	**0,907**		**0,867**		**0.981**		**0,778**		**0,990**	
Average size	19,5		70,6		59,9		59,3		28,1	

*) – farm size (ha)

Table 9

Correlation between farm size and economic performance in Bulgaria, Czech Republic, Poland, Romania and Hungary

Economic size class (euro)	Bulgaria		Czech Republic		Poland		Romania		Hungary	
	D. A. *)	Euro/ha	D. A.	Euro/ha	D. A.	Euro/ha	D. A.	Euro/ha	D. A.	Euro/ha
0-2000	0,62	1612,6	3,94	254,1	1,98	506,2	0,83	1198,4	0,46	2193,2
2000-4000	1,53	1962,7	6,08	493,0	3,54	847,5	2,33	1284,9	2,21	1359,5
4000-8000	3,61	1662,4	7,62	787,2	6,00	999,7	3,72	1612,8	5,19	1155,1
8000-15000	9,06	1268,8	13,77	834,9	9,69	1186,7	7,14	1609,9	10,65	1080,2
15000-25000	19,92	1003,9	24,17	827,4	14,00	1428,5	14,13	1415,3	19,85	1007,4
25000-50000	39,99	937,8	44,51	842,5	21,90	1712,2	36,38	1030,8	37,54	998,9
50000-100000	104,04	720,9	79,57	942,5	39,68	1890,2	113,10	663,1	79,31	945,6
100000-250000	288,31	607,0	181,74	962,9	76,77	2279,7	302,04	579,4	179,54	974,7
250000-500000	779,27	481,2	418,17	896,8	170,50	2199,4	682,86	549,2	369,24	1015,6
over 500000	1692,96	472,5	1633,57	918,2	541,00	2218,1	1681,26	550,2	1229,17	1016,9
Correlation coefficient	**-0,629**		**0,322**		**0,583**		**-0,643**		**-0,244**	
Average size	18,9		154,1		10,3		3,6		10,6	

*) – farm size (ha)
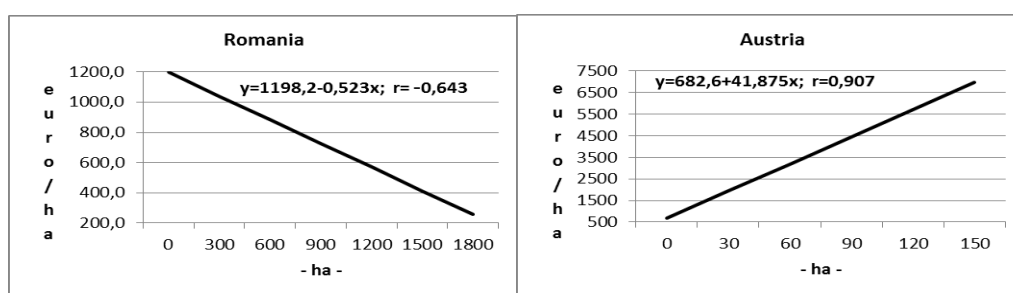
Fig. 3 – Size impact on the economic effect in Romania and Austria
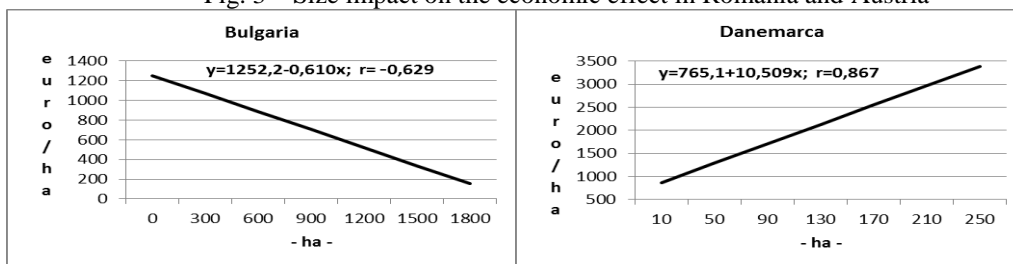
Fig. 4 – Size impact on the economic effect in Bulgaria and Denmark
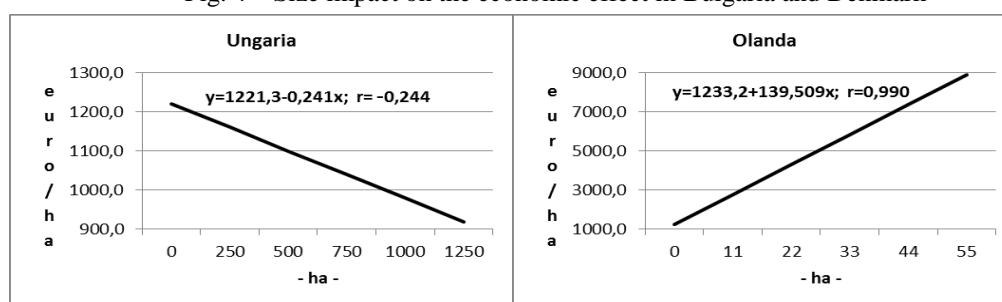
Fig. 5 – Size impact on the economic effect in Hungary and the Netherlands
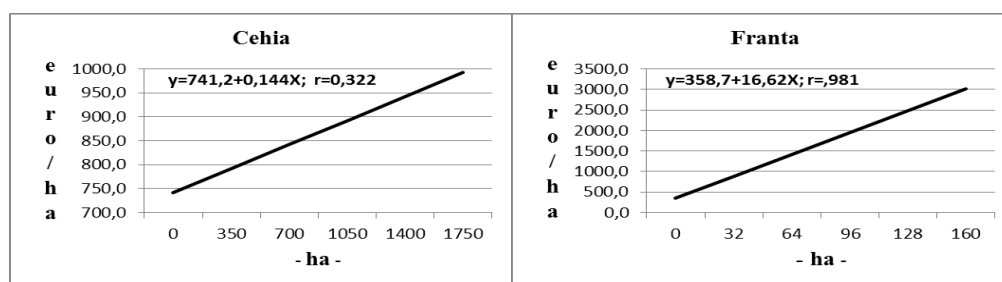
Fig. 6 – Size impact on the economic effect in Czech Republic and France
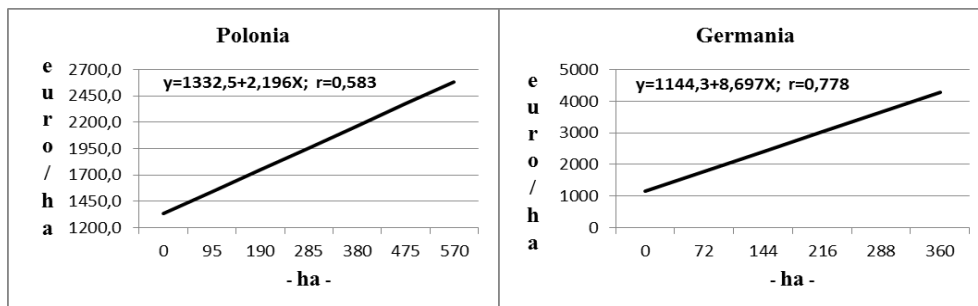
Fig. 7 – Size impact on the economic effect in Poland and Germany

The comparative analysis of economic performance made by developed and developing countries shows that size is a necessary factor for achieving notable economic performance, but it is not sufficient.

It may be noted that in Western European countries, with an agriculture very strongly capitalized, there is an intense direct correlation between farm size and economic performance, the causality relationship being statistically assured and through correlation coefficients which, usually, tend to be value one. A parallel between the size of correlation coefficients for the two country groups is quite illuminating (Table 10).

Table 10

Country group	Correlation coefficients				
Performing	Austria	Denmark	France	Germany	Netherlands
	0,907	**0,867**	**0.981**	**0,778**	**0,990**
Nonperforming	Romania	Bulgaria	Czech Republic	Poland	Hungary
	-0,643	**-0,629**	**0,322**	**0,583**	**-0,244**

In Central and Eastern European countries, countries that are generally poorly capitalized, there is a weak or, paradoxically, even negative correlation between farm size and economic performance per hectare. It is typical in this respect, the case of Romania, of Bulgaria and Hungary. Certainly, for these countries, size influence is mediated by a complex of specific factors, often with a very harmful effect on the organizational framework. The first and most important factor is the lack of capitalization. Besides the lack of capital in each country can be evoked factors that annul the positive influence of the organizational framework.

In Romania and Bulgaria, for instance, can be suspected practices of collecting subsidies without cultivating the land. Also, many experts believe that a large part of the agricultural production is sold on the black market, data reported by EUROSTAT being substantially tithe.

In Hungary's case, it appears that the substantial efficiency of small properties is due to growing small businesses such as: fur animals, exotic birds, exotic fish etc., rooted since the communist era.

CONCLUSIONS

1. The countries of the world have been, are and will be divided into dominant and dominated;
2. Modernisation of agricultural structures is an essential prerequisite for competitiveness and for achieving competitive economic performance in agriculture;
3. Competitive laws, without protectionist regulations, always favor dominant countries that increase benefits in relation to those dominated;
4. The causality relationship between farm size and economic performance in developed countries has a certain stability, a stability that has crystallized over time, and calculations prove that it is ensured statistically and through the size of correlation coefficients with positive values tending to one;

5. The extension of farms is not enough unless it is associated with a high degree of capitalization of agriculture, capitalization being a binding partner;

6. In Central and Eastern European countries, countries that are generally poorly capitalized, there is a weak or even negative correlation between farm size and economic performance per hectare. It is typical in this respect, the case of Romania, of Bulgaria and Hungary;

7. In Romania, the agrarian structure lacks "core", being characterized as a feudal structure, similar to boyars times. This conclusion is backed up by size farm amplitude (from 0,8 to 1681,3 in Romania and from 3,6 to 140,3 in Austria);

8. Besides the lack of capital in each country, there can be evoked factors that annihilate the positive influence of the organizational framework. In Romania and Bulgaria, for instance, can be suspected practices of collecting subsidies without cultivating the land. Also, many experts believe that a large part of the agricultural production is sold on the black market, data reported by EUROSTAT being substantially tithe;

9. In a similar situation is also Hungary, with the observation that the inverse relationship between farm size and economic performance is caused largely by favorable economic effects particularly of small farms specialized in the provision of high impact commercial activities;

10. A special case is also the Czech Republic that, by maintaining agricultural structures from the communist period, on new legal bases, had in 2013 the largest average size of farms in the European Union (154,1 ha);

11. Poland, by promoting national strategies for economic development, especially in agriculture, is approaching the performance achieved by Germany.

REFERENCES

1. *** EUROSTAT. *Date of extraction: Thu, 23 Feb. 2016.*
2. Blaga, L. (1937). *Elogiul Satului Românesc…discurs de primire în Academia Română.*
3. Diamond, J. (2015). *Al treilea cimpanzeu – Evoluţia şi viitorul Omului*. Bucharest, ALL Publishing House.
4. Merce E. & Merce C. C. (2009). *Statistică – Paradigme consacrate şi paradigme întregitoare*. Cluj-Napoca, AcademicPres Publishing House.
5. Merce E. & Merce C. C. (2015). *România după 1989 – de la dezvoltare la distorsiune retrospectivă*. Cluj-Napoca, Grinta Publishing House.
6. Merce E., Merce C. C. & Dumitraş D. (2007). *Puncte de vedere privind aprecierea gradului de modernizare a structurilor agrare*. Timişoara, Scientific papers, Series I, vol. IX.

IMPLEMENTATION RISK ANALYSIS OF CLOUD COMPUTING TECHNOLOGIES AT FARM LEVEL

SIPICĂ ALEXANDRU[1] FURDUESCU BOGDAN[2]

SUMMARY: *If there is some experience of project management in the rural economy on European Union markets, we can say that in Romania things go slowly. This can be primarily distinguished by poor absorption of European funds. Establishing a strategy, set up of Digital Agenda are targets assumed and fulfilled by Romania. However, the use of new technologies in rural areas is still low. This paper aims mainly migratory risk analysis applications used in the business environment in rural areas.*

Keywords: *cloud computing, improve performance, business, management, risk, technologies*.

Clasificarea JEL: Business Management, Agriculture Project Management

INTRODUCTION

In terms of a competition increasingly closer to having that work in the future, it becomes important that everyone clearly demonstrate, precisely and convincingly how can create value by making and make primarily those activities that create value, generating a project-oriented thinking [6] Risks, as explained by various authors (A. Simionescu 2008) Project Management, refer to future conditions or circumstances, which are beyond the control of the project team, which once occurred could have a negative impact on project.

For some, cloud computing is one of the most important technological revolutions which has emerged in recent years. For others, it represents the natural evolution of a set of technologies designed to achieve the long- waited dream of a utility computing. In any event, a large number of stakeholders cloud computing plays a role in the development of their technological strategies [3]

For business, cloud computing offers a real opportunity to diversify the business both by increasing agility business (ability to quickly take advantage of the business opportunity constantly changing, which is the key to success in business today) [2] as and access to smart agriculture

In the activity technical - economic level business environment, understanding of innovations brought by cloud technologies are essential in increasing the performance of all attendees.

MATERIAL AND METHODS

Preparation of this article has considered emerging risks in implementing cloud computing technologies to increase the level of business performances in agriculture. The materials aim specifically research carried out both in the cloud and in the economic field. Research methods are outlined in the primary analysis reports research of cloud computing domain and complemented by theoretical references from the literature.

RESULTS AND DISCUSSIONS

Because risks are often perceived as something detrimental to the project manager's first reaction is to look for ways to combat them. The solution should be designed to eliminate the risk or at least reduce it to take place. Encountered in literature are four methods of risk management [6]

Supporting risk - option is valid only when there is the possibility of bearing effect caused by risk, or when the other risk management options generate higher costs;

Risk monitoring - there are situations when availability of time to monitor risk and see if there is a possibility of disappearing;

---

[1] PHD in Agronomics, National Institut for Research and Development in Informatics ICI București, alexs@ici.ro
[2] PHD sudent in Management at „Valahia" University of Targoviste, bogdan_af@yahoo.com

Avoiding risk - when the possibility of isolation and risk avoidance. If the project is certain stages with high-risk, you can proceed to the elimination stages;

Outsourcing risk - in some cases the responsibility for risk management can be moved out of the project, placing it in the charge of a third party. This third party must be skilled and capable of eliminating the risk.

The risk is manifested in several planes, of which: operational responsibility plan, technological plan and economic – financial plan. Oancea M. believes that Technological risk is manifested by the occurrence of inputs and products, malfunctions of facilities, choice and application of specific technologies or technological works, to specify the timing of their (ex. when trimming sheep, carrying irrigation etc.) [5]

Through scientific research and documentation through professional competence, responsibility and control can reduce the influence of technological risk. Technological risk is part of operational risk, that risk may have be influenced by a number of actions from staff units as: sabotage, embezzlement, forgery, slack etc.

In literature, Cloud Computing represents a very dynamic at the moment, with new providers and new offerings arriving all the time. There are a number of security risks associated with cloud computing, which must be properly addressed, so:

Loss of government services. For public cloud deployments, gives users control necessarily a cloud provider on a number of issues related to security impairment. Another problem that can occur simultaneously is that cloud service level agreements (SLA) cannot provide for such a commitment from the provider of cloud capabilities, thus leaving gaps in security.

Responsibility ambiguity. Given that the use of cloud computing services are spread throughout organizations, in both the cloud service provider and the beneficiary (users from the business of agriculture), responsible for security matters may be spread to both organizations. The division of responsibilities between the consumer society and supplier may vary depending on the model used for cloud computing (eg, compared with SaaS IaaS).

Failure isolation. Multi-hire services and shared resources are defining characteristics of cloud site is public. This risk category relates to the failure of mechanisms separating and use of: storage, memory, routing and even reputation between different beneficiaries (eg, so-called guest-hopping attacks). [7]

Provider. Dependence on proprietary services of a particular cloud provider could lead to binding consumer that provider. Services that do not support application portability, and other providers increase the risk of data unavailability of data and services.

Compliance and legal risks. Investments in achieving certifications (eg industry standard or regulatory requirements) may be endangered by migration, and use Cloud Computing, where the provider cloud cannot provide evidence of their compliance with the relevant requirements or if the provider cloud does not allow audit.

It is the user's responsibility to verify cloud provider has the proper certifications in place. It is also necessary for the farm manager to be informed about the security division of responsibilities between the consumer and supplier ensuring that consumer responsibilities are handled when using cloud computing services.

Handling security incidents. Detection, reporting and subsequent management of security breaches are a concern for firms in the rural economy, which expects cloud service providers to manage such problems.

Vulnerability management interface. Interface Management public entity in rural areas by a cloud provider are usually accessible via the Internet and media. Access to larger sets of resources compared to traditional hosting providers increased risk, especially when combined with remote access and web browser vulnerabilities

Protecting data. Cloud computing technology presents several risks for data protection for consumers in rural and cloud providers. Major concerns are not only exposure or release of sensitive data, but also include the loss or lack of data. In some cases, it may be difficult for the user's cloud (in the role of data controller) to check effectively use practices cloud provider data and

be sure that the data is used in a lawful manner. This problem is exacerbated in cases when there are multiple data transfers, for example, between the federated cloud services.

Internal malicious behaviour. Damages for actions malicious internal users working within an organization can be substantial, given access and authorizations they may have. This is exacerbated in the cloud from such an activity that could take place either at one or both organizations (client or supplier).

Cloud provider business failure. Such failures could cause business critical data and applications to be unavailable to users.

Unavailability service. This could be caused by a number of factors, from equipment or software or any errors in the data center provider, the failure of communications between consumer systems and services provider.

Erasing unreliable or incomplete data. For example, cloud resources deletion requests when a customer (manager of a farm) canceled its services from one provider, it cannot really erase the data. Because there is a possibility that the disc store other applications or information for proper with other guests, or children security features which are stored but not available, deletion will take a longer time, which can become an inconvenience for managers holdings in the environment rural economy.

In the case of the multi-tenancy and reuse of hardware, remove unreliable data represents a greater risk to the consumer than any dedicated hardware. [2, 7]

Table 1. List of security risks in cloud computing

RISK	SPECIFICATIONS
User access rights	Cloud service providers generally have access to information (data) users, such controls are necessary to address the risk of privileged user rights that can lead to compromised customer data;
Location and separation	By definition of cloud computing, it is noted that customers may not know where their data is stored and cannot be a risk of storing data and personal information of clients;
Data erasing	Clearing data from the cloud and their permanent removal is considered a risk, especially when the hardware is dynamic and delete customer data according to their needs. Property cloud services for customers to demand an investigation report electronically limited to delivery model and complexity of the architecture used. The risk that data will not be deleted from databases, backup partition, is increased in the cloud;
Electronic Investigation and product monitoring	Cloud services property for customers to demand an electronically investigation report limited to delivery model and complexity of the used architecture. Customers can not effectively implement monitoring systems infrastructure that they are not hold, they

	should be based on systems used by cloud service provider to support the investigation.
Ensuring security in the cloud	Customers cannot easily ensure the security systems it manages directly without using SLA and have the advantage of controlling their security agreement

Processed: Jaydip Sen, Security and Privacy Issues in Cloud Computing [4]

CONCLUSIONS

1. Holdings, managers, or economic - financial activity administrator's and / or production, seeking the use of cloud computing services, must carry out a comprehensive review and refine the own migration risks to the cloud.
2. Cloud providers must provide all necessary information to clients that request cloud services;
3. Security and legal security for business users in agriculture should be the key drivers that underpin tenders for cloud services;
4. Technically, the choice of cloud provider is apparently not a difficult decision for managers of agricultural holdings, given that most services are similar. However legal compliance, especially in European Union data protection legislation, must be considered eliminatory criterion for bids;
5. Creating or running a business especially in the agricultural business environment is a challenge for any manager. Adapting to modern technologies is an unwritten rule imposed on the market. Risk analysis has played and will play a key role in the development and set up of any business.

BIBLIOGRAPHY

1. Cloud Standards Customer Council, 2012, Security for Cloud Computing 10 Steps to Ensure Success, document can be found at: http://www.cloud-council.org/Security_for_Cloud_Computing-Final_080912.pdf;
2. Eve B. Achieving Business Agility with Data Virtualization., 2011, document can be found at: http://stats.manticoretechnology.com/ImgHost/582/12917/2011/News/DBTA_Dec2011.pdf;
3. Grupul de lucru pentru protecţia datelor instituit în Temeiul articolului 29, 2012, document can be found at: http://ec.europa.eu/justice/data-protection/article-29/documentation/opinion-recommendation/files/2012/wp196_ro.pdf;
4. Jaydip Sen, Security and Privacy Issues in Cloud Computing, document can be found at: http://arxiv.org/ftp/arxiv/papers/1303/1303.4814.pdf;
5. Oancea M, Managementul, Gestiunea Economică şi Strategia Unităţiilor Agricole, 2007, Editura Ceres;
6. Simionescu A,, Bud N, 2008, Managementul Proiectelor, Editura Economică, ISBN 978-973-709-404-9;
7. Sipică A. Furduescu B., 2015, Raport de cercetare "Identificarea de soluţii tehnice privind funcţionalitatea şi omogenizarea bazelor de date într-un sistem de Cloud", ICI Bucureşti.

EVALUATION OF AGRICULTURAL SUPPORT IN THE REPUBLIC OF MOLDOVA

OLGA SHIK[1], ALEXANDRU STRATAN[2], ANATOLIE IGNAT[3], EUGENIA LUCASENCO[4]

Summary: *This paper presents the outcome of the study conducted by the Food and Agriculture Organization of the United Nations in collaboration with the National Institute for Economic Research in the Republic of Moldova. The paper assesses the level and structure of government support to agriculture in Moldova by using a combination of formal quantitative, informal quantitative and qualitative analysis. Application of the PSE methodology by OECD provides a standardized quantitative method of measurement of support to agricultural sector. The methodology is based on comparing output producers' prices (farm gate prices) with prices expected without policy interventions, e.g. market equilibrium or reference prices. Reference price must be selected in a way that best represents the opportunity costs of producing the commodity domestically. The effect of the public policy is measured by the difference between market and reference prices. If the difference between market and reference output prices is positive, policy causes benefits to producers, and if negative – policy leads to implicit taxation of the farmers. The paper suggests strategies and policy actions in order to increase efficiency of public support to agriculture with the focus on export growth.*

Keywords: *agricultural support, Producer Support Estimate, Market Price Support, evaluation*

JEL:

INTRODUCTION

The agricultural sector plays a key role in the Moldovan economy. In 2015, agriculture accounted for 11.7% of GDP and for 31.7% of total employment; approximately 2 million people (57.5% of the total population) live in rural areas.

Moldova's mild favourable climate and high quality soils determined Moldova's agricultural specialization, particularly in the production of high value crops like fruits and vegetables.

Large scale agricultural companies produce mostly low value-added crops (such as cereals, oilseeds, sugar beet). About two thirds of agricultural land is cultivated by agricultural farms that cultivate more than 50 ha of land. These companies form the export potential of the agri-food sector.

The agricultural sector of the Republic of Moldova has undergone significant changes in the last years. A specific emphasis has been recently made on the modernization and development of the agricultural sector. Only a limited number of studies evaluating the current state of agriculture support in Moldova have been conducted so far, and this is the first attempt to apply the PSE methodology to develop policy strategies for agricultural export promotion.

MATERIALS AND METHODS

This paper assesses the level and structure of government support to agriculture in Moldova by using a combination of formal quantitative, informal quantitative and qualitative analysis.

Application of the PSE methodology by OECD provides a standardized quantitative method of measurement of support to agricultural sector. The methodology is based on comparing output producers' prices (farm gate prices) with prices expected without policy interventions, e.g. market equilibrium or reference prices. Reference price must be selected in a way that best

---

[1] Dr., Olga Shik, Agricultural Policy Consulting, shikolga@gmail.com

[2] Dr., prof., Alexandru Stratan, National Institute for Economic Research, Republic of Moldova, alex_stratan@yahoo.com

[3] Dr., Anatolie Ignat, National Institute for Economic Research, Republic of Moldova, anatolie.ignat@gmail.com

[4] PhD student, Eugenia Lucasenco, National Institute for Economic Research, Republic of Moldova, eugenia_lucasenco@yahoo.com

represents the opportunity costs of producing the commodity domestically. The effect of the public policy is measured by the difference between market and reference prices. If the difference between market and reference output prices is positive, policy causes benefits to producers, and if negative – policy leads to implicit taxation of the farmers.

OECD recommends, that the average share of the sum of the values of the selected set of representative commodities (MPS commodities) in the total value of agricultural production for the last 3 years is not less than 70%, and the share of each selected commodity is >1%. The representative set of commodities selected in Moldova is presented in Figure 1.

Figure 1. Share of Selected MPS commodities in Total Value of Agricultural Production, %
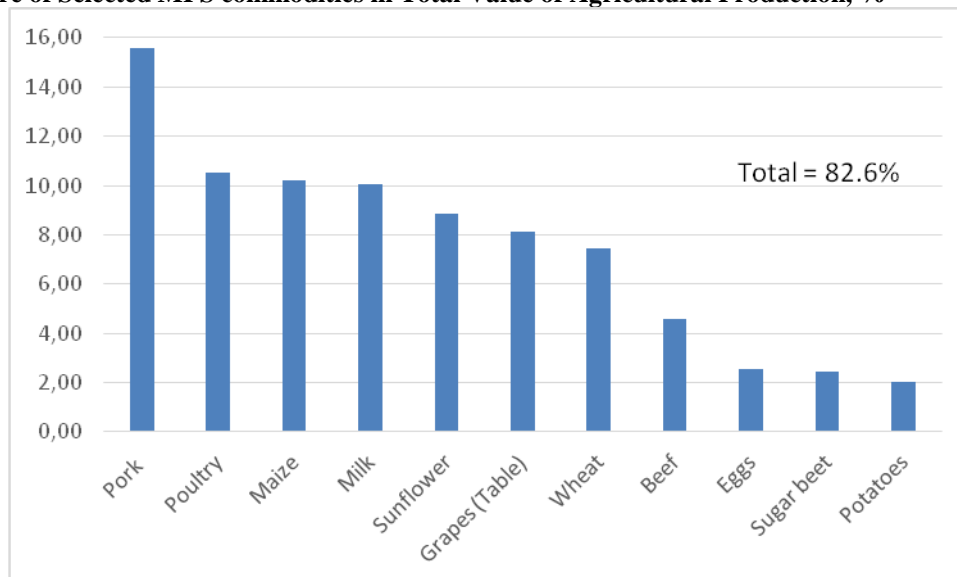
Source: authors estimation based on National Bureau of Statistics, Moldova

RESULTS AND DISCUSSION

The level of support to agricultural producers measured by PSE is low and volatile, fluctuating between +6% and -21% in the period of study (Figure 2). Both market price support and budget transfers components of PSE were volatile, however, the share of MPS in PSE was much higher, and in some years the level of budget transfers was not high enough to compensate for negative MPS, resulting in negative PSE. However, in some years, namely in 2009 and 2012 the level of budget transfers was higher than MPS.

Average percentage PSE in 2012-2014 equalled -10%, which means that implicit taxation of the producers arising from agricultural policy was equal to ten percent of total farm receipts.

Figure2. Producer Support Estimate composition in Moldova, 2006-2014
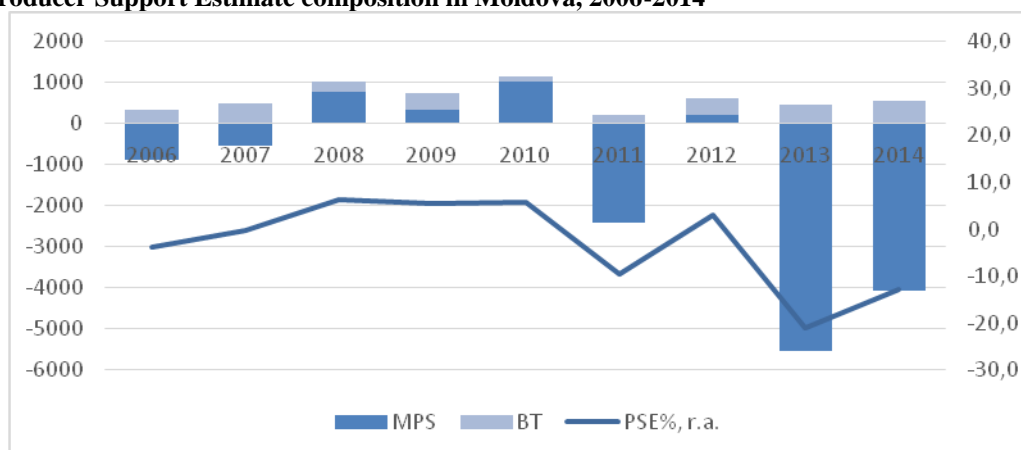
Source: authors' estimations

In Moldova, like in most developing countries, the major component of the PSE is price support (MPS). The development of PSE composition in OECD countries demonstrates that with the development of the economy budget transfers, especially those that are not directly connected to the production and do not distort trade, play more and more important role. Thus, while during the 1980s, MPS was the main component of support for the countries in OECD area, with time the importance of decoupled payments is growing. The same trend is followed by most developing countries, therefore, it is important to monitor and analyze budget transfers to agriculture, even if they do not play a major role in support to producers now, they will most likely play more important role in the nearest future.

Market Price Support

The level of support by commodity is measured be MPS (transfers from consumers and taxpayers measured by the price difference) and SCT% (MPS plus transfers from taxpayers in the form of budget payments as a share of gross farm receipts).

Market price support is the form of support directly affecting the production decisions, and therefore, distorting markets and trade. Negative market price support in recent years in Moldova is favorable for the consumers of agricultural products and indicates potential price competitiveness for exported commodities.

Government's policy of regulating the price mark-ups along the value chain, is aimed at protecting consumers, and contributes to the negative MPS, or taxation of agricultural producers. In the absence of this type of policy, producers would benefit from better transmission of the world prices to domestic markets.

Figure 3. Market Price Support in Moldova, mln. MDL
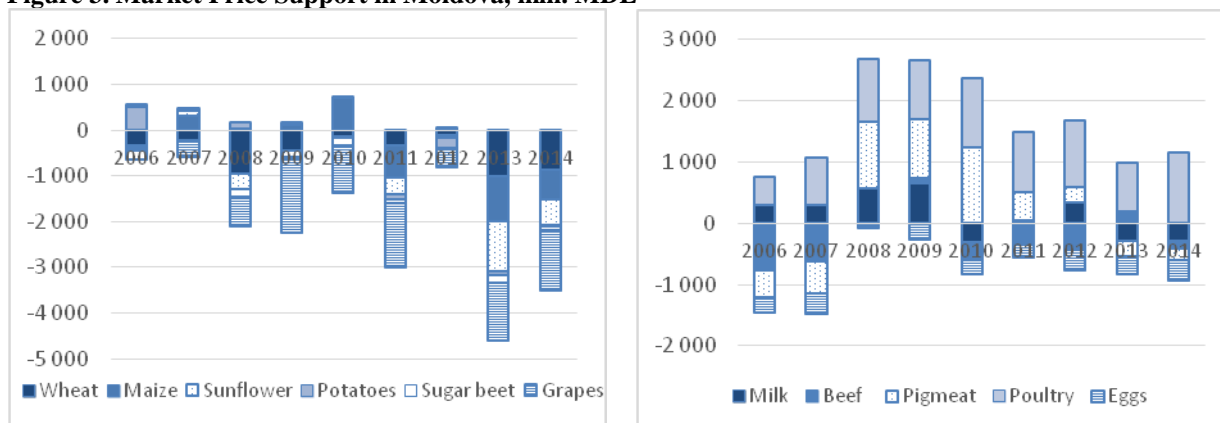
Source: authors' estimation

In Moldova, MPS commodities can be grouped into three categories by the level of support: cereals and oilseeds, fruits and vegetables and livestock products. MPS for cereal, oilseeds and sugar beet was mostly negative and very volatile. The volatility of MPS was mostly caused by domestic price fluctuation.

Grapes, an export-oriented commodity, was taxed in all years except for 2006, while potatoes where supported till 2010, and taxed in 2011-2014.

Livestock sector, on the other hand, especially poultry, received higher levels of price support.

High level of support to livestock sector in some years can be partially explained by artificial protection to the market created by underdeveloped infrastructure. Underdeveloped infrastructure creates "natural protection" for the domestic markers (Josling, 2011), and thus PSE results overestimate actual support to producers, who suffer from infrastructure deficiencies. Farmers have to bear additional costs to overcome the infrastructure deficiencies: pay bribes at road checks, pay to access information that is not publicly available, etc.

The aggregate national MPS in Moldova is a combination of high level of support in poultry subsector and implicit taxation in the rest of the sector, and therefore, should be interpreted with care.

Support to Producers by Commodity
Single Commodity Transfers (SCT) to agricultural producers in Moldova as a percent share of gross farm receipts are summarized in
Figure 4. The level of support to most commodities reduced in recent years, and poultry remained the only supported commodity in 2012-2014.

Figure 4. Producers Single Commodity Transfers in Moldova, %
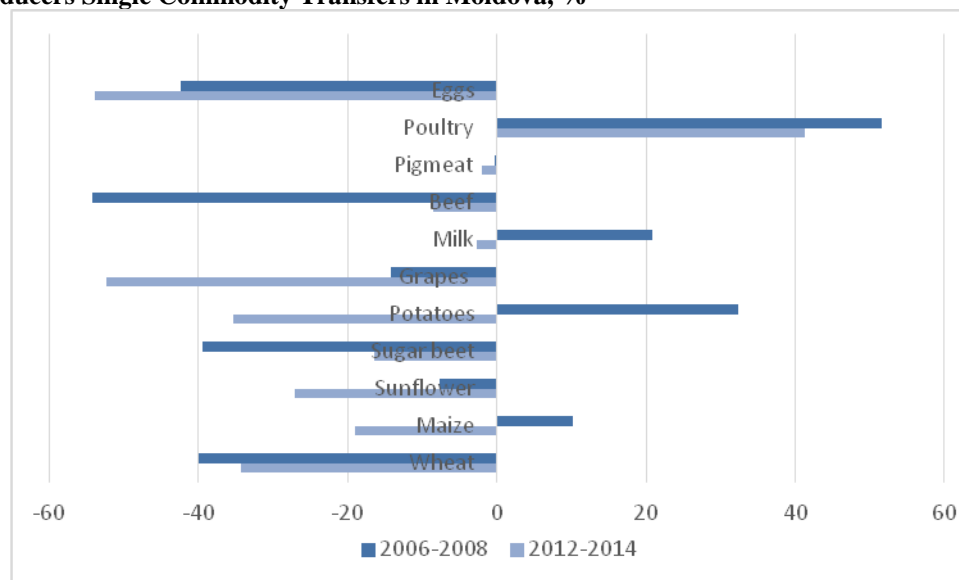
Source: authors' estimation.

Cereals, Oilseeds and Sugar
Cereals play an important role in Moldova's agricultural exports. However, the level of production is volatile and vulnerable to climate events (draughts of 2007 and 2012).
Both producers' and reference prices of wheat were volatile, and MPS remained negative during the whole period of study. Maize MPS was positive in most years, but became negative in 2013-2014. Both in wheat and maize subsectors, stable prices at the world markets in the recent years were not transmitted to the local farm-gate level.
Sunflower subsector contributed more than the rest of the subsectors to the level of national PSE. The producers in this sub-sector were taxed and the value of implicit taxation increased in recent years, reaching 23% of total farm receipts in 2012-2014.
Sugar MPS was negative during the whole period of study. Sugar production is considered by the Government as an industry with a large export potential. Domestic market enjoys substantial level of protection from imports (in-quota tariff rate is 10%, above quota – 75%). However, this level of protection is not transmitted to the farm-gate level.

Fruits and Vegetables
Grape and wine sector is very important for Moldovan economy and is a major contributor to export revenues and to national budget. At the same time, grapes production is volatile, and the average productivity is low.
Due to the data availability limitations, only table grapes where included in PSE analysis. MPS for potatoes was positive in 2006-2010 and negative since 2011.

Livestock

Import-competing subsectors, like livestock in Moldova, usually receive more price support than exporting subsectors. Major obstacle to entering European markets is a necessity to comply with strict food safety requirements. Such compliance requires considerable public funds, institutional, administrative and capacity development efforts along the whole value chain.

While farm-gate price of milk followed the reference price trends, MPS for milk was slightly negative in 2010, 2013 and 2014. Pork MPS, while being positive in most years, became negative in 2013 and 2014.

Beef subsector was mostly taxed, however MPS was positive in 2009 and 2013.

Poultry is the only commodity which was supported during the whole period of study, with SCT over 50% in 2007-2010 and close to it in the following years. This means that transfers from taxpayers and consumers constituted about 50% of total receipts of poultry farmers. On the other hand, eggs MPS stayed negative.

Budget Support Evaluation

Budget transfers are included in PSE as a separate component, however, since domestic agricultural policy affects producer's prices by implicitly or explicitly preventing price transmission, their effect is also reflected in MPS.

The break-down of budget expenditures according to the PSE methodology was designed in order to facilitate the evaluation of the share of the most distorting measures in the budget, as well as the share of budget expenditures to the general services – the least distorting measures.

On-farm infrastructure development and support to purchase of machinery and equipment is the main focus of the transfers to producers in Moldova (Figure 5). Output-based and other most distorting measures are not currently applied.

Figure 5. Budget Transfers to Agricultural Producers in Moldova, mln MDL
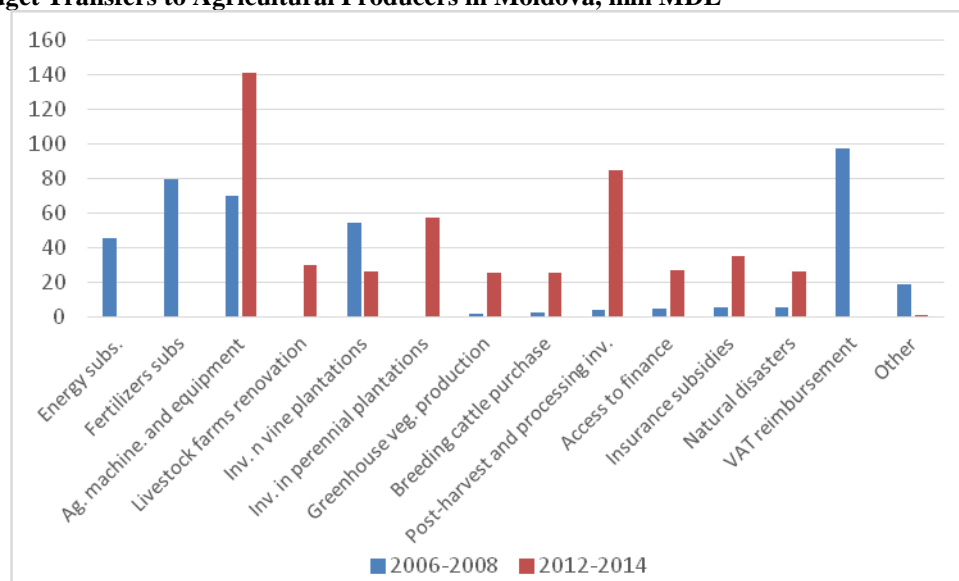
*VAT reimbursement subsidy was not estimated in 2012-14
Source: authors' estimation based on BOOST and AIPA data

Support to General Services and Total Support Estimate

The majority of support to general services is transfers to inspection and control. It is understandable because acquiring access to EU markets requires strict inspections to confirm compliance with food safety standards.

Figure 6. General Services Support Estimate Composition, Moldova, 2012-2014
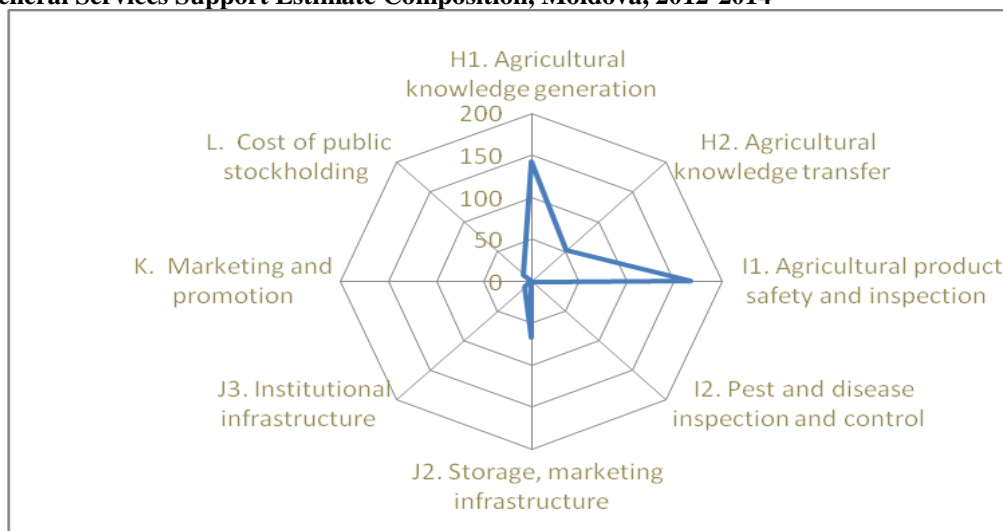
Source: authors' estimation.

GSSE measures the budget transfers to support infrastructure not only in the form of the investment in physical infrastructure, but also of assistance in production marketing, extension centers, information dissimilation, etc. Underdevelopment of infrastructure refers not only to the physical, but also to commercial and institutional infrastructure. Weak institutions, lack of storage and collecting facilities for fruits and vegetables, unavailability of market information are among the factors affecting agricultural producers which are reflected in PSE. A recent study has demonstrated, that GSSE spending contribute most to the long-term competitiveness and growth in agriculture[5].

Figure7. Total Support Estimate Composition, Moldova, 2006-2014
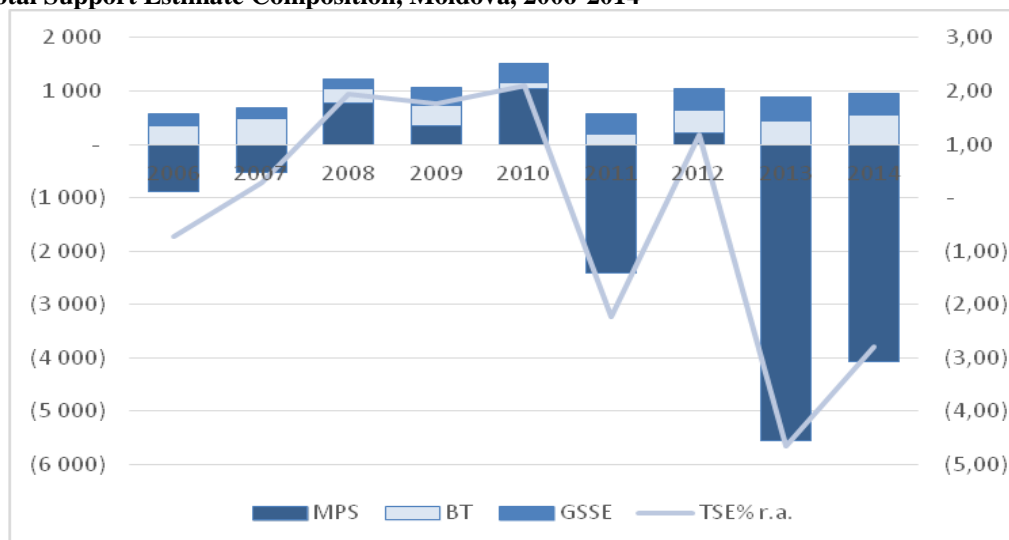
Source: authors' estimation

Total support estimate is a combination of support to producers individually, collectively and transfers to consumers from taxpayers.

TSE in Moldova in 2012-2014 amounted to -3 bln MDL. It was -2% as a percent share of GDP

Figure. Support to consumers does not exist in Moldova, and like for PSE, MPS remained the main driver of TSE fluctuations during the whole time period.

---

[5] The results show, that a shift of 10 percentage points of the agricultural budget from private goods to general services, leads to approximately a 5 percent increase in value added per capita. To achieve the same increase would require an increase of approximately 25 percent or more in total spending while holding the mix constant (Anríquez, Foster et al, 2016).

Positive TSE in 2008-2010 and 2012 should be treated with care, as it reflects two opposite trends in agricultural policy: protection of poultry and pork, and implicit taxation of crops.

CONCLUSIONS

The results of PSE estimations in Moldova suggest the following observations:

- The level of transfers to agricultural producers is low or negative during the whole period of study.

- Aggregate national MPS in Moldova is a combination of high level of support in poultry subsector and implicit taxation in the rest of the sector.

- Support to general services plays important role in the structure of budget transfer to agriculture, with a focus on infrastructure development and safety control.

- However, soft infrastructure development, such as contracting support, information system, and marketing and promotion do not get sufficient attention.

- Positive value of TSE in some years should be treated with care as it reflects two opposite trends in agricultural policy, protection of livestock and taxation of crops.

BIBLIOGRAPHY

1. Annual Statistical Yearbook, National Bureau of Statistics, 2015
2. BOOST database, http://www.mf.gov.md/actdoc/BOOST
3. *FAO*. 2015. MAFAP Methodological paper: Volume I. Analysis of price incentives. MAFAP Technical Notes Series, Rome, Italy: FAO.
4. Gustavo Anríquez G., Foster W., Ortega J., Falconi C., De Salvo C.P. 2016. Public expenditures and the performance of Latin American and Caribbean agriculture. IDB Working Paper Series 722
5. Marsden, K., Garzia, M. 1998. Agro-industrial Policy Reviews: Methodological Guidelines. Rome: FAO.
6. NATIONAL STRATEGY ON AGRICULTURE AND RURAL DEVELOPMENT FOR THE PERIOD 2014-2020. 2014
7. ----. 2010. *OECD's Producer Support Estimate and Related Indicators of Agricultural Support: Concepts, Calculations, Interpretation and Use (The PSE Manual)*. Paris, France: OECD.
8. Republic of Moldova Food Security Assessment Analysis of the Current Situation and Next Steps, April 24, 2015, World Bank Report
9. Stratan A., Moroz V., Ignat A., Lucasenco E., Moldova country report, made in the framework of the project AGRICISTRADE, 2015
10. Tangermann, S. *Agricultural Policies in OECD Countries 10 Years After the Uruguay Round: How Much Progress*. Paper presented at IATRC Meeting, "Agricultural Policy Reform and the WTO: Where are We Heading?" Capri, Italy, June 23-26, 2003.
11. UNComtrade.org
12. Volk T., Erjavec E., Rac I., Rednak M. 2015. "Exploring the Potential for Agricultural and Biomass Trade in the Commonwealth of Independent States. Policy Report.".
13. Moldova Public Expenditure Review: Agriculture, World Bank Final Report 2015

AN ANALYSIS OF THE ROMANIAN AGRI-FOOD INTERNATIONAL TRADE EXPANSION DURING THE POST-ACCESSION PERIOD

GAVRILESCU CAMELIA[1], KEVORCHIAN CRISTIAN[2]

Abstract: *Romania's accession to the European Union meant the free access of its agri-food products on the European Single market, without tariff barriers or export quotas, as well as a better access on the international markets. At the same time, it meant the free access on the Romanian market of competitor products coming from the other member states. After a two-year period of adaptation to the new „rules of the game", and the overcome of the economic crisis shock manifested in 2009, the agri-food exports increased significantly, at a faster pace than the imports, so as the agri-food trade balance deficit, after reaching a peak in 2008, diminished continuously until it turned to surplus in 2013 and 2014, just to go back to a slight deficit again in 2015. The paper is analyzing the evolution of agri-food exports and imports, with focus on latest export developments, in terms of value, product composition and geographical orientation of the trade flows.*

Key words: *agri-food products, extra-community exports, intra-EU trade, Romania*

JEL classification: F14, Q17

INTRODUCTION

The evolution of the Romanian agri-food trade during the last 25 years may be divided in three different periods, each with specific characteristics: transition period, pre-accession period, and EU membership (post-accession period).

The economic and systemic crisis that Romania faced during the transition period from a centrally planned to a market economy came to an end in 2000. The fractures and dysfunctionalities occurred in the agri-food chains as a result of changes in the ownership regime and in economic mechanisms were reflected in the insufficient capacity to cover the domestic demand (in quantity and quality terms) and in a low competitiveness of Romanian agri-food products on international markets. Therefore, the Romanian international agri-food trade showed for a long time a negative balance.

Joining CEFTA in 1997 meant the beginning of the process of alleviation of the previous severe protectionist policies: elimination of import and export restrictions and the adoption of a moderate tariff regime. These came together with trade facilities (among the CEFTA member countries), which added to facilities resulting from the Association Agreement with the EU (in force since 1995). The competition pressure of the imported agri-food products on the Romanian markets found the domestic agri-food producers almost completely unprepared to face it. In different areas of the food chains, privatization was progressing at different paces, resulting in insufficient and inefficient domestic supply (Gavrilescu, 2014a). Thus, a good part of the Romanian agri-food markets was lost to the domestic producers in favor of cheaper imported products. The proximity of the EU accession put even more pressure on the Romanian agri-food producers. At the same time, it pushed for increasing investments through pre- and post-accession investment programs (such as SAPARD and NPRD) in the basic agricultural sector, and for increasing investments with both foreign and domestic capital in the food processing sector. The result was capitalization in basic agricultural sector – slow, but continuous - and modernization in the food processing sector, which, started regaining slowly the domestic agri-food markets, and on the other hand, started entering the Single Market while observing the quality and food safety requirements.

---

[1] Dr. Camelia Gavrilescu, senior researcher, Institute of Agricultural Economics, Romanian Academy; email: cami_gavrilescu@yahoo.com
[2] Dr. Cristian Kevorchian, senior researcher, Institute of Agricultural Economics, Romanian Academy; email: ck@fmi.unibuc.ro

MATERIAL AND METHODS

In order to ensure data consistency and comparability with other countries, the source for the data was Eurostat trade database (Comext), in the Combined Nomenclature, at two-digit level (HS chapters 01-24). Intra-community trade (dispatches and arrivals) was separated from the extra-community and general trade (according to Eurostat – Agriculture Trade Statistics). EU trade as a total and by country was calculated with the contributions of each new member country since its first year of accession: EU-25 for 2004-2006, EU-27 for 2007-2012 and EU-28 for 2013-2015. The hierarchy, values and directions of exchanges were analyzed, as well as the composition of the main trade flows.

RESULTS AND DISCUSSIONS

The year 2000 marked the country's exit from the "transition" crisis and the entry into a period of economic development that coincided with the pre-accession to the EU. By 2006 (the last year before EU accession), exports doubled, the value of imports multiplied 2.4 times and the agri-food trade deficit increased 2.5 times.

The Romanian agri-food trade increased continuously since 2002. In the pre-accession period (2002-2006), the export value increased by 85%. After accession, growth accelerated: in the first year, exports increased by 30% as compared to 2006. The advantages of the presence in the Single Market, the significant support for agriculture coming from the CAP budget, together with the pre- and post-accession development programs, that took form of important investment in both production farms and in modern processing units, aligned to the EU quality standards, have resulted in spectacular growth of Romanian food exports (Gavrilescu and Voicilas, 2014). After the first two years of EU membership only, the export value was 2.5 times higher than in 2006. Then, all along the post-accession period, exports continued to expand significantly: in 2015 (9 years of membership), the export value was 6.9 times higher than in 2006, last year before accession (EUR 5.6 billion).

Imports increased as well during the pre-accession period, by 95% between 2002 and 2006. Besides the significant export expansion, the first two years after accession meant an even more massive penetration of agri-food imports (as compared cu previous years): + EUR 0.9 billion in 2007 as compared to 2006 and + EUR 1 billion in 2008 as compared to 2007. The pace of the imports growth in the post-accession period proved to be slower than the one of exports: the import value was in 2015 only 2.5 times higher than in 2006.

The coverage of imports by exports varied around 35% in the pre-accession period, resulting in a negative trade balance (figure 1). Since the imports grew faster in both real and relative terms than exports, the deficit increased continuously. The shock of accession resulted in a maximum value of the deficit (EUR -2.2 billion). Nevertheless, in their first two years after accession the same happened to most of the other new Member States, so it can be considered as a necessary period of time for adapting to the EU membership status.

The effects of the crisis became apparent in the Romanian agri-food trade 2009, by a 12% reduction in imports, but the exports managed to remain on an upward trend. The free access to the EU Single Market and the devaluation of the national currency were factors favoring exports (Gavrilescu, 2014b).

As a result of the accelerated increase in agri-food products exports in 2010-2015, combined with a slower pace in imports increase, the ever-increasing trend of the deficit reversed. Moreover, the deficit diminished rapidly, by 81% in just four years: from the maximum of EUR -2,215 million in 2007, down to EUR -425 million in 2011, increased slightly in 2012 (due to a very bad agricultural year which pushed up imports) (EUR -750 million), and eventually in 2013 it turned to surplus (EUR +337 million) for the first time after 25 years. The surplus increased in 2014, reaching EUR 455 million, but turned again into a slight deficit in 2015 (EUR -125 million).

Changes in the Romanian intra-EU agri-food trade

Since 1995 (enforcement of the Association Agreement with the EU), the Romanian agri-food trade became increasingly oriented to the EU. The share of exports to EU countries in the pre-accession period varied between 70-77%.

Figure 1 – Coverage of total agri-food imports by exports (%)
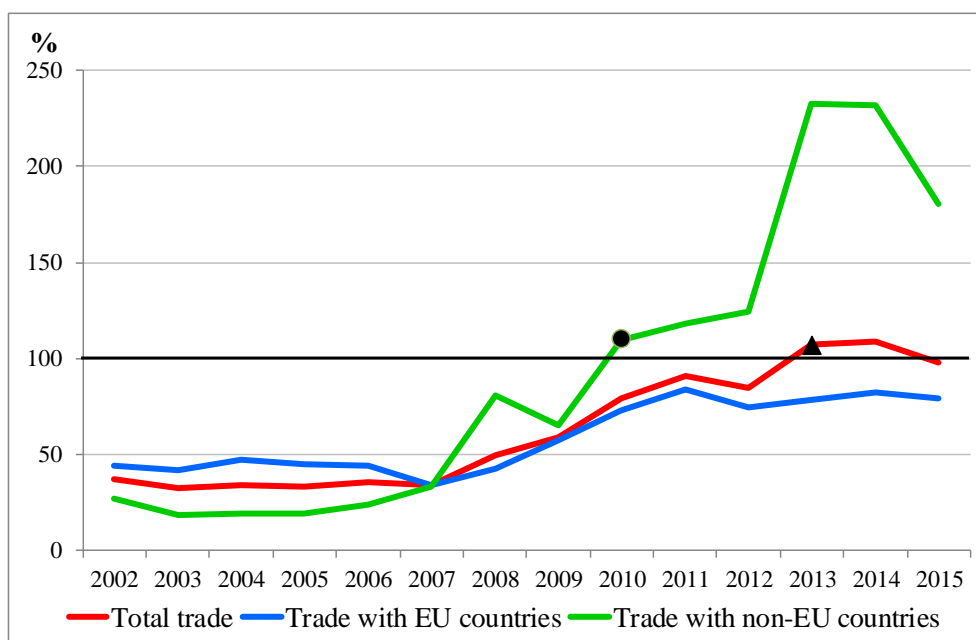
Source: calculations using Eurostat data

After accession, the intra-EU exports share reached a maximum of 79% in 2009 and subsequently decreased in relative terms, while increasing in absolute terms. Imports from EU countries varied in the pre-accession period between 54-59%, but after accession, their share doubled, due to the community preference principle and to the fact that Romania applied the Community customs rules and tariffs (figure 2).

At the time of its accession to the EU, Romania was presenting itself with an agri-food sector far less developed and efficient as compared to the Old Member States, and even to the New Member States that joined the EU in 2004 (Gavrilescu and Voicilaş, 2014). The opportunities offered by the free access on the Single Market and the financial support from the Common Agricultural Policy boosted the development efforts, which yielded important efficiency and output gains in the product chains, reflected inter alia in a significant expansion of the agri-food exports.

The Romanian agri-food trade with the EU countries increased significantly during the post-accession period. In value terms, exports multiplied by a factor of 6.7 (2015 as compared to 2006, last year before accession). Imports expanded as well, but at a slower pace, only 3.6 times between 2006 and 2015. In the first two post-accession years, the Romanian trade deficit with the EU countries reached its maximum values, since it took a couple of years to adapt to the new condition of EU member state. The Romanian intra-EU trade deficit contributed to the general agri-food trade deficit by large shares (by 74% in 2007 and by 94% in 2008). In the subsequent years, the trade deficit with the EU countries diminished significantly (figure 3): from the peak of 2008 (EUR -2 billion), to less than half in 2010-2015 (EUR -0.8 billion).

Still, the Romanian agri-food products are not competitive enough on the Single Market, thus the trade balance remained negative to the present day.

The geographical directions for the Romanian agri-food trade with the EU countries, the main destinations for exports were in 2011-2015: Italy, Bulgaria, Hungary, Netherlands and Spain, accounting together for 62% of the intra-EU export value.

Figure 2 - Share of intra-EU and extra-EU flows in total Romanian agri-food exports and imports
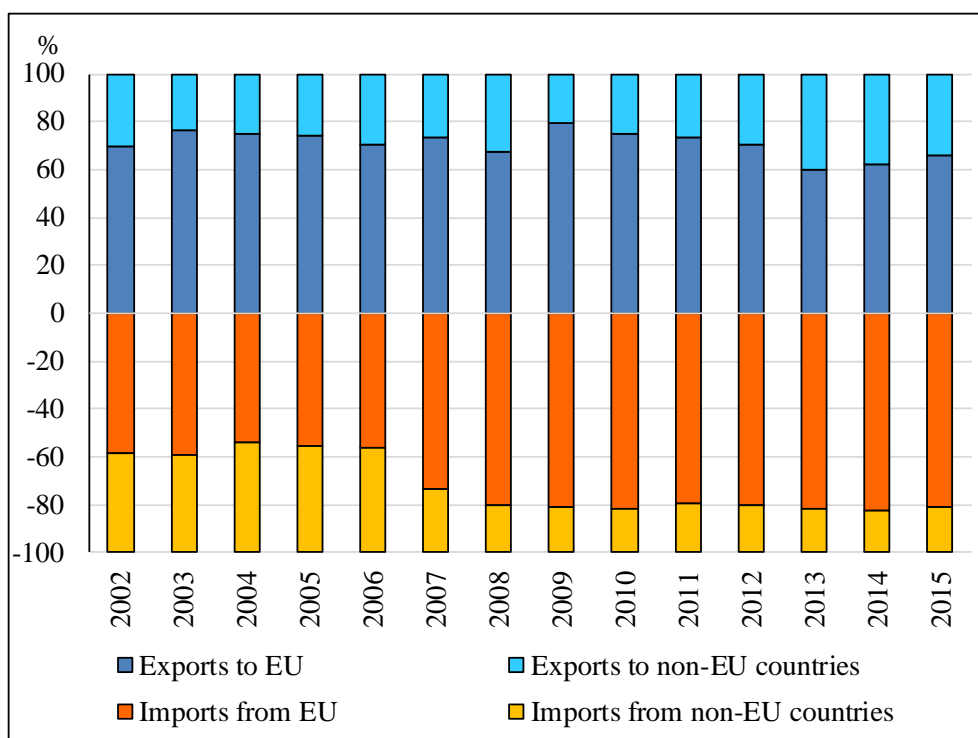
Source: calculations using Eurostat data

Figure 3 – Romanian agri-food trade with EU member countries
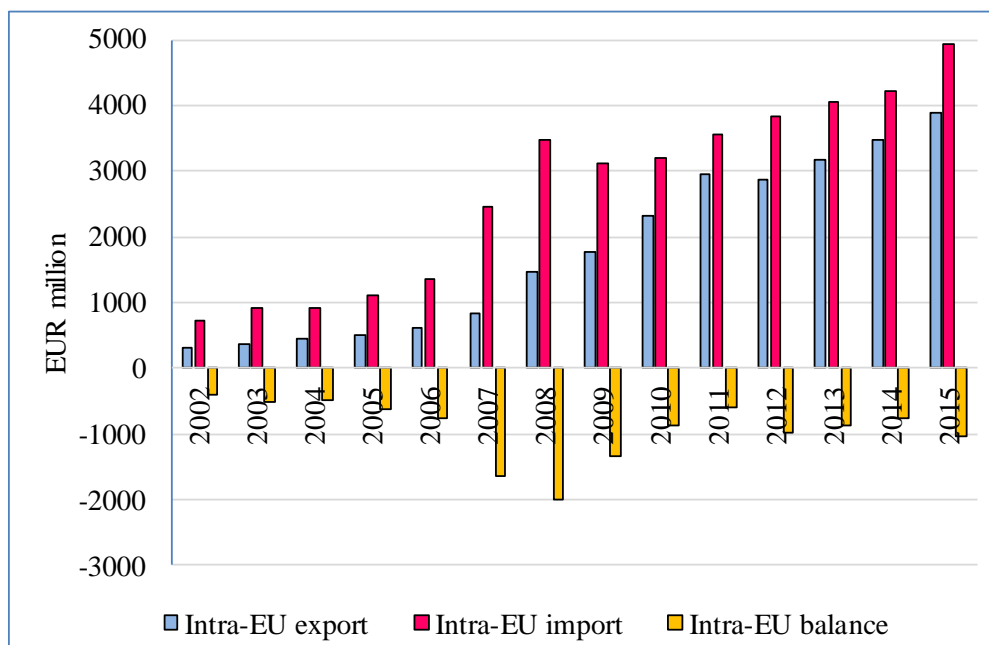
Source: calculations using Eurostat data

Figure 4 is illustrating the changes in the exports and imports to the main EU destinations. Basically, the major destinations remained about the same before and after accession, but the values multiplied significantly between the pre-accession period (the average 2004-2006, we shall mark it as P0), and the two post-accession periods (average 2007-2010 will be marked as P1, and the average 2011-2015 will be marked as P2). To Italy, which is the first destination, Romanian exports

increased 1.9 times between P1 and P2, and 7 times between P0 and P2; to United Kingdom, exports increased 3.8 times in P2/P1, and 14.7 times in P2/P0; to Hungary 2.5 times in P2/P1 and 10 times in P2/P0); to Germany, exports increased 1.9 times during the post-accession period and 13 times as compared to the pre-accession period, etc.

Figure 4 – The Romanian intra-EU agri-food trade: changes in the top 10 export destinations and top 10 import origins
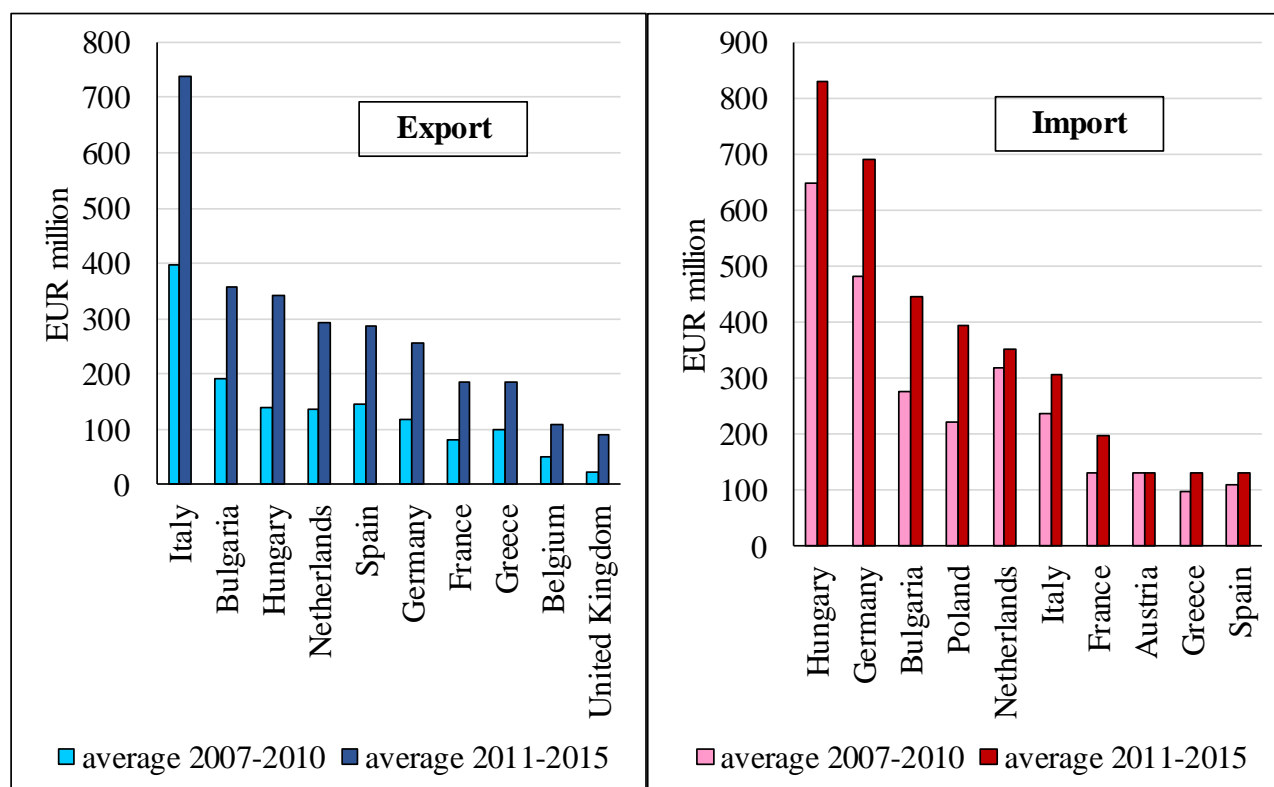
Source: calculations using Eurostat data

The largest agri-food imports were originating (average 2011-2015) from Hungary, followed by Germany, Bulgaria, Poland and Netherlands. These first five origin countries accounted together for 2/3 of the total Romanian intra-EU imports (figure 4).

Imports multiplied as well, but far less spectacular than exports, mainly because they were already very large, and their increasing pace was lower. From the main partner, Hungary, Romania imported in 2011-2015 agri-food products worth 5 times more than in the pre-accession period (2004-2006), while in the post-accession period it increased only 1.3 times (P2/P1). Similarly, imports from Germany and the Netherlands multiplied 4 times (each), and from Italy 3.9 times between P2/P0, while during the post-accession period (P2/P1), they increased only 1.4 times (from Germany), 1.1 times (from Netherlands), and 1.3 times (from Italy) respectively.

The result of these combined evolutions reflected in the trade balance (average 2004-2006 compared with average 2011-2015): with Italy, Greece and Portugal the balance remained positive, and the surplus increased; with Spain and United Kingdom, the balance shifted from negative to positive.

The trade balance remained negative and the deficit increased between the two analyzed post-accession time periods (2011-2015 / 2007-2010) with: Germany, Poland, Bulgaria and Czech Republic; while the deficit diminished in trade with Hungary, the Netherlands and Austria. The trade with Greece, Spain and Italy showed during the post-accession period an increasing trade surplus.

Table 1 is illustrating the changes in the Romanian exports of the 24 groups of agri-food products (HS chapters 01-24 in the Combined Nomenclature) to the EU countries.

Table 1 – Changes in the composition of Romanian intra-EU agri-food trade by product groups

HS chapter	Share in export (%)			Share in import (%)			Balance (EUR million)		
	Average 2004-2006	Average 2007-2010	Average 2011-2015	Average 2004-2006	Average 2007-2010	Average 2011-2015	Average 2004-2006	Average 2007-2010	Average 2011-2015
01	24.4	10.0	4.9	2.7	3.0	3.7	94.6	69.6	8.1
02	3.2	4.0	6.7	22.0	19.2	12.2	-233.7	-522.3	-284.9
03	0.4	0.3	0.4	1.5	2.3	2.4	-15.4	-64.3	-87.0
04	5.1	3.1	3.8	3.3	6.6	6.9	-10.8	-151.1	-160.2
05	1.3	0.7	0.9	0.8	0.7	0.7	-2.4	-9.7	-1.0
06	0.2	0.1	0.1	2.0	2.3	2.2	-21.5	-68.8	-87.1
07	7.5	2.9	2.1	2.7	2.8	3.8	8.1	-40.8	-87.0
08	4.8	2.0	2.0	3.1	3.8	5.8	-10.6	-84.5	-171.8
09	0.3	0.3	0.4	3.5	2.5	3.3	-37.5	-71.3	-120.4
10	11.3	16.3	18.0	3.0	7.6	8.4	24.5	28.2	241.9
11	0.2	0.5	0.4	3.3	3.1	2.5	-37.0	-87.4	-89.5
12	14.8	19.2	17.5	2.1	4.3	4.4	52.1	176.2	388.1
13	0.0	0.0	0.0	0.4	0.4	0.4	-4.8	-12.7	-16.3
14	0.4	0.1	0.0	0.0	0.0	0.0	1.7	0.3	0.5
15	5.8	6.0	5.7	2.8	4.5	4.1	-2.0	-41.7	16.3
16	3.1	2.4	3.0	1.0	1.6	2.3	5.1	-9.7	3.4
17	1.7	2.5	2.5	3.2	4.0	3.0	-27.2	-82.1	-41.1
18	0.5	0.8	1.1	3.0	3.1	4.0	-31.8	-83.1	-129.7
19	3.7	2.2	2.4	5.1	4.9	5.7	-39.2	-115.7	-152.5
20	3.0	1.4	1.1	4.4	4.0	3.6	-34.6	-99.8	-112.1
21	2.2	2.4	2.7	8.5	6.7	6.3	-85.7	-166.3	-170.2
22	3.3	3.0	2.6	4.7	4.8	5.3	-36.0	-98.5	-130.3
23	2.0	2.9	3.2	5.9	4.3	4.8	-56.1	-85.7	-91.3
24	0.4	16.8	18.3	10.9	3.5	4.1	-121.8	159.3	428.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	-622.1	-1,461.9	-845.4

Notes: chapters HS (Harmonized System) 01-24, which are covering all agri-food products: 01-live animals; 02-meat; 03-fish and seafood; 04-dairy products, eggs and honey; 05-other animal products; 06-live plants; 07-vegetables; 08-fruit; 09-coffee, tea and spices; 10-cereals; 11-products of the milling industry; 12-oilseeds; 13-lacs, gums and resins; 14-other vegetable products; 15-oils and fats; 16-meat and fish preparations; 17-sugar and confectionery; 18-cocoa and cocoa products; 19-cereal baking and pastry products; 20-vegetable and fruit preparations; 21-miscellaneous edible preparations; 22-beverages; 23-animal feed; 24-tobacco and tobacco products.
Source: calculations using Eurostat data

The averages used in the analysis allows for a better picture of longer trends, thus the results are less influenced by yearly changes in the exchange rate, by unfavorable climatic conditions or by singular random export opportunities.

The expansion of exports is obvious, for all the product groups between 2007-2010 and 2011-2015. One can observe that export expansion relied basically on very few products, mainly agricultural commodities, such as cereals (group 10 – export value multiplied 2.3 times to reach EUR 589 million in P2), and oilseeds (group 12 - export value multiplied 1.9 times, to reach EUR 571 million in P2). The only group of processed products whose exports expanded noticeably were the tobacco products (group 24 - the export value multiplied 2.2 times in P2/P1, but no less than 322 times between the pre- and post-accession period), as a result of an FDI (foreign direct investment) in a large processing unit for tobacco products. The other processed products (HS 15-23) showed a more moderate expansion in exports, but nevertheless, their value increased several times as compared to the pre-accession period: HS-15 - oils and fats increased 5.9 times to reach EUR 177 million), HS-16 - meat and fish preparations increased 7.1 times and reached EUR 114 million. For HS-19 - cereal baking and pastry products, HS-21 - miscellaneous edible preparations and HS-22 -

beverages the export value increased 4.9 times, 8.2 times and 5.1 times respectively. During the post-accession period, all these product groups doubled at least their export value, and reached about EUR 90 million each.

Changes in the Romanian extra-EU agri-food trade

Due to the pre-accession membership to several free trade agreements (with Republic of Moldova, Turkey and Israel), Romanian trade with non-EU countries increased significantly. In the pre-accession period, exports increased 1.8 times. After accession, extra-EU exports increased spectacularly: in 2012 they were 4.7 times higher than in 2006. But the real progress came since 2013, when Romania was able to penetrate the Middle-Easter markets: in 2013-2015, exports were almost double as compared to 2012, and 8.5 times higher than in 2006 (figure 5).

Figure 5 – Romanian trade with non-EU countries
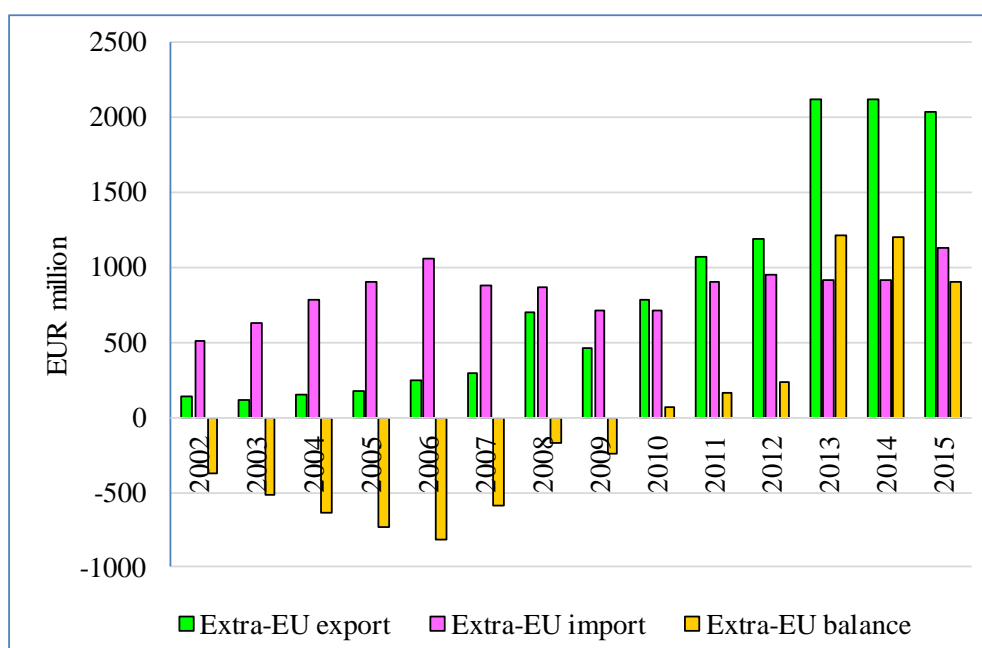
Source: calculations using Eurostat data

Imports from non-EU countries was increasingly high in the pre-accession period: in 2003-2005 its value was 5 times higher than of the exports. The imports value decreased in absolute terms after accession, in 2010 imports were by 33% lower than in 2006. The import trend became positive since 2011, varying between EUR 900 to 950 million EUR, and peaked in 2015 (EUR 1.13 billion).

As a result, the Romanian extra-EU agri-food trade deficit increased until 2006, when it reached a pick of EUR -811 billion, then reduced sharply until 2009, and turned positive since 2010. Due to massive exports, the surplus of the agri-food trade balance with the extra-EU countries reached EUR 1.2 billion, to diminish slightly in 2015.

The destinations for the Romanian extra-EU exports changed rather significantly in the post-accession period (table 2). Averages have been calculated in order to diminish the influence of yearly variations and better observe longer trends. In 2007-2010, the top 10 destinations for the Romanian extra-EU exports were: Turkey (almost a quarter – 22.7%, that is about EUR 50 million yearly, and exports consisted of oilseeds, edible oils and fats, fruit, animal feed and cereals), South Korea, Syria and Pakistan (about 7% each), while Egypt ranked 8-th (1.7%). The surge of the cereals and oilseeds exports on the Middle-East markets in the last years changed completely the hierarchy of the extra-EU export destinations: Egypt ranks first (14.7%), Turkey comes second (11.5%), followed by Jordan (8.3%), Libya (7.4%), Saudi Arabia (6.7%) and Israel (4.4%).

Table 2 – Change in the Romanian extra-EU trade with top 10 partners

Partner	Average 2007-2010	Average 2011-2015	Change 2011-2015 /2007-2010	Average 2007-2010	Average 2011-2015	Change 2011-2015 /2007-2010
EXPORTS	**Value (EUR million)**			**Share in total extra-EU export (%)**		
Total extra-EU	560.6	1,703.7	1143.1	100.0	100.0	0.0
Egypt	9.3	250.6	241.3	1.7	14.7	13.1
Turkey	127.1	195.8	68.7	22.7	11.5	-11.2
Jordan	8.4	141.4	132.9	1.5	8.3	6.8
Libya	15.3	126.4	111.1	2.7	7.4	4.7
Saudi Arabia	33.3	114.2	80.8	5.9	6.7	0.8
South Korea	38.5	80.1	41.7	6.9	4.7	-2.2
Israel	33.5	74.9	41.4	6.0	4.4	-1.6
Ukraine	7.7	60.7	53.0	1.4	3.6	2.2
Syria	38.0	57.2	19.2	6.8	3.4	-3.4
Pakistan	37.6	49.2	11.6	6.7	2.9	-3.8
IMPORTS	**Value (EUR million)**			**Share in total extra-EU import (%)**		
Total extra-EU	794.3	960.5	166.2	100.0	100.0	0.0
Brazil	195.5	236.2	40.6	24.6	24.6	0.0
Turkey	117.4	134.2	16.8	14.8	14.0	-0.8
Moldova, Rep.	38.8	69.8	31.1	4.9	7.3	2.4
United States	61.8	64.0	2.2	7.8	6.7	-1.1
Argentina	40.6	59.1	18.5	5.1	6.1	1.0
China	48.5	43.5	-4.9	6.1	4.5	-1.6
Serbia	29.2	30.9	1.7	3.7	3.2	-0.5
Ukraine	10.3	28.7	18.4	1.3	3.0	1.7
Vietnam	20.6	23.0	2.4	2.6	2.4	-0.2
Zimbabwe	4.6	21.8	17.2	0.6	2.3	1.7

Source: calculations using Eurostat data

Although exports to Russia increased 1.3 times (products not banned in the embargo), it still ranks 11 as compared to rank 4 before accession. The same happened to Republic of Moldova, which fell from second place (in 2004-2006) to the 13-th place (in 2011-2015), although the value of exports increased 2.4 times.

In terms of imports, the changes have been far less spectacular than for exports (table 2). In 2004-2006, the largest imports came from Brazil 24.2% (that is about EUR 222 million yearly, the imports consisting mainly of sugar, meat and animal feed), then from USA (17.7%), Turkey (8.7%) (fresh fruit and vegetables, vegetable and fruit preparations, and cereal baking and pastry products), Canada (6.3%), Ecuador (4.9%), China (4.3%), Republic of Moldova (4.1%), Switzerland (2.7%), Egypt (2.5%), Malaysia (1.8%). In 2011-2015, the top two origin countries, Brazil and Turkey kept their ranking, while Argentina climbed from 10-th position before accession to 5-th place after accession. Imports from USA diminished by 61% between pre- and post-accession periods, while exports to Republic of Moldova doubled, pushing it as third origin country.

Among the 24 HS groups, only three groups: live animals (HS-01); cereals (HS-10); lacs, gums and resins (HS-13) are exported mainly to non-EU destinations, nonetheless they represent together 72.2% of the total extra-EU exports and 25% of the total Romanian agri-food exports.

More than 50% of the total exports of these groups of products went to non-EU countries: live animals were exported to Libya, Jordan and Israel; cereals went mostly to Egypt, Saudi Arabia and Jordan.

In terms of composition of the extra-EU agri-food exports, in both studied periods cereals and oilseeds took the top positions. The value of exported cereals increased 29 times, from EUR 38 million in 2004-2006 to EUR 1.9 billion in 2011-2015, and 3 times during the post-accession period (P2, that is 2011-2015, as compared to P1, that is 2007-2010); so, the share of cereals in exports

increased more than 3 times (from 19.8% to 65.6%). Oilseeds exports increased as well, although not as spectacular as the cereals: their value multiplied 5.3 times (post- versus pre-accession period), and doubled only in P2/P1. Similar to oilseeds, the value of live animals exports increased (7 times in post- versus pre-accession period), and 6.4 times in P2/P1, while their share in total extra-EU exports diminished. Exports of tobacco and tobacco products increased as well, due to an EUR 40 million investment in a tobacco products factory in Ploiesti, by British American Tobacco company. In the pre-accession period, Romanian extra-EU exports were highly concentrated (73.2%), but in the post-accession period, the concentration increased even more: first 5 exported products accounted for to 89% of the total exports, due to the massive orientation to cereals and oilseeds (table 3).

Table 3 - Changes in the composition of Romanian extra-EU agri-food trade by product groups

HS chapter	Average 2007-2010	Average 2011-2015	Change 2011-2015 /2007-2010	Average 2007-2010	Average 2011-2015	Change 2011-2015 /2007-2010
EXPORTS	**Value (EUR million)**			**Share in total extra-EU export (%)**		
10 – Cereals	317.7	1,091.7	774.0	56.7	64.1	7.4
12 – Oilseeds	98.8	191.7	92.9	17.6	11.3	-6.4
01 – Live animals	21.7	138.2	116.5	3.9	8.1	4.2
23 – Animal feed	9.6	59.6	50.0	1.7	3.5	1.8
15 – Oils and fats	10.7	33.4	22.7	1.9	2.0	0.0
24 – Tobacco and tobacco prod.	21.7	29.0	7.3	3.9	1.7	-2.2
22 – Beverages	19.3	25.3	6.0	3.4	1.5	-2.0
21 – Miscellaneous edible prep	9.1	25.0	15.9	1.6	1.5	-0.2
19 – Cereal baking and pastry pr.	9.0	20.1	11.1	1.6	1.2	-0.4
02 - Meat	4.1	16.4	12.3	0.7	1.0	0.2
Total extra-EU export	560.6	1,703.7	1,143.1	100.0	100.0	0.0
IMPORTS	**Value (EUR million)**			**Share in total extra-EU import (%)**		
17 – Sugar and confectionery	104.9	178.3	73.4	13.2	18.6	5.4
23 – Animal feed	98.3	167.0	68.7	12.4	17.4	5.0
24 – Tobacco and tobacco prod.	61.1	105.3	44.2	7.7	11.0	3.3
12 – Oilseeds	52.9	86.5	33.6	6.7	9.0	2.3
08 – Fruit	94.2	70.2	-24.0	11.9	7.3	-4.6
21 – Miscellaneous edible prep	43.7	46.1	2.4	5.5	4.8	-0.7
09 – Coffee and tea	38.6	43.3	4.7	4.9	4.5	-0.4
07 - Vegetables	55.6	43.1	-12.6	7.0	4.5	-2.5
15 – Oils and fats	49.5	36.7	-12.8	6.2	3.8	-2.4
19 – Cereal baking and pastry pr.	12.3	32.2	19.9	1.5	3.3	1.8
Total extra-EU import	794.3	960.5	166.2	100.0	100.0	

Source: calculations using Eurostat data

In imports, again most of the products are originating mainly from the EU, while the notable exceptions are: sugar and animal feed (soy cakes). Sugar originating from the non-EU countries is imported from Brazil (half of the quantity), but also from Zimbabwe, Moldova, Serbia and Cuba. Of the total imports of animal feed (mostly soy cakes), 44% is coming from Brazil, Argentina and the USA.

Romanian extra-EU imports are much more diversified as compared to exports: the first 5 imported products accounted together for 63.3% only in the pre-accession period, and increased just slightly (to 63.2%) in 2011-2015.

CONCLUSIONS

The value of the Romanian agri-food trade increased continuously for the last 15 years, mostly after accession. In the pre-accession period, exports expanded slower than imports (due to a delayed adaption to the EU quality, sanitary and veterinary requirements, as well as to the barriers to trade - tariffs and quotas). After the first two years of accession, the trends reversed: exports expanded faster than imports, resulting a very quick diminishment of the general agri-food trade balance, and its shift to surplus since 2013.

Trade with EU countries followed the same general patterns, but the gap in product chains competitiveness persists to the present day, so the Romanian intra-EU trade balance remained negative.

The largest share of trade, for most product groups (HS 01-24), is with EU countries; nevertheless, there are few exceptions such as: live animals; cereals; oilseeds; lacs, gums and resins, for which more than half is exported outside the EU. For the particular products, such as sugar and animal feed, for which nor Romania neither EU are self-sufficient; more than half of imports are coming from extra-EU countries.

The main EU destinations for the Romanian exports (dispatches) were in the post-accession period: Italy, Bulgaria, Hungary, Netherlands and Spain, accounting together for almost 2/3 of the intra-EU export (dispatches) value, while the main EU origins for imports (arrivals) were Hungary, Germany, Bulgaria, Poland and Netherlands, accounting together for almost 70% of the intra-EU import (arrivals) value.

Exports of all 24 agri-food product groups increased after accession, but the largest shares in exports are taken by basic agricultural products such as live animals, cereals, and oilseeds, and tobacco products only from the group of processed products.

Imports increased almost continuously since 2002, with meat as main imported product group, followed by milk and dairy products, cereals, miscellaneous edible preparations, fruit and cereal and pastry products.

Since accession, Romania increased spectacularly its agri-food trade. Although there have been important positive developments, significant gains in output and efficiency in the products chains need to be achieved in order to be able to export more on the Single Market, as well as to increase the share of processed products (with more added value) as opposed to low-value basic agricultural commodities.

BIBLIOGRAPHY

1. EU Commission (2016) - Monitoring EU Agri-Food Trade: Development until December 2015 - http://ec.europa.eu/agriculture/trade-analysis/monitoring-agri-food-trade/2015-12_en.pdf
2. European Commission (2010), *Agriculture in the European Union - Statistical and economic information..*
3. Eurostat (2011), *External and intra-European Union trade. Data 2004-2010*.
4. Eurostat, Agriculture Trade Statistics. http://ec.europa.eu/trade.
5. Gavrilescu, Camelia (2014a) - *Evolution trends of the Romanian post-accession agrifood trade*. Ovidius University of Constanța Annals, Economic and Sciences Series, XIV (1), 119-124.
6. Gavrilescu, Camelia (2014b) - *Agricultural commodities and processed products in the Romanian international agri-food trade*, Proceedings of the 5th International Symposium „Agrarian Economy and Rural Development", Ed. ASE, Bucharest, ISSN 2285-6893, p. 86-93.
7. Gavrilescu, Camelia ; Voicilaș, Dan-Marius (2014) - *Changes in the Romanian agri-food trade competitiveness in the post-accession period*. Management theory and studies for rural business and infrastructure development, 36(4), p. 823-834, http://mts.asu.lt/mtsrbid/article/view/886.
8. http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics

THE ANALYSIS OF THE MAIN INDICATORS EVOLUTION OF SOCIAL AND ECONOMIC DEVELOPMENT IN THE ARAB REPUBLIC OF SYRIA, PERIOD 1960-2014

AL MAHAMMAD JAGHAYEF[1], RALUCA NECULA[2], DIANA NECULA[3]

Summary. *The paper's aim is a retrospective analysis of the evolution of the main indicators of social and economic development from Syria by highlighting the degree of development of the country before the policy crisis in 2011. An attempt was also the surprise of external and internal influences in the country: a comparison with neighboring Arab countries of Syria, managing the formation of an overview image of economic and social development of the country, and the effects of the civil war start in 2011 resulting from the analysis of statistical data and official reports. The key indicators analyzed have been the Gross Domestic Product and the Human Development Index, the evolution being completed by the analysis of the main indicators that characterizes the evolution of agriculture in the period analyzed. The result of the research shows a country with a developed evolution potential, the development indicators up to 2011 being favorable for the country, but the conflict from 2011 affecting all economic and social sectors, the damage and the possibilities of economic recovery is still very hard to estimate.*

INTRODUCTION

Syria Arab Republic, Al-Jumhuria Al-Arabia Al-Suria has an area of 185,180 km², with an expanse from East to West of 829 km and from North to South of 748 km The territory is situated in the Southwest of Asia, an area known as small *Asia.* Syria is one of the ancient land of civilization in the Middle East.

Agriculture, due to environmental conditions, is practiced especially on coastal plains, in the Central depressions and in the Euphrates River Valley, where there are irrigation systems. The main crops are wheat, barley, and cotton. Fruit breeding are represented by citrus, olives and apples. The main economic partners of Arab countries are China, Germany, and Italy.

At the beginning of the Syrian Civil War, Syria has been classified by the World Bank as a country with lower-middle-income[(World Bank,2012). In 2010, Syria remained dependent on oil and agricultural sectors (World Bank, 2010), The oil sector provided about 40% of export earnings. At the beginning of the civil war, the economy decreased by 35% (2013), and the Syrian lira has fallen to one-sixth of her value from before the war (Barnard, 2013). The political instability brought a significant threat to future economic development. Foreign investments are affected by violence, governmental restrictions, economic sanctions and international isolation. Syria's economy also remains blocked of the State bureaucracy, falling oil production, increasing budgetary deficits and inflation(The Heritage Foundation,2016).

Before the civil war in 2011, the Government hoped to attract new investment in tourism, services and natural gas spheres, in order to diversify its economy and reduce dependence on oil and agriculture. The Government began to make economic reforms designed to liberalize most markets, but these reforms were completely nullified since the outbreak of the conflict in 2011 (Al-Khalidi, 2012).

In 2012, due to the Syrian civil war in progress, the value of the overall exports of Syria fell by two-thirds, from the figure of US $ 12 billion in 2010 at just US $ 4 billion in 2012. Syria's GDP fell by over 3% in 2011. In 2012, especially Syria's oil and tourism industries were devastated, with

1 Ph. D Student, University of Agricultural Sciences and Veterinary Medicine Bucharest, 59 Marasti, District 1, 11464, Bucharest, Romania ; email: hagihagi93@yahoo.com
2 Lecturer, Ph.D, University of Agricultural Sciences and Veterinary Medicine Bucharest, 59 Marasti, District 1, 11464, Bucharest, Romania, email: raluca_nec@yahoo.com
3 Researcher, Research Institute for Agricultural Economics and Rural Development, 61 Mărăşti, District 1, Bucharest, 011464 , email: necula.diana@iceadr.ro

US $ 5 billion lost in the ongoing conflict during the civil war. The necessary reconstruction caused by the ongoing civil war will cost no less than US $ 10 billion (Abboud, 2012). The sanctions have exhausted the Government finances. The U.S. and European Union interdictions on imports of oil, which entered into force in 2012, it is estimated that it costs Syria around US $ 400 million a month.

MATERIALS AND METHOD

The standard of living and level of life are linked: the standard of living indicates the degree of accessibility to agri-food products, while the level of life sums our entire existence: from health to education, the standard of living, t personal security, the individual's participation in the activities of the community. An important role has the wealth (GDP) and the demographic aspects.

GDP per capita is used to express the standard of living of a country, as the sum of the market value of all goods and services intended for final consumption, produced in all branches of the economy in a country in one year(Wikipedia, 2016).

According to GDP per capita, expressed in Gross National Income PPT (Purchasing Power Parity), the World Bank classifies countries into four categories: low-income countries: under US $ 1,005; middle-income country: between US $ 1,006 and US $ 3,975; country with middle income: between US $ 3,976 and US $ 12,275; high-income country: over US $ 12,276(Popa,2012).

HDI Human Development Index, which takes into account in addition to the standard of living (GDP) , the life expectancy, literacy and education(Wikipedia,2015)and which may have a maximum value of 1 (one). According to the HDI, the countries are categorized into four groups of indices: very high, high, medium and low.

The indicators used have targeted the agricultural areas, total and average agricultural production, total population, and the main crops and animal species.

The annual growth rate= $r2000-2014 = 14\sqrt{\prod(p1/p0)}-1$ or $r_{2000-2014}$= (geomean (p1/po)-1) * 100

where:

∏ p1/po = product of indicators in chain for the analyzed period; geomean = the geometric mean

RESULTS AND DISCUSSION

1. **The analysis of the correlation between population growth and the increase of the index of agricultural production from Syria and the countries of this area, during the period 1960-2013**

Syria is among the countries with an annual rate of increase in the population of 3.0% for the period 1960-2013, an increase of 4.8 times, from 4,593 thousand persons to 22,158 thousand persons.

Table 1. Analysis of the average annual growth rate of total population and agricultural production (branches) in Syria and in some countries during the period 1960-2013

Country	Total population			Annual growth rates			
	1960	2013	2013 compared to 1960	Total population	Vegetal production	Vineyards and fruit trees	Animal Production
	Th. persons	Th. persons	times	%	%	%	%
Egypt	27,072	89,580	3.3	2.2	3.3	3.7	4.6
Iran	21,907	78,144	3.6	2.4	4.3	4.1	3.2
Iraq	7,290	34,812	4.8	2.9	2.7	2.0	0.6
Jordan	844	6,607	7.8	3.9	1.6	2.5	5.4
Lebanon	1,805	4,547	2.5	1.7	1.9	2.2	3.4
Syria	4,593	22,158	4.8	3.0	2.9	3.5	3.8

Processed by: FAO,2016, http://faostat3.fao.org/download/FB/FBS/F

During the same period we have increases of the population in Lebanon of 2.5 times, Egypt 3.3 times, 3.6 times Iran, Iraq by 4.8 times and Jordan by 7.8 times (table 1). Analyzing the annual increase of the population compared to the agricultural production branches growth rates for the

period 1960-2013, noted that only in Egypt and Iran the rhythms of growth of agricultural production branches are higher than the growth rate of the population.

A main characteristic of agricultural production in Syria and in other countries in the area is the agricultural productions oscillation in the analyzed period which is around 100%, demonstrating why agriculture depends very much on climatic conditions (table 2).

Table 2.The oscillations analysis of the agricultural production index realization (on branches) in Syria and in the countries of the area, during the period 1960-2013

Country	Vegetal production				Fruit and vegetable production				Animal Prod			
	Achievement index			Annual rate	Achievement index			Annual rate	Achievement index			Annual rate
	min	Max	diff		min	Max	diff		min	Max	diff	
Egypt	21.5	115.0	93.5	3.3	17.5	118.7	101.2	3.7	12.9	130.8	117.9	4.6
Iran	12.8	116.8	104.1	4.3	14.3	113.3	99.0	4.1	20.4	106.8	86.4	3.2
Iraq	31.7	132.4	100.7	2.7	45.3	128.6	83.3	2.0	75.9	190.8	114.9	0.6
Jordan	14.2	131.0	116.8	1.6	16.4	136.7	120.3	2.5	9.3	147.2	137.9	5.4
Lebanon	33.2	136.1	102.9	1.9	29.3	116.6	87.3	2.2	16.7	112.2	95.6	3.4
Syria	17.6	105.0	87.4	2.9	14.1	106.7	92.7	3.5	12.4	111.9	99.4	3.8

Processed by: FAO,2016, http://faostat3.fao.org/download/FB/FBS/F

In Syria, on the whole period, the effect of measures to increase the agricultural production, the growth rates of agricultural production branches are higher than the population growth of 3 % for the population, of 2.9% for crop production, of 3,5% for the production of fruit and vegetables and of 3.8% for livestock production.

By analyzing these increases in population and agricultural production for the period 1960-1999 and 2000-2013, we find the following:

-   for the period 1960-1999, population growth rates are lower or almost equal with the growths rates of the branches of agricultural production, with the exception of Iraq. In Syria the growth rate of population is 3.2%, while the vegetal production of 3.6%, vineyards and fruit trees of 4.2%, and animal production by 4.7 percent. (table 3)

Table 3. Analysis of the average annual growth rate of total population and agricultural production (on branches) in Syria and in some countries during the period 1960-1999

	Total population			Annual growth			
	1960	1999	1999 compared to 1960	Total population	Vegetal Prod.	Vineyards and fruit trees	Animal Prod.
Country	Th. pers.	Th. pers.	times	%	%	%	%
Egypt	27,072	67,113	2.5	2.4	3.6	4.1	4.9
Iran	21,907	64,780	3.0	2.8	5.0	4.6	3.6
Iraq	7,290	22,889	3.1	3.0	2.9	2.2	0.4
Jordan	844	4,680	5.5	4.5	0.0	1.5	6.0
Lebanon	1,805	3,157	1.7	1.4	2.8	3.1	4.2
Syria	4,593	15,972	3.5	3.2	3.6	4.2	4.7

Processed by: FAO,2016, http://faostat3.fao.org/download/FB/FBS/F

-   in the period 2000-2013 both population growth rates and those of agricultural production are lower. In Egypt, Iran and Jordan the rhythms of agricultural production are higher than the population growth rate, while in Iraq, Lebanon and Syria they are smaller. Thus, in this period, Syria's population has an annual growth rate of 2.2%, and crop production is-0.5%, production of fruit trees and vegetables by 0.5%, and livestock production 0,9%. (table 4)

Table 4. Analysis of the average annual growth rate of total population and agricultural production (branches) in Syria and in some countries for the period 2000-2013

Country	Total population			Annual growth			
	2000	2013	1999 compared to 1960	Total population	Vegetal Prod.	Vegetables and fruits	Animal Prod.
	Th. pers.	Th. pers.	times	%	%	%	%
Egypt	68,335	89,580	1.3	1.9	2.1	2.6	3.7
Iran	65,850	78,144	1.2	1.2	3.3	2.9	2.0
Iraq	23,575	34,812	1.5	2.8	2.9	1.8	0.2
Jordan	4,797	6,607	1.4	2.3	4.1	4.1	4.2
Lebanon	3,235	4,547	1.4	2.6	-0.4	-0.2	0.6
Syria	16,354	22,158	1.4	2.2	-0.5	0.5	0.9

Processed by: FAO, 2016, http://faostat3.fao.org/download/FB/FBS/F

In the period 2000-2013, oscillations are smaller and with larger differences between the countries considered in the study. The crop production with 44.5% in Iraq, Iran with 40.4%, 28.8% in Syria and in Lebanon 12.7%. For the animal production these oscillations are higher respectively 61.5% in Jordan, 52.1%, Egypt and 42% for Syria (table 5).

Table 5. The oscillations analysis of agricultural production realization index (branches) in Syria and in the countries, during the period 2000-2013

Country	Vegetal production				Fruit and vegetable production				Animal Production			
	Achievement index			Annual rate	Achievement index			Annual rate	Achievement index			Annual rate
	min	max	diff		min	max	diff		min	max	diff	
Egypt	85.2	115.0	29.8	2.1	82.3	118.7	36.5	2.6	78.7	130.8	52.1	3.7
Iran	76.5	116.8	40.4	3.3	77.8	113.3	35.5	2.9	81.2	106.8	25.6	2.0
Iraq	88.0	132.4	44.5	2.9	91.2	128.6	37.4	1.8	81.8	132.3	50.5	0.2
Jordan	63.4	131.0	67.6	4.1	71.6	136.7	65.0	4.1	85.7	147.2	61.5	4.2
Lebanon	92.2	104.9	12.7	-0.4	90.0	104.1	14.0	-0.2	73.0	112.2	39.3	0.6
Syria	76.2	105.0	28.8	-0.5	77.7	106.7	29.1	0.5	69.8	111.9	42.0	0.9

Processed by: FAO,2016, http://faostat3.fao.org/download/FB/FBS/F

During the period 1960-200, the GDP/ (U$) per capita has increased by 2.9 times, from 563.1 U$/cap in 1960 to 1648.8 U$/cap in the year 2007. Throughout the all period the average annual growth rate was of 2.31 %.

Table 6. The GDP per capita evolution in Syria during the period 1960-2007

Year	Gross Domestic Product	Percentage increase				
	US$ current 2005/capita	Towards 1960 (%)	Towards 1970 (%)	Towards 1980 (%)	Towards 1990 (%)	Towards 2000 (%)
1960	563.1	100.0				
1965	675.1	119.9				
1970	676.8	120.2	100.0			
1975	1064.3	189.0	157.2			
1980	1242.5	220.7	183.6	100.0		
1985	1204.5	213.9	178.0	96.9		
1990	1109.5	197.0	163.9	89.3	100.0	
1995	1413.1	251.0	208.8	113.7	127.4	
2000	1386.9	246.3	204.9	111.6	125.0	100.0
2005	1591.5	282.7	235.1	128.1	143.4	114.8
2006	1618.0	287.4	239.1	130.2	145.8	116.7
2007	1648.8	292.8	243.6	132.7	148.6	118.9

World DataBank, Indicateurs du développement dans le monde, http://databank.banquemondiale.org/data/home.aspx

Analyzing the dynamics of GDP per capita in relation to different reference years, we find that this increase is of 2.4 times compared to year 1970, 1.3 times towards year 1980, by 1.4 times compared to year 1990 and 1.18 times compared to year 2000. (Table 6)

2. The human development index (HDI) analysis in Syria

For a real image of the actual living standard, UNDP (United Nations Development Programme) has calculated and inserted the Index HDI (human development index), which in addition to GDP per capita, takes into account the health and longevity (years), access to education (number of years) and material level (GDP/ capita).

Table 7. The evolution of the human development index, in Syria, and some countries in the region during the period 1980-1986

| Country | HDI 1980 | Annual growths (HDI) | | | | | | HDI 2014 | Place in the world 2014 | Class[4] |
		1980-1990	1990-2000	2000-2010	2012	2013	2014			
Lebanon	...	...	...	...	0.000	0.007	0.001	**0.769**	67	HHD
Iran	**0.490**	0.008	0.010	0.008	0.013	0.000	0.001	**0.766**	69	HHD
Jordan	**0.587**	0.004	0.008	0.004	0.003	0.001	0.001	**0.748**	80	HHD
Egypt	**0.452**	0.009	0.008	0.006	0.006	0.001	0.001	**0.690**	108	MHD
Iraq	**0.500**	0.007	0.003	0.004	0.005	0.003	-0.003	**0.654**	121	MHD
Syria	**0.528**	0.002	0.003	0.005	-0.012	-0.015	-0.014	**0.594**	134	MHD
The Arab States	**0.492**	0.006	0.006	0.006	0.005	0.002	0.001	**0.686**	x	MHD
World	**0.559**	0.004	0.004	0.006	0.004	0.002	0.002	**0.711**	x	MHD

Manufactured by: Trends in the Human Development Index, 1990-2014, 989-09
* VHHD: Very high human development(HDI over 0,900); HHD: High human development(HDI between 0,800-0,899); MHD: Medium human development(HDI between 0,500-0,799); LHD: Low human development(HDI under 0,500), http://www.hdr.undp.org/en/data

From the analysis of the level of HDI during the period 1980-1986, in Syria and in some countries in the region we find the following:
- in the arabic countries the level of HDI in 2014, was 0.686 (MHD) being high relative to 1980 with 0.194 units. Syria is situated on 134 place in the world, this after the past few years when it has lost important points because of the crisis triggered in 2011, 0.594 (MHD). During the period 1980-2010, Syria presents the increases that have reached have at 0.005 annually, in the decade 2000-2010 (table 7)
- among the states from this area on the first position lies Lebanon with HDI = 0,769, which ranks at 67 place in the world;
- towards the average annual increases of Arab States and worldwide, Syria presented between 1890-2000, lower growths, but higher on the decade 2000-2010.

To see the difference in assessment of the standard of living calculated by HDI and GDP calculated, expressed as PPP/capita , a comparison can be made with the data presented in table 8. The following is found:
- some countries lose places in the world hierarchy after PPP/capita towards the HDI. Thus, Iraq from the 77place after the PPP/capita passes on 108 after HDI, and Egypt go from 96 to 108. It demonstrates that the standard of living has decreased due to the level of education and life expectancy that have another world hierarchy(Rahman,2015).

Table 8. World rankings analysis, offered by GDP and HDI for Syria and the countries of the area, in the year 2014

| Country | Human development index | | Life expectancy | Average years of schooling | GDP in PPP per capita | | Differences = Place HDI Place PPP |
	HDI	World place	years	years	2011 PPP $	World place	No.
Lebanon	0.769	67	79.3	7.9	16,509	66	1
Iran	0.766	69	75.4	8.2	15,440	73	-4
Jordan	0.748	80	74.0	9.9	11,365	91	-11
Egypt	0.690	108	71.1	6.6	10,512	96	12
Iraq	0.654	121	69.4	6.4	14,003	77	44

Syria	0.594	134	69.6	6.3	2,728	155	-21

Processed by: Trends in the Human Development Index, 1990-2014 http://www.hdr.undp.org/en/data

- Other countries win places in the world hierarchy after calculation of the HDI, in relation to PPP/ capita. So Jordan win at the HDI index 11 places from 91 place after GDP to 80 place after HDI, and Syria wins 21 places from 155 after GDP to 134 after HDI, demonstrating an increase in the level of education and life expectancy.

3. The impact of the political crisis on the development of the Arab Republic of Syria

The events of what was called the "Arab spring" have taken the international community by surprise because the objective indicators of economic and social development presented a progressive improvement of the economies in those parts of North Africa and the Middle East, namely: economic growth, reasonable prices of agri-food products, the rate of absolute poverty decreasing, an inequality level quite low and with middle-income, infant mortality rates declining, life expectancy rising(Ianchovichina,2013).

Although in early 2011, Syria was a middle-income country, with an economical growth with fiscal stability, with GDP growth of 4.5%, with about 91% of the population owned their own home and 85% had running water, a part of the population have reproached the Government the discrepancies between the rich and the poor, of hoarding power and enable more freedom(Nasser,2013).

The statistical statements demonstrate, after 2010, decreases of the total agricultural yields . Thus in relation to 2010, in the year 2014 the total productions fell to the wheat crop to 65%, the barley crop at 88,3%, corn culture 50,4%, potato crop at 80.2 percent, the cultivation of sugar beets at 4.4%. The total production of apple dropped at 65.3% and grape production at 94.2% in 2013. (Table 10)

Table 10. The main indicators evolution of the main crops total production in Syria during the period 2010-2014

Culture	MU	2010	2011	2012	2013	2014	Mean	Annual rate	Standard Deviation	Coef. of variation (%)
What	Th. to	3,083	3,858	3,609	3,182	2,024	3,151	-9.99	705	22.36
	%	100.0	125.1	117.1	103.2	65.7	x	X	x	x
Barley	Th. to	6,797	6,667	7,280	9,109	6,001	7,171	-3.07	1176	16.40
	%	100.0	98.1	107.1	134.0	88.3	x	X	x	x
Corn	Th. to	1,330	2,983	2,576	1,091	670	1,730	-15.75	997	57.64
	%	100.0	224.3	193.7	82.0	50.4	x	X	x	x
Potatoes	Th. to	6,731	7,152	6,981	4,417	5,396	6,135	-5.38	1184	19.29
	%	100.0	106.3	103.7	65.6	80.2	x	X	x	x
Sugar-beet	Th. to	14,929	18,051	10,279	3,168	653	9,416	-54.27	7442	79.03
	%	100.0	120.9	68.9	21.2	4.4	x	X	x	x
Apple	Th. to	3,931	3,077	3,491	2,566		3,266	-13.25	583	17.84
	%	100.0	78.3	88.8	65.3		x	X	x	x
Grapes	Th. to	3,256	3,379	3,624	3,067		3,332	-1.97	233	7.01
	%	100.0	103.8	111.3	94.2	0.0	x	X	x	x

Source: Faostat, accessed 15.12.2015, http://faostat3.fao.org/download/FB/FBS/F

It is interesting to found that during this period 2010-2014, livestock has insignificant decreases. In the rural areas, for most families, the animal breeding represents the only source of nourishment.

In the period 2010-2014, the livestock of sheep herds have increased by 32%, from 15,511 thousands head in 2010 to 17,858 thousands heads in 2000 (annual rate of increase of 3.59%). Herds of cattle have had an annual rate of increase of 1.94 percent, rising from 1,010 thousands heads in 2010, to 10,905 thousand heads in 2014 (annual rate of 1.94). Herds of goats increased from 2,250 thousands heads in 2010 at 2,286 thousands heads in 2014, with an annual growth rate of increase of 2.67 percent.

Table 11. The livestock evolution during the period 2010-2014 in the Arab Republic of Syria

Species	MU	2010	2011	2012	2013	2014	Media	Abat standard	Coef of variation	Annual rate
							UM	UM	%	%
Sheep	Th. heads	15,511	18,071	18,063	18,019	17,858	17,504	1,117.6	6.38	3.59
	%	100.00	116.50	116.45	116.17	115.13	x	x	x	x
Cattle	Th. heads	1,010	1,111.7	1,108.5	1,113.2	1,090.5	1,087	43.9	4.04	1.94
	%		100.00	99.71	100.13	98.09	x	x	x	x
Goats	Th. heads	2,057	2,294	2,293	2,294	2,286	2,245	105.0	4.68	2.67
	%		100.00	99.96	100.00	99.65	x	x	x	x
Hens	Th. heads	25,401	26,203	25,024	19,187	16,601	22,483	4,309.0	19.17	-10.09
	%		100.00	95.50	73.22	63.36	x	x	x	x
Bee hives	Th. heads	630.8	631.5	597.9	544.8	…	601	40.8	6.78	-4.77
	%		100.00	94.68	86.27	...	x	x	x	x

Manufactured by: FAO,2016, http://faostat3.fao.org/download/FB/FBS/F

Hens present a decrease of -10.09% from 25,401 thousands heads in 2010, to 16,601 thousands heads in 2014.

Bees families number also dropped from 630.8 thousands in 2010 at 544.8 thousands in 2013, with a rate of -4.77% annually (table 11).

It is worth noting that in response to the requirements of democratization, in spring 2011 was abolished the martial law (April 2011). Also the Government has shown its intention to launch a "national dialogue" (May 2011) and promised "reform". These included a new electoral law (July 2011), a new law of the press (august 2011) and a new Constitution (March 2012)(Zein, 2011). However, these governmental measures have not resolved the crisis because "the opposition" considered that these reforms " were political, limited and slow"(Gobat,2016). The events that followed in Syria after 2011, were complex especially by internal conflict, militarization and its internationalization.

By the end of 2013, the total economic losses since the start of the conflict have been estimated at $ 143.8 billion, which is equivalent to 276% of GDP in 2010(SCPR,2014).

This fact has determined the U.N. to declare in January 2013 the crisis from Syria at level three of emergency (L3), being the highest level of humanitarian crisis ever launched by the United Nation, UNDP (United Nations Development Programme), UNRWA (United Nations Relief and Works Agency for Palestine Refugees) and SCPR (Syrian Centre for Policy Research), joined activities and resulted in IASC Inter-Agency Humanitarian Evaluations Steering Group(Slim,2014) which coordinates the activity of aid to Syria.

Humanitarian aids are distributed to the civilian population by "tens of thousands of Syrian activists, non-violent", which "holds up in the name of freedom, citizenship, equal opportunities and social justice"(Slim,2014).

CONCLUSIONS

1. In the 1960-2013 period, Syria has had a population growth rate of 3.0%, succeeding an increase of 4.8 times of the population from 4,593 thousands persons at 22,158 thousands persons. During the same time period had increased the population for Lebanon by 2.5 times, Egypt 3.3 times, 3.6 times in Iran, 4.8 times in Iraq and Jordan by 7.8 times.

2. A main characteristic of agricultural production in Syria and in other countries in the area is the agricultural productions oscillation in the analyzed period which is around 100%, demonstrating why agriculture depends very much on climatic conditions. Analyzing the annual increment of the population compared to the growth rates by branches of the agricultural production for the period

1960-2013, it is found that only in Egypt and Iran the rhythms of growth of the agricultural production branches are higher than the growth rate of the population.

3. The crisis has destroyed the economy. Agriculture, in the absence of imports of food products has become even more important in terms of ensuring food security, which in these circumstances contributed to the maintenance of a minimum level of life for thousands of Syrian families. The economic loss by the end of 2013 was valued at 143.8 billion dollars, equivalent to 276% of Syria's GDP by 2010, of which 64.8 billion because of robbery and theft. (ISCR,2014. By the end of 2015, these losses are estimated at 254.7 billion dollars (ISCR,2016).

4. The crisis has caused a disastrous drop in the level of life at the majority of the population by destroying the economy and by international sanctions applied. The standard of living, on the whole, in 2014, assessed by HDI index using health status, education and income has deteriorated greatly due to the conflict.
The education system has suffered. Because of the war many children cannot follow a primary school and some of the young men have left higher education.

5. These decreases in the living standards have meant:
-health: health infrastructure destruction and killing doctors; the collapse of the pharmaceutical industry; the uncertainty of life; an increase in the rate of mortality in children from $4.4\%_0$ in 2010 at $10.9\%_0$ in 2014 (SCPR, 2016); the number of doctors fell returning 1 doctor/4000 people towards 1doctor at 661 people in 2010; the vaccination rate for children dropped from 99 to 100% before the crisis to 50-70% today. By the end of 2015, it is estimated that 1.88 million persons had suffered, which is 11.5% of the population;
-Education: educational infrastructure suffered, destroyed schools have reached 28% in 2014, and it is estimated that it will reach about 35% by the end of 2015. Educational staff has suffered due to the forced movement or that "some of them were killed, wounded, kidnapped or apprehended" (SCPR, 2016);
-for standard of living. Syria has paid the most the will of change , the year 2011, which from an uprising turned into a deadly conflict, due to local, regional and international powers. The overall poverty rate in 2014 was 83% in comparison with 12.4% in 2007. Moreover, the armed conflict has damaged human capital by forcing people to leave their homes in search of safety of leaving behind their family members, employment and property. The local food market is enslaved by local and foreign persons, who have farms, food aid are diverted from their purpose of serving those who do not have what to eat, the monitoring and evaluation systems of international organizations are prevented to carry out their mission by the warring parties.

6. Finding a quick solution in Syria is given by its complexity at the international level and internal for the current situation. The reports considers that " it is need a new social contract based on justice, on empowering people, on equitable opportunities and a free thinking environment.

BIBLIOGRAPHY

1. Abboud S.,(2012), *The Syrian Economy: Hanging by a Thread*, Retrieved July 2016 from http://carnegieendowment.org/2012/06/20/syrian-economy-hanging-by-thread/dwq7
2. Al-Khalidi S. (2012), *Syria reverts to socialist economic policies to ease tension*, Retrieved August 2016 from http://www.reuters.com/article/us-syria-economy-socialist-idUSBRE8630FA20120704
3. Barnard A., (2013), *Syria Weighs Its Tactics as Pillars of Its Economy Continue to Crumble*, The New York Times. retrieved July 2013 from http://www.nytimes.com/2013/07/14/world/middleeast/government-in-syria-searches-for-answers-as-economy-crumbles.html
4. Demografic growth,(2010), Retrieved May 2011 from http://www.dictsociologie.netfirms.com/_IndDem/IndReproducere.htm
5. Gobat J., Kostia K., (2016), *Syria's Conflict Economy*, WP/16/123,IMF Working Papers, Retrieved September 2016 from http://www.imf.org/external/pubs/ft/wp/2016/wp16123.pdf
6. HDI, Human Development Index, Retrieved March 2015 from http://ro.wikipedia.org/wiki/Indicele_dezvolt%C4%83rii_umane

7. Ianchovichina E. and others, (2015), *Économie en croissance, bonheur en déclin : le paradoxe du monde arabe*, Retrieved September 2015 from http://blogs.worldbank.org/arabvoices/fr/developing-growing-less-happy-what-explains-paradox-arab-world

8. ISCR,(2016), *Siria,Confronting Fragmentation! Impact of Syrian Crisis Report , Quarterly based report* (2015), Retrieved August 2016 from http://www.ara.cat/2016/02/11/1520927894.pdf?hash=3a186be3bc9bfbc70d11f0241fd49d847f7f0042

9. Nasser R. and others,(2013), *Socioeconomic Roots and Impact of the Syrian Crisis, The Syrian Centre for Policy Research*, January 2013, p18.

10. Popa S. A., (2012), What kind of economy is Romania?, Retrieved August 2016 from http://www.manager.ro/articole/analize/ce-fel-de-economie-este-romania-[analiza]-19464.html

11. Rahman I.A., Jaghayet M. and others,(2015), *The economic and social development analysis in Syria for the period 1980-2013*, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol. 15,   Issue 4, 2015

12. Slim H., Trombetta L., (2014), *Syria Crisis Common Context Analysis*, United Nations Office for the Coordination of Humanitarian Affairs, New York , United Nations Headquarters

13. Syria Center for Policy Research, (2015), *Syria: Alienation and Violence: Impact of Syria Crisis Report 2014*, Retrieved October 2015 from http://www.unrwa.org/sites/default/files/alienation_and_violence_impact_of_the_syria_crisis_in_2014_eng.pdf

14. Syrian Center for Policy Research, (2016): "Human Status in Syria", forthcoming report.

15. Syrian Centre for Policy Research (SCPR),(2014), Squandering Humanity Socioeconomic Monitoring Report on Syria, Combined third and fourth quarter report (July – December 2013), Retrieved July 2014 from http://www.unrwa.org/sites/default/files/scpr_report_q3-q4_2013_270514final_3.pdf

16. The Heritage Foundation, *Syria, Index of Economic Freedom* ,Retrieved September 2016 from http://www.heritage.org/index/pdf/2016/countries/syria.pdf

17. UNICEF,(2016),Syria Crisis Humanitarian Highlights and Results, Retrieved March 2016 from http://childrenofsyria.info/2016/02/29/syria-crisis-january-2016-humanitarianhighlights-

18. Wikipedia*, Gross Domestic Product*, Retrieved April 2016 from http://ro.wikipedia.org/wiki/Produs_intern_brut

19. World Bank (2012), *Country and Lending Groups*, retrieved July 26 2012 from https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups

20. World Bank, (2010), *Syria Country Brief, September 2010*, retrieved July 2012 from http://siteresources.worldbank.org/INTSYRIANARAB/Resources/Syria_Web_brief.pdf

21. Zein, D., (2011), *The 'New' Syrian Media Law is Nothing New*, Committee to protect journalists (Cpj), Retrieved October 2015from http://cpj.org/blog/2011/09/the-new-syrian-media-law-is-nothing-new.php

INCREASING THE AGRICULTURE BUSINESS PERFORMANCE BY MIGRATING TO CLOUD SERVICES OF INFORMATIONAL STRUCTURES

SIPICĂ ALEXANDRU[1], FURDUESCU BOGDAN[2]

Abstract: *To experience a rapid development in the past decade brought the IT industry ordered the establishment of new performance indicators for world economies. These new indicators refer to the information society development. Thus, is going to be the question in any economic the administration and development of the informational structure. This paper aims to analyze the Company's performance growth opportunity of farming business in agriculture, by migrating to cloud structures.*

Keywords: cloud computing, management, agricultural production, smart agriculture

Clasificarea JEL: Business Management, Agriculture Project Management

INTRODUCTION

Although many of the old challenges remain, in twenty years Romania has turned into an open country as part of the global market. After joining the EU in 2007, Romania had to adapt to new requirements imposed by EU legislation, accepting new challenges.[8] Moving forward, Romania must find its place in Europe and must learn to thrive under a new set of circumstances

Today, the rapid development of technology is perhaps the most significant feature of our world. Everything, or almost everything today depends on technology, be it social aspects, the fight for resources, generate solutions to the complex problems of the economy and the environment. Regarding technological developments that made the difference and which has seen perhaps the most significant progress of the last decade, it is IT.

On small-scale farming most businesses are less profitable than it ought to be. Reasons for the low profitability can mention lack of access to inputs, the lack of capital and reduced ability to withstand risks. As stated in the expert reports (World Bank, 2007), [7] a major contributor to the low profitability of businesses in rural areas is the information gap that is limiting the adoption of available technologies and management practices.

MATERIAL AND METHOD

The material presented in this article was developed under a research on implementation and usage of cloud computing services in the Romanian agriculture business environment. The methods have focused mostly on literature review and results achieved in various research profile. And methods were also used to correlate data.

RESULTS AND DISCUSSIONS

As a vital branch of each society economy, agriculture must face a large number of challenge in the coming years. Statistically, FAO (Food and Agriculture Organization) anticipates that the world population will be over 9 billion until 2050. Thus, in order to provide food requirements it's necessary to increase over 70% of food production.

[1] PHD in Agronomie, Institutul Național de Cercetare – Dezvoltare ICI București, alexs@ici.ro
[2] PHD sudent in Management at „Valahia" University of Targoviste, bogdan_af@yahoo.com

Community agricultural industry growth through the introduction and use of modern technologies has generated high interest for the European Union leadership in promoting smart agriculture technologies.

Thus, scientific conferences of the European Union will have the directions carefully as crops and livestock. These directions will be treated in view of the latest advances in applications:

- Big Data & Data Analytics;
- Cloud Computing
- Drones;
- Robotics & Automation;
- Internet of AgriThings;

On agriculture as a business, research reports from the field (Brugger F., 2011) put in a wider cycle of agricultural production and the use of software, creating a complete picture of the economic, social and institutional. The report also highlights the existence of a potential initiative and experience of IT technology to encourage performance and productivity of farmers, agri-food value chain including service support, as shown in Figure 2. [1]

Figure 1. Agricultural activities in a business perspective

Processed F. Brugger , 2011 Mobile Applications in Agriculture, Syngenta Foundation [1]

This perspective on the structure and organization of food involves many stakeholders and coordinating agents. There are also Included intermediaries (brokers , processors , exporters and retailers), support organizations (agents extension , NGOs , foundations , researchers, government agencies) , service providers (banks , insurance) and consumers (internal and external) (Figure 1).

The contribution of ICT involves collecting, processing and sharing / disseminating information. Each party involved in the agricultural value chain has different functions, interests and information flows must be managed. Some studies groups IT after the following categories of information flow from agricultural environment by fulfilling the need of communication between the parties, such Parikh et al., 2008 (4) distinguishes three categories:

link-to-link (L2L) – this flow of information is necessary to coordinate the products distribution throughout the value chain.

peer-to-peer (P2P) – necessary communication and information exchange among members of a group of experts with the sector.

end-to-end (E2E) – communication between producers and consumers to facilitate the exchange of non-economic values as inputs external for market pricing.

Another example of an information provided by computer applications is published by (F. Brugger , 2011). [1] In view of this study group focuses on information in the position of agriculture as follows: (figure 2)

- *Extension services*

The applications discussed in this category covers communications required to transfer and exchange of knowledge and experience to and between farmers, to facilitate research and dissemination of information from domestic agencies to farmers.This flow of information contributes significantly to addressing the shortage of competent small producers and offers the potential to touch many more farmers than traditional ways.

- *Market Information and Interaction*

This category tighten the flow of information necessary to coordinate acts of procuring and distributing products throughout the process of increasing their value from early stages until sale to the consumer. It is hoped that using the software will improve transparency and market efficiency and strengthen the position of farmers as sellers of goods.

- Market information - these prices include information systems (ie . Market prices of various inputs and agricultural commodities trading in various locations).

- Facilities commerce / trading platforms: trading systems and platforms to identify the best opportunities to buy or sell goods and exchange platform.

- *Services and Support Systems*

- Business Process Management: It aims to maintain full operation of production within the parameters of quality, quantity and time required by the basic objectives of production and the quality assurance of functional stability of production while the variability of input disturbances environmental and the dynamic market requirements;

- Quality control: communication between buyers and sellers, producers and consumers, to facilitate the exchange of product quality (eg. Determining the quality of a product) and non-economic values as external inputs for determining the market price (eg. Product certification fair trade, maintaining quality standards, ECO label, verify the origin of the product).

It is obvious that Cloud Computing technology is a developing field of information technology (ICT), but for now, there is no compatibility for each project or application. Such projects or applications, are not suitable for cloud migrate. If, management, customers and end users are satisfied with the current arrangements for hosting and managing the current system is cheaper than cloud platforms option, then there is no reason for migrating to the cloud [6].

A definition of cloud migration is given in "Cloud Migration Challenges and Its Benefits Issue", published in 2010 by Mr. Shrikant and D. Bhopal. (5) As defined in cloud migration is the transition of databases, business applications or IT systems of companies to cloud platforms, or moving them from one cloud environment to another.[3] Migration often involves moving data to the cloud , or other business items between cloud environments, also called cloud to cloud movement.

Today, many companies in the national economy, want to migrate databases with existing information systems to cloud platforms as they begin to have problems in adopting new

technologies, platforms and new standards. The literature identifies a number of issues, as follows: (5)

Low agility -Because these applications are compatible with the new technology, it takes significant efforts to make changes to existing digital content;

More time on the market - In order to support and diversify the business, it takes more time to launch new services and features;

Cost of maintenance - Over the years, it becomes costly maintenance of personnel for system maintenance and routine updates;

Difficult integration – Integration of older application with the new and modern standards - based technologies and special services is a difficult but necessary;

Difficult updated - Especially older applications client-server type applications require a client application to be installed on workstations (desktop computers, laptop..etc) so that the user can access the applications.

Figure 2. The information requirements and business processes that provide opportunities for applications

Processed F. Brugger , 2011 Mobile Applications in Agriculture, Syngenta Foundation [1]

Today, many companies in the national economy, want to migrate databases with existing information systems to cloud platforms as they begin to have problems in adopting new

technologies, platforms and new standards. The literature identifies a number of issues, as follows: (5)

Low agility -Because these applications are compatible with the new technology, it takes significant efforts to make changes to existing digital content;

More time on the market - In order to support and diversify the business, it takes more time to launch new services and features;

Cost of maintenance - Over the years, it becomes costly maintenance of personnel for system maintenance and routine updates;

Difficult integration – Integration of older application with the new and modern standards - based technologies and special services is a difficult but necessary;

Difficult updated - Especially older applications client-server type applications require a client application to be installed on workstations (desktop computers, laptop..etc) so that the user can access the applications.

Because the transition of applications and databases of customers on cloud computing makes the level of services provided in the cloud environment is comparable with IT services offered in traditional media. Failure to properly migrate applications and database servers in cloud computing may lead ultimately increase costs and decrease turnover of the companies, thus negating any potential benefits of cloud computing platforms. To ensure successful migration of existing applications, in the literature are offered a series of measures such as: [2]

1. Analysis of applications and workloads;
2. Drawing up of business plans;
3. Develop a technical approaches;
4. Adopt a flexible integration model;
5. Security and confidentiality is mandatory;
6. Managing migration;

Measure 1 *Analysis of applications and workloads*

Evaluation of applications and workloads for cloud availability, enables organizations to determine which applications and which data can be or cannot be easily moved to the cloud environment and what can be sustained delivery models (public, private or hybrid).

Measure 2. *Drawing up of business plans*

Developing a business plan for migrating applications to the cloud requires developing an overall company strategy for migration to cloud and to determine the specific information describing the current state and demonstrating the advantages of cloud computing, not only to reduce only costs but also get a high turnover. In the context of a strategy to farms for use cloud computing services, extending to issues related applications business environment, we can identify cloud services required to validate a proper migration strategy.

Measure 3. *Develop a technical approaches*

In general, there are two service models target potential for migration of applications and databases existing in an organization: (a) Infrastructure as a Service - IaaS (service IT integration scalability cloud model the customer to migrate applications and data bases) and (b) Platform as a service - PaaS (an iT service that provides the client a set of software components that it can use to implement their own electronic services).

Measure 4. *Adopting a flexible integration model*

It is common for an application to be migrated to a cloud service to have connections for various types of applications and systems. Therefore, applications administrators need to understand the impact of these connections between applications and its behavior.

Measure 5. *Security and confidentiality*

Security and privacy are two of the issues to which customers show the highest concern for cloud services. Depending on the sector, in terms of priority may be above or below the availability and performance concerns.

Measure 6. *Migration management*

Given that factual execution of a migration is a complex and delicate, it is necessary pursuit of a migration plan: tasks, durations, resources, costs and implementation risks. Finally, after being well defined and "on paper" project on how the migration of applications, system administrators can plan, execute and manage effective migration to cloud structures.

CONCLUSIONS

Technological changes of recent years have various problems in the national economy. One of the most affected business environments is the agriculture, where implementation of IT technology was slower. Among the main problems occurred more frequently in market demand can remember decreasing market agility, increased costs of administration and existing platforms maintenance, often structure information updating difficult. Such negative aspects can be reduced by migration to various services offered by cloud technologies.

Against the advantages of the use of information systems for business are taken into account the following
• Increased production and quality;
• Preserving and enhancing soil fertility;
• Reducing costs and increasing sales / profitability

Organization management system involves coordinating various interest groups. This includes categories such sons intermediaries (brokers, processors, exporters and retailers) and providers (banks, insurance).

Grouping IT applications is mainly the categories of information flows in the agricultural environment by fulfilling the need of communication between parties.

BIBLIOGRAPHY

1. Brugger F. (2011). *Mobile Applications in Agriculture*, Syngenta Foundation, document can be found at: http://www.syngentafoundation.org/__temp/Report_on_mAgriculture_abridged_web_version.pdf;
2. Cloud Standards Customer Concil, (2013). *Migrating Applications to Public Cloud Services: Roadmap for Success*, document can be found at: http://www.cloud-council.org/Migrating-Apps-to-the-Cloud-Final.pdf
3. Molnar, D. & Schechter, S. (2010). *Self-Hosting vs. Cloud Hosting: Accounting for the Security Impact of Hosting in the Cloud*. In Proceedings of the Workshop on the Economics of Information Security, document can be found at: http://weis2010.econinfosec.org/papers/session5/weis2010_schechter.pdf
4. Parikh, Tapan S., Neil Patel, Yael Schwartzman. (2008). 'A Survey of Information Systems Reaching Small Producers in Global Agricultural Value Chains', 11
5. Mr. Shrikant D. Bhopale, *Cloud Migration Benefits and Its Challenges Issue*, document can be found at: http://www.iosrjournals.org/iosr-jce/papers/sicete-volume1/8.pdf
6. Sipică A. Furduescu B., (2015). *Raport de cercetare "Identificarea de soluţii tehnice privind funcţionalitatea şi omogenizarea bazelor de date într-un sistem de Cloud"*, ICI Bucureşti
7. FWorld Bank (2007), *'Agriculture for Development'*, World Development Report, document can be found at: http://www.worldbank.org/external/default/WDSContentServer/IW3P/IB/2006/09/13/000112742_20060913111024/Rendered/PDF/359990WDR0complete.pdf;
8. ***http://www.madr.ro/docs/dezvoltare-rurala

INTEGRATED WEB SYSTEMS AS STRATEGIC SOLUTIONS FOR (SUCCESSFULLY) BRANDING THE RURAL BOARDING HOUSES

CODRIN DINU VASILIU[1], LUCIAN TANASĂ[2], IOAN SEBASTIAN BRUMĂ[3]

Abstract: *For the past 15 years, mostly in the context of raising the financing volume for the rural environment, the number of rural boarding houses has been expanding exponentially. This increase has failed yet to be correlated with efficient marketing solutions, the development itself happened rather through actions defined by an intuitive nature. Within the rural tourism the brands have not reached their peak potential for appealing to the tourists' interest and growth. Although there are clear signs of an obvious evolution in the culture of promotion, there is also noticeable that digital technologies are not fully employed in building the brands of the rural boarding houses. In the context of the current competitional environment the virtual presence is a neccessary term for having visibility, constant audience and also a must have for increasing the tourists' number, all indispensable elements for successfully running this type of business. Although the contemporary evolution of technologies has a high degree of unpredictability which forces the boarding houses to appeal to creative solutions for maintaing and developing the brand, there is still possible to identify a series of strategic approaches of the digital technologies, depending on certain predictible parameters linked to issues such as audience psychology, cultural context, aesthetical determinations of the environments, accessibility, usability, efficiency of broadcasting the message. A likely solution for such a strategical approach is given by the integrated web systems. An integrated web system serves as a technology centered on a web product whose functions are expanded and improved by other technologies which may be either digital or non-digital. This study addresses mainly to the owners of boarding houses who intent to develop their brands and suggests a few practical solutions for successfully implementing the integrated web systems which best characterize their spectrum of activities. The solutions introduced here contain practical directions for the construction of a site, its integration in social media and in a promotional package. Starting from the current offers in the market of digital technologies we also present a cost analysis for implementing the above suggested technologies.*

Key words: *branding, rural boarding house, integrated web solutions, rural development*

Classification JEL: *Z32, O18, M31*

INTRODUCTION

The Paradox of the Rural Tourism

In the matter of the promotion discourse for one's own business the rural boarding house faces a paradox: it is forced by its own nature to convey a traditional message but also, at the same time, it has to address to quite a sophisticated tourist community with a behavoiur rather defined by urban concepts regarding life quality, with a high cognitive standard and last but not least, with greater and greater expectations to what concerns the unique character of the whole visiting experience.

Concurrently this paradox is doubled by the fact that the actual local data from the rural tourism find their best promotion and communication solution in virtualizing their own identity. The rural boarding house, in its material data, should come up with a digital translation to better communicate and appeal to an increasing number of more and more demanding tourists.

Digital Durability and Sustainability

Nevertheless, for reasons concerning mentalities or financial possibilities, the digital technologies are not used at their maximum capacity in the marketing of the tourist boarding houses. For that purpose we are facing at least two negative approaches:
1. The owner of a boarding house chooses a cheap digital solution which is partial and does not characterize the particular aspects of the rural boarding house. We could say that such

---

[1] CS III Codrin Dinu Vasiliu, Institutul de Cercetări Economice și Sociale „Gh. Zane" al Academiei Române, Filiala Iași, codrindinuvasiliu@gmail.com
[2] CS III Tanasă Lucian, Institutul de Cercetări Economice și Sociale „Gh. Zane" al Academiei Române, Filiala Iași,luciantanasa@ices.acadiasi.ro
[3] CS III Brumă Ioan Sebastian, Institutul de Cercetări Economice și Sociale „Gh. Zane" al Academiei Române, Filiala Iași, sebastianbruma@ices.acadiasi.ro

an approach lacks digital durability, mostly due to the faulty transmission of the message, blocks the communication openings, fails to catch the interest of the users and, consequently, does not provide continuity for the web.

2. The owner of a boarding house chooses an efficient digital solution which provides all the neccessary applications but does not employ the digital tools at their full capacity. He/ She does not have a recurring online presence, both visible and predictible, does not use the technologies available in an integrated formula and does not update the message in accordance with the behavioural variations of the users. Such a pattern does not use all the resources in a strategic manner, so it is only fair to conclude that it breaks the digital sustainability.

Hence we can acknowledge digital sustainability and durability as two parameters which can be easily taken into consideration in the digital marketing of the rural boarding house.

Integrated web systems as solutions for digital sustainability and durability

An integrated web system represents a technology centered on a web product whose functions are expanded and improved by other technologies which may be either digital or non-digital.

The integration relation may occur at the level of digital technologies (between a presentation site and a social media account, for example), but also, between a digital technology and a non-digital product (such as between a site and a presentation brochure). The integration can be done by simply passing from one product to another, by using logo and other significant marks, by correlating messages, by using a common set of representative colours for the values broadcast, by reposting apps of a message from the presentation site to the social media account (or the other way around), by automatization of apps for posts, by QR apps and so on.

At the same time, it is necessary to mention that we cannot yet speak about an integrated web system where a site or a presentation web application does not exist in the system's reference center. The central site provides vitality and coherence to the boarding house's brand, while the integration function brings digital durability and sustainability for the whole system.

MATERIAL AND METHODS

The present article derives from understanding the problems of the digital technologies in promoting the brand of rural boarding house. These matters have been addressed through careful analysis, assessment and interpretation of the brand, especially on the rural boarding houses from Târgu-Neamț tourist area. A good deal of these data can be found in the RDRP database as *Accomodation Units* (*Unități de cazare* http://rdrp.acadiasi.org/node/247).

The main objective of this study is to suggest integrated web systems as efficient digital tools in promoting the brand of the rural boarding house. To that purpose, the present study underlines the necessary features of the rural boarding house to provide their owners and web developers as well a general view upon the object of their collaboration.

RESULTS AND DISCUSSIONS

Possible scenarios for implementing an integrated web system

As previously noticed, an integrated web system serves as a technology focused on a web product whose functions are expanded and improved by other technologies which may be both digital and non-digital.

Starting from this minimal definition of the integrated web systems we would like to include in our agenda a few scenarios which may prove helpful for the rural boarding houses. For that purpose we shall analyze the fundamental elements of an integrated web system and the ways in which they are influenced by the basic elements of the boarding house's brand. In other words we shall analyze the name of the boarding house, the name of the web domain chosen for the presentation site, the identity elements of the brand (logo, slogan, mission, identical colour set, personalized design), the

presentation site, social media accounts, printed promotional materials and a series of suggestions regarding all these elements.

As main example we shall choose Drumul Plutașilor boarding house from Neamț county. The structure of this system includes the following:

- a presentation site (www.drumulplutasilor.ro);
- affiliations to certain accomodation platforms (booking.com)
- a FaceBook account (www.facebook.com/drumulplutasilor);
- Google Maps and Google My Maps integration;
- printed promotional materials (tri-fold brochure, business card, wall calendar, presentation folder, personalized letterheads, street billboards for direction);
- video clips done by different persons or institutions which are free and open to the public.

The Name of the Boarding House

When the business is at its very beginning or a rebranding is necessary, choosing the name of the boarding house is an opportunity which should be treated accordingly and making use of many creative resources. At the risk of sounding repetitive, a few specifications are in order, so the name of the boarding house should be chosen in accordance with the following principles:

1. *It should be unique*. We can all agree with the fact that the name of a business must be unique, but, often, the singularity of the name is not properly checked. The variations wanted can be easily verified by a simple on-line search. Sometimes the temptations to take advantage of already well-known brands can be quite seductive and consequently determine favoring a close name or, worse, alike. Even though there are some advantages on short term, such an approach creates confusion and draws negative effects on long term. However, these tactics convey lack of honesty, which is presently sanctioned by the tourist community.

2. *It should be as representative as possible* for both boarding house and region where it is located. Needless to say that a name such as *The Cabin in the Woods* is not emblematic for the seaside tourism, no matter how creative it could seem at the time. The representativity can be accomplished by referring to a few specific elements of local geography or culture. At the same time, the obvious references are to be avoided as they are used by many other boarding houses from the same region. Names such as *Bucovina (Bukovina)* or *Mestecăniş (Birchwoods)* are names at anyone's hand and cause confusion sometimes.

3. *It should be as simple, easily transmissive and memorized as possible*. The boarding houses need avoiding long names, acronyms which are difficult to pronounce, unknown words (regionalisms, archaisms or highly-particular neologisms). Where it is possible, it would be ideal to choose words without diacritics to avoid a series of complications which can occur during web developing or when choosing special fonts for the promotional materials.

4. *It should be easily inserted in a logo*. A name which refers to actual visual elements can have a simple creative graphic translation. The abstracts words may prove intricate in designing a logo.

5. *It should have a free equivalent web domain*. Regardless how stylistically speaking is the name choice, the name of the boarding house must pass the web domain test. In other words, we should have the possibility to purchase an equivalent web domain with the chosen name. Here a few aspects call our attention.

- the first one comes under the ideal extension issue. Although it is true that .ro extension are more visible in Romania, while .com extensions are more visible aut, the suggestion to pick one of them in accordance with what type of tourists we would like to appeal to is not exactly just. On the contrary. A tourist who will choose to spend a holiday in Romania is going to contextualize his/ her on-line searches in the Romanian on-line media. Namely it will be automatically directed to sites with .ro extension. Therefore our suggestion is to purchase domains with .ro extension. They may be purchased directly from ROTLD national authority (Romanian Top LevelDomain - http://www.rotld.ro/) or from third-party (mainly, web hosting services). If we choose ROTLD or

other well-known firms on the market, the purchase procedures of a domain grant data confidentiality and have a high security level. We do not recommend purchasing more extensions or correspondent names for redirecting. These practices no longer have the directing effect they used to have a decade ago. A domain name with .ro extension costs somewhere between 230 and 250 lei for unlimited period of time.

- the second aspect is about the options we have when the name of the domain is not available. For this particular case there are three solutions: looking for a web domain with a different extension (.org, .info, .com, .eu, etc); adding another word or phrase (if, for example, bucovina.ro is not available, it can be searched for pensiuneabucovina.ro); purchasing the domain from the current owner (this could be a very expensive solution). Generally, the extensions different from .ro cost somewhere between 9 and 12 euros + VAT anually.

About the above mentioned recommandations we would like to specify by referring to the example previously proposed. Drumul Plutașilor boarding house should have had a different name, one referring to mountain flowers, but the owners realized that the singularity degree was not exactly high and chose Drumul Plutașilor (The Rafters's Watercourse), unique, representative for their location, apparently oxymoronic, exciting, easily memorized and with a simple graphic translation (thier logo shows and actual rafter).

Defining one's own identity

The identification of a boarding house naturally starts from its name but it does not stop here, as formulating one's identity should rely on the following strategies:

• **Defining and communicating the values promoted by the boarding house**. For example: traditionalism or modernism, local gastronomy, leisure time and relaxation or, on the contrary, leisure time through dynamic outdoor activities. These values should be clearly formulated as they represent the ideological component of the boarding house mission and also specified in all the promotional materials. Ideally, all the promoted values should be written as a narration (story as it is now known in marketing) which expresses the identity message. The rethorical impact can be huge and the mnemonic character can also lead to a better recollection of the boarding house in the tourists'memories.

• **Integration in the regional brand where the rural boarding house is located.** The rural boarding house should also have an integrating discourse in the geography and culture of the hosting region. The key elements of the local patrimony should be present in both presentation site and printed promotional materials. Between the brand of the boarding house and that of the region there is a strong connection, an interchangeable bond. The two brands contribute each to the development and visibility of each other and, consequently, to stimulating the interest for the regional tourism. These matters are so well correlated that even the negative aspects go from one brand to another.

• **Identity and honesty**. The attitude towards one's identity should be a sincere, transparent one in accordance with the available resources. Any distortion ca lead to the brand erosion with negative effects for the business.

About the identity issue, Drumul Plutașilor boarding house, for example, has chosen a mission that conveys local traditional values complemented by various *outdoor* activities. The name of the boarding house and all these values are formulated, at an identity level, in a story which refers to a local historical fact: the watercourse of the rafters on Bistrița river, from Vatra Dornei to Galați. The historical fact to which the reference is made is loaded with concepts such as preserving the traditions, adventure, honesty, friendship, communion with nature. The message sent is documented by photo and video materials uploaded on the presentation site and Facebook account. Thus we are dealing with a simple, direct, familiar and transparent message that is in accordance with the available resources.

Other defining elements for the brand of the boarding house

Besides name, there are other elements which bring their vital contributions in defining the identity and finding the place of the boarding houses's brand on the market: logo, slogan, personalized design, design colour set, fonts.

These should be in accordance with the mission of the boarding house and used as much as possible but without irritating the audience. Our recommandation is to call on a design specialized firm, mainly due to the fact that these sort of elements have a long usability in promoting the boarding house.

The integration of these elements on the presentation site should take into consideration the following suggestions: the site title should correspond with the name of the boarding house's brand and appear as text format on the site, for a better optimization with the search engines (the sites in which the name apperas as picture format has a lower impact when indexing the brand of that site).

The slogan should be simple, different from the other competitors'slogans, also unforgetable and should avoid the wooden language of tourist propaganda and express with maximum transperancy the brand of the boarding house. It should appear on the first page of the presentation site, in the letterheads of the social media accounts, in the tri-folded brochures, on calenders, also on the banners used, street billboards, on the personalized letterheads and, if possible, on the business card itself.

About the web design and design of the printed materials, they should be correlated with the colour set used by content and fonts. Ideally the correlation strategy should also include the design of the boarding house. A set of maximum 3 colours (with hue variations) is generally recommended. To get more inspired one could appeal to specialized sites such as Adobe Color CC (https://color.adobe.com/create/color-wheel). In the matter of fonts, again a set of maximum 3 fonts (ideally 2) is recommended by professional graphic designers.

The presentation site. The reference center of the integrated web system

As we have previously brought to your attention, an integrated web system has as a reference center a presentation site. Further we shall present the problems which usually occur while constructing the web site of a boarding house. By the specific range of economic activities they provide, the rural boarding houses should have a presentation site which carries out certain marketing and communication objectives. We would like to insist mostly on the on the distinguishing elements of the rural boarding houses. The issues in question may appear technical at some point, but they could be included on the negociation list with the web developers so the communication between the owner of the boarding house and the firm chosen for the site construction should be as efficient as possible for both parties. At the same time, the web developers with less experience in constructing sites for boarding houses can have a better understanding of the necessities which derive from the particular nature of these economic activities. To continue, we shall refer to the issue of online hosting, technical solutions for web development and particular necessities of the presentation sites of the rural boarding houses.

The construction of the presentation site. The issue of online hosting

The key element of an integrated web system is the presentation site. The first issue, right after finding the name of the domain which shall be used, is choosing an online hosting service.

From the geographical point of the digital media a site has to live somewhere. Contrary to the common intuition, a site does not live on its domain (its domain name). His digital name is merely an address (a friendly format actually) where we can find that certain site. A site lives in fact on a server. Therefore to exist in the online media, a site needs a physical presence on a server.

We do not recommend a site installation on one's own server. This solution may rise high security risks and more problems in terms of time consuming tasks, especially when running a boarding house.

But we do recommend the commercial solution, namely, purchasing space on a server provided by a firm specialized in online hosting. The costs are rather low (they start from a few euros

per month) and the benefits are great. In the case of a presentation site for the boarding house the cheapest hosting service is quite enough. If the site is frequently accessed and has a lot of social media content, there are options for hosting services with extra space and resources which are also not very expensive (starting from 20-30 euros per month). At the same time, the social media materials can be uploaded on specialized social sites (Youtube or Vimeo for videoclips, Flickr or 500px for images) to avoid raising the resource necessary. Their integration with the site of the boarding house is quite simple and attracts audience as well.

After choosing the online hosting solution, the next step should be electing the construction solution, of that technology best suited for the site construction.

The construction of the presentation site. Technical options

The worst option is, naturally, not having a presentation site. Some owners of boarding houses believe that simply adhering to an accomodation platform is good enough. But things are not as they appear. The web user, after identifying an accomodation platform, will try, quite frequently, to find extra information and will browse for a presentation site.

Another solution, not much happier, is given by the free, instant and so-called „ready in five minutes" sites. And the online media is literally invaded by these sort of offers. These types of sites, most often, are not exactly free and, however, provide little necessary applications for a modern presentation site of a rural boarding house.

An efficient solution means collaborating with the web development firms which offer personalized products built by their own employees. These are the sites with a high degree of personal touch, but they also come with a few disadvantages, namely, the owners of boarding houses are almost entirely dependent to that firms. Thus the maintenance has to be provided by the web developer chosen and it has always been tricky to transfer a partnership to another firm.

From our point of view, even if things are debateable, the best solution is given by partnerships with web developers who work with the so-called CMS - Content Management Systems, such as Wordpress, Drupal or Joomla (these are the most popular ones). These systems provide a lot of free online resources (extra apps, documentation, trening, design patterns and models, etc). Furthermore the transition from one web developer to another can be done more easily, if there are problems with the first firm chosen. At the same time, the maintenance can be done by employees of the boarding house if they possess a minimal baggage of technical digital knowledge and skills.

Nevertheless we recommend to have a relationship built on mutual trust and respect with a serious web developer. Such firms, even if they might appear expensive, are specialized in web development and will come up with the best solutions of online promovation for the rural boarding houses.

The site of Drumul Plutaşilor boarding house, which we have previously used for exemplification is built on Wordpress technology.

In the case of presentation sites which also have a blog we recommend the Wordpress technology, while in the cases of sites with apps requiring personalized databases (accomodation, booking, online payments, etc) we recommend the Drupal technology.

The construction of the presentation site. Structural principles

The web space is an environment which is largely determined by the same principles of living and communication as the moral principles in real life. Thus there are certain rugulations which, if not respected, may lead to a dramatic shortage of audience. Certain recommandations are so important that, if not implemented, the search engines can restrict the visitors' access.

One of the key recommandations is the so-called principle of the reactive design (the design of the site adjusts itself to all display types). The Google search engine limits the sites which do not have a reactive design.

Another vital recommandation is about the principle of accesibility. The web space is an environment used by persons with disabilities as well. Their access cannot be done if the sites fail to implement certain applications (the possibility to minimize or maximize fonts, for instance).

Regarding the effective design of the site, at present there are two essensial debates: parallax system or classical system? Minimalism or maximalism?

Generally, a parallax design appeals to technical tricks which create dynamic visual images producing perspective illusions of 2D or 3D type. For visitors the experience is one almost cinematic. Is it more useful a parallaxlike design or a classical one? To answer the question the following aspects should be underlined: the parallax design is beneficial to web users who surf the web with no real agenda in mind (without a precise informative objective) but can be quite inconvenient for those who try to access certain data. Then the parallax design gets annoying at the third or fourth access of the site (the element of surprise has already gone). Our recommandation is to use a mixed design where the classical formulas should prevail, keeping in mind that the site of a boarding house has both a presentation and informative role.

Minimalism or maximalism. Considering all the audience tendencies, we recommend the minimalist design but containing a lot of media elements for having a good grip on the audience. Nevertheless minimalism should not exclude the attention paid to details. Details in design are quite important.

Information, applications and functions necessary for the presentation site

The presentation site of a boarding house should contain at least the following information: the presentation of the boarding house and its integration in the region, the classification of the boarding house, the accomodation terms and facilities, tourist activities, prices in a transparent and clear format, travelling directions to the destination, tourist attractions in the area, data about tourist services in the area.

From the content point of view, the site of Drumul Plutașilor boarding house includes their presentation and integration in the region, classification, facilities (such as free wireless, rooms with bathrooms, free parching, breakfast included), outdoor tourist activities (hikings, canoeing, offroad, cycling, tourist assisstance for visitors), accomodation prices, tourist attractions in the area, tourist information, travelling directions to the destination.

The presentation site of a boarding house should also include the following applications: SEO integration, geolocation, form or precise contact directions, photo galleries, QR apps, partition links for social media accounts, apps for multilingualism and internationalization. A blog is also recommended as an app which can advise the web users about the activities of the boarding house.

The presentation site of a boarding house should accomplish the following functionalities: a simple and coherent presentation of the identity and communication elements, a simple and intuitive navigation, a design which should respect the principles of a loose visualization of the site (non-aggressive contrasts, simple and readable, harmonious relations and so on).

Because it is highly significant we shall specify a few aspects regarding the navigation of a presentation site of a rural boarding house.

For that purpose it is advisable to respect a *pattern* largely engaged in the construction of the sites for boarding houses. As a rule, the main navigation meniu has the following links: *Home*, *Accomodation*, *Tourist Activities*, *Contact*. With a few possible additions: *Blog*, *Media*, *Tourist Attractions*. Regarding the main meniu it is generally recommended to use the term *Home* or the phrase *About Us* instead of *Home*, *First Page* or *Frontpage*.

To visualize the site on displays such as desktops, the text of the links from the main meniu can be doubled by specific and standard icons. The graphical references can increase the navigation fluency.

In the case of the sites meant for boarding houses we do recommend to use secondary menus. The functionalities of the secondary menus should be taken over by other apps, for instance, photo galleries.

To visualize the site on tablets or mobile phones it is recommended to include the app „hamburger button" in the menu to allow the user to switch it on or off depending on the navigation intentions.

The Social Media Accounts

Regardless how frivolous the social media looks, at least Facebook offers three key advantages: holding the audience's attention, personalizing the communication in direct relationship with the audience, getting vital information about rival boarding houses. A presentation site is, generally, an immobile product in the field of communication. The only technology which can boost and dynamize a presentation site, except for the social media accounts, is the blog. Quite important and recommendable. With the observation note that a blog is quite a handful for persons who have poor or few skills in writing or in the production of media materials (photographies, video clips, etc). Whether we like or not, the social media accounts are nowadays the most important technology that brings audience and complex means of direct communications with the audience.

CONCLUSIONS

The integrated web systems are highly efficient digital tools for introducing the rural boarding house, for establishing an effective communication framework and even for managing the business. To implement all these mentioned above it is necessary for the owners of boarding houses to understand the mechanism on its whole and the indispensable functionalities in the case of the boarding houses. Cocurrently, the web developers and designers should know precisely the specific needs of a boarding house.

This study aims to make available a series of suggestions and recommendations meant to help the owners of rural boarding house, especially when dealing with web developers or designers.

At the same time, it opens the research theme *Digital Technologies for Branding the Rural Boarding House in Moldova and Bukovina* (http://rdrp.acadiasi.org/node/143), developed on Rural DevelopmentResearchPlatform. On the same platform there are many other suggestions which could not be inserted in the present study, due to scarcity of space.

BIBLIOGRAPHY

*** 500px - https://500px.com
*** Adobe Color CC - https://color.adobe.com/create/color-wheel
*** Drupal - https://www.drupal.org
*** Facebook - http://www.facebook.com
*** Flickr - https://www.flickr.com
*** Google Maps - https://www.google.ro/maps
*** Google MyMaps - https://www.google.com/maps/d Joomla - https://www.joomla.org
*** Drumul Plutașilor boarding house - http://drumulplutasilor.ro
*** Romanian Top LevelDomain - http://www.rotld.ro
*** Rural Development ResearchPlatform - http://rdrp.acadiasi.org
*** Vimeo - https://vimeo.com
*** Wordpress - https://wordpress.org
*** Youtube - https://www.youtube.com

LAND RECLAMATION POLICIES AND STRATEGIES. HISTORICAL REVIEW AND PROSPECTS

AUREL LUP[1], LILIANA MIRON[2], INDIRA DENIZ ALIM[3]

Abstract: *This paper describes the evolution of land reclamation works in Romania, from the second half of the twentieth century and until today. Given that over two thirds of the farmland was affected by unfavorable phenomena, such as frequent drought, waterlogging and soil erosion, the totalitarian political power instituted after the Second World War decided to improve the situation. Priority was given to irrigation facilities because they were expected to substantially increase the agricultural production and yield per hectare, which were among the lowest in Europe. Between 1950 and 1989, by successive programs developed by specialists under political order, over 3 million hectares were equipped for irrigation (ranking the second or the third in Europe); on similar surfaces, there were performed works to combat waterlogging, and over 2.2 million hectares were equipped with facilities for soil erosion control. Given that, in 1950, only 42 thousand hectares were equipped for irrigation, 368 thousand hectares were equipped against waterlogging, and only 2 thousand ha for soil erosion, in the next four decades (1950-1989) there were performed land reclamation works and improvements on more than 8 million hectares. The financial effort, the rush, but also the lack of some measure in some works, such as irrigation, damaged the quality of works, many of them with important missing parts. The faulty operation for which there were insufficient financial resources yielded to unsatisfactory results compared to what was expected. After 1989, the arrangements have been degraded, and the land was irrigated increasingly less, while working endlessly to rehabilitation and modernization studies and projects, this time in accordance with the principles of market economy.*

Keywords: *land reclamation, strategies, rehabilitations.*
JEL Classification: *Q 15*

INTRODUCTION

Without getting lost in the mists of the ages, land reclamations in Romania have a long history, written by renowned specialists, i.e. professors and researchers in the field. Many of them, such as Ion Ionescu de la Brad, P. S. Aurelian, Gh. Ionescu Sisesti and others, had administrative responsibilities, for longer or shorter periods (1).The purpose of this paper is to present only the period after the Second World War, when almost all land reclamation works were implemented. In 1950, there were equipped 1,432 thousand ha, of which only 42 thousand ha for irrigation and 2 thousand ha against soil erosion; the remaining 1,388 thousand ha were embankment and drainage works carried out mainly in the Western Plain, for over two centuries (3). In the next four decades, there were equipped no less than 8,000 thousand hectares, of which 3,000 thousand ha for irrigation, more than 2,700 thousand ha against waterlogging and 2,220 thousand ha for soil erosion control (1). Specifically, until the end of 1989, there were equipped 8,416 thousand ha, of which 3,100 thousand ha for irrigation, 3.085 thousand hectares against waterlogging and 2,222 thousand ha for soil erosion control, which envisioned an area of 16,330 thousand ha, of which 5,500 thousand ha for irrigation, 5,300 thousand ha for drainage and 5.530 thousand ha for soil erosion control. This area was equipped during the period covered by this paper. In its turn, the land reclamation strategy was the result of a series of political decisions whose final objectives aimed not only at combating these three natural phenomena, i.e. drought, waterlogging and soil erosion but also at increasing the agricultural yield per ha, Romania ranking among the last places in Europe in this regard.

MATERIAL AND METHOD

Like any other economic study, our paper is based on figures from various sources, such as statistics, strategies, operational records from entities operating land reclamation works, figures revealed by balance sheets, and similar documents from farms benefitting from land reclamation

---

[1] Prof. at OVIDIUS University of Constanța
[2] OVIDIUS University of Constanța
[3] OVIDIUS University of Constanța

works. This material was selected, analyzed and processed by economic research methods and techniques.

RESULTS AND DISCUSSIONS

3.1. The development strategy of land reclamation works in planned economy (1950-1989)

The studies and research dating back to the nineteenth century were demonstrating the need for land reclamation works on more than half of the country. Not only the drought but also the floods, waterlogging and landslides severely affected the agricultural yield, food security and the safety of settlements. However, at the end of the Second World War, the only more significant works in size were 622 thousand ha of impounded lands and 358 thousand ha of drained lands, mainly in the west of the country. In addition, in 1950, there were irrigated only 42 thousand ha, mainly with vegetables and rice, and soil erosion prevention works amounted to only 2 thousand ha.

In the spring of 1945, the totalitarian political power decided to combat the country's backwardness in terms of land reclamation; thus, in 1950, there was developed the first large-scale land reclamation draft, covering a period of 10 years.

3.1.1. The electrification plan. Launched in 1950, the plan bore this name because it also included the construction of the hydroelectric plant from Bicaz, on Bistrita. In terms of land reclamation, the irrigation works started on the driest areas estimated at 2.7 million hectares. In the first phase, 1.2 million ha would be equipped, using the following water sources: the Danube for 500 thousand ha, reservoirs for another 500 thousand ha, and inland rivers for the remaining area of 200 thousand ha. The water from Bicaz lake would irrigate 300 thousand ha (no ha was irrigated from this water source). However, ten years later, in 1960, the irrigation facilities totaled only 200 thousand ha, 506 thousand ha had been drained and 100 thousand ha were equipped against soil erosion (3).

3.1.2. The national program for the extension of land reclamation works during 1960-1970. During this period, 530 thousand ha were equipped, mostly after 1965, when the construction of the major irrigation systems began: Carasu - 200 thousand ha, Galati Calarasi - 82 thousand ha, Braila Terrace - 71 thousand ha.

3.1.3. The national program on water resources management, the extension of irrigation works, dams and soil erosion control works in the SRR (the Socialist Republic of Romania), in 1971-1975, and the general and prospective provisions until 1985 was released in July 1970. This program also derives from a political decision, i.e. the objectives set by the tenth Congress of the RCP – Romanian Communist Party (august 1969): *The objectives that we have set in irrigation must be performed consistently, so that about two and a half million hectares be irrigated in 1975...* In reality, the figure achieved in 1975 was 1,474.2 thousand ha, by more than one million ha compared to the Congress provisions.

3.1.4. The national program for ensuring secure and stable agricultural yields by increasing the productive potential of the land, by a better organization and consistent use of the agricultural land, in the whole country, by performing irrigations on 55-60% of the arable land, by drainage and soil erosion control works. It was launched in 1983 with indicators personally set by Nicolae Ceausescu (4). In terms of figures, the program revealed the following (Table 1):

Table 1

Objectives to be achieved by the end of 1989
in terms of land reclamation, compared to the situation at the end of 1982

No.	Action	The surface to be equipped (potential)	Equipped surface on the 31st December 1982	Remaining surface to be equipped
1	Irrigation equipment	5500	2380	3120
2	Drainage	5530	2576	2954
3	Soil erosion control	5300	1718	3582

Source: (4)

3.2. The market planned economy era

It is characterized by a series of analyzes, surveys, strategies, studies and projects for the rehabilitation of irrigation systems, parts thereof, or even of all land reclamation works. Due to the lack of financial resources, most of the areas proposed for rehabilitation remained only on paper, and the actually irrigated areas have been reduced to one tenth or less of the equipped area existing at the end of 1989.

3.2.1. The analysis of the planned economy period. At the end of 1989, over 700 investment objectives were carried out, representing the remainder of the last land reclamation program: 3,120 thousand ha of hydro-facilities (irrigation), 2,954 thousand ha of drained land – actually waterlogging control works, because the actual draining works, performed mostly in the Danube Floodplain, were virtually completed – and 3,582 thousand ha of soil erosion control works. After all works had been stopped, the Prime Minister Petre Roman established a commission to analyze the situation in this sector and make proposals on the cessation, maintenance and full completion of the ongoing objectives[4]. The Commission's report describes, in the first part, the inadequate condition of the works performed: high water loss on non-waterproof channels (at a rate of 40%); water leaks upon irrigation; the poor quality of pumping aggregates (low yield); lack of flow meters and of water recirculation systems. Finally, the commission proposes:

   - the definitive shut-down of 207 investment objectives, including primarily drainage and soil erosion control works;

   - the partial suspension of 139 irrigation objectives, where drainage and soil erosion control works remained unfinished;

   - completion of 136 investment objectives (5).

One task of this commission was to propose some modernization (rehabilitation) systems. In line with this last task, since 1990, a number of studies with different rehabilitation priorities (studies that continue even today) have been performed. Even in 1990, a Romanian-French joint team, i.e. ISPIF Bucharest and GERSAR BRL, began a study for the rehabilitation of the irrigation systems from Carasu, Constanta County, Galati-Calarasi and Pietrosu-Stefan cel Mare, Ialomita and Calarasi counties (Reh).

This was followed by an extensive study conducted by a Romanian-English consortium, i.e. of BINNIE-PARTNERS AND HUNTING TECHNICAL SERVICES LTD, which conducted the study *Irrigation and Drainage in Romania*, for 2 years (1992-1994). Taking into account the high electricity costs, this study proposed to stop the rehabilitation of those systems or parts of the systems where the pumping height exceeded 70 m. Specifically, only 45 systems, fully or partly summing up an area of 1,361 thousand ha, were situated below this height. In the Danube Floodplain, 203 thousand ha could be maintained, depending on irrigation efficiency and, according to a detailed study, another 172 thousand ha could be rehabilitated; therefore, in total, there were maximum 1,736 thousand ha or 54.5% of the equipped area that existed in 1990 (7).

During 1993-1995, two rehabilitation studies were carried out, the first one by an American company, i.e. MORRISON KNUDSERN CORPORATION, for the irrigation systems GIURGIU-RĂZMIREȘTI, IALOMIȚA-CĂLMĂȚUI and GALEȘU-CONSTANȚA (8) and another one by a Japanese company, i.e. JAPAN INTERNATIONAL COOPERATION AGENCY, for an area of 22,360 ha of *Siret-Baragan Canal* project, whose completion would allow the gravity fed irrigation of about 700 thousand ha[5]. Since the mid 90s and up to the present, the issues raised by land reclamation – irrigation, in particular – have been addressed at different levels and in

---

[4] The governmental commission was composed of: Prof. Hâncu Simion, PhD from "N.Bălcescu" Agronomic Institute of Bucharest, President; Engineer Găzdaru Adrian, PhD - advisor to the Minister; Engineer Răuță Cornel, PhD - director of the Soil and Agrochemical Research Institute; Assoc. Prof. Izbășoiu Eugen, PhD from the Polytechnic Institute of Bucharest - secretary; Engineer Levițchi Crișan, PhD - director of the State Agriculture Department; Engineer Berbeci Vasile from the Department of Land Reclamation and Engineer Aurel Lup, PhD - scientific secretary at the Research Station for Irrigated Crops, Valu Traian, Constanta county.

[5] By the ISPIF company, Bucharest, the author has worked as a consultant on irrigation economic issues, in the beneficiary agricultural units. With all these four companies, he drafted and proposed structures of crops and income and expenditure budgets comparable to the system under irrigated agriculture.

different contexts: government strategy, surveys, national debates. We are going to present some of them.

The National Strategy to Combat Drought, Prevent and Combat Land Degradation and Desertification - 2007[6]. It was actually an update of the strategy developed in 2000, structured on six priorities: 1. Improving legislation; 2. Developing the institutional capacity; 3. Ensuring human resources; 4. Developing the technical-scientific base; 5. Rural development in areas at risk of drought and desertification; 6. Rural development in areas at risk of land degradation. There was resumed the discussion on the derivation works Siret-Baragan and Olt-Vedea-Neajlov (discontinued after 1990) that would ensure irrigation with low energy consumption. This triggered criticism related to the political decision taken before 1989 to use the Danube as a water source; this required pumping water on terraces at considerable heights and on long runs, with heavy losses on non-waterproof channels, triggering thus high energy consumption and, finally, negative economic effects.

National Debate Danube River and Danube Floodplain and Delta - Agriculture and Environment - Present Situation and Future Projections. (2). The debate was held on 8th-9th May 2008 and it was sponsored by AAFS (The Academy of Agricultural and Forestry Sciences; the Romanian abbreviation is ASAS). The topic was important; it manifested itself critically, precisely with regard to the hydro-facilities in the Danube Floodplain, highlighting their weaknesses, including their costs and inefficiencies.

The discussions were dominated by the representatives of the Institute for Studies and Projects on Land Reclamation – ISPLR (the Romanian abbreviation is ISPIF) – which was the also the organizer of the debate. Although some speakers drew the attention to unresolved environmental issues (waterlogging, in particular) or to issues that could be solved with huge costs, or to the danger of soil degradation (salinization, compaction, erosion, decreased fertility by the rapid depletion of the organic matter), it was appreciated that, this time, through rational exploitation (which did not happen in 20 years of operation), the irrigation systems should be rehabilitated and that the uncontrolled destruction of dams and a *chaotic* flooding would be harmful (though no one proposed it). The attention was drawn to the danger posed by the deforestation of an area of nearly 89,000 ha. The final resolution recommended *the maximum use of facilities and of the works performed*, after their modernization, and the completion of some works, such as waterproofing the irrigation channels.

The works of debate were published in a volume that lacked concrete data on the yields and results obtained in more than 20 years of irrigated agricultural operation, on its economic efficiency, on the costs triggered by the water drainage process of drained premises; the negative effects were minimized, although the respective designers and builders knew well their magnitude. The evolution of soils and the agricultural yield would be studied further.

The investigation of the Parliamentary Commission on the situation of irrigation systems and of other land reclamation sectors[7]. The Commission would verify how the specialized bodies pursued the compliance with the rehabilitation and maintenance measures, including the irrigation facilities, the functionality of drainage systems and the maintenance of soil erosion control works.

For over two months, the commission divided, into four sub-commissions, traveled throughout the country, drawn up a set of forms previously prepared with the updated situation of each branch (12 in total), including the areas irrigated in the last three years, i.e. 320 thousand ha in 2007; 258 thousand ha in 2008 and 288 thousand ha in 2009. The main findings of this parliamentary commission in the three land reclamation categories (irrigation, drainage and soil erosion control works) were:

Hydro-facilities - Irrigation:
- Decay, abandonment, lack of user interest;

---

[6] It was approached in 2007, based on Government Decision no. 474/2004.

[7] It was established by the Chamber of Deputies Decision no.31/24 June 2009, comprising a total of 15 deputies from all political formations and four specialists - experts in the field, including first author of this paper.

- Lack of funds for rehabilitation, maintenance and operation;
- Disappearance of the Forecasting and Warning Compartment from the organizational structure of subsidiaries;
- Disproportion between the area equipped for irrigation, the area organized in IWUOs – Irrigation Water Users' Organizations (the Romanian abbreviation is OUAI) and the effectively irrigated area;
- Lack of watering equipment; the inadequate condition of pumping aggregates.

    Drainage facilities:
- Decay; clogged channels, flooded by vegetation;
- Abandonment and neglect;
- Broken up and degraded pumping stations;
- Lack of financial resources for rehabilitation and proper operation;
- In some areas, such as Olt-Arges, Arges-Buzau, Arges-Ialomita-Siret branches, 70% of the hydro-facilities were on drained land, cumulating the deficiencies of both categories, i.e. irrigation and drainage works.
- In the same area, there was the Siret-Baragan bypass, designed for the gravity fed irrigation of an area of 500 thousand ha, thus with minimum energy consumption; this project was abandoned.

    Soil erosion control works:
- Affected by land laws that led to their destruction and abandonment;
- Fragmentation and almost total neglect by the new landowners.

The Commission also noted that Law 138/2004, which separated the former NCLR (the National Company of Land Reclamation; the Romanian abbreviation is SNIF) in NALR (the National Agency for Land Reclamation; the Romanian abbreviation is ANIF) – a no lucrative/ non-profit administrative unit – and NCLR SA (the Romanian abbreviation is SNIF SA) – a lucrative/ profit-making unit - was a mistake and that the priority allocation of funds to NALR was also harmful. The Commission also found that the personnel plans of the branches included specialists with little specialized training or that there were no specialists, the personnel being appointed by political criteria.

Regarding the users' involvement in the management of equipped areas (land reclamation works), under Law no.138/2004 for the establishment of IWUOs (Irrigation Water Users' Organizations), the commission found that, in 2009, 400 units were established, covering an area of 1,000 thousand ha – i.e. more than 30% of the area equipped at the national level –, while the actually irrigated area was 288 thousand ha, at national level, in 2009– i.e. 9.3% of the equipped potential existing in 1990, or 35% of the area declared viable in 2009.

The most important causes that led to significant reductions in irrigated areas are:
• Dissolution of large operating structures, of agricultural cooperatives in the beginning, under Law no. 18/1991 of the land, and then under Law no. 1/2000;
• Degradation of the infrastructure of hydro-facilities by destruction, theft, disrepair, abandonment, the new landowners' lack of interest. This was accompanied by the policy makers' inability to manage and organize the operation of an important national agricultural and economic heritage;
• The transition to a market economy, whose engine was represented by the profit obtained exclusively by the economic entity and not by the national economy;
• The progressive increase in irrigation water costs and, in particular, the differentiation on pumping steps reduced the interest in irrigation;
• Destruction of the electricity transmission network, together with switching off the power supply network and removing parts of it (such as the extraction of processors), motivated by non-use;
• Many landowners were not convinced of the economic benefits of agriculture under irrigation, associated with the delayed establishment of IWUAs/ IWUOs – Irrigation Water Users' Associations/ Irrigation Water Users' Organizations (the Romanian abbreviation is AUAI/ OUAI);

• Shortage in terms of water management equipment;

• Mismatch between the activities carried out in order to rehabilitate the irrigation infrastructure and the actual water demand at the level of the hydro-technical system;

• Uncertainty regarding the sale of yields for the breeds responding best to irrigation, such as corn or vegetables, under very permissive policies on imports.

At the end of the Report (160 pages), the Parliamentary Commission makes a number of proposals, such as:

• Conducting an inventory of the systems and subsystems that can be functional without investment;

• Finalizing the economically viable systems or parts thereof (when the ratio between benefit and cost is greater than 1);

• Awarding the public utility status to gravity fed irrigation systems, in order to make them eligible for grants, after their inclusion in IWUOs at a rate of more than 50%.

• Completing the priority list of schemes for rehabilitation and modernization investments (modern watering infrastructure and facilities) based on economic viability and inclusion in IWUOs and/ or Federations;

• Resuming the work on Siret-Baragan and Olt-See-Neajlov bypasses and identifying other areas that can be equipped with gravity fed irrigation systems;

• The areas subject to an obvious degree of aridity and desertification and whose irrigation systems have no economic viability (e.g. Dobrogea) should be treated as *disadvantaged areas*;

• As far as functional irrigation systems are concerned, the payment of compensation under drought should not be accepted, and lease contracts should provide for the mandatory irrigation of these areas;

• Establishing land reclamation organizations – LROs (the Romanian abbreviation is OIF) (LRO-Draining (the Romanian abbreviation is OIF-Desecare); LRO-SRC (Soil Erosion Control; the Romanian abbreviation is OIF- CES); OIF-Irrigations (the Romanian abbreviation is OIF-IA)) in collaboration with local committees, and the association in federations organized at the level of systems, polders and micro-watersheds;

• Acquisition of machines and equipment for rapid intervention in emergency cases;

• Reviewing the project on the Economic and ecological resize of the Danube Floodplain, drafted and approved by the Ministry of the Environment;

• Promoting and remunerating the staff involved in the operation, maintenance and repair activities solely under performance indicators.

The strategy on the investment in the irrigation sector (7). This study was conducted by a Dutch company, i.e. *Fidman Merk at*, within the Project for the Rehabilitation and Reform of the Irrigation Sector – PRRIS (the Romanian abbreviation is PRRSI) – in order to provide the Ministry of Agriculture and Rural Development – MARD (the Romanian abbreviation is MADR) – solutions regarding the conduct of the investment in hydro-facilities.

This study is based on Romanian realities and considers that irrigation is a business component and, hence, the value of the additional yield must cover additional costs and make profit. Thus, farmers need to introduce a structure of specific crops and have a sufficient level of economic development in order to manage irrigation. Without these conditions (mentioned in the preamble of the study), *we can speak only of enthusiasm without any foundation, and the case of those who propose irrigation at any cost during dry periods* (although the aridity index is just one of the seven criteria for prioritizing investments) *is just a demagogical manifestation*. Another need is represented by the recognition of the fact that *irrigation does not fall into the state's responsibilities, money cannot be spent on irrigation just in order to respond to the false perceptions of the public opinion and the media. They should not be introduced by force or announced as election topics; they should be designed as business components.*

Based on these considerations, the objectives of the strategy were the following:

a) Investing in those irrigation facilities where farmers have a high potential in terms of

the use and maintenance of systems, and also in terms of the contribution to the investments in irrigation equipments;

b) Modernizing the irrigation infrastructure by reducing water loss and energy consumption.

In addition, the principles of the irrigation investment strategy were the following:

a) The technical and economic viability of irrigation systems, which translates in recovering the operating costs and making profit, subsequent to irrigation;

b) The user's interest. Investments are made only at the request of potential beneficiaries. Without the users' active involvement, investments are not sustainable and such principle must be excluded;

c) Contribution. The farmers who will benefit from investments must bring their own contribution to the rehabilitation / modernization or creation of new facilities;

d) The economic capacity of water users;

e) Crops adequate to irrigation;

f) Adjustment to request. Modernization should meet the users' requirements in terms of the irrigation methods adopted by users;

g) Support, development and modernization of local irrigation facilities.

From more than three million ha equipped for irrigation, existing in the NALR records (the National Agency of Land Reclamation; the Romanian abbreviation is ANIF), a total of 56 systems were selected – most in the Danube Floodplain, i.e. about 570 thousand ha –, with a total area of 1,412 thousand ha, wherefrom an area of 823 thousand ha was deemed viable and recommended for the inclusion in investment programs, in the next period. The selection criteria included:

1) Crop structure (as recorded at APIA – the Agency of Intervention and Payment for Agriculture) in the year before the financing documentation;

2) Utilization degree (the Romanian abbreviation is G_u); it indicates a part of the efficiency of the system; the higher the G_u, the lower the users' costs per volume unit (1000 m^3);

3) The delivery charge of the water provider (the Romanian abbreviation is TL);

4) Inclusion rate within IWUOs (the Romanian abbreviation is Gw);

5) Integrated projects that rehabilitate both the main section of the system and the interior fittings;

6) The existence of windbreaks;

7) Aridity index (AI; the Romanian abbreviation is IA).

Each of these criteria were assessed and taken into account in the selection. For example, for the crop structure, there were taken into account the percentage of those elements that are suitable for irrigation (that trigger great additional value bonuses, such as corn, wheat, sugar beet, fodder, seeds), usability (what surface from the entire system was irrigated in 2008-2009) etc. Moreover, priority was given to those systems that have a high coverage rate of water user organizations and, obviously, this included the farmers with areas of tens of thousands of ha (some of them were unique associates). Drought is lost among these strictly commercial criteria, although the Danube Floodplain is not the driest (the poem *The Deer's Death* (in Romanian, *Moartea Caprioarei*) was not written at Bailesti and *Papura-Voda* was not "ban" of Craiova).

When establishing the investment program, three scenarios were drawn up:

- The entire area found viable: 823 thousand ha;

- The maximum area irrigated in 2008-2009, on each system, but not less than 51% of the system: 433,723 ha;

- The maximum area irrigated in 2008-2009: 25, 759 ha.

The specific investment needed in order to rehabilitate those areas was assessed at about 1,130 euro/ha.

CONCLUSIONS

1. The totalitarian regime installed after the Second World War tried to eliminate Romania's backwardness in the field of land reclamation and irrigation, in particular, drought being considered the main cause of some of the lowest yields in Europe.

2. By particularly large financial efforts, including foreign loans, in four decades, almost eight million ha were equipped by land reclamation works, including more than three million ha equipped for irrigation, about 2,700 thousand ha were equipped against waterlogging and 2.2 million ha benefitted from soil erosion control works.

3. The financial effort was enormous – i.e. over 10 billion dollars, modestly assessed at 10-12 billion dollars; however, according to the World Bank's assessment, there were invested about 50 billion dollars. Haste, lack of action, especially in irrigation – the 2nd place in Europe and the 1st place in the world, in terms of equipped areas per capita – damaged the quality of works; this was associated with the inappropriate operation triggered by the lack of money, leading to unsatisfactory results.

4. There were registered modest yield increases, assessed at less than half of the projected level; there were registered losses instead of additional revenue, in the intensive crops, such as corn, sugar beet, soybeans and potatoes.

5. After 1989, a real campaign was declared for the elaboration of rehabilitation studies and projects, both by Romanian specialists and by specialized foreign companies: French, English, American, Japanese and Dutch. They aimed at rehabilitating and completing the construction deficiencies of these systems.

6. The last Dutch study recommends prioritizing the rehabilitation of the systems located in the Danube Floodplain, not on grounds of drought, but on profit maximization, but also having in view that large agricultural producers installed themselves in this Floodplain.

BIBLIOGRAFIE

1. Davidescu D. (subredacția), 1991: *Istoria științelor în România. Științele agricole.* Ed. Academiei Române. București.

2. Hâncu S., Jelev I., Codreanu M.M. (subredacția), 2009: *Dezbatere naționala - Dunărea si Delta Dunării. Agricultura si mediu. Prezent si perspectiva.* Ed. BREN, București.

3. Lup A., 1997: *Irigațiile in agricultura României. Potențial de producție. Grad de utilizare, perspective.* Ed. Agris, București.

4. x x x: 1983: *Programul National pentru asigurarea unor producții agricole sigure si stabile prin creșterea potențialului productiv al pământului, mai buna organizare si folosire in mod unitar a terenurilor agricole, a întregii suprafețe a țării, realizarea irigațiilor pe circa 55-60% din suprafața arabila, lucrărilor de desecări și combatere a eroziunii solului.*

5. x x x: 1991: *Raportul Comisiei guvernamentale pentru analiza si soluționarea problemelor legate de lucrările de îmbunătățiri funciare.*

6. x x x: 2008: *Strategia națională de combatere a secetei, prevenirea și combaterea degradării terenurilor și deșertificării.*

7. x x x: 2011: *Strategia Investițiilor în sectorul Irigațiilor* (Fidman-Merk).

SECTION 2

"ECONOMY, MANAGEMENT AND AGRICULTURAL MARKETING"

EVOLUTION OF AGRARIAN STRUCTURES IN ROMANIA

GAVRILĂ VIORICA[1]

Abstract

The main indicators used in the analysis refer to: Utilized Agricultural Area (UAA), labour force in agriculture, animal herds, physical and economic farm size. In the period 2005-2013, the number of small-sized farms significantly decreased in Romania, while the number of medium and large-sized farms increased. The Utilized Agricultural Area distribution reveals that the bipolar structure of agriculture has been maintained. Although this distribution indicates a weak presence of medium-sized agrarian structures, there is a consolidation tendency of these structures. While the livestock production activity on the small-sized farms considerably decreased, the livestock herds doubled on the large-sized farms. However, this increase was not enough, so that overall one quarter of total herds was lost. The exit from the farming activity had a higher intensity on the mixed farms. Only a few types of activity entailed labour force increase.

Key words: *agricultural holdings*

JEL Classification: Q12

INTRODUCTION

There are more than 570 million agricultural holdings in the world, and most them are small or very small-sized. The distribution of the latter reveals that 72% of the agricultural holdings worldwide have less than 1 hectare and utilize only 8 % of the agricultural land; the holdings in the category 1 – 2 hectares account for 12 % of total holdings and control 4% of land, while the agricultural holdings in the category 2 – 5 hectares account for 10 % of total farms and utilize 7 % of the agricultural land. Only 1 % of total agricultural holdings are larger than 50 hectares but these use 65 % of the agricultural land of the world (FAO, 2014).

The distribution patterns of agricultural holdings by size worldwide indicate the prevalence of very large-sized holdings in the countries with high and medium incomes and in the countries where large-scale grazing of animals prevails in the agricultural system (Sarah K. Lowder, 2014). The studies at European level on the structure of agricultural holdings in the year 2013 reveal that there were 10.8 million farms in EU-28 operating 174.4 million hectares (Utilized Agricultural Area – UAA), and one third of these (33.5% or 3.6 million) are located in Romania (Eurostat, 2015). The average farm size in EU-28 was 16.1 hectares, while in Romania it is four times lower (3.6 hectares). These average values must be considered in the context of strong contrasts in the structure of agriculture: in the entire EU, on one hand, there was a great number (4.9 million – almost half of all farms) of very small-sized farms (less than 2 hectares in size) that operated a small percentage (2.5%) of the total area of land utilized for agriculture in 2013 and on the other hand, a small number (0.3 million corresponding to 3.1% of total farms) of very large-sized farms (over 100 hectares), which operated half (50.1%) of the utilized agricultural area in EU-28.

The Common Agricultural Policy values focus on multifunctional agriculture (basic commodity delivery, environmental services, landscape and cultural heritage facilities). In the European Union, the agricultural policies encouraged the family farming pattern as well as the increase of farm size.

Almost half of the Utilized Agricultural Area of EU-28 is owned by four member states (France (15.9% of total EU-28), Spain (13.4%), United Kingdom (9.8%) and Germany (9.6%). Romania ranks 6th, with 7.5%, after Poland (8.3%).

Dr. CSIII VIORICA GAVRILA, Institute of Agricultural Economics, NIER, Romanian Academy, Calea 13 Septembrie no. 13, sector 5, Bucharest, tel/fax:021/3182411; e-mail: vio.gavrila@yahoo.com

Structural development in agriculture is frequently described as a change in the number and size of farms. The final result of the structural change, already noticeable at the horizon in the rich countries, is an economy and society in which agriculture is an economic activity that is not different from other sectors, at least as regards labour and capital productivity (Timmer, 2007). In most EU member states, there is a general decreasing tendency of the number of farms and labour force, but the great diversity of farms and their evolution are determined by different socio-economic contexts.

Although Romania's joining the European Union has created new conditions for the development of rural areas and agriculture, the context in which these evolved has been entirely unfavourable from the perspective of the main production factors: agricultural land organization (excessive agricultural land fragmentation), economic power (deficient capitalization) and managerial ability. Under the background of destructured agricultural markets, the agricultural holdings were confronted with new challenges, determined by the free movement of commodities as well as by the adoption of the European agricultural support model. Having in view these factors constraining economic performance, at present, for our country's agriculture, an important objective is solving up the productivity problem, as the increase of productivity in agriculture is most often linked to competitiveness.

MATERIAL AND METHOD

For the analysis of farm structure evolution, certain physical indicators are used, namely: number of farms, Utilized Agricultural Area, labour force on farm. The limitative factor of these physical size indicators resides in their dependence on the type of agricultural activity, and the economic situation of the farm is not known. In this context, the economic efficiency of production factors utilization is analysed on the basis of the level and evolution of labour and land.

The changes in the analyzed period are highlighted by the percentage variation of the utilized indicators, both per total farms and by the legal status of farm.

The data sources on the *farm structure* are represented by the basic surveys, i.e. the General Agricultural Census (GAC), conducted every 10 years and the intermediate structural surveys (ISS), as sample surveys, three times between the basic surveys. The data are presented by size classes, depending on different indicators, namely: Utilized Agricultural Area (UAA), total Standard Output of farm, expressed in euro, legal status of farm, type of farm, etc.

RESULTS AND DISCUSSIONS

In the year 2013, more than 3629 thousand agricultural holdings operated in Romania, with a total Utilized Agricultural Area (UAA) of 13055 thousand hectares.

Similarly to the European context, the evolution of the number of farms in Romania has followed a decreasing trend, so that in the year 2013, the number of farms that operated in agriculture was down by 15% compared to the year 2005. In real terms, more than 636 thousand farms without legal status ceased their activity and 9.6 thousand farms with legal status were set up.

From the size perspective, farms up to 20 hectares exited the farming activity, and out of these more than half belong to the size class 2 – 4.9 hectares. At the same time, under the background of their disappearance, an increase in the number of farms larger than 20 hectares was noticed, out of which 55% are farms ranging from 20 to 99.9 hectares, and 45% have more than 100 hectares.

Table 1. Evolution of the number of holdings by legal status and UAA size classes, 2013/2005

	Total farms, out of which:		Without legal status		With legal status	
	Number	%	Number	%	Number	%
Total	-626490	-15%	-636110	-15%	9620	53%

0 ha	-69020	-51%	-69030	-51%	10	2%
<2 ha	-131790	-5%	-134770	-5%	2980	98%
2-4.9	-322850	-32%	-323680	-32%	830	36%
5-9.9	-95710	-33%	-95910	-33%	200	8%
10-19.9	-16260	-25%	-17000	-26%	750	54%
20-29.9	130	1%	-410	-4%	540	142%
30-49.9	2480	41%	1810	33%	670	143%
50-99.9	2360	48%	1450	37%	920	93%
>100	4150	46%	1430	64%	2720	41%

Source: calculations based on Eurostat data [ef_kvaareg]

The Utilized Agricultural Area (UAA) decreased on the farms without legal status over time, by 1831 thousand hectares. The farms with legal status absorbed a large part of this area, yet overall UAA decreased by more than 850 thousand hectares, the decrease increasing in intensity in the period after the accession to the EU 2007-2010. In percentage terms, UAA decreased by over 6%.

The UAA diminution phenomenon is present on the farms up to 19.9 hectares, being mainly noticeable in the size category 2-4.9 hectares, where the UAA decrease totals more than 1 million hectares. This decrease was compensated by an almost similar increase of areas in the category of farms over 100 hectares.

Table 2. Evolution of Utilized Agricultural Area by legal status of farms and UAA size classes, 2013/2005

	Total farms, out of which:		Without legal status		With legal status	
	Hectares	%	Hectares	%	Hectares	%
Total	-850850	-6%	-1831010	-20%	980160	20%
0 ha	0	0%	0	0%	0	0%
<2 ha	-357020	-18%	-359220	-19%	2200	108%
2-4.9	-1019490	-32%	-1022330	-32%	2840	38%
5-9.9	-631210	-33%	-633670	-33%	2460	15%
10-19.9	-195690	-23%	-207600	-25%	11900	69%
20-29.9	4740	2%	-8600	-4%	13340	145%
30-49.9	99390	44%	72710	35%	26680	146%
50-99.9	173520	52%	104510	40%	69010	97%
>100	1074900	21%	223180	40%	851720	18%

Source: calculations based on Eurostat data [ef_kvaareg]

The Utilized Agricultural Area distribution reveals the continuation of the bipolar structure in the farming sector: the farms up to 10 hectare operate 43% of total UAA, while the farms larger than 100 hectares operate 48%. Although this distribution reveals a weak presence of medium-sized agrarian structures, a farm consolidation tendency exists, as the largest UAA increase too place in the case of farms from the category 50-99.9 hectares (52%) and of farms in the size class 30-49.9 hectares (44%).

In the year 2005, more than 3453 thousand farms representing 81% of total farms were involved in livestock raising activities, while in the year 2013 livestock raising was practiced on 2727 thousand farms, i.e. on 75% of total farms. Although the sheep, goat and poultry numbers increased, due to the diminution of cattle and pig herds, overall, the number of animals was down by one quarter; in absolute figures, this loss represents more than 1627 thousand LU.

Livestock raising became non-attractive in time on the farms up to 20 hectares, yet a positive evolution was noticed for the medium and large-sized farms. In percentage terms, on the large-sized agricultural units the number of animals has doubled.

Table 3. Evolution of livestock herds by legal status of farms and UAA size classes, 2013/2005

	Total farms, out of which:		Without legal status		With legal status	
	LU	%	LU	%	LU	%
Total	-1627440	-25%	-1883130	-31%	255680	41%
0 ha	-12250	0%	-23210	0%	10950	0%
<2 ha	-816200	-35%	-806280	-35%	-9920	-33%
2-4.9	-909890	-44%	-918630	-45%	8730	99%
5-9.9	-294170	-32%	-290870	-32%	-3300	-18%
10-19.9	-6240	-2%	-8310	-3%	2070	6%
20-29.9	21990	23%	32550	40%	-10570	-69%
30-49.9	52650	69%	49480	73%	3170	36%
50-99.9	82580	81%	48120	73%	34460	96%
>100	254110	105%	34000	47%	220100	131%

Source: calculations based on Eurostat data [ef_kvaareg]

The ceasing of farming activities on 15% of agricultural holdings has been also materialized into the diminution of the number of agricultural workers by almost 23%. From the full-time employment perspective, the labour input was down by more than 40% representing the exit from farming of more than 1042 thousand Annual Work Units (AWU). The withdrawal from the farming activity was manifest on the farms without legal status, with a higher frequency on the farms in the size class 0-19.9 hectares. In absolute terms, the highest decrease took place on the small-sized units, while on the medium and large-sized farms the number of persons and farm work (AWU) slightly increased.

Table 4. Evolution of labour force by the legal status of farms and UAA size classes, 2013/2005

	Total farms, out of which:		Without legal status		With legal status	
	AWU	%	AWU	%	AWU	%
Total	-1042960	-40%	-1046020	-42%	3060	4%
0 ha	-17920	0%	-16550	0%	-1370	0%
<2 ha	-439080	-36%	-439160	-36%	70	3%
2-4.9	-424940	-50%	-424600	-50%	-330	-17%
5-9.9	-142170	-47%	-142190	-48%	20	1%
10-19.9	-25080	-32%	-25470	-33%	400	16%
20-29.9	-1210	-8%	-1650	-12%	430	36%
30-49.9	1820	15%	1300	13%	510	25%
50-99.9	2400	20%	1460	20%	930	19%
>100	3230	5%	840	12%	2380	4%

Source: calculations based on Eurostat data [ef_kvaareg]

The exit from farming was manifested with a higher intensity on the mixed farms (with mixed crop – livestock production). Only a few types of activities attracted the increase of labour force, namely vine growing, fruit growing and other types of horticultural activities, as well as in cattle, sheep and goat raising and fattening.

In the year 2013, the Standard Output (SO) reached 11989578 thousand euro. Compared to 2005, this was a positive evolution (+14%), under the background of significant growth on the farms with legal status, as well as on the medium and large-sized farms without legal status.

While at the beginning of the investigated period 82% of the Standard Output was obtained on the farms without legal status, in time the share of these farms in SO was down to 70% on the basis of gradual increase of the output value on the farms with legal status (from 18% to 30%).

In the period 2005 – 2013 the agricultural output value increased by 14%, under the background of significant increase on the farms with legal status as well as on the medium and large-sized farms without legal status.

Table 5. Standard Output evolution by total farms and by legal status of farms and UAA size classes, 2013/2005

	Total farms, out of which:		Without legal status		With legal status	
	SO - euro	%	SO - euro	%	SO – euro	%
Total	1471659110	14.0%	-173857600	-2%	1645516710	86.9%
0 ha	180966230	0%	4222260	0%	176743970	0%
<2 ha	42241310	1%	36798300	1%	5443010	21%
2-4.9	-548904150	-18%	-566981690	-19%	18077540	182%
5-9.9	-173129840	-12%	-177140230	-12%	4010390	18%
10-19.9	73414860	13%	44911220	9%	28503650	76%
20-29.9	64809850	42%	62924230	47%	1885620	11%
30-49.9	121258760	87%	104985640	93%	16273120	62%
50-99.9	194855030	102%	110802570	86%	84052470	135%
>100	1516147050	86%	205620110	87%	1310526950	86%

Source: calculations based on Eurostat data [ef_kvaareg]

In the context of these structural changes, an increase of the load on the Annual Work Unit took place, both as regards UAA (+57%) and the livestock herds (+26%). This resulted in labour productivity increase from 4052 euro/AWU in 2005 to 7722 euro/AWU in 2013, representing a 91% increase. As regards UAA productivity, this increased by only 21%.

Figure 1. UAA and AWU productivity evolution in the year 2013 as compared to 2005, %
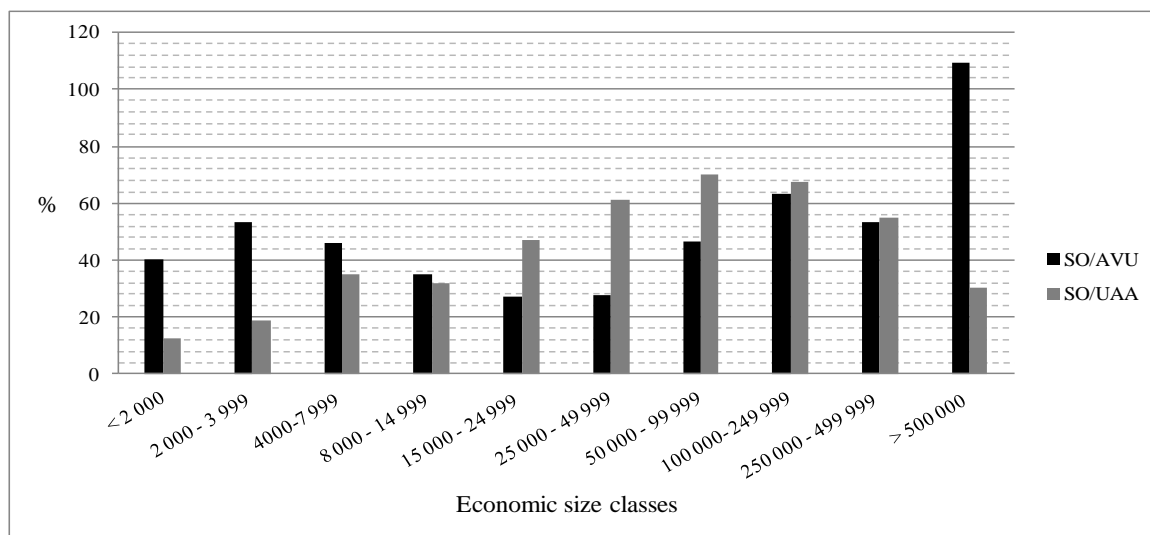
Source: calculations based on Eurostat data [ef_kvaareg]

Although these indicators represent a partial measure of productivity, they reveal a general trend, mainly from the perspective of the analysis by economic size classes. Figure 1 illustrates a more significant labour productivity growth on the large farms, as well as on the subsistence and semi-subsistence farms. Land productivity also positively evolved, with more significant increases on the commercial farms, mainly in the economic size class 50000 – 99999, in which it increased by 70%.

CONCLUSIONS

The farming structure in the European Union member states depends on several factors, with a mutual interaction between the structural change in agriculture and the socio-economic aspects.

In the period 2005-2013, in Romania, the number of small-sized farms significantly decreased, while the number of medium and large-sized farms increased. These modifications were accompanied by UAA diminution by more than 1 million hectares on the small-sized farms, compensated by an almost similar increase on the farms with more than 100 hectares in size. Unlike the general tendency in the EU, UAA decreased by 6% in Romania, mainly in the post-accession period.

The exit from the farming activity was more intense on the mixed farms (crop-livestock production mix). Only a few types of activity attracted labour force increase, namely vine growing, fruit growing and other types of horticultural activities, as well as in cattle, sheep and goat raising and fattening.

At present, for our country's agriculture, an important objective is solving up the productivity problem. In this context, the medium-sized farm consolidation represents a blending of the need to increase productivity in agriculture with the respect for the CAP values.

In reaching this productivity increase objective, there are major constraints that impact the development of the farming activity:
1) Deficiencies in farm management
2) Land fragmentation and unreliability of transactions on the land market
3) Deficient technologies and climate changes that will impact the availability of basic natural resources (water, soil).

Education is the main pillar of human development and an important factor in agriculture development. A farmer with four years of basic training and education is on the average by 8.7 % more productive than an uneducated farmer (FAO, 2002). Solving up these problems presupposes the increase of the attractiveness level for setting up young farmers. A young farmer is well-connected to the technological and innovative realities, as essential elements for putting into value the resources (land, operating capital), existence of a strong agricultural consultancy service based on farmers' training (initial and vocational training), extension services for performant technologies and delivery of marketing support information.

At the same time, solving up the problems in the field of agricultural cadastre and those in the irrigation system are important levers for the development of agriculture and rural areas with a positive impact in speeding up farm consolidation.

The importance of medium-sized farm consolidation derives from their comparative advantage in the delivery of differentiated, unique products on the increasingly uniformized agri-food markets. The medium-sized farms operate in the space between the vertically integrated commodity markets and the direct markets and have the advantage that they can sell their production directly to consumers on the short food chains, providing reasonable income sources for farmers and a high level of employment.

REFERENCES

1. Eurostat. (2015). *Farm structure statistics.* Taken over from Statistics Explained.
2. FAO. (2002). The role of agriculture in the development of least-developed countries and their integration into the world economy. Rome.
3. FAO. (2014). The State of Food and Agriculture, Innovation in family farming. Rome.
4. Sarah K. Lowder, J. S. (2014). *What do we really know about the number and distribution of farms and family farms in the world.* FAO. Rome: FAO.
5. Timmer, P. (2007). *The Structural Transformation and the Changing Role of Agriculture in Economic Development: Empirics and Implications.* American Enterprise Institute, Washington, DC.

ABANDONED LAND: A BARRIER FOR SUSTAINABLE DEVELOPMENT OF AGRICULTURE OF THE REPUBLIC OF MOLDOVA

LEAH TAMARA[1]

Abstract. *According to the General Agricultural Census the agricultural area utilized in agriculture consist 1.941.400 ha. At the same time, abandoned agricultural area was 246.900 ha, of which 60.600 ha, or 24.5%, belonging firms and 186.300 ha, or 75.5% - individual persons. Neglected land is abandoned for several reasons. More and more lands are abandoned by people who go abroad. But those who remain in the country are not able to work, they are elderly, have no financial resources to support their own land. Abandonment of agricultural land is a problem for adjacent land owners. This contributes to long-term increase the vulnerability of soil and there is a source of spread the weeds and creating conditions of outbreaks of diseases and pests of agricultural plants. There are lands which it state is not determined from 1992-1994. It is not clear what level of degradation of these soils. In order to redress the situation is necessary to implement the measures on maintain and improve an efficient land management, at republican, regional and local level, based on land consolidation, land monitoring, implementation activities directed towards the land protection and sustainable development of agriculture in Moldova.*

Key words*: abandoned land, agriculture, soil degradation, sustainable development*

JEL Classification: Q01, Q15, Q24

INTRODUCTION

Soils of Moldova, characterized in the past with a high natural fertility, in the last decades, due intensification of degradation processes risk losing their fertility. Land affected by various degradation processes occupies more than 2 million hectares. The worst forms of degradation are water erosion, affected area - 40% of the agricultural land; dehumification, soil nutrient depletion and extensive secondary compaction that extended throughout the entire of arable land; salinization, alkalization, active landslides - 245 thousand ha [3].

In the agricultural holdings not respected the zonal crop rotations, including pedoprotective measures. The share of leguminous crops, ameliorating, biological nitrogen fixing, decreased 5-6 times. The volume of organic fertilizers incorporated in soil decreased by 20 times, the minerals fertilizers - 15 times. The balance of humus and nutrients in soils is negative. The average creditworthiness note of soils is 63 points. About 178 thousand ha of highly degraded or damaged soils have their creditworthiness note less than 20 points. The damage to the economy by soil degradation processes is about 3 billion MDL per year [4].

Another issue that appeared after land privatization is their abandonment and inactivity, which are gradually transformed into fallow area. The main causes of land abandonment are: lack of financial sources to farmers, high degree of soil degradation process, unprofitable processing land in economic terms, holders not whom to pass it on lease or they are gone abroad, holders old age or simply do not want to work it.

Moldova lost an agricultural production equivalent to one million tons of grain, due to the large number of uncultivated land [7, 9]. The widespread abandonment of agricultural land in Moldova offers new opportunities for ecological restoration and conservation of soil fertility, creating new programs and strategies on soil quality and food security for the population. The abandonment of arable land and perennial plantation require their study in an ecology system context, implementation of protection measures and application of a correct and sustainable management of land use.

---

[1] Dr. Assoc. prof. Tamara LEAH, Institute of Soil Science, Agrochemistry and Soil Protection "Nicolae Dimo", tamaraleah09@gmail.com

MATERIAL AND METHODS

Research regarding land use effects on abandoned soils, left as fallow for several reasons, and has been of great interest in connection with considerable increase in their surface in the Republic of Moldova. The qualitative research methods (the general modality, the strategic approach, the study of reality) were used for analysis the documents and data published by the Bureau of Statistics and Land Cadastre on study issues, computer assisted.

RESULTS AND DICUSSIONS

According to the situation of 01.01.2015 the land fund of the Republic of Moldova constitutes 3384.6 thousand ha. Agricultural land area is 2.500 ha (73.9% of the total area), including arable land - 1.816 thousand ha (53.7%), perennial plantations - 295.3 thousand ha (8.8%), meadows and pastures - 350.1 thousand ha (10.3%). Forest plantations consists 465.2 thousand ha (13.7%). In the Republic of Moldova, as in other countries, take place the reduction of arable land per capita. According to recent data this area is 0.407 ha [2]. The average of utilized agricultural area is 2.29 ha per capita [8].

Abandoned land is considered where: i) the owner does not accept responsibility (or, for various reasons, cannot take responsibility) of working farmland for more than three years; ii) does not transmit the field (rights and obligations upon him) to a third party to be worked in agricultural use; iii) does not assume responsibility for the negative impact on land, environment, including damage to neighboring land [1].

The uncultivated (abandoned) land means any area of arable land, pastures and meadows, agricultural permanent crops or other non-agricultural land from extravilan or intravilan, owners who do not sanitizes the land. Agricultural lands are abandoned for various reasons: age of the owner, lack of financial resources, migration of rural population, etc. Abandoned lands left as fallow are not included in the cadastral register. There are lands, that their status is not determined from 1992-1994 years. It is not clear what the degradation level of these soils is.

From the group of abandoned land take part the uncultivated arable soils (left as fellow), soils in vineyards that do not bear fruit, highly eroded soils, degraded pastures and hayfields. The used (cultivated) agricultural land consists 87% of the total land (arable, permanent crops, pastures and hay fields) and 13% - unused land (250 thousand ha). In the structure of agricultural land used the major share (73%) returns to arable, followed to pasture and hayfields (17%), permanent crops (orchards and vineyards) - 10% (Fig.1). The areas of fallow land in territorial aspect continue to grow from expansion of abandoned land (Fig.2).
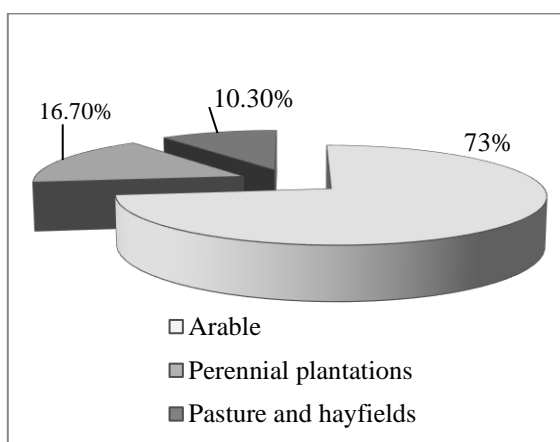
Figure 1. The structure of agriculture land
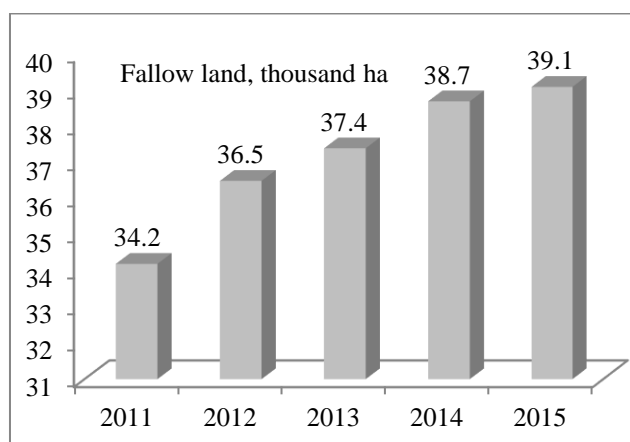
Figure 2. The area of fallows land

The statistics of General Agricultural Census performed in Moldova in 2011 showed that 2.25 million reviewed hectares of agricultural land, almost 250 thousand ha are uncultivated (abandoned), that consists 11% of the total utilized agricultural area or 20% of arable land. Most unused agricultural land (over 114 thousand ha) is located in the center of the country (Hincesti - 18 thousand ha, Calarasi - 12 thousand ha, Ialoveni - 12 thousand ha). The fewest unused agricultural land are in the north of Moldova (Donduşeni - 650 ha). Out of abandoned agricultural land (250 thousand ha), 60.6 thousand ha (24.5%) are owned of enterprises and 186.3 thousand ha (75.5%) - of individuals [8].

Considering the fact that in recent years there have been constant growths of uncultivated agricultural areas, which at the moment, according to information submitted by the district agricultural departments are up to 20% of the arable land (Table, Fig.3).

Table. The surface of uncultivated land in the Republic of Moldova (ha)

No.	District	Total of uncultivated agricultural land	Inclusive			
			Arable	Vineyards	Orchards	Other
1	Cahul	23145	17536	4410	1110	89
2	Rezina	4979	3353	24	1227	375
3	Ungheni	6345	5473	618	1254	-
4	Străşeni	3644	1408	689	1269	-
5	Taraclia	4101	997	2447	657	-
6	Soroca	4227,8	3026	76,8	1110	15
7	Briceni	766	576	-	190	-
8	Rîşcani	1513,17	794,21	24,5	666,34	28,12
9	Drochia	2310	1745	26	539	-
10	Ialoveni	10319	5548	2825	2245	-
11	Ocniţa	1195	980,5	-	214,4	-
12	Cimişlia	9131	5601	2171	1359	-
13	Anenii Noi	11690	9261	1246	1134	49
14	Cantemir	4741,1	3452,6	511	777,5	-
15	Căuşeni	8341	6677	776	888	-
16	Hînceşti	15959	11788	2682	2244	343
17	Edineţ	1620	162	-	1458	-
18	Glodeni	1246	713	50	483	-
19	mun. Chişinău	5222	4167	484	571	-
20	Sîngerei	3039	2165	288	575,45	10,58
21	Orhei	8009	2914	444	2585	2066
22	Basarabeasca	3041	1954	719	313	55
23	Şoldăneşti	1698	807	-	891	-
24	Leova	5938	4221	1163	547,5	6,27
25	Făleşti	1066	858	16	192	-
26	Floreşti	3651,5	2135,5	-	1516	-
27	Donduşeni	1212	543	-	669	-
28	Călăraşi	7949	3803	2313	1833	-
29	Ştefan Vodă	5727,29	3107,33	1412,05	1199,91	8
30	mun. Bălţi	283,5	119,5	-	164	-
31	Dubăsari	1734	1108	3	236	387
32	Criuleni	5137,67	3553,24	486,35	1063,75	34,33
33	Teleneşti	4144	3112	483	525	24
34	Nisporeni	5422	3020	1195	1208	-

35	UTA Găgăuzia	22261	17323	3833	1105	-
	TOTAL	**200808,03**	**134001,88**	**31415,7**	**34019,85**	**3490,3**

The results show an excessive fragmentation of agricultural land, which determines a decrease in agricultural productivity, disruption of crop rotation, soil degradation, and other negative effects. However, the average area of the land parcel in the country is 0.85 ha. The central part of the country is most fragmented, the representing minimum area of plots is 0.29 ha (Fig. 4).
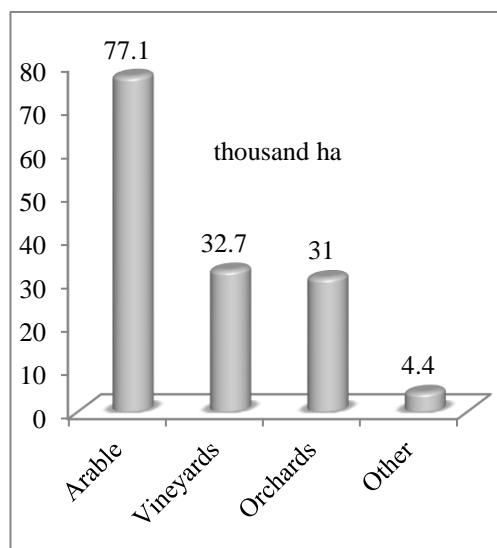
Figure 3. The surface of abandoned agricultural land in the territorial aspect
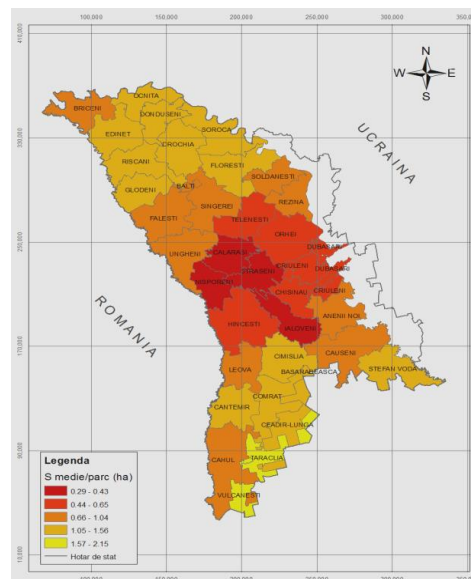
Figure 4. The average size of agricultural parcels on the districts of Moldova

Around 40% of agricultural lands in Moldova are *eroded soils.* From the one million affected hectares, 110 thousand hectares are impracticable. The largest areas of agricultural land of eroded soils are in the south zone, an area with high risk of desertification. In total, 114 thousand ha (from 2.3 million ha) of agricultural land are heavily eroded [3].

The largest areas of farmland with eroded soils are in Cahul district. Here, about 10 thousand ha are damaged and cannot be cultivated. In the same condition are the soils in Gagauzia. Other 8 thousand ha of land are infertile (Hincesti and Ungheni). In Singerei district over 6 thousand hectares of agricultural land are impracticable. Soils in the north zone of Moldova have a higher quality status. In Donduseni district are just over 800 ha of eroded land in Briceni - almost 800, and Ocnita - only 555 ha of soils have poor quality. In total, 114 thousand ha of the 2.3 million ha of agricultural land are heavily eroded [8].

In the near future, much of soils planted with *vine plantations* become abandoned land (or left uncultivated). Almost half of vine plantations in Moldova are ineffective. Only about 37 thousand hectares of vineyards from the total of 150 thousand hectares give good fruit. However, these data are not based on the recent assessment, because the authorities have not finance recourses for further study. Almost 60 thousand hectares of agricultural land in Moldova are planted with vines, which no longer bear fruit. Meanwhile, over 50 thousand hectares of vineyards have an average productivity, in short time; they will cease to bear fruit. Only a quarter of the vine plantations have a productivity of 4-5 tons per hectare. Furthermore, the effectiveness vine plantations of Moldova are among the lowest in the world. In 2010, the total production of grapes was 480 thousand tons, the lowest in 10 years. The average productivity per hectare of vineyards in Moldova is 6.4 tons per hectare [5].

Land inactivity is known and typical problem that prevent the efficient functioning of land markets; limited the investment in rural areas; creation and development of competitive rural areas.

Agricultural land inactivity brings prejudice to local public administration - the failure of any taxes and payments, to owners of adjacent land to the worked land - technology issues. However this phenomenon leads to increase the soil vulnerability on the long-term, soil degradation, providing high weeds and creating the pest outbreaks and diseases of plants, which reduces the space of crops, hampering agricultural works and increase production costs.

Agricultural land abandonment reduces soils and crops productivity. The non development of measures may lead to substantial reductions in agricultural production with consequences for food security of the population and the abandonment of cultivation agricultural land and lower economic activity in rural areas. Approval of certain measures referred to uncultivated land that will have positive impacts on economic activity in rural areas and food security of the population has become a necessity of emergency. Sanctioning of landowners who do not work and respect the land rights of landowners is justified. The project submitted for consideration are proposed new legal rules in the Land Code and Contravention Code, namely: "*The obligations of landowners*" and "*Uncultivated agricultural land*" and penalties for "*Abandonment of agricultural works on land and failure to minimum processing technology land actions, in aim to not affect neighboring lots*" [1].

To improve the situation on the quality state of soil cover, the Government of Moldova approved in 2003 the "*Complex Program of new lands exploitation and increasing the soil fertility*" for 2003-2010 years. The activities covered by this program due to lack of finance, have been met by volume of less than 5 percent. Given the current quality state of soil cover has decided to extend land reclamation activities in the "*Program for conservation and enhancement of soil fertility*" for 2012-2027 years [6]. Program aim: to achieve measures to stop the degradation and increase soil fertility through the modernization and expansion of land reclamation, implementation of modern technologies and environmentally friendly agricultural practices. Program objectives: to create the Geoinformational System of the soil quality state under pedological and agrochemical researches; to stop active forms of damage to the soil cover; to increase the soil fertility in the expected harvests.

The program is the basic document for planning and promotion the unique state policy on the protection, rational use and increase soil fertility by the central and local public administration. It is developed for the period of 15 years and establishes objectives, actions, expected results and performance indicators, the volume of work, amount and sources of funding. Achieving Program will ensure minimizing or stopping the main forms of degradation of soil cover and create prerequisites for increasing agricultural production 1.3-1.5 times. The measures provided by the program will have positive impact on the ecological situation in the Republic of Moldova.

CONCLUSIONS

Agricultural land used consists 87% of the total (arable land, permanent crops, pastures and hay fields) and 13% - unused land (250 thousand ha). In the structure of agricultural land used the major share (73%) returns to arable, followed to pasture and hayfields (17%), permanent crops (orchards and vineyards) - 10%. The country's agriculture dominates a large number of small farms. The average area of farm is about 2.5 ha, of which 2.2 ha is cultivated surface. Across the country there is an excessive level of land lots. The number of plots, which are divided the agricultural lands, is 2.7 million ha, or in average about 3 plots on the farm. The average size of parcel is 0.8 ha. The share of agricultural land with small units on the total land area is only 0.5%. The high degree of fragmentation of land creates great difficulty using modern agricultural techniques and advanced technologies in agriculture.

BIBLIOGRAPHY

1. *Codul Funciar* (2011). Publicat: 04.09.2011 în Monitorul Oficial, nr.107, art. nr. 817, from http://lex.justice.md/
2. *Fondul Funciar* (2014) după modul de folosința, la 1 ianuarie (2011-2014), from http://www.statistica.md/

3. Leah T. Cerbari V. (2013). *Degradation of Ordinary Chernozem in the South of Moldova and phytotechnical measures to remedy of their fertility. Scientific Papers. Series Agronomy. Volume LVI, Bucharest, Romania, 56-62.*

4. Leah T., Povar I., Lupascu T., Andrieş S., Filipciuc V. (2013). *Studying the research results regarding fertilizers used in the Republic of Moldova. Chemistry Journal of Moldova. General, Industrial and Ecological Chemistry, nr. 8 (1), 14-22.*

5. *Producţia de struguri de masa în întreprinderile agricole* (2006-2014), nr.16.2.14. BNS, http://www.statistica.md/

6. *Programul de conservare şi sporire a fertilităţii solurilor pentru anii 2011-2020.* Publicat: 26.08.2011 în Monitorul Oficial nr. 139-145, art Nr : 696, from http://lex.justice.md/

7. Publica (2012). *Tot mai multe terenuri agricole sunt nevalorificate.* 24.01.2012. http://www.publika.md/

8. *Recensământul General Agricol - 2011 in Republica Moldova. Principalele rezultate.* BNS, from http://www.statistica.md/public/files/publicatii_electronice/

9. *Vocea Poporului* (2013). *Moldovenii îşi lasă terenurile în paragină* 12.06.2013, from www.vocea.md.

ANALYSIS ON THE SITUATION OF AGRICULTURAL HOLDINGS IN THE CONTEXT OF THE END OF THE FIRST PROGRAMMING PERIOD (2007-2013)

MICU ANA-RUXANDRA [1], REBEGA DANA[2], GIMBĂȘANU GABRIELA[3]

Summary: *One of the main problems of Romania, which appeared immediately after the revolution of 1989 has represented by an excessive fragmentation of agricultural land, accounting and currently an issue that is trying to be remedied by different measures to encourage through the pooling of agricultural exploitations. Farms in Romania, very many are also characterized by the low productivity are concentrated holdings of subsistence and semi-subsistence farmers barely that can provide the necessary products for their own use, so that did not enter into question whether commercialization of products in order to obtain revenue.*

Keywords: farms, subsistence and semi-subsistence production value standard

INTRODUCTION

Farms in Romania plays an important role in the lives of people in rural areas where farming is the most widespread. Agricultural activity comes in addition to other activities that are not necessarily related to agriculture, such as tourism, agritourism transformed, becoming a complementary form into incomes in rural areas.

According to the definition submitted by the European Union, the farm is a form of organization made up of assembly units used for agricultural activities and managed by a farmer situated within the same Member State of the European Union.

In order to highlight more accurately reflect the situation of a farm is used S.O (Standard Output), which is the economic dimension determined based on standard production total farm denominated in euro, determined in accordance with Regulation (EC) No. 1242/2008 of the European Commission.

At European level, family farms are considered to be the best performing managed both direct labor and lease and specific farm where the works are carried out mostly by family members.

Currently, the law classifies farms and farms is the law no. 37/2015 wishing to regulate a uniform framework for the implementation of programs financed from the national budget and EU funds.

Farms in Romania are represented by farms which have a size of less than 2 hectares and reduced weight of associative forms of the total utilized agricultural area, as well as associative forms for marketing agricultural products (producer groups and cooperatives).

Under the legislation, farms and agricultural holdings are classified according to economic size, as follows:

• Under 1,999 euros - subsistence farms produce entirely for personal consumption;

• 2000-7999 euro - semi-subsistence farms to ensure their own consumption and a small part of what sells agricultural production;

• 8000-49999 euro - small commercial farms that sell more than 50% of agricultural production that achieved;

• 50000-999999 euro - commercial farms / farm sells its entire medium that it conducts agricultural production;

[1] PhD Candidate, MICU Ana-Ruxandra, University of Agronomic Sciences and Veterinary Medicine from Bucharest, email: micuanaruxandra@yahoo.com;

[2] PhD Candidate, REBEGA Elena Daniela, Academy of Economic Studies from Bucharest, email: dana.rebega@yahoo.com;

[3] PhD Candidate, GIMBĂȘANU Gabriela Florentina, University of Agronomic Sciences and Veterinary Medicine from Buchares, email: gimbasanugabriela@yahoo.com;

• Over 1,000,000 euro - commercial farms / large farms that market their entire agricultural production herself.[4]

MATERIALS AND METHODS

The research is based on information taken from the database of the European Union (Eurostat) and the General Agricultural Census 2013. To analyze the indicators taken into account were used indicator determined based on the economic dimension total standard output of the holding expressed in Euro determined in accordance with Regulation (EC) No. 1242/2008 of 8 December 2008 establishing a Community typology for agricultural holdings;

Total production standard is the standard value of gross production, determined in accordance with Regulation (EC) No. 1242/2008.[5]

RESULTS AND DISCUSSIONS

In the year 2013 France had the largest arable area of European Union countries, with over 18 million hectares, followed by Germany with 11.8 million hectares and 11.2 million hectares Spain.

Table no. 1.

The number of farms in Europe during the period 2005 - 2013

Country	2005	2007	2010	2013
Belgium	51,540	48,010	42,850	37,760
Bulgaria	534,610	493,130	370,490	254,410
Czech Republic	42,250	39,400	22,860	26,250
Denmark	51,680	44,620	42,100	38,830
Germany	389,880	370,480	299,130	285,030
Estonia	27,750	23,340	19,610	19,190
Ireland	132,670	128,240	139,890	139,600
Greece	833,590	860,150	723,060	709,500
Spain	1,079,420	1,043,910	989,800	965,000
France	567,140	527,350	516,100	472,210
Croatia	-	181,250	233,280	157,450
Italy	1,728,530	1,679,440	1,620,880	1,010,330
Cyprus	45,170	40,120	38,860	35,380
Latvia	128,670	107,750	83,390	81,800
Lithuania	252,950	230,270	199,910	171,800
luxembourg	2,450	2,300	2,200	2,080
Hungary	714,790	626,320	576,810	491,330
Malta	11,070	11,020	12,530	9,360
Netherlands	81,830	76,740	72,320	67,480
Austria	170,640	165,420	150,170	140,430
Poland	2,476,470	2,390,960	1,506,620	1,429,010
Portugal	323,920	275,080	305,270	264,420
Romania	4,256,150	3,931,350	3,859,040	3,629,660
Slovenia	77,170	75,340	74,650	72,380
Slovakia	68,490	68,990	24,460	23,570
Finland	70,620	68,230	63,870	54,400
Sweden	75,810	72,610	71,090	67,150
UK	286,750	226,660	186,800	185,190
Iceland	-	-	2,590	-
Norway	53,000	49,940	46,620	43,730
Switzerland	63,630	61,760	59,070	:
Montenegro	-	-	48,870	-

Source: Eurostat database, 2016;

---

[4] Law no. 37/2015 concerning the classification of farms and agricultural holdings;
[5] Law no. 37/2015 concerning the classification of farms and agricultural holdings;

Among the new countries joined the European Union, Poland has made 2013 an arable area of 10.7 million hectares, so that Romania ranks 4 with 8 million hectares, ranking above countries like Italy or UK in terms of agricultural area.

According to Table. no. 1 trend in the number of farms across Europe, tends to decrease counting on their fusion, thus registering an increase S.O's holdings, being able to say that this is a general phenomenon among these countries. For example, in the case of Bulgaria, the country joined the European Union in the same year with Romania, managed to reduce the number of holdings from more than 530,000 farms in 2005 to about 254,000 farms, thus registering a decline in the number their approximately 52% *(Table 1.)*.

Also this phenomenon was registered in countries with a tradition of agriculture, like France and Germany which were significant decreases among farms in this country, so that in France decreased number of these holdings was approximately 17% in 2013 compared to 2005, while for Germany decreased had the same 17%, falling from 389 880 in 2005-285030 in 2013 *(Table 1.)*.

In Romania, in 2013, the arable land was 8.1 million hectares, down from the previous years, especially from 2005, when the arable land was 8.8 million hectares, the decline of approximately 8% compared to 2005.

Table no. 2.

Classification number of farms by area during 2005 - 2013 in Romania

Specification	2005	2007	2010	2013
The total number of farms in which:	4,256,150	3,931,350	3,859,040	3,629,660
0 ha	886,360	772,460	1,102,130	1,026,420
Sub 1 ha	1,646,840	1,562,670	1,617,120	1,516,290
1-1.9 ha	769,460	716,220	563,770	524,770
2-4.9 ha	739,890	667,840	444,070	425,870
5-9.9 ha	160,570	157,420	85,090	88,020
10-19.9 ha	35,400	34,840	22,350	24,280
20-29.9 ha	5,190	6,000	5,940	5,980
30-79.9 ha	6,240	7,010	8,600	8,320
80-149.9 ha	1,980	2,180	3,390	3,270
peste 150 ha	4,220	4,710	6,590	6,450

Source: Eurostat database, 2016;

Regarding the classification number of farms according to their surface, we can say that the number of farms that have less than 1 hectare is between 1.6 million and 1.5 million farms. Also they have the largest share of total holdings, representing the level of 2013, representing 41% of all farms in Romania. It is noted among farms that have a surface between 1 and 20 hectares a sharp decline in their practically halved the number of them within 8 years, so that farms with a size between 1 and 1.9 ha were reduced from over 760,000 to about 524,000 farms, representing a decrease of approximately 32% compared to 2005 *(Table no. 2).* Also in the case of holdings which have an area over 150 hectares there is an upward trend, so the number of times these holdings rose over 8 years by about 50% compared with 2005 *(Table no. 2).*

Table no. 3.

Classification number of farms according to standard production value (S.O.) during 2005-2013 in Romania

Specificare	2005	2007	2010	2013
zero euro	43,280	85,830	99,840	56,270
under 2.000 euro	2,769,710	2,556,660	2,716,620	2,437,160
2.000-3.999 euro	889,260	778,820	602,470	577,640
4.000-7.999 euro	435,640	374,670	313,000	375,280
8.000-14.999 euro	82,240	91,050	78,460	114,280
15.000-24.999 euro	17,560	23,380	22,240	33,830
25.000-49.999 euro	9,520	10,860	13,370	18,820
50.000-99.999 euro	4,200	5,130	6,450	7,830
100.000-249.999 euro	2,900	3,120	4,120	5,000
250.000-499.999 euro	1,110	1,140	1,450	2,100
over 500.000 euro	740	700	1,010	1,470

Source: Eurostat database, 2016;

Regarding the classification of farms according to production value standard (SO) in the period 2005 to 2013 we can see that subsistence farms shows a trend swing, so if those that had a value of production standard 0 euro in 2005 period preceding the entry into the European Union, there were over 43 thousand holdings at the end of 2013 they were about 56 000 holdings, reaching a maximum in 2010 of about 100,000 farms. On the other hand if the farm under 2,000 euros SO, their number ranged from the peak in 2005 of more than 2.7 million holdings and minimum recorded in 2013 the 2.4 million farms *(Table no. 3.)*.

For farms that have an economic value of between 25,000 and 500,000 euros trend registered during the period under review, is one ascending so that their number almost doubled for each category of holdings, between 25,000 and 500,000 euros, With reference to 2005 *(Table no. 3)*.

CONCLUSIONS AND RECOMMENDATIONS

Between 2005 - 2013, a period that coincided with the accession of Romania to the European Union (in 2007), was a moment of rethinking Romanian farm size.

According to data analysis, trend it pursues these farms would be to merge, those small, and hence the decrease in numbers, and increase the number of large agricultural holdings.

The decline in 2010 relative to 2007 in the case of holdings analyzed by economic size (especially those that have an economic size of 8,000 euros ie those who sell at least 50% of yields), which besides trend followed by other member countries of the European Union (consolidation) would be able to represent and inability to adapt them to the standards imposed by the European Union, where conditions for the marketing of certain products were more demanding than law existing prior to accession of Romania to the European.

Basically, the money available from the EU budget, both in the Common Agricultural Policy and the National Program for Rural Development (2007 - 2013) were encouraged development of these holdings small and most of the funds assigned They've turned to the medium and large-sized farms.

Currently to qualify for the subsidy Scheme (SAPS) provided by the Agency for Payments and Intervention in Agriculture (APIA), one of the eligibility conditions is the operation of an agricultural area of 1 hectare, so this subsidy can not benefit households that do not have this minimum area.

One of the most accessed measures available in the National Programme for Rural Development 2007-2013 was measure 121 - Modernisation of agricultural holdings, which had as objective as development of new technologies, adaptation of farms to EU standards, increase farm income and who played a important role in the development of farms.

By continuing to increase the economic dimension of agricultural exploitations will lead to enhanced yields obtained and yields. Also not a viable solution actual reduction of farms (farms of subsistence and semi-subsistence) but their development as effects that may occur can be devastating for Romanian rural area.

BIBLIOGRAPHY

1. Alecu Ioan, Managementul exploatațiilor agricole, 2012;
2. Alecu Ioan, Situația agriculturii și a exploatațiilor agricole în țările membre ale Uniunii Europene, 2015, Editura Ceres;
3. Micu M.M., Tudor Valentina, Sterghiu N., Pandelea Monica, 2012, Studiu privind perspectivele agricole ale județului Argeș, prin viziunea agricultorilor, Lucrări Științifice, Seria Agronomie, vol. 55, nr. 1, Print ISSN: 1454-7414, Electronic ISSN: 2069-6727, Editura „Ion Ionescu de la Brad", U.S.A.M.V Iași.
4. Valentina Tudor, Marius Mihai Micu, Reta Condei, Analiză asupra tipurilor de agricultură ce ar trebui practicată de producătorii agricoli în vederea creșterii producție în județul Argeș și returnarea randamentului factoriilor economici și financiari, Volume 16, 2014, Paginile 526-534, ISSN 2212-5671.
5. Zahiu Letiția și colab., Agricultura Uniunii Europene sub impactul politicii agricole comune (2011), Editura Ceres;
6. Date statistice – Institutul European de Statistică al Comisiei Europene – Eurostat;

7. Date statistice - Recensământul General Agricol 2013;
8. Ghidul fermierului pentru plăți pe suprafață (SAPS);
9. Programul Național de Dezvoltarea Rurală 2007 – 2013 – măsura 121 – Investiții în exploatații agricole;
10. Legea nr. 37/2015 privind clasificarea fermelor și exploatațiilor agricole;

ANALYSIS OF THE CONCENTRATION IN GROWTH POTENTIAL OF ORGANIC AGRICULTURE AT THE LEVEL OF EU MEMBER STATES

BABUCEA ANA-GABRIELA[1], BĂLĂCESCU ANIELA[2]

Abstract: *Recent aspects of European and global economy reveals that consumer demand for organic products is growing and this provides the opportunity to develop a sustainable agriculture. However, while there is a visible new approach in all European countries on the management of organic farming, there are major differences in the growth potential of thereof nationally among the EU Member States, both in terms of areas used organic agriculture but also, total utilised agricultural area and total organic operators (agricultural producers). On based on the dataset available on Eurostat database for the years 2013 and 2014 on organic farming, the study aims to identify differences in the growth potential of organic agriculture between EU member states appealing to statistical methods specific to the analysis of the concentration, as a measured tool of their convergence. It involved the use of Lorenz curve and Gini-Struck coefficient to identify a model of the European organic agriculture concentration regarding the organic farming considered indicators, given that, their specific and changes differs considerably from one EU member state to another.*

Keywords: *organic farming, Lorenz curve, Gini-Struck coefficient, European Member States*

JEL Classification: C82, Q01, Q15

INTRODUCTION

In literature with related topic, there are a lot of definitions of the term "organic agriculture", but all of them consider its environmental and social impacts by eliminating the use of synthetic inputs, which are replaced with traditional specific practices that maintain and increase long-term sustainability of soil fertility and prevent pest and diseases. Even though consumer demand for organic products is concentrated mainly in the developed economies while the member states gave different attention to organic farming, at the level of EU, it registered a rapid growth in the last years. Since the 1990s, organic farming was extended in Europe, the increasing of the operated ecologically area being significant, the organic farming sector being in continuously developing, registering significant increases from year to year. This is the result of political support for the realization of organic farming offered by the governments of each country and the EU, but also due to the growing demand for organic products from consumers. Agriculture plays an important role in the economy of member countries EU, supported both by share of employment in agriculture and the contribution to their gross domestic product. Organic farming is subordinate to sustainable development and sustainable farming systems, but the transition from conventional agriculture to organic takes time because economic structures do not feel the effects of fall in productivity, and manufacturers to gain confidence in ecological systems. Organic farming does not require significant financial investment or large-sized farms but requires a higher workforce (Cicea, Subic&Pirlogea, 2010). Organic farming may represent the same time an opportunity for business development in rural areas, people are becoming more concerned about factors that directly influence health, such as food security and food quality, even for countries that still exists a high level of disparities between rural and urban, as Romania.

MATERIAL AND METHODS

The study aims to identify the potential of growth for organic agriculture at the level of the EU (28) member states, given the agricultural areas used by each country as a natural support for their conversion into organic area (fully converted and under conversion) and the number of organic operators, agricultural producers, for the years 2013 (the year of accession of Croatia, the 28th member country), and 2014, the year for which data are available for all member states for the

consider variables. In the first part of the study, we presented a descriptive analysis of the spatial distribution of the variables: utilised agricultural area and utilized organic agricultural area, by countries, in the European Union (28), in the years 2013 and 2014 to identify the changes registered at the level of EU (28) and at the level of each member state. We identified the existence of excessive values - marginal and extreme and also the localization of the countries in their distribution and a correlation between them, and so, countries that have the geographical potential to increase organic production by extending surfaces used. The concentration, defined as an increasing accumulation in favor of a number more decreased of holders, expresses a state of inequality proportional to the degree of concentration. Thus, in the second part, to assess the degree of concentration of the sector organic agriculture in the EU (28) member states in 2014 compared to 2013 was used Gini-Struck coefficient based on knowledge elements provided by Lorenz concentration curve. Lorenz concentration curve (Lorenz, MO, 1905) applied to the study of spatial concentration of utilized organic agriculture area is a graphical representation of a system of two rectangular axes, of the points of coordinates (p_i, q_i), where p_i is the cumulative ratio of the organic operators (agricultural producers) and q_i is the cumulative ratio of organic agriculture area (fully converted area to organic production and area under conversion). Concentration Gini-Struck coefficient (Cs) is actually a form corrected Gini coefficient, which is a measure of inequality, too. (Minciu, R. 2004, p.43):

$$G_s = \sqrt{\frac{n \sum g_i^2 - 1}{n - 1}},$$

where *n* is the number of categories and *gi* are the total share of each category. This concentration ratio can have values in the range [0, 1]. The minimum amount possible (Cs = 0) is independent of the categories considered, that gives to the coefficient a comparable advantage and facile interpretations. A value of 1 is reached when the concentration is at a maximum and the value 0 when there is a uniform distribution (Jaba E., 2002, p. 198). For the calculations statistical data of Eurostat, were used, as well as scientific publications and research results. The strong differences can be indicated in the level of development in organic agriculture, due different problems faced by these countries.

RESULTS AND DISCUSSIONS

With according to Eurostat data, the total organic area in the EU (28) fully converted area to organic production and area under conversion was 10.315.126 hectares in 2014 and it is on an upward trend. The increase in utilised agricultural organic area between 2013 and 2014 was 2.4 %, respective 0,14 % in the percentages of total utilised agricultural area. From 2013 to 2014, 16 countries recorded growths, but only three had growths of over 10 %, Croatia (23,1 %), Malta (385,7 %), and Slovakia (14,2 %) and that was because its contribution on the total area was modest in 2013 as in 2014. If we discuss in absolute values, Spain presented the highest increase (100.346 ha), followed by Italy (70.692 ha) and lowest increase presented Luxembourg 43 ha, and Malta only 27 ha.

Table no. 1 - Total organic area (fully converted and under conversion), 2013 and 2014

GEO/TIME	Utilised agricultural area		Utilised agricultural organic area						Percentage of total utilised agricultural area		
	2013	2014	2013		2014		Changes		2013	2014	Changes
	1000 ha	1000 ha	ha	%	ha	%	ha	%			
EU (28)	178.301,16	178.115,23	10.070.639	100	10.315.126	100	244.487	2,4	5,77	5,91	0,14
Belgium	1.338,57	1.333,40	62.471	0,62	66.704	0,65	4.233	6,8	4,78	5,10	0,32
Bulgaria	4.995,11	4.976,82	56.287	0,56	47.914	0,46	-8.373	-14,9	1,21	1,03	-0,18
Czech Republic	3.521,00	3.515,56	474.231	4,71	472.663	4,58	-1.568	-0,3	13,58	13,54	-0,04
Denmark	2.627,80	2.652,00	169.310	1,68	165.773	1,61	-3.537	-2,1	6,46	6,33	-0,13
Germany	16.699,60	16.724,80	1.008.926	10,02	1.033.807	10,02	24.881	2,5	6,04	6,19	0,15
Estonia	965,90	974,80	151.164	1,50	155.560	1,51	4.396	2,9	15,79	16,25	0,46
Ireland	4.477,77	4.465,77	53.812	0,53	51.871	0,50	-1.941	-3,6	1,09	1,05	-0,04
Greece	5.417,48	5.127,19	383.606	3,81	362.826	3,52	-20.780	-5,4	7,90	7,47	-0,43

Spain	23.494,57	23.571,78	1.610.129	15,99	1.710.475	16,58	100.346	6,2	6,91	7,34	0,43
France	28.975,97	28.929,82	1.060.755	10,53	1.118.845	10,85	58.090	5,5	3,82	4,03	0,21
Croatia	1.300,81	1.240,87	40.660	0,40	50.054	0,49	9.394	23,1	2,59	3,19	0,6
Italy	12.426,00	12.720,15	1.317.177	13,08	1.387.869	13,45	70.692	5,4	10,89	11,47	0,58
Cyprus	107,13	107,03	4.315	0,04	3.887	0,04	-428	-9,9	3,95	3,56	-0,39
Latvia	1.877,70	1.872,50	185.752	1,84	203.443	1,97	17.691	9,5	9,89	10,83	0,94
Lithuania	2.891,40	2.952,40	165.885	1,65	164.390	1,59	-1.495	-0,9	5,80	5,75	-0,05
Luxembourg	131,04	131,08	4.447	0,04	4.490	0,04	43	1,0	3,39	3,43	0,04
Hungary	5.339,53	5.346,30	130.990	1,30	124.841	1,21	-6.149	-4,7	2,81	2,68	-0,13
Malta	11,69	11,69	7	0,00	34	0,00	27	385,7	0,06	0,31	0,25
Netherlands	1.847,60	1.839,00	48.936	0,49	49.159	0,48	223	0,5	2,65	2,66	0,01
Austria	2.862,44	2.716,16	526.689	5,23	525.521	5,09	-1.168	-0,2	19,31	19,27	-0,04
Poland	14.409,90	14.424,20	669.863	6,65	657.902	6,38	-11.961	-1,8	4,65	4,57	-0,08
Portugal	3.716,43	3.701,28	197.295	1,96	212.346	2,06	15.051	7,6	5,42	5,83	0,41
Romania	13.904,64	13.830,42	286.896	2,85	289.252	2,80	2.356	0,8	2,20	2,22	0,02
Slovenia	478,89	482,21	38.664	0,38	41.237	0,40	2.573	6,7	7,96	8,49	0,53
Slovakia	1.928,51	1.924,73	157.848	1,57	180.307	1,75	22.459	14,2	8,30	9,48	1,18
Finland	2.258,60	2.267,20	204.810	2,03	210.649	2,04	5.839	2,9	8,97	9,23	0,26
Sweden	3.036,08	3.036,07	500.996	4,97	501.831	4,87	835	0,2	16,50	16,53	0,03
United Kingdom	17.259,00	17.240,00	558.718	5,55	521.475	5,06	-37.243	-6,7	3,22	3,01	-0,21

Source: Eurostat database (online data code: org_cropap, apro_acs_a)

For the other 12 EU Member States, the area of organic crops decreased in that time. Bulgaria and Cyprus were the most significant declines, with more than 10 %. However, as a share of the total EU (28) organic area, only four countries, Spain, Italy, France and Germany covered together almost 50 % in 2013 with 4.996.987 ha, respectively 51 % in 2014 with 5.250.996 ha (see Table 1). When referring to the share of the organic area in total agricultural surfaces of each EU Member State, rank on the first places Austria, Sweden, Estonia with percentages between 15 % and 19 %. In these terms, even if at the level of EU (28) we note an increase of 0,14 %, 11 countries had registered decreases on the share of organic farming in the total agriculture area. The size and changes of the organic area differ significantly from one country to another in EU (28).

To test if the variable considered, utilised organic agricultural area, has a normal distribution, for each of the years 2013 and 2014, was appealed the Kolmogorov - Smirnov statistically test (K-S) by using SPSS procedure. Sig. values K-S test, respectively 0.07 for the year 2013 and 0,061 for 2014, higher than 0.05 indicate that the variable has a normal distribution of data in both periods considered. The result was to retain the null hypothesis for both distributions. To have a graphic picture for the extremes of the variable, and also the values for maximum and minimum limits, so that extremes are clearly identified and having a visualisation of differences between empirical and theoretical distribution have used the histogram.

a)   b)
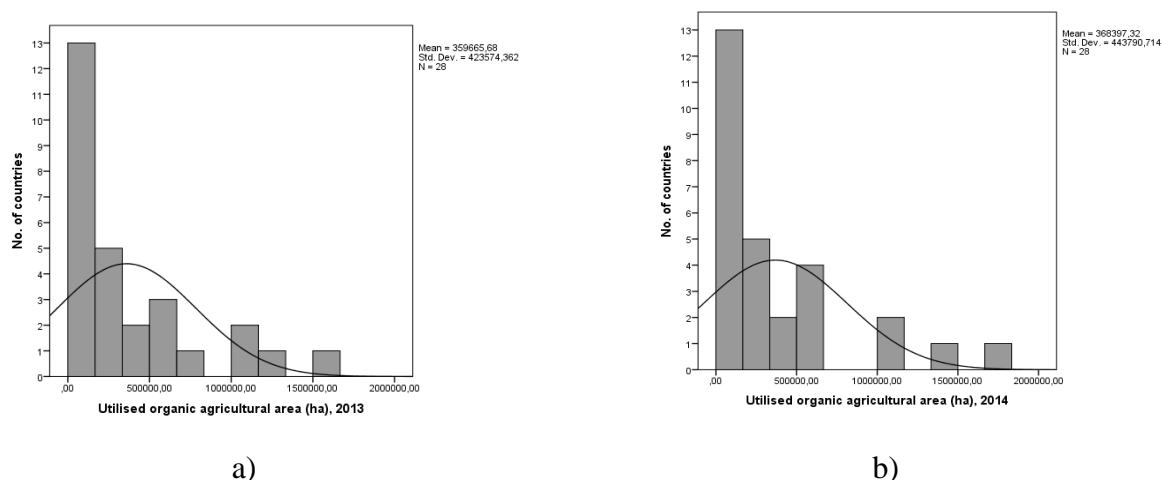
Figure 1 – Distribution of the EU (28) member states by the utilised organic agricultural area, in years 2013 and 2014

It is noticed that the density function differs for the total organic agricultural area, both in year the 2013 and also in 2014. Distribution of countries by utilised organic agricultural area

indicates a mean and a Std. Deviation that are higher in 2014 than in 2013. While the two countries with extreme values Spain placed first, and Malta the last in the hierarchy in terms of utilised organic agricultural area, increased their level in 2014 compared to 2013, the gap between them increased, too (Table no.2).

Table no. 2 – Statistics of the main indicators of agriculture

		Utilized organic agricultural area,_2013	Utilized organic agricultural area,_2014
N	Valid	28	28
	Missing	0	0
Mean		359.665,6786	368397,3214
Median		177.531,0000	191875,0000
Std. Deviation		423.574,36190	443790,71354
Sum		10.070.639,00	10.315.125,00
Quartiles	1st Quartile	54.430,7500	50508,2500
	2nd Quartile	177.531,0000	191875,0000
	3rd Quartile	520265,7500	516564,0000

Source: Calculated with SPSS

In the year 2013, 50 % of European Union - 28 countries: Malta, Cyprus, Luxembourg, Slovenia, Croatia, Netherlands, Ireland, Bulgaria, Belgium, Hungary, Estonia, Slovakia, Lithuania, and Denmark had used for organic farming, less than 177 531 ha (2nd quartiles) from the total area of organic agriculture of EU that was about 1,084,796 ha, that means less than 11 % of the total area under organic farming in the EU, or, in the other words almost 16 % of the utilized agricultural areas of the EU. That means that, up to the year 2013, half of the EU countries had converted to organic surfaces, or undergoing conversion, less than 4% of farmland used. In the year 2014 compared with 2013, the same 14 countries, in time that their total agricultural area registered a sensible decrease, with 3.650 thousand hectares, increased their organic agricultural areas by 2 %, from 1.084.796 ha to 1.106.221 ha, each of them having up to 191 875 ha (2nd Quart, 50 %) utilised, and this, representing only 10,72 % of the total EU organic surfaces in 2014. The situation is offset by the 7 member states which have used organic surfaces exceeding 3rd Quart (520.265,75 hectares in 2013, for 516.564 in 2014): United Kingdom, Austria, Poland, Germany, France, Italy, Spain, and which together utilised over 67 % of the organic areas of EU, in conditions that account for over 65 % of agricultural areas.

Note that, for the year 2014 compare with 2013, this group of countries recorded increases both for the utilized organic area and also for total utilised agricultural area. It is obvious that one of the determining factors regarding the potential growth of organic farmland remains availability for the agricultural areas of each country. For a better overview of the distributions of the utilised agricultural area and organic agricultural area, at the end of the years 2013 and 2014 and detecting the existence of excessive values - marginal and extreme, we used the box-plot graphic representation in the figure below:

a) Utilised agricultural area   b) Utilised organic agricultural area
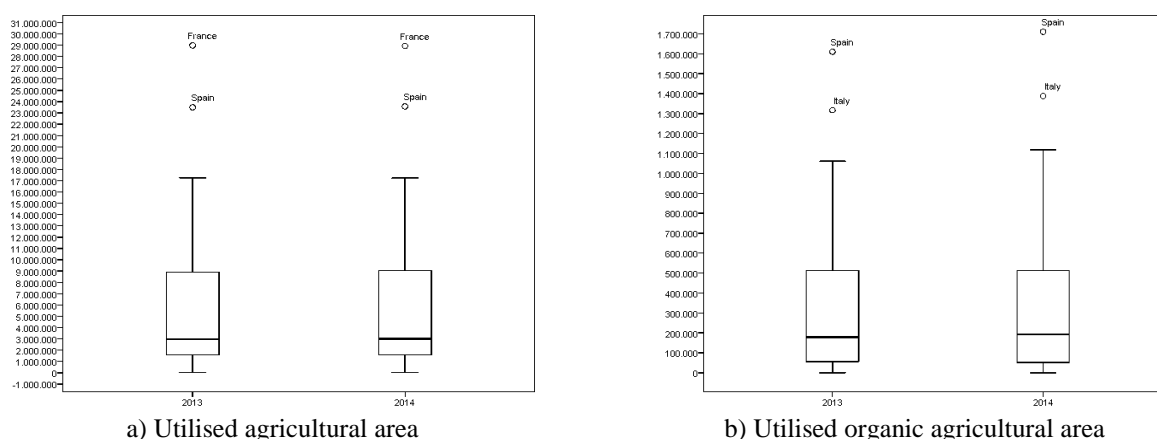
Figure 2 – Box-Plots representation

It stands higher outliers, France and Spain in Figure 2. a), and Spain and Italy in Figure 2. b). As can be seen from the graphs in Figure 3, the agricultural area organic (converted or undergoing conversion) correlate linearly, very strongly, with total area of agricultural, the differences at national level is rather revealed that over 70 % of the total organic agricultural area in EU (28), i.e. 71,32 % in 2013 and 71,55 % in 2014, are owned only 7 of the countries, 25% of those 28, respectively France, Spain, United Kingdom, Germany, Poland, Romania and Italy, while all other 21 Member States (75%) have the remaining agricultural area. Noting however atypical situations such as Romania, which although in the category of countries with generous agricultural areas has much least 2% of the surface area organic farming, while Poland and Italy, countries with agricultural areas similar with Romania, have exceeded shares 4,57% in Poland and 11,47 % in Italy of organic surfaces in total agricultural area in 2014.

Consider that Romania remained an individual case in Europe with a great potential for grows its organic agricultural. But, with almost 89 % of its territory located in rural areas, and approximately 47,3 % of the total population that live in these regions, Romanian rural economy faces a number of problems such as predominance of subsistence agriculture, production for self-consumption largely, a great number of persons employed or working on the black and an excessive labor involved in agriculture. (Rabontu C.I, Babucea A.G, 2013). On the other hand, Austria, Sweden, and the Czech Republic, although with modest agricultural areas, is characterized by a high share of organic surfaces. EU (28) had converted or undergoing conversion in the organic agricultural area below 6 % of the agricultural area, while less than 50 % of the agricultural area (14 countries) do not provide even 30 %, so there is a very high potential for growth its organic area.

a) 2013   b) 2014
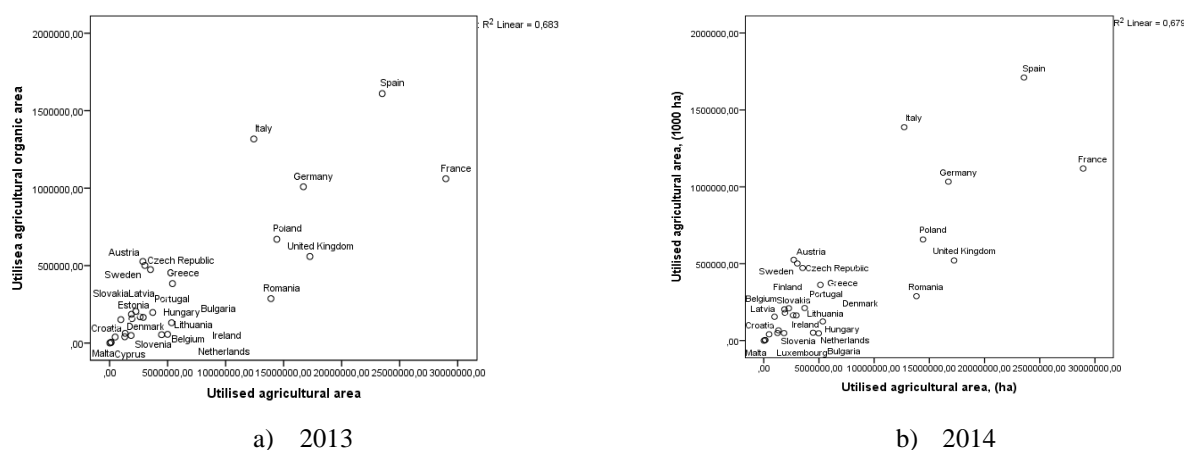
Figure 3 – Correlation between the utilised organic agricultural area and total utilised agricultural area, at the level of EU (28) member states

The degree of organic agricultural area spatial concentration according to the distribution of the organic agriculture producers can be assessed using the Lorenz curve for whose graphical representation were calculated the cumulative shares for the years 2013, respectively 2014, presented in the Table no. 3 and 4.

Table no. 3 - Algorithm for calculating the cumulative shared used for Lorenz curve graphic representation, 2013

European Union (28 countries)	Organic agricultural producers No.	Utilised agricultural organic area ha	% Organic agricultural producers	% Utilised agricultural organic area	% organic area/ % organic producers	Cumulative % in organic agricultural producers	Cumulative % in utilised organic agricultural area
Malta	9	7	0,003500257	6,9509E-05	0,019858	0,00350	0,00007
Cyprus	746	4315	0,290132387	0,042847331	0,147682	0,29363	0,04292
Slovenia	3.045	38664	1,184253512	0,383927971	0,324194	1,47789	0,42684
Bulgaria	3.854	56287	1,498887696	0,558921832	0,372891	2,97677	0,98577
Greece	21.986	383606	8,550738165	3,809152527	0,445476	11,52751	4,79492
Romania	14.553	286896	5,65991506	2,848836107	0,503335	17,18743	7,64376

European Union (28 countries)	Organic agricultural producers No.	Utilised agricultural organic area ha	% Organic agricultural producers	% Utilised agricultural organic area	% organic area/ % organic producers	Cumulative % in organic agricultural producers	Cumulative % in utilised organic agricultural area
Austria	21.863	526689	8,502901324	5,229946183	0,615078	25,69033	12,87370
Poland	26.598	669863	10,34442526	6,651643456	0,643017	36,03475	19,52534
Croatia	1.583	40660	0,615656259	0,403747965	0,655801	36,65041	19,92909
Italy	45.965	1317177	17,87658873	13,07937858	0,731648	54,52700	33,00847
Netherlands	1.650	48936	0,641713726	0,485927457	0,757234	55,16871	33,49440
Belgium	1.656	62471	0,64404723	0,620328065	0,963172	55,81276	34,11473
Ireland	1.351	53812	0,52542742	0,534345437	1,016973	56,33819	34,64907
France	25.467	1060755	9,904559668	10,53314492	1,063464	66,24275	45,18222
Germany	23.271	1008926	9,050497036	10,01849039	1,106955	75,29324	55,20071
Finland	4.284	204810	1,666122182	2,033733907	1,220639	76,95937	57,23444
Spain	30.502	1610129	11,86275882	15,9883499	1,347777	88,82212	73,22279
Latvia	3.490	185752	1,357321759	1,844490702	1,358919	90,17945	75,06728
Luxembourg	83	4447	0,032280145	0,044158072	1,367964	90,21173	75,11144
Lithuania	2.570	165885	0,999517742	1,647214243	1,648009	91,21124	76,75865
Portugal	3.029	197295	1,178030833	1,959111036	1,663039	92,38928	78,71777
Denmark	2.589	169310	1,006907173	1,681224002	1,669691	93,39618	80,39899
Hungary	1.682	130990	0,654159083	1,300711901	1,988372	94,05034	81,69970
Sweden	5.584	500996	2,171714815	4,97481838	2,290733	96,22206	86,67452
Estonia	1.553	151164	0,603988737	1,501036826	2,485207	96,82605	88,17556
Czech Republic	3.910	474231	1,520667071	4,709045772	3,096697	98,34671	92,88460
United Kingdom	3.908	558718	1,519889236	5,547989557	3,650259	99,86660	98,43259
Slovakia	343	157848	0,133398671	1,567407987	11,7498	100,00000	100,00000

Source: Authors calculations from data available on Eurostat database (online data code: org_cropap, org_coptyp)

To assess the concentration of organic agriculture sector in the EU Member States (28) in 2014, the year for which data are available for all member states compared to 2013, Lorenz curve was built for 2014, too. The data required graphical representation are shown in Table 4. The graphical representations in Figure 4, a) for the year 2013 and b) for 2014, show a moderate level of concentration in both of the years, if we consider the organic agricultural producers of each country as a point of reference in assessing the utilised organic agricultural area (fully converted and under conversion), but that indicates an increase over the period considered even if it is not significant.

Table no. 4 - Algorithm for calculating the cumulative shared used for Lorenz curve graphic representation, 2014

European Union (28 countries)	Organic agricultural producers No.	Utilised agricultural organic area ha	% Organic agricultural producers	% Utilised agricultural organic area	% organic area/ % organic producers	Cumulative % in organic agricultural producers	Cumulative % in utilised organic agricultural area
Malta	10	34	0,003932	0,00033	0,083819	0,003932	0,00033
Cyprus	746	3.887	0,29336	0,037683	0,128451	0,297293	0,038012
Bulgaria	3.893	47.914	1,530899	0,464502	0,303418	1,828192	0,502515
Slovenia	3.293	41.237	1,294953	0,399772	0,308716	3,123144	0,902287
Greece	20.186	362.826	7,938025	3,517417	0,44311	11,06117	4,419704
Romania	14.151	289.252	5,564797	2,804154	0,50391	16,62597	7,223858
Austria	22.184	525.521	8,723726	5,094664	0,584001	25,34969	12,31852
Croatia	2.043	50.054	0,803398	0,485249	0,603996	26,15309	12,80377
Poland	24.829	657.902	9,763857	6,378032	0,653229	35,91695	19,1818
Italy	48.662	1.387.869	19,13604	13,4547	0,703108	55,05299	32,6365
Netherlands	1.457	49.159	0,572957	0,476572	0,831777	55,62595	33,11307
Ireland	1.275	51.871	0,501386	0,502864	1,002946	56,12733	33,61594
Belgium	1.602	66.704	0,629977	0,646662	1,026485	56,75731	34,2626
France	26.466	1.118.845	10,4076	10,84665	1,042185	67,16491	45,10924
Germany	23.717	1.033.807	9,32657	10,02224	1,074591	76,49148	55,13149
Finland	4.247	210.649	1,670108	2,042137	1,222758	78,16158	57,17363
Spain	30.602	1.710.475	12,03405	16,5822	1,37794	90,19564	73,75583
Luxembourg	79	4.490	0,031066	0,043528	1,401143	90,22671	73,79936
Latvia	3.475	203.443	1,366523	1,972279	1,443282	91,59323	75,77164
Portugal	3.329	212.346	1,309109	2,058589	1,572511	92,90234	77,83023
Denmark	2.540	165.773	0,99884	1,607087	1,608953	93,90118	79,43731
Lithuania	2.445	164.390	0,961482	1,593679	1,657524	94,86266	81,03099

European Union (28 countries)	Organic agricultural producers No.	Utilised agricultural organic area ha	% Organic agricultural producers	% Utilised agricultural organic area	% organic area∕ % organic producers	Cumulative % in organic agricultural producers	Cumulative % in utilised organic agricultural area
Hungary	1.672	124.841	0,657504	1,210271	1,840705	95,52016	82,24126
Sweden	5.406	501.831	2,125877	4,865002	2,288468	97,64604	87,10626
Estonia	1.542	155.560	0,606382	1,508077	2,487006	98,25242	88,61434
Czech Republic	3.866	472.663	1,520282	4,582232	3,014068	99,7727	93,19657
Slovakia	403	180.307	0,158477	1,747987	11,02988	99,93118	94,94456
United Kingdom	175	521.475	0,068818	5,05544	73,46133	100	100

Source: Authors calculations from data available on Eurostat database (online data code: org_cropap, org_coptyp)

a) 2013 b) 2014
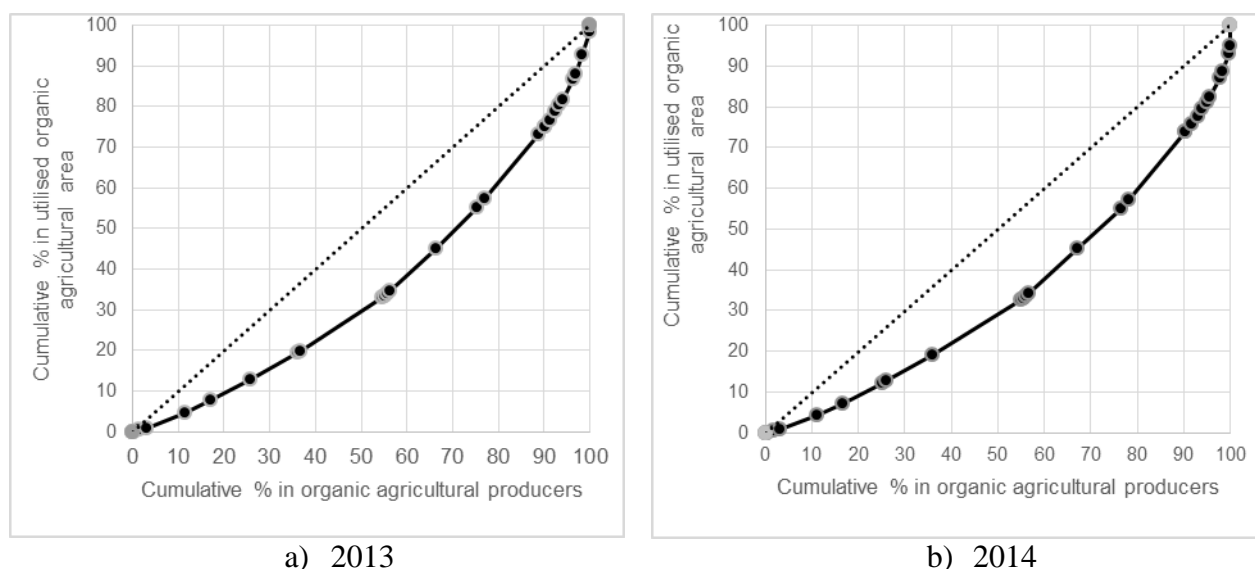
Figure 4 - Lorenz Curves

Concentration coefficients for each variable considered were calculated based on the data in Tables 3 and 4, the territorial concentration coefficients (territorial distributions) were determined using the concentration Gini-Struck (Gs): and presented in the Table below:

Table no. 5 - Gini-Struck coefficients for main indicators

Indicators	Gini-Struck coefficient: $G_s = \sqrt{\dfrac{n\sum g_i^2 - 1}{n-1}}$	
	2013	2014
Organic operators – Agricultural producers	0,247567392	0,256871603
Utilised agricultural organic area (fully converted and under conversion)	0,22256233	0,227657903

Source: Authors calculations.

The values obtained from the calculations for concentration coefficients of European Union Member States distributions show a relatively uniform, both for agricultural producers and also for the utilised agricultural organic area. So, for all these Gini-Struck coefficients values we can speak about territorial disparities. Based on the Gini-Struck coefficients for each year, small changes can be noticed, but we can see a slight increase in concentration for producers in 2014.

CONCLUSIONS

At the level of EU (28) enlargement processes can be seen for organic farming, but there is a great lag between the countries. In time that 50 % of EU - 28 countries had used for organic farming, less than 11% from the total area of organic agriculture, other 25% of them had more than 70%. There is also an increase in the average size for all the main indicators considered in the study in 2014 compared with 2013, even if in several small countries is reducing, and in the larger countries is growing. Remark countries with low potential in terms of available agricultural area,

but which have significant shares of agricultural areas of organic, as are Austria, Czech Republic, Sweden, and even Greece, but also countries with large potential, but that fail to achieve than a low level of organic agricultural area, without increases in the period considered, as Romania. Even if the utilised organic agricultural areas are in a continuous growth in the EU, most are concentrated in developed countries, and this makes that, the potential of organic farming of countries with the similar position in terms of available agricultural area, or producers is different. This determined some concentration of organic agriculture, mainly driven by higher demand in these countries for organic products, and the effectiveness of the financial support provided by the European Union through specific financing measures, laid down in the 2007-2013 Rural Development Program, which contributed to increase the number of organic producers and the development of this sector in these countries. As regional markets will develop, and the farmers will produce organic food priority for consumers in their region, organic farming will have a much higher share in the agriculture of each European countries.

BIBLIOGRAPHY

[1] Andrei, J. V., Ion, R. A., Popescu H. G., Nica, E., Zaharia M. (2016). *Implications of agricultural bioenergy crop production and prices inchanging the land use paradigm - The case of Romania, Land Use Policy, 50, 399-407.*

[2] Brumă, I. S. (2011). *Economic Studies and Research on Ecological Agricultural Production. Agronomy Series of Scientific Research/Lucrari Stiintifice, Seria Agronomie, 54(2), 348-353.*

[3] Brumă, I. S. (2014). *The Evolution of Organic Agricultural Land Areas in the Emerging Countries of the European Union. Agricultural Economics and Rural Development, 11(2), 167-179.*

[4] Codreanu, C. (2007). *Conceptul de agricultură ecologică – bază importantă pentru dezvoltarea agriculturii durabile în România, Revista Lucrări Ştiinifice, Seria Agronomie, 50 (Supliment), 298-302.*

[5] Constantin, F. (2012). *Economic performance of organic farming in Romania and European Union. Economia Seria Management, 15(1), 108-119.*

[6] Cicea, C., Subic, J. &Pirlogea, C. (2010). *Considerations regarding investments efficiency in agriculture. Economia. Seria Management, 13(2), 321-331.*

[7] Jaba, E.. (Ed.). (2002). *Statistică, Ediţia a II-a,* Editura Economică, Bucureşti.

[8] Minciu, R.. (Ed.). (2004). *Economia turismului, Ediţia a II-a,* Editura Uranus, Bucureşti.

[9] Lorenz, M. O. (1905). *Methods of Measuring the Concentration of Wealth. Publications of the American Statistical Association. Vol. 9, No. 70, 209-219.*

[10] Rabontu, C.I.,&Babucea, A. G. (2013). *Economic Aspects of the Romanian Agriculture Evolution. Education, 2087 (1064.0), 919-3.*

[11] Rusu, M. (2014), *Organic agriculture: current situation, evolutions and perspectives. In Proceedings of the International Conference Globalization, Intercultural Dialogue and National Identity,* ed.: Iulian Boldea - Tîrgu-Mureş,

AN OVERVIEW ON ORGANIC AGRICULTURE OF ROMANIA IN THE CONTEXT OF THE CURRENT EUROPEAN DEVELOPMENT MODEL

STELIANA RODINO[1], ALINA BUTU[2], MARIAN BUTU[3]

SUMMARY: *This works stand as an overview on organic agriculture of Romania in the context of the current European development model, presenting relevant information on the organic sector, legislation in force and some data regarding the trade market, at national and European Level. Organic agriculture is a holistic system of production designed to maximize productivity of diverse communities within the agro-system, combining tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved. The organic production sector is one of the most dynamic industrial sectors of EU, with significant increase every year for the last 10 years, in response to the growth in consumers demand. According to official numbers, the ecological agriculture in Romania has seen an upward trend in recent years, both in the vegetable and livestock production sector. Although ecological agriculture represents narrow segments in terms of both acreage and production, it is gaining increased attention due to its sustainable principles of ecological importance and to the economic opportunities it may offer.*

Keywords: *ecological agriculture, organic production, consumers awareness, natural balance*

JEL Classification: N40, N50, Q01,Q15

INTRODUCTION

Pressure from society and from within the farming community itself has resulted in a movement towards a system of organic food production (Kijlstra *et al.,* 2008), that comprises all levels of plant and animal production, from the cultivation of land and growing of animals to the processing and distribution of organic foods and their control. The organic production is designed towards the respect of the natural balance of resources, aims a better treatment and welfare of the animals, at the same time producing goods that do not contain chemical residues

The organic sector is one of the most dynamic sectors of EU agriculture, with constant yearly growth as a response to the growth in consumers demand for food products obtained in processes respecting organic principles (EC data). The aim of the present study was to offer an overview on organic agriculture of Romania in the context of the current European development model, presenting general information on the organic sector, legislation in force and some data regarding the trade market, at national and European Level.

MATERIALS AND METHODS

The study aims to highlight the main features of ecological agriculture at national and European Level. The data analyzed was extracted from on the wide range of statistical information provided by Eurostat database and MARD database. The research has a conceptual and a methodological dimension. The information was processed through analysis, evaluation, comparison of data originating from tables and charts that can lead to identification of current status and future trends, thus providing the necessary arguments for an objective conclusion, visualizing correlations between conceptual models.

[1]CS III Dr. Steliana RODINO, National Institute of Research and Development for Biological Sciences, Bucharest, Romania, Splaiul Independentei 296, P.O. Box 17-16, 060031, Bucharest, Romania, Tel. / Fax. +4 021 220 0880

[2] CS I Dr. Alina BUTU, National Institute of Research and Development for Biological Sciences, Bucharest, Romania, Splaiul Independentei 296, P.O. Box 17-16, 060031, Bucharest, Romania, Tel. / Fax. +4 021 220 0880

[3]CS I Dr. Marian BUTU National Institute of Research and Development for Biological Sciences, Bucharest, Romania, Splaiul Independentei 296, P.O. Box 17-16, 060031, Bucharest, Romania, Tel. / Fax. +4 021 220 0880

e-mail of corresponding author: marian_butu@yahoo.com

Thus, we have analyzed the evolution of some indicators such as: total organic area in Romania and in Europe, number of economic agents involved in organic production sector, total organic surface within UAA, diversity and dynamics of crops cultivated.

Characteristics of organic production

Organic agriculture is a holistic system of production designed to maximize productivity of diverse communities within the agro-system, including groundwater organisms, vegetation, livestock and human beings. It implies conservation of biodiversity and use of natural cycles adapted to local conditions, avoiding the prevention treatments and external inputs with high resilience and negative long term effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved (IFOAM, 2009; Paull J et al., 2011). The primary goal of organic agriculture is to develop productive enterprises that are sustainable and environmentally friendly (Kesavan *et al*., 2008). Organic production is defined as a system that integrates cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity (Regulations of department of Agriculture, 2011).

Focused on sustainable management practices, the general principles of organic farming are chosen carefully in order to restore and then maintain the ecological stability of the area chosen. Soil fertility is maintained and enhanced by a system that favors the maximal biological activity in the soil as well as the soil conservation. Fighting against weeds, pests and diseases is achieved through integrated methods of biological control, cultural and mechanical methods, such as limitation for as much as possible of the land works, selection and crop rotation, recycling plant and animal residues, water management, the massive release of useful insects thus fostering the balance and between predatory victim and promote biological diversity (Wilson *et al*. 2016).

An organic production system of livestock is complying a large number of rules directed towards a high status of animal welfare, care for the environment and restricted use of medical drugs (mainly antibiotics). This system of quality, composed of food and biological farming methods acceptable morally, helps to reduce stress levels and to prevent diseases thus fostering a good health of the livestock. Organic livestock production does not allow preventive medical treatments and there are set prolonged waiting times before delivery of products after medical treatments (Sutherland, 2013).

Legislation in organic systems

Organic production is regulated throughout the EU by Council Regulation (EC) No. 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No. 2092/91 (EC) No. 834/2007). More detailed rules were issued by Commission Regulation (EC) No. 889/2008 of 5 September 2008 with detailed rules on production, labelling and control and Commission Regulation (EC) No. 1235/2008 of 8 December 2008 with detailed rules concerning import of organic products from third countries.

These regulations establish the legal framework for all levels of production, distribution, control and labelling of organic products that can be traded in the EU. They are setting out the principles, scope and rules of organic production and are describing the way the organic products must be labelled. All member states have to comply with these rules. Moreover, some countries have issued their own additional rules.

In our country, the EU legislation on organic farming and other regulations apply. The first national legislation on organic farming was issued in 2000 (Emergency Ordinance of the Government O.U.G no 34/2000*)*. This was followed by Law 38/2001 in 2001. The legislation is up-to-date and follows EU Regulation (EC) No 834/2007.

Organic producers must be certified by one of the registered control bodies. There are 13 inspection and certification bodies for organic products accredited by MARD. This organizations also

takes care of certification and inform farmers and processors within the food chain about legislation. Certified producers are allowed to use the national logo for organic products, which is owned by the Ministry of Agriculture and Rural Development. It is legally protected and can only be used for products that comply with the Romanian Organic legislation.

a)   *b)*

Figure 1. Organic agriculture logo a) for Romania, b) for EU

Ecological farming („Agricultură ecologică"), represents a protected term attributed by U.E to Romania to define this system of agriculture (MARD). It is similar with the terms „organic farming" or „biological farming" used in other Member States as follows: organic (United Kingdom), biological (France, Italy, Belgium, Greece, Luxembourg, Hungary, Bulgaria) and ecological (Germany, Austria, Spain, Denmark, Netherlands, Portugal, Sweden, Finland).

Current trends in European Policy

The first European Action Plan for Organic Food and Farming was published 10th of June 2004. It was only ten years after, that EC released the second action plan, on March 25, 2014. The ambition of the Action Plan is to support the growth of the sector, together with the forthcoming changes to the legislative framework in particular by exploring new medium and long term avenues for solutions to the challenges of supply and demand (Communication from the commission to the European parliament, Action Plan for the future of Organic Production in the EU, /* COM/2014/0179 final */).

The action plan for the development of organic production that EC released in 2014 has three major lines of action:

• The development of the European organic sector (increasing awareness and synergies on new EU instruments; developing research and innovation to overcome challenges in organic rules; and also targeting consumer awareness of organic scheme including EU organic logo);

• Ensuring consumer confidence in the organic products (more research and innovation to overcome challenges in organic rules; increasing traceability of organic production by implantation of an electronic system of certification; development and implementation of an organic fraud prevention policy);

• Reinforce the external dimension of EU organic production (supporting cooperation with enterprises originating from developing countries; extending the worldwide co-operation on organic production by possible plurilateral agreements between the leading organic markets; collecting data on potential markets from the developing countries, as growing suppliers to the EU markets; design and development of an action plan for emerging sector, such as aquaculture and wine; internationally registration of the trade mark of the EU organic logo).

The rules to be followed in the organic production process, the control requirements and labelling guidelines were clearly established and can only be changed by the European Council of Agricultural Ministers. Those legislative proposals for a new Regulation adopted by the Commission are expected to take effect in 2017. The critics opinion is that the proposal contains stricter rules for the production and import of organic products and as a result, it will be more difficult for conventional

farmers to transit to organic agriculture practices, or even cause many organic producers to switch back to conventional farming.

Evolution of organic sector in Europe

The organic sector is one of the most dynamic industrial sectors of EU, with significant increase every year for the last 10 years, in response to the growth in consumers demand. By 2014, some 5.9 % of EU farming area was certified as organic. The value of organic production has also increased constantly by 5 to 10 % a year over the last decade, reaching over EUR 24 billion in 2014 (European Commission, Agriculture and Rural Development, News, Organic production: authorisation 39 substances in line with principles of organic production, 03/05/2016,).

Table 1. Total organic area and utilized agricultural area (UAA) by country, 2013

Nr.crt	Country	Organic area (1000 ha) 2013	UAA (1000 ha) 2013	% Organic vs UAA by country	% UAA by country Vs UAA EU 28
0	**EU 28**	**10,084.9**	**174,606.6**	**5.8**	100.0
1	Spain	1,610.1	23,300.2	6.9	13.3
2	Italy	1,317.2	12,098.9	10.9	6.9
3	France	1,060.8	27,739.4	3.8	15.9
4	Germany	1,008.9	16,699.6	6.0	9.6
5	Poland	669.9	14,409.9	4.6	8.3
6	UK	558.7	17,327.0	3.2	9.9
7	Austria	526.7	2,726.9	19.3	1.6
8	Sweden	501.0	3,028.6	16.5	1.7
9	Czech republic	474.2	3,491.5	13.6	2.0
10	Greece	383.6	4,856.8	7.9	2.8
11	**Romania**	**301.1**	**13,055.9**	**2.3**	**7.5**
12	Finland	204.8	2,284.4	9.0	1.3
13	Portugal	197.3	3,641.6	5.4	2.1
14	Latvia	185.8	1,877.7	9.9	1.1
15	Denmark	169.3	2,619.3	6.5	1.5
16	Lithuania	165.9	2,861.3	5.8	1.6
17	Slovakia	157.8	1,901.6	8.3	1.1
18	Estonia	151.2	957.5	15.8	0.5
19	Hungary	131.0	4,656.5	2.8	2.7
20	Belgium	62.5	1,307.9	4.8	0.7
21	Bulgaria	56.3	4,650.9	1.2	2.7
22	Ireland	53.8	4,959.4	1.1	2.8
23	Netherlands	48.9	1,847.6	2.6	1.1
24	Croatia	40.7	1,571.2	2.6	0.9
25	Slovenia	38.7	485.8	8.0	0.3
26	Luxembourg	4.4	131.0	3.4	0.1
27	Cyprus	4.3	109.3	3.9	0.1
28	Malta	0.007	10.9	0.1	0.0

Data processed based on information from Eurostat

As seen from the table, Romania, is situated in the first half of the group countries (2.3 % of its own UAA) when counting the total organic area cultivated (around 300,000 hectares), although the total UAA accounts for a 7.5 % of the Total EU 28 UAA (Table 1).

Table 2: Total organic area (fully converted and under conversion), by country, 2013 and 2014

Nr.crt	Country	Organic area (ha)		Change 2013-2014 (%)
		2013	**2014**	
1	Spain	1,610,129	1,710,475	6.2
2	Italy	1,317,177	1,387,913	5.4
3	France	1,060,756	1,118,845	5.5
4	Germany	1,008,926	1,033,807	2.5
5	Poland	669,863	657,902	-1.8
6	United Kingdom	558,718	521,475	-6.7
7	Austria	526,689	525,521	-0.2
8	Sweden	500,996	501,831	0.2
9	Czech republic	474,231	472,663	-0.3
10	Greece	383,606	362,826	-5.4
11	**Romania**	**301,148**	**289,252**	**-4.0**
12	Finland	204,810	210,649	2.9
13	Portugal	197,295	212,346	7.6
14	Latvia	185,752	203,443	9.5
15	Denmark	169,298	165,773	-2.1

Data Source: Eurostat

In 2014, it can be observed an overall trend of slow decrease of the cultivated area in the organic system for most the countries that were in the first ten positions, while for Finland, Portugal and Latvia (positions 12-14 in 2013), the situation looked much better, with an increase of almost 10 % for Latvia, 7.6% for Portugal and 2.9 % for Finland. Croatia accounted for a 23% increase of the acreage while Bulgaria accounted for the highest decrease (14%). In our country, the acreage decreased, too, and this trend followed in 2015, as will be seen explained in the following paragraphs.

Prospects of the national market

The national market of organic food, relatively well established if counting the number of economical agents existing (around 1200 certified entities), is still in the process of development. Although the certified number of economic agents is relatively high, there are many uncertified small producers, located in small villages across the country. Most of the organic production from Romania goes to the export market. Because the internal market is underdeveloped, cost of distribution are high and the existing data on consumer demand is scarce, many producers (especially medium companies) found the export to be a better solution for their production and being more profitable than sale on national market.

The main distribution channels in national market are direct sale (especially for the small producers), which may be in specialized shops or in the on-line environment.

Unfortunately, the consumers awareness towards organic food is low. However more and more consumers are looking for high quality food, produced in clean environment and respecting the natural balance. Nevertheless, with society education and organic food promotion campaigns there is a growing potential regarding the development of organic food sector

According to MARD, organic farming is a dynamic sector in Romania which has seen an upward trend in recent years (Figure 2), both in the vegetable and livestock production sector.
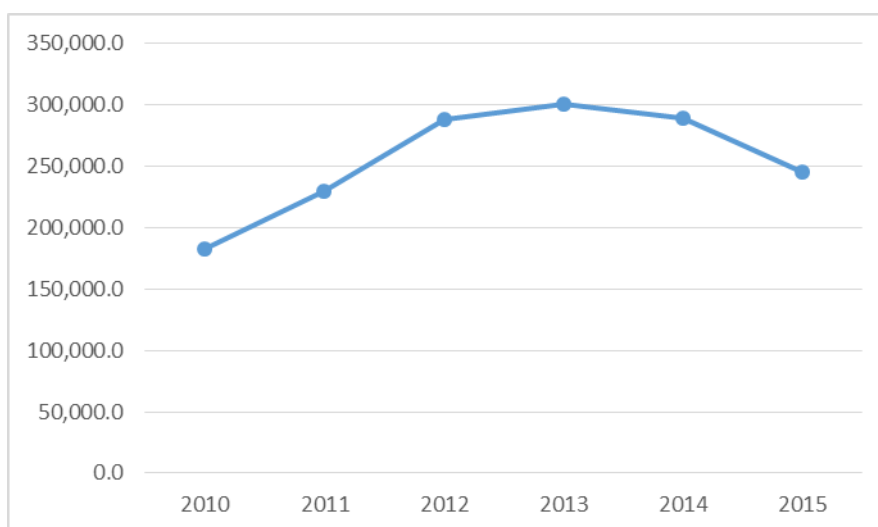
Source: Data processed based on information MARD, 2015

Figure 2. Total surface cultivated in organic system in Romania

In 2013, In Romania, there were over 15,000 certified farms, providing organic production (Figure 3). They represented 2,3 % of the utilized agricultural area (UAA), around 300,000 hectares. This was the highest peak of organic production in the last five years. The cultivated area decreased in 2014 and 2015.
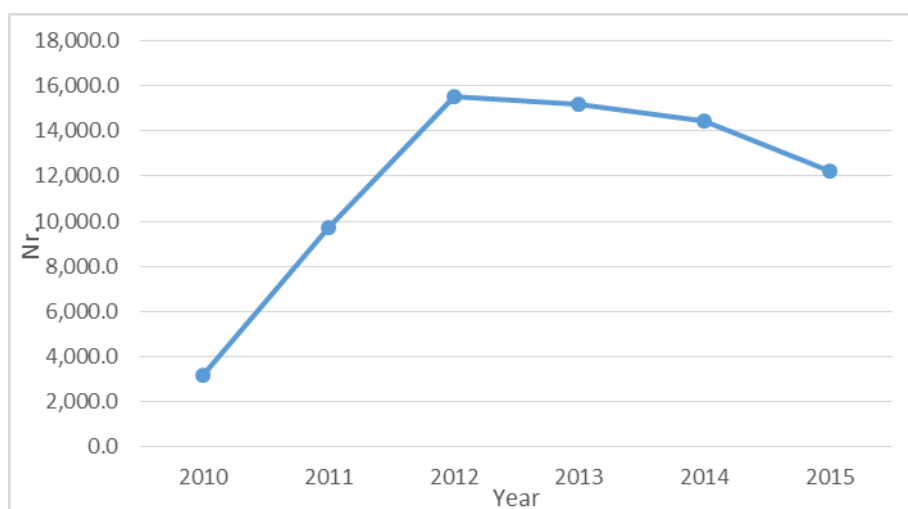
Source: Data processed based on information MARD, 2015

Figure 3. Number of certified agents in ecological farming in Romania

Although ecological agriculture represents narrow segments in terms of both acreage and production, it is gaining increased attention due to its sustainable principles of ecological importance and to the economic opportunities it may offer. Moreover, there is growing interests from several industrial and economic sectors at different levels for the promotion and development of organic sector. The common practices issued by the organic producers are basic integrated management practices such as crop rotation, natural pest management and using bio-fertilizers and organic manures mainly vermi-compost and green manure in soil fertility management. At this moment, the current research in organic agriculture are targeted in the design and development of new alternatives for the synthetic chemical treatments or optimisation of the traditional knowledge regarding

biological control of pests and diseases, both for plant protection and veterinary use (Cordeau et al., 2016, Xiao et al., 2016).

As to respect to the diversity of the ecological production, in 2015 the scenario followed the typical development of the past 5 years, meaning, nearly one third (33%) of the organic farming production in Romania was represented by cereals, 31% was permanent grassland and / or forage crops, 21% industrial crops, followed by other cultures which account for less than 10 % each, such us dry pulses, root crops, plants harvested green from arable land, vegetables, and orchards and vineyards (Figure 4).
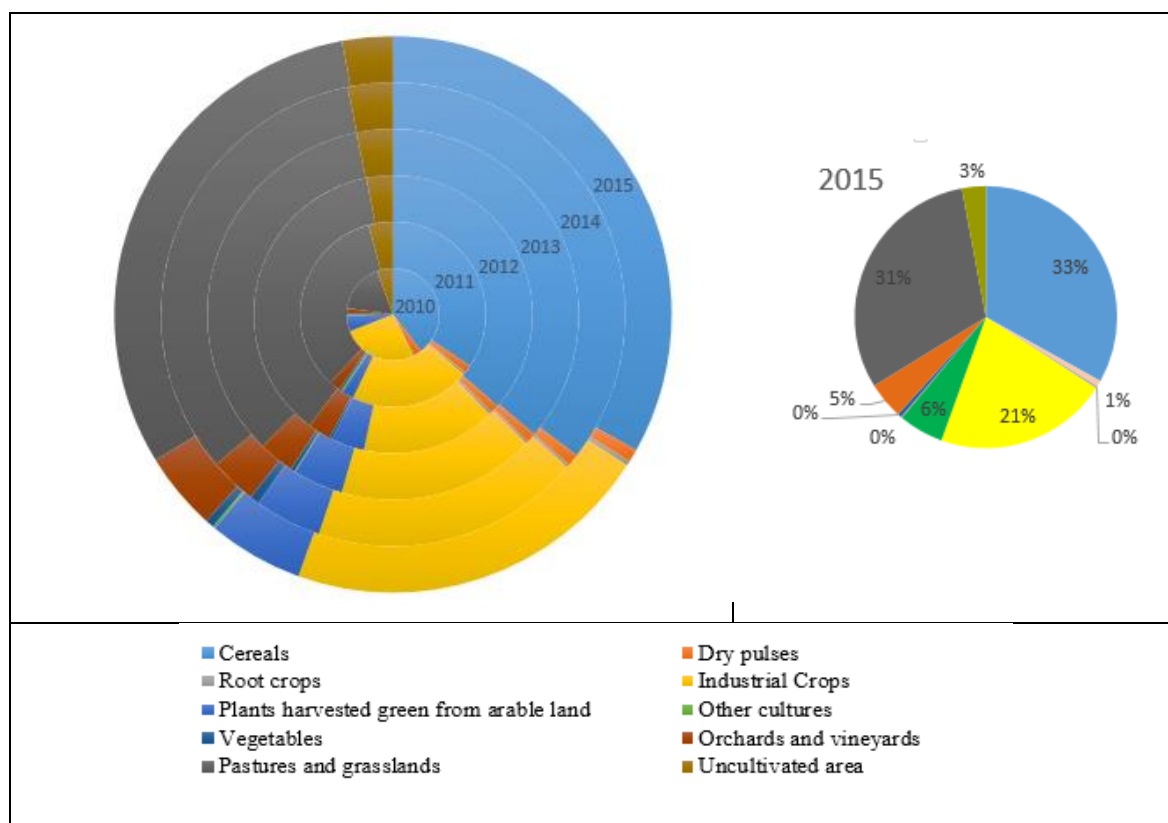
Source: Data processed based on information MARD, 2015

Figure 4. The diversity of organic production during 2010-2015 in Romania

Future development

Through its comprehensive approach to the protection of natural balance, organic farming is a promising response to the fight against globalization and natural resources depletion. It is supported by consumers and the government, which is encouraging and essential for producers.

Trying to develop alternative strategies to the use of synthetic chemicals, thus reducing the disease resistance and the environmental pollution, organic farmers will continue to innovate. The techniques will evolve further with qualitative and quantitative results, like for example the use of plant extracts and other natural substances, a technique that is developed by researchers to naturally prevent plant diseases.

Probably various models will be followed when speaking about the trade markets, some farmers preferring to develop direct contacts with end consumers (especially in the emerging modern markets such as the e- commerce), while others will collaborate in in cooperation with companies.

Nevertheless, the challenge of the future will be to enable the development of the organic sector, encouraging farmers increase the organic production. This requires solidarity among farmers, respect from the processors and distributors and consumer support, not to mention that of the public authorities.

CONCLUSIONS

Organic agriculture is represented by that production method that enhances soil fertility maintenance conservation of natural resources and promote ecological balance of the environment. For this, it uses agricultural and livestock practices that are directed to maintain natural balances. It is also a factor supporting sustainable development as it is environmentally friendly, fostering in the same time the improvement of the social and economic status in rural areas. Consequently, the development of ecological agriculture may create opportunities for underdeveloped rural areas of our country.

ACKNOWLEDGEMENTS

BIBLIOGRAPHY

Commission Regulation (EC) No. 1235/2008 of 8 December 2008 with detailed rules concerning import of organic products from third countries.

Commission Regulation (EC) No. 889/2008 of 5 September 2008 with detailed rules on production, labelling and control.

Communication from the commission to the European parliament, the council, the European economic and social committee and the committee of the regions Action Plan for the future of Organic Production in the European Union, /* COM/2014/0179 final */

Cordeau, S, Triolet, M, Wayman, S, Steinberg, C, Guillemin, JP. (2016). Bioherbicides: Dead in the water? A review of the existing products for integrated weed management, Crop protection, 87, 44-49.

Council Regulation (EC) No. 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No. 2092/91.

European Commission, Agriculture and Rural Development, News, Organic production: authorisation 39 substances in line with principles of organic production, 03/05/2016, http://ec.europa.eu/agriculture/newsroom/276_en.htm

Eurostat database, http://ec.europa.eu/eurostat/data/database.

International Federation of Organic Agriculture Movements (IFOAM 2009)

Kesavan P.C, Swaminathan M.S. (2008). Strategies and models for agricultural sustainability in developing Asian countries, Philos Trans R Soc Lond B Biol Sci. 363(1492): 877–891. doi: 10.1098/rstb.2007.2189

Kijlstra A., Eijck I.A.J.M. (2006) Animal health in organic livestock production systems: a review, NJAS - Wageningen Journal of Life Sciences Volume 54, Issue 1, 77-94

Ministry of Agriculture and Rural Development, http://www.madr.ro/

Paull, J. and Hennig, B. (2011). A World Map of Organic Agriculture. *European Journal of Social Sciences* 24 (3): 360-369

Regulations of the Department of Agriculture, Agricultural Marketing Service (Standards, Inspections, Marketing Practices), Organic Foods Production Act Provisions, 7 CFR 205.2 - Terms defined, https://www.gpo.gov/fdsys/granule/CFR-2011-title7-vol3/CFR-2011-title7-vol3-sec205-2

Sutherland M. A., Webster J., Sutherland I. (2013). Animal Health and Welfare Issues Facing Organic Production Systems, Animals (Basel). 3(4): 1021–1035, doi: 10.3390/ani3041021

Wilson, M.H., Lovell, S.T. (2016). Agroforestry-The Next Step in Sustainable and Resilient Agriculture, Sustainability, 8, 6, article no 574,

Xiao, Z.G., Liu, M.Q., Jiang, L.H., Chen, X.Y., Griffiths, B.S., Li, H.X., Hu, F. (2016). Vermicompost increases defense against root-knot nematode (Meloidogyne incognita) in tomato plants, Applied soil ecology, 105, 177-186,

REALITY AND PROSPECTS OF ORGANIC AGRICULTURE IN IRAQ AND NEIGHBORING COUNTRIES

HUSSEIN ALI HUSSEIN AL QAESI[1], ABDULMUTTALEB ABBAS[2], MOHAMED DHARY YOUSIF EL-JUBOURI[3]

Abstract. *Agriculture in Iraq represents a vital component of the country's economy. Prior to the development of the petroleum industry, agriculture was the primary economic activity in Iraq.*
Over the past several decades agriculture's role in the economy has been heavily influenced by Iraq's involvement in military conflicts (particularly the 1980-1988 Iran-Iraq War, the 1991 Gulf War, and the 2003 Iraq War). These military conflicts influenced government policy intervention to promote and/or control agricultural production. In 1971 to 1990, Iraq's population grew at an annual rate of 3.2% compared with only a 1.2% growth rate for Iraq's cereal production, given the context that cereals are the principal source of calories in Iraq.
Nowadays, there is a strong debate about which direction should Iraqi agriculture take, for its revival and for contributing to national wellbeing, taking also into account the growing competition for water and the challenges due to climate change.
This study will be divided into four main sections, which is an introduction in which the literature will also be reviewed, the second main section will be dedicated to organic agriculture and related activities since organic agriculture represents an important method for the extension of agriculture. The last two important sections will be dedicated to the results, which will contain tables of statistical data followed by a discussion in which data will be interpreted, and it will end with the conclusions and recommendations for prospects of organic agriculture in Iraq.

Keywords: *organic agriculture, agriculture in Iraq, extension of agriculture*

JEL Classification: O13, Q 50

INTRODUCTION

The present research is situated in the field of agriculture, focusing on evaluating the reality and prospects of organic agriculture in Iraq and neighboring countries, such as Iran, Jordan, Saudi Arabia, Turkey, and Syria.
1. How are environmental conditions in the Iraq and neighboring countries changing?
2. What is the reality of organic agriculture in Iraq and neighboring countries?
3. What are the prospects of organic agriculture in Iraq and neighboring countries?
4. What are practical activities of society responding to the issues?

The aim of this study is also to serve as a baseline that will allow measuring progress in the future and get insights about Organic Agriculture's potential within the current Iraqi agriculture framework. Agricultural productivity growth is important because it is an essential source of overall growth in an economy, that is why productivity differences among countries, and mainly between developed and underdeveloped ones, represents a central issue of development economics. By Middle-Eastern standards, Iraq is well endowed with agricultural resources that include fertile soils, access to water from two major river systems (the Euphrates and the Tigris), and extensive irrigation potential. Multiple claims to individual land and water rights have evolved, spawned by political patronage and persecution, and outright military conflict.

For centuries Iraq has been a net food exporter, thanks to its abundance of water and land, with a relatively small population. After World War II and independence, oil revenues were invested for a

[1] Ph. D Student, University of Agricultural Sciences and Veterinary Medicine Bucharest, 59 Marasti, District 1, 11464, Bucharest, Romania, Phone/Fax: 00 40773 870 500; mail: hussein_782003@yahoo.com
[2] Ph. D Student, University of Agricultural Sciences and Veterinary Medicine Bucharest, 59 Marasti, District 1, 11464, Bucharest, Romania, Phone/Fax: 00 40733 230 691; mail: abd_mtlb@yahoo.com
[3] Ph. D Student, University of Agricultural Sciences and Veterinary Medicine Bucharest, 59 Marasti, District 1, 11464, Bucharest, Romania, Phone/Fax: 00 40 744 6474 10; mail: mdhj1965@yahoo.com

massive modernization of the agro-industrial complex in Iraq, with capital intensive initiatives and the introduction of modern inputs and the expansion of irrigation (Schnepf, 2003).

Iraq's agricultural sector suffered a first structural change in the late nineteenth century at the creation of large privately-held estates, followed, in 1958, by the rise to dominance of the central state. In 1979, Saddam Hussein assumed power and immediately set out to recreate the state under his control. Many factors, such as population growth, massive urbanization, warfare and domestic turmoil have determined an ever increasing recourse to food imports and during the conflict with Iran, many producers were almost obliged to abandon input intensive production systems and they had to retrieve traditional methods and to rely on local inputs. This is why, at the time, extension of agriculture is an important matter of discussion, since it has a major economic and sociologic impact. According to many Iraqi experts and within the Iraqi population, there is a growing awareness about the pollution problems caused by the misuse of chemicals, while the cost of many imported inputs makes them unaffordable for most small farmers (Bashur, 2008).

There is a pressing need to factor in the impact of climate change on Iraqi agriculture. Iraq's capacity to adapt to climate change at the moment is considered to be marginal, but the country is expected to develop a capacity to adjust since it has the financial resources to invest in its future and to neutralize the negative impact of global warming on its economy.

Regarding the direction that agriculture should take in Iraq, Iran, Saudi Arabia and other neighboring countries, there are strong forces pushing for a westernized type of intensive farming, based on all possible inputs,(USAID 2006) similar to the green revolution, but on the other hand there are also those who suggest various forms of low external inputs agriculture and even organic agriculture, at least for some areas of the country and for some products and markets.

Organic agriculture ranks 6th, after the involvement of international agencies and after the opening in Baghdad of the ISO office, although the organic option, in spite of being appealing, is not considered very feasible over the whole country, due to several reasons, according to Bishay (2003) and Thomas (2008).

One of the most important threats to agricultural development appears to be the continuous reliance on the revenues from oil, which diverts the attention of the policy makers and of much Iraqi population from the need for a sound and balanced development, based on many economic sectors. Another threat would be the lack of water, due to growing urban demand, decreasing rainfall and to likely problems with neighboring countries.

Still, organic agriculture is an important option when considering the extension of agriculture so its reality and future prospects require theoretical and applied research, a good administration that would reflect in society's involvement, trough targeted investments, agricultural education, and appropriate legislation, also cooperation with foreign firms or NGOs. The efficiency of organic agriculture can be measured trough production and the effects of production on animal farming, plant growth through its impact on society and economy as well.

Relative levels of agricultural incomes and productivity vary largely from country to another, for example Turkey and the United Arab Emirates are characterized by highly uneven urban and rural development of agriculture. Syria, due to the efforts made to encourage agricultural production and reach food self-sufficiency, is characterized by equal productivity. Iraq is the only country where average agricultural incomes seem much higher than in other sectors, as a result of the embargo since the Gulf ware. Agricultural exports are less than 10% of the total exports in neighboring countries, except in Jordan (more than 40% of the total exports).

Agricultural growth has been uneven from country to country as well. Saudi Arabia is in the top with a total of 132 % growth / capita over the period considered due to large investments made in irrigation schemes. Iran and Jordan have also had sustained growth (+25%). Turkey has maintained the same level of production during 1980-1996. Agricultural growth has been strong in horticulture (vegetables and fruits), meat and sugar, but insufficient in cereals, oilseeds and milk according to Nordlom and Shomo (1995).

The links of agriculture with the rest of economy are not yet very strongly defined, but are rapidly improving. A more detailed comparison between the expansion of agriculture in Iraq and other neighboring countries will be made in the section dedicated to organic agriculture and the statistical data will be interpreted in the results and discussion section.

MATERIAL AND METHODS

This study involves the use of theory and statistical data. The theory may or may not be made explicit in the design of the research, although it will usually be made explicit in presentation of the findings and conclusions.

In the paper the fallowing indicators have been used: arithmetic mean, coefficient of variation, average annual growth rate, ecologic indicators and statistical indicators.

The formulas used for to calculate these indicators, are:

$For\ the\ arithmetic\ mean = \bar{x} = \frac{\sum xi}{n}$, where $\bar{x}$ = the arithmetical mean, xi= the average production values for a number of years (i); n= number of years taken into account

The average annual rate of growth [1] = r1990-1999 (and respectively r2000 – 20014)= $\sqrt{\prod \left(\frac{p1}{p0}\right) - 1}$;

where r1990-1999, and respectively r2000 – 20014= average annual growth rate; $\prod \left(\frac{p1}{p0}\right)$ = entagled growth indicators

The research method followed the following steps, beginning with scientific databases research of the relevant articles concerning organic agriculture in Iraq and neighboring countries, followed by an analysis and selection of the relevant data and the last step was extraction and summarization of the results based on interpretation and evaluation of data.

"Organic Agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved" (IFOAM, 2005)

There are many definitions of organic agriculture. The one above was adopted in Vignola, Italy, after the General Assembly of IFOAM passed a motion to establish a succinct definition reflecting the four principles of organic agriculture. The four principles of organic agriculture are the principle of health, the principle of ecology, the principle of fairness and the principle of care.

As I mentioned earlier, there are many definitions for organic agriculture but all spin around the idea that it is a system that relies on ecosystem management rather than external agricultural inputs:

"Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system." (FAO, 1999).

It is a system that eliminates the use of synthetic inputs, such as synthetic fertilizers and pesticides, veterinary drugs, genetically modified seeds and breeds, preservatives, additives and irradiation an replaces them with specific management practices that increase long-term soil fertility and prevent pest and diseases. The benefits of Organic Agriculture are multiple and they are not only restricted to a sounder production system but also to different environmental benefits, to animal care and to a healthier food for the consumer. The interest in organic agriculture is driven by: Increase in consumer awareness and interest to have safe food; Higher economic return of organic than conventional products; Eliminating factors negatively affecting the environment; Increased market

share of organic products; Increased number of control bodies for production, processing, and marketing of organic products.

According to Kahouli, agriculture has a high priority in Iran and organic agriculture has recently been introduce into the country (Kahouli 2002) by private initiatives motivated by economic growth since the soils and climate offer a great diversity. Also in Turkey, organic agriculture is very popular and most of the products are exported(Ozkan 2002).

The role of organic farming is to eliminate the use of fertilizers, pesticides, animal drugs and food additives, I order to improve soil, water and environmental quality. The excess use of nitrogen fertilizers in agriculture can lead to nitrate accumulation into plants which constitute a problem when eaten since part of the ingested nitrate may be converted to nitrite causing *methaemoglobinaemia* or even to *carcinogenic nitrosamines*.

In Iraq, the organic matter of cultivated clay soils is between 1.0- 2.5%, while in the calcareous and sandy desert soil, it is usually less than 0.5% under arid and semiarid conditions (Nordblom, 1995)

Other activities, besides organic agriculture, help the expansion of agriculture in Iraq. The project for Harmonized Support for Agriculture Development (HSAD) is a research for development initiative that aims to improve the Iraqi agricultural value. The main objectives of the HSAD project (2014) were improving extension, developing new policies, rules and regulations, testing, validating and distributing new technologies and promoting innovative farming practice. Trainings were held on the following courses: Integrated Pest Management Courses; Water Management Courses; Biotechnology Courses; Information and Communication Technology Courses; Tools and Technologies Courses.

The problems that extension of agriculture and related research systems in Iraq are summarized as follows: a) Issues regarding the agricultural systems production and the needs for agricultural extension not effectively addressed; b) Agriculture problems in economic, social and cultural dimensions not fully addressed by scientific research in order to identify effective projects that could increase agricultural production (Al-Hakim 2011); c) Lack of effective communication on new techniques and trends in innovative production systems; d) Lack of extension services, such as infrastructure facilities, needed to achieve centers of excellence for extension and agricultural development; e) Lack of fitted equipment needed to develop modern extension services (Al-Hakim 2011); f) Improving training facilities with laboratories materials in order to teach students needed technical information and prepare extension guidelines for agricultural technicians in order to be more knowledgeable about the most efficient agricultural practices;

Given these limitations affect the extension services in Iraq, the new government has considered introducing new extension policies that should improve communication and coordination between agricultural research centers and extension services, aiming to strengthen the link between researchers and extension officers and to lay the foundations for best joint approaches in the achievement of effective extension (Ministry of Agriculture, 2008).

The overall extension policies include:

• Documenting the current situation of agricultural extension in Iraq and compare with extension experiences and success stories which involves learning from developed countries' agricultural extension best programs and methods;

• Implementing ways to effectively apply results of scientific research in such a way that they are fully applicable and adaptable to local conditions;

• Developing agricultural technologies for the medium covering all aspects of complex agricultural environment of Iraq; (Ministry of Agriculture, 2008).

• Introducing cost-effective incentives to stimulate agricultural producers to adopt effective agricultural technologies given the socio-economic restrictions farmers might have.

At the time, extension of agriculture is an important matter of discussion in Iraq and its neighboring countries, since it has a major economic and sociologic impact. According to experts

there is a growing awareness about the pollution problems caused by the misuse of chemicals, while the cost of many imported inputs makes them unaffordable for most small farmers (Bashur, 2008). One of the most important threats to agricultural development appears to be the continuous reliance on the revenues from oil, which diverts the attention of the policy makers and of much Iraqi population from the need for a sound and balanced development, based on many economic sectors. Another threat would be the lack of water, due to growing urban demand, decreasing rainfall and to likely problems with neighboring countries. Also, after the fall of the previous regime, Iraq has been to some extent "technologically" invaded, not for the benefit of the country, but for increasing the profits of the foreign input providers and due to the poor research and extension system, a sustainable agricultural development of organic agriculture might be impeded.

RESULTS AND DISCUSSION

Organic agriculture is an important option when considering the extension of agriculture so its reality and future prospects require theoretical and applied research, a good administration that would reflect in society's involvement, trough targeted investments, agricultural education, and appropriate legislation.

Comparison on the development of agricultural areas in Iraq, Iran, Jordan, Syria and Turkey for the period 1990-1999. During 1990-1999, Iran shows a positive annual growth rate of 0.39 percent, and a mean of 63753, whyle Iraq shows a negative annual growth rate. Jordan and Syria have a relatively close annual growth rate, followed by Turkey with 0.17. The highest coefficient of variation is in Iraq (12,35), whyle the smallest one in Syria (0.56). The next highest mean of agricultural area during this period is shown in Turkey, then is followed by Syria and Iraq. Jordan has the lowest mean of 1069. The negative results of Iraq can be explained given the 1991 Gulf War, which resulted in significant damage to the irrigation and transportation infrastructure which were very important to the agricultural sector, also agricultural machinery, and the means of spraying planted areas with pesticides.

Table 1(a).Evolution of agricultural areas in Iraq and neighboring countries during the period 1990-1999

Country	MU	1990	1995	1999	Mean	St. Dev.	Coefficient of variation	The annual growth rate
					ml. ha	ml. ha	%	%
Iran	1,000 ha	61,500	64,208	63,687	63,753	7,877	12.35	0.39
Iraq	1,000 ha	9,230	9,100	8,750	9,214	552	5.99	-0.59
Jordan	1,000 ha	1,040	1,114	1,067	1,069.2	28	2.60	0.28
Syria	1,000 ha	13,495	13,789	13,767	13,695	76	0.56	0.22
Turkey	1,000 ha	39,677	39,493	40,302	39,803	1,117	2.81	0.17

FAOSTAT: http://faostat.fao.org/site/679/default.aspx#ancor

Comparison on the development of agricultural areas in Iraq, Iran, Jordan, Syria and Turkey for the period 2000-2012.
The highest coefficient of variation shows again in Iran, with a mean of 54350 mll./ha and a negative annual growth rate of almost -2 (1.98). Iran also shows a small annual growth rate, followed by Iraq, Turkey and Jordan. Syria is the only country with a positive growth rate of 0.09 during this period of time.
The highest mean of agricultural areas appears to be in Iran, followed by Turkey and Iraq. The smallest development of agricultural areas appears to be in Jordan and Syria. Iraq shows an increase during 2000-2005, which is followed by a decrease starting from 2010.

Table 1(b).Evolution of agricultural areas in Iraq and neighboring countries during the period 2000-2012

Country	MU	2000	2005	2010	2012	Mean	St. Dev.	Coefficient of variation	The annual growth rate
						Ml. ha	Ml. ha	%	%
Iran	1,000 ha	62,884	47,631	48,699	49,131	54,350	7,877	14.49	-1.98

Iraq	1,000 ha	8,300	9,390	7,870	7,657	8,460	552	6.53	-1.02
Jordan	1,000 ha	1,069	1,013	1,002.3	1042.3	1,015	28	2.74	-0.18
Syria	1,000 ha	13,711	13,828	13,908	13,921	13,851	76	0.55	0.09
Turkey	1,000 ha	40,479	41,223	39,012	38,407	39,955	1,117	2.80	-0.37

FAOSTAT: http://faostat.fao.org/site/679/default.aspx#ancor

Comparison on the evolution of certified organic agricultural areas in Iraq, Iran, Jordan, Syria and Turkey for the period 2006-2012. Turkey has by far the highest mean of certified organic areas, with 0.6 % agricultural area. Syria and Iran follow with a mean of 30,5 respectively 16,2. Jordan has a very small mean of 1.4. Iraq has not yet developed organic crop areas during this period, so there is definitely room for improvement.

The share of certified organic farmland in the agricultural area of the country. In Iran, the organic agricultural land consists of 7'256 hectares. The wild collection area mounts to 40'700 hectares, and it is located in the three provinces of Fars, Kerman, and Khorasan. Main products are wild pistachio, herbs, and licorice.

In Turkey, Eastern Anatolia makes up nearly half of the distribution of organic farming in Turkey, with the Black Sea and Aegean regions following with nearly 15% each. In Syria, an FAO project started in 2006, titled "Institutional Development of Organic Agriculture in Syria, but unfortunately there is no organic certification body.

Table 2. The size and weight organic crop areas occupied in the agricultural area during the period 2006-2012

Country	Area	2006	2007	2008	2009	2010	2011	2012	Mean
Iran	1,000 ha			11.4	8.0	6.0	14.4	41.4	16.2
	% area			*0.024*	*0.017*	*0.012*	*0.03*	*0.08*	*0.2*
Iraq	1,000 ha								
Jordan	1,000 ha		1.03	1.03	1.03		2.6		1.4
	% area		*0.11*	*0.11*	*0.10*		*0.26*		*0.1*
Syria	1,000 ha			*25.66*	*35.4*				*30.5*
	% area			*0.18*	*0.25*				*0.2*
Turkey	1,000 ha	162.0	135.0	142.0	250.0	192.0	326.0	399.0	229.4
	% area	0.40	0.34	0.36	0.64	0.49	0.85	1.04	0.6

FAOSTAT: http://faostat.fao.org/site/679/default.aspx#ancor

Comparison on the development of chemical fertilizers per hectare which is applied in Iraq, Iran, Jordan, Syria and Turkey, during 2002-2010. According to the table, the highest development of chemical fertilizers per hectare is applied in Jordan, followed by Iran and Turkey. The smallest evolution of chemical fertilizer appears to be in Iraq. Syria has a medium mean of development in comparison to the other countries.

Table 3. The evolution of fertilizer (N + P2O5) per hectare in Iraq and neighboring countries, between 2002-2010

Country	MU	2002	2004	2010	Mean	StDev	Coefficient of variation	The annual growth rate
					mll ha	mll ha	%	%
Iran	kg/ha	66.8	83.94	43.09	72	15.2	21.1	-5.0
Iraq	kg/ha	…	23.38	31.44	32	20.8	65.4	5.0
Jordan	kg/ha	300.63	204.64	87.78	208	180.9	87.2	-14.3
Syria	kg/ha	57.76	60.24	27.08	59	13.6	22.8	-9.0
Turkey	kg/ha	62.95	73.57	76.17	73	7.1	9.7	2.0

FAOSTAT: http://faostat.fao.org/site/679/default.aspx#ancor

Table 4 (a). *Comparison on developments quantities of pesticides applied per hectare in Iraq, Iran, Jordan, Syria and Turkey in 1990-1999.*

Country	MU	1990	1995	1999	Mean	StDev	Coefficient of variation	The annual growth rate
					kg/ha	kg/ha	%	%

Iran	kg/ha	0.65	0.47		0.57	0.2	33.28	-12.59
Iraq	kg/ha		0.16	0.1	0.14	0.03	20.70	-5.11
Jordan	kg/ha	2.95	2.36	1.9	3.11	0.8	24.75	-4.63
Syria	kg/ha			0.76	0.66	0.2	36.19	39.60
Turkey	kg/ha	1.08	1.01	1.23	1.06	0.1	12.74	1.46

Pesticides are apparently applied mostly in Jordan. Turkey follows with a mean of 1.06.Syria and Iran have relatively close mean of 0.66 and 0.57 Iraq has the lowest development of quantities of pesticides applied per hectare.

Table 4(b). *Comparison on developments quantities of pesticides applied per hectare in Iraq, Iran, Jordan, Syria and Turkey for the period 2000-2010*

Country	MU	2000	2005	2010	Mean	St. Dev	Coefficient of variation	The annual growth rate
					kg/ha	kg/ha	%	%
Iran	kg/ha	1.56	1.17		1.14	0.4	39.26	-14.78
Iraq	kg/ha	0.12	0.16		0.17	0.03	16.27	11.84
Jordan	kg/ha	1.99	10.78	4.74	6.68	3.0	44.66	6.81
Syria	kg/ha	0.61			0.62	0.01	2.28	3.28
Turkey	kg/ha	1.27	1.52	1.59	1.38	0.3	21.51	2.09

FAOSTAT: http://faostat.fao.org/site/679/default.aspx#ancor

According to the table, in comparison to the other countries, Jordan has the highest mean of pesticides applied per hectare. Turkey and Iran follow, but with a much lower mean, (1.38, respectively 1.14). Syria and Iraq have a relatively close mean of 0.62 and 0.17.

Table 5(a). Comparison on developments quantities of manure that is applied per hectare in Iraq, Iran, Jordan, Syria and Turkey for the period 1990-1999

Country	MU	1990	1995	1999	Mean	StDev	Coefficient of variation	The annual growth rate
					kg/ha	**kg/ha**	%	%
Iran	kg/ha	4.70	5.06	5.37	4.97	0.36	7.34	1.49
Iraq	kg/ha	1.62	0.64	0.79	0.75	0.32	42.07	-7.60
Iordan	kg/ha	1.66	2.38	2.58	2.34	0.31	13.21	5.05
Syria	kg/ha	0.30	0.33	0.39	0.34	0.03	9.57	2.96
Turkey	kg/ha	9.36	9.43	8.74	9.17	0.32	3.49	-0.75

FAOSTAT: http://faostat.fao.org/site/679/default.aspx#ancor

Application of organic fertilizers is one of important practical measures to improve soil fertility. Turkey seems the have the highest mean of manure applied per hectare, followed by Iran. Jordan have comes second, while Iraq and Syria have a mean of 0.75 and 0.34 kg of manure/ha.

Table 5(b). Comparison on developments quantities of manure that is applied per hectare in Iraq, Iran, Jordan, Syria and Turkey for the period 2000-2012

Country	MU	2000	2005	2010	2012	Mean	StDev	Coefficient of variation	The annual growth rate
						kg/ha	**kg/ha**	%	%
Iran	kg/ha	5.38	8.51	9.37	9.49	7.63	1.79	23.39	4.84
Iraq	kg/ha	0.92	1.24	1.89	2.04	1.41	0.42	29.70	6.88
Iordan	kg/ha	2.63	3.41	2.87	2.91	2.96	0.21	6.98	0.86
Syria	kg/ha	0.40	0.44	0.44	0.45	0.45	0.03	7.80	1.03
Turkey	kg/ha	8.63	7.61	7.84	9.20	8.13	0.50	6.10	0.53

FAOSTAT: http://faostat.fao.org/site/679/default.aspx#ancor

During this period, an increase in manure applied /ha shows in Iraq, Iran, Jordan and Syria. Turkey maintains the highest mean, followed by Iran. Jordan has a very slight increase over the last period, and Syria has again the lowest rate.

Graph 1. The prospect after FAO quantities of manure per hectare in Iraq and neighboring countries, in 2030 and 2050
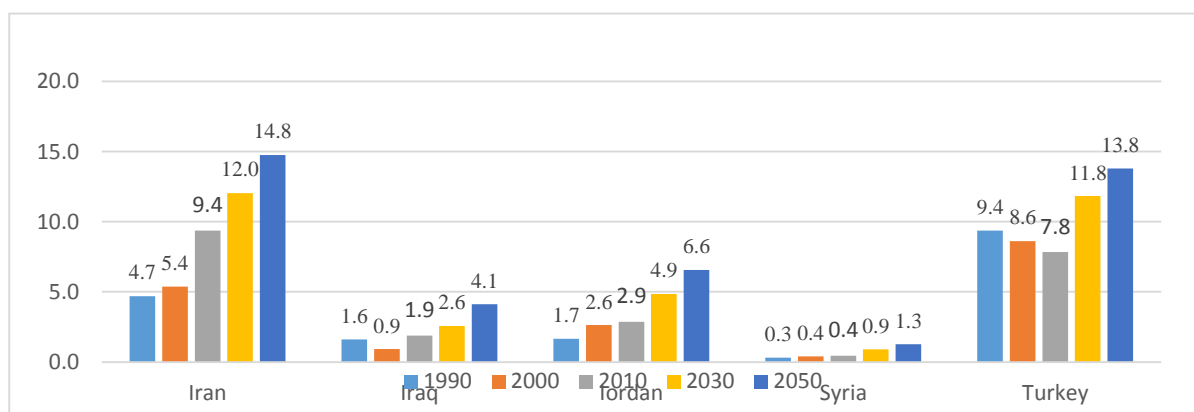
CONCLUSIONS

Organic agriculture is an excellent option that would help the extension of agriculture, but its diffusion in Iraq will require time to cover applied research and extension, good administration and appropriate legislation.

In conclusion, the problems that extension of agriculture and related research systems in Iraq regarding improving extension, developing new policies, rules and regulations, testing, validating and distributing new technologies and promoting innovative farming practice, should be resolved by taking into consideration the following:

- agricultural systems production and the needs for agricultural extension not effectively addressed;
- create effective communication on new techniques and trends in innovative production systems;
- create extension services, such as infrastructure facilities, needed to achieve centers of excellence for extension and agricultural development;
- provision of fitted equipment needed to develop modern extension services;
- improving training facilities with laboratories materials in order to teach students needed technical information and prepare extension guidelines for agricultural technicians in order to be more knowledgeable about the most efficient agricultural practices;

REFERENCES

Al-Hakim Abdul Hussein Nuri , (2011), *Studies in Iraqi agriculture: Farming for the future*, Supreme Committee for the agricultural initiative to the Prime Minister, Baghdad

Bashur, I. Pesticides, fertilizers and food safety, in Tolba,(2008), *"Arab environment future challenges",* Arab Forum for Environment and Development, Beirut, pp. 137-144

Bishay, F. , (2003), *Towards sustainable agricultural development in Iraq*, 2003; retrieved September 2016, from http://www.fao.org/docrep/006/y9870e/y9870e00.htm

FAO/WHO, Codex Alimentarius Commission, (1999), Retrieved March 2016 from http://www.fao.org/organicag/oa-faq/oa-faq1/en/

HSAD, Activités de formation HSAD, (2014), retrieved October 2016 from http://hsad.icarda.org/blog/update-hsad-training-activities

Kahouli, H.M., (2002) *Organic farming in NENA region: Challenges and opportunities*. FAO publication. RNE Cairo, Egypt

Mahmoudi, H., Hosseininia, G., Azadi, H., Fatemi, M. , (2008), *Enhancing date palm processing, marketing and pest control through organic culture,* Journal of Organic Systems, 3 (2): pp.29-39, 2008.

Nordblom, T. L., and F. Shomo.(1995), "Food and Feed Prospects to 2020 in the West Asia/ North Africa Region." Social Science Papers, no. 2. *International Center for Agricultural Research in the Dry Areas*, Aleppo, Syria

Ozkan, M., (2002), *Organic agriculture and national legislation in Turkey*. OECD workshop on organic agriculture 23-26 September, Washington, D.C.

Schnepf, R. , (2003), *Iraq's agriculture: background and status*, CRS Report for Congress, retrieved July 2016 from http://digital.library.unt.edu/ark:/67531/metacrs7073/m1/1/high_res_d/RS21516_2003May13.pdf

Thomas, R.J. (2008), *Opportunities to reduce the vulnerability of dryland farmers in Central and West Asia and North Africa to climate change*, Agriculture, Ecosystems and Environment, 126, pp. 36-45. 2008

USAID, (2006), *Agricultural reconstruction and development program for Iraq*, Volume 1, Washington DC, p.327

ECONOMIC EFFICIENCY OF LEASED LANDS IN ROMANIA LEASE VERSUS ASSOCIATION

PETRE IONUȚ LAURENȚIU[1], DUMITRU EDUARD ALEXANDRU[2]

Summary: *Leasing is an effective method of using agricultural land in Romania? This paper will answer this question, it will analyze the impact assessment produced by leasing land, the benefit to the farmer concerned. Take into account the causes of the lease, such as inability plot work, the health of the owner, etc. It will consider the Lease Law, but also statistics on the soils in this stage. It will analyze the benefit derived by the landowner, but a comparison in terms between cooperation and farmers association. The comparative study will be made in two distinct cases: first, the owner gives the agricultural goods and the second the same beneficiary can be integrated or may give rise to an association of owners. In the end will determine whether leasing land is indeed an effective method of "exploitation" of the land, or if is a more "comfortable". It will make some recommendations, some relating to negotiating and arranging the lease, others about association, but also recommendations about legislation.*

Keywords: *leasing land, producer associations, economic efficiency, legislation.*

Jel classification: Q12, Q15.

INTRODUCTION

In the current period, they shout across agricultural land are often not worked, forgotten over time by the youth heirs of the rightful owners of these lands, owners are no longer living or are inability to further exploit the land. A partial solution, we learn and how effective is giving this land on lease in exchange for agricultural products or counter-value.

At the basis of the lease is a contract concluded in the agreement of two parties, one of which is "lessor" which transmits agricultural assets (land and livestock), the "lessee" he exploiting those assets for a period of time determined by contract, in exchange for "rent" (price).

Lease Law (No.16 / 1994) was repealed, with the advent and adoption of the new Civil Code on 1 October 2012, which is found in section three, jurific on lease arrangements.

In accordance with art. 1836 of the New Civil Code, agricultural goods are considered the following:

"- Agricultural lands, namely productive agricultural land - arable, vineyards, orchards, vineyards tree nurseries, the fruit trees, hops and mulberry trees, wooded pastures, land occupied by construction and installation agricultural buildings, facilities fisheries and land reclamation technological roads platforms and storage facilities serving the needs of agricultural and unproductive land that can be arranged and used for agricultural production; "

"- Animals, buildings of any kind, machinery, and other such goods for agricultural use."

Causes Release lease of agricultural land can be varied: from poor health related to age, the lack of machinery for processing terrain and lack of knowledge and information necessary to difficulties in production.

Given the variety of relationships that are established in the domestic agriculture, and between agriculture and other areas of the economy, there are a variety of relations Association. Thus, in agriculture, according to the law, you may encounter the following types of association "agricultural companies and other forms of association in agriculture" (L.36 / 1991), "associations" (L.246 / 2005), "agricultural cooperatives" (L.566 / 2004).

According to law number 246 of 18 July 2005 approving the GO issued. no. 26/2000 on associations and foundations, art. 4 specifies that:

---

[1] ASC- specialized agri-food economy, The Research Institute for Agriculture Economy and Rural Development, email: petre.ionut@iceadr.ro

[2] ASC- specialized agri-food economy, The Research Institute for Agriculture Economy and Rural Development, email: dumitru.eduard@iceadr.ro

"The association is a legal entity of three or more persons, on the basis of an agreement, pooling and no right of return material contribution, knowledge or their work contribution in the development of activities in the general interest of some communities or, where appropriate, in their private patrimonial. "

Considering the two methods of land use, we analyze the economic profitability and efficiency and we each put in antithesis to observe the advantages and disadvantages held by each of them.

Beneficiaries of this study can be represented by owners of agricultural land, both individuals and those authorized; tenants and homeowners associations.

MATERIAL AND METHOD

The comparative study will be conducted on a small farm size (3-5ha) in two separate cases: first, the owner gives the agricultural goods and the second the same beneficiary can be integrated or may give rise to an association of owners .The two cases will be interpreted economically, given the new Civil Code regulations (for rent) and Law No. 246/2005 (if the producer group). It will establish operating income differences, differences in profit, for both the beneficiaries and service providers.

The size of agricultural property that underlies the comparative analysis will be correlated with the average size of area in the case of 3.8 million producers, reaching a value of 3.5 hectares. It will conduct an economic analysis will highlight the benefit of the lessor and the respective member association of producers or pecuniary benefit either naturally correlated with the costs in each case. The advantages and disadvantages of these two systems can be observed in a comparison table.

RESULTS AND DISCUSSIONS

At the end of 2015, in Romania there were about 800,000 farmers who own property between 1 and 5 hectares of farmland, representing in total about 4 million. Hectares of land.

"The economic activity of a country is conducted on branches, sub-branches and manufacturing sectors, each with specifics and actual working conditions, which of course put their imprint on the organization of the production process."

Land Fund resources attracted in agricultural output circuit is a factor of production - which, by volume (area), characteristics, quality (low fertility) and determine the potential cost, organization, structure and economic efficiency of agricultural production.

Leasing Land

As set out in Chapter Material and Method, leasing is based on rules of the new Civil Code; this is done under contract in which two parties, lessors and lessees, determine the period of time to the Agreement and the payment amount (rent) that a landowner will receive the predetermined time period all through that contract. Usually the amount of rent are at the level of 30-35% of gross income.

Therefore if an owner has an arable area of 3.5 hectares and decides to give on lease, it will also endeavor, and will benefit from certain effects; by simulation for this area and it will grow wheat assuming we have the following situation:

Table 1. Renter`s efforts and effects

3.5 ha land lease	
Land tax (RON)	147
Total expenses (RON)	**147**
Production came (kg) 30% * 3590 kg/ha	3769.5 kg
Production value (RON) 3769.5*0.65	2450.175
Value of subsidy	-
Income tax (16%)	392.03
Total income (RON)	**2058.15**

Source: Own calculations

As can be seen in Table 1, the only major expense in this situation, the lease is the tax on land. This was calculated given the area where the land, considerânndu the Village area (Rank village being V- which means a correction coefficient of 1.00. This correction coefficient multiplying by 42 the amount of tax for arable land and the surface of 3.5 ha). Therefore tax expense, but so total expenditure amounts to 147 lei for the 3.5 hectares.

The price or rent it receives it is the natural value of 3769.5 kg. It was calculated given the average production of wheat in 2014, according to 13.1.2 ADER project supported by the Research Institute for Agricultural Economics and Rural Development is 3590 kg per hectare; share of 30% negotiated in the lease multiplied by the average yield on the 3.5 ha and assimilated led to this amount of agricultural product. From an economic perspective, this amount valued at the price of 0.65 lei per kilogram would mean a gross value of 2450.17 lei. It is by applying to income tax of 16% owner will charge the amount of 2058 lei. Thus it will achieve a net result of 1911 lei for three and a half hectares.

Producer associations

Currently speaking increasingly efficient agriculture forms only in conjunction with the Association of owners or agricultural cooperatives. More and more Reves specialized in agriculture publishes articles that suggest no association or cooperative farming will not have a future.

The producer group is based on Law 246/2005 which can create associations and foundations with interest and common purpose. Thus simulating a similar situation with the lease will have the following structure of expenditure and revenue:

Table 2 Member`s association efforts and effects

Association of producers 3.5 ha	
a) Manual works - Served equipment	112
b) Direct expenses	5813.5
c) Operating expenses (10%)	581
Production cost (RON) (a+b+c)	6506.5
Land tax (RON)	147
Total expenses (RON)	**6653.5**
Production value (RON) 5000 kg/ha*0.65	11375
Value of subsidy 165euro/ha	2598.75
Total income (RON)	**13973.75**
Gross profit	7320.25
Net income	6149.01

Source: GD 216/2016; http://m.business24.ro;

In the second case, the owner is part of an association of producers, the total expenditure amounting to 6653 lei will include production costs for the 3.5 hectares - 6506 lei (1859 lei / ha) and tax 147 lei field. Out of total income gains that will highlight up, recovery of production at the same market price, given the high output of 5 t / ha and the amount of 165 euro subsidy areas 1-5 hectares (on a course valuatar 1 euro = 4.5 lei). Thus the net result of the member association is 6149 lei, representing a profit rate of 42%.

Figure No.1 Comparison net profit
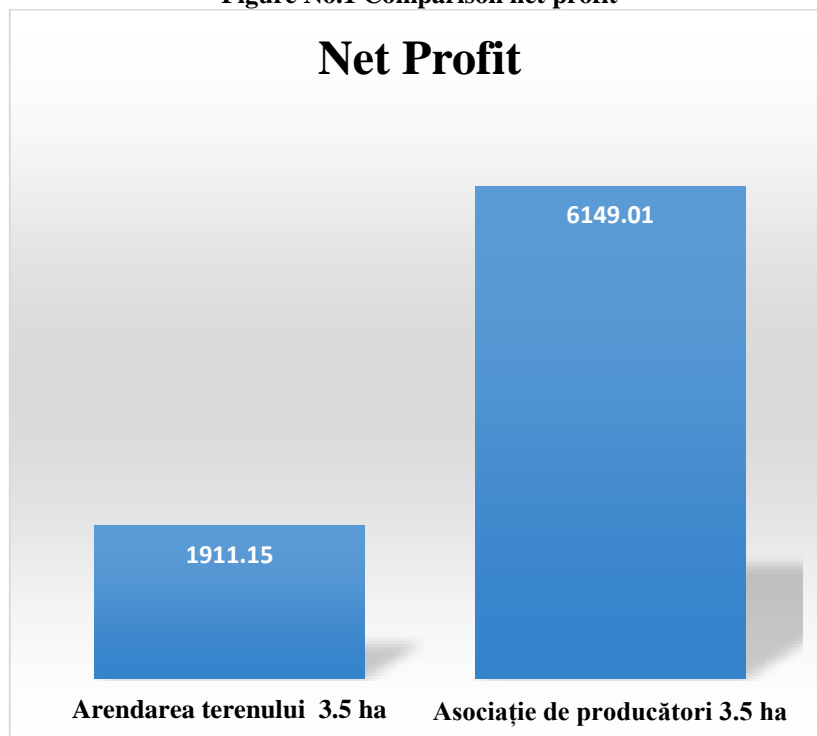
From the above figure can be seen the difference in net profit between the two cases analyzed, namely leasing of land of 3.5 hectares or employment in the same field a producer.

CONCLUSIONS

This study had an objective in which were found two cases approach or agricultural land, was not intended to benefit or disadvantage one of the two systems, each application depending on many factors internally or externally owners .

The conclusion of this study explains the benefits and disadvantages of the two methods outlined by the prorpietarii earth will get some benefit from them:

Table no.3 Advantages and Disadvantages

Leasing land		Producer Associations	
Advantages	Disadvantages	Advantages	Disadvantages
• The overwhelming rate of profitability (80%) ; • Convenient use of the land; • The level of expenditure is low;	• Low level of rent or of benefit;; • In some cases, tenants are required to categorical agreement between the parties, sometimes borderline illegal; • Limiting exploitation of diversified crops; • Failure to receive subsidies cumulative pay property tax;	• Possibility decision after negotiation higher prices for inputs and selling prices; • Issuance responsibility of the owner of sale; • Expanding production; • Access to information; • Easier access to EU funds; • Increasing capital; • The profit level is high;	• Farmers reluctant to associate; • Find at least two members of management and the establishment of the association; • Investing large amounts; • A high rate, in practice, the failure associations;

In this study we highlighted features and benefit to the owner by using one of two methods of land exploitation, leasing of agricultural land or the establishment or integration into a producer. These owners will choose subjectively possibility of PRIMS and factors are influenced, with we age, inability land use, area of residence, training, and other resources available.

BIBLIOGRAPHY

1. Centrul de Investigații Strategice și Reforme (CISR) – „Arenda pământului în Republica Moldova”- Chișinău, 2001
2. Manole, V., Boboc,D, Ion, Raluca Andreea – „Grupurile de producători și cooperativele de marketing” Editura Tribuna Economică, București, 2009
3. Marin Popescu – „Eficiența economică a utilizării pământului” , Agricultura României v.16 , 2005
4. Proiect ADER 13.1.2 – Institutul de Cercetare pentru Economia Agriculturii și Dezvoltare Rurală (ICEADR)
5. ***HG 216/2016
6. *** Legea nr. 246 din 18 iulie 2005
7. *** Noul Cod Civil
8. http://m.business24.ro
9. http://agrointel.ro
10. http://www.stiriagricole.ro
11. http://indrumari-juridice.eu
12. http://lapar.org

IMPACT OF SUBSIDIES IN AN AGRICULTURAL EXPLOITATION OF MEDIUM SIZE FROM VEGETABLE SECTOR

ŞURCĂ DANIELA-ELENA[1]

Summary: *exploitations of small and medium size plays an important role in Romanian agriculture, which are numerous, representing a significant percentage of the total number of those receiving subsidies. In this regard a case study drawn up on a farm representative of mid-size indicates the significant contribution has subsidization and which currently makes a clear separation between profit and loss for the Romanian farmer.*

Keywords: *subventions, agricultural exploitation, technical and economic indicators*

Clasificare JEL: Q12 – Micro Analysis of Farm Firms, Farm Households, and Farm Input Markets

INTRODUCTION

The area payment plays a very important role for the Romanian farmer assuring continuity and the possibility of obtaining a minimum profit with which to live. European trend is one of uniformity, since the differences from country to country are very large, having as compared to Malta where the subsidy on the surface amounts to 750 euros / ha, which exceeded the previous years and the value 1,500 euros per hectare, while in Romania until it approaches the sum of 200 euros / ha.

Agriculture is an industry base in most powerful countries of the world are supported by a range of financial mechanisms, even if non-European countries such as the United States and especially Japan, the country that subsidizes most agriculture, covering even after losses producer price fluctuations in the market.

Returning to the subsidy granted to the agriculture, the European Union stands at around 250 euros and 12 countries found that over this threshold. To remember is that although Croatia is an EU member only in 2013 managed to negotiate a higher subsidy as Romania, for approx 200 euros.

Although Romania has benefited since 2007 from a subsidy which started at 71 euros / ha, it has succeeded in the new common agricultural policy to receive a grant higher at around 190 euros / ha for 2014 and the tendency is to rise by 10 euros per hectare by 2020.

Fig. no. 1
The amount of subsidies recorded by the member countries of the European Union

Malta	1526
Grecia	709
Olanda	529
Slovenia	526
Cipru	511
Belgia	504
Italia	456
Ungaria	450
Denemarca	434
Germania	428
Irlanda	409
Austria	403
Luxemburg	384
Cehia	379
Finlanda	375
Slovacia	366
Franţa	357
Portugalia	350
Suedia	333
Bulgaria	320
Polonia	316
Marea Britanie	294
Spania	258
Lituania	239
Estonia	237
România	191
Letonia	168

Sursă: Comisia Europeană

---
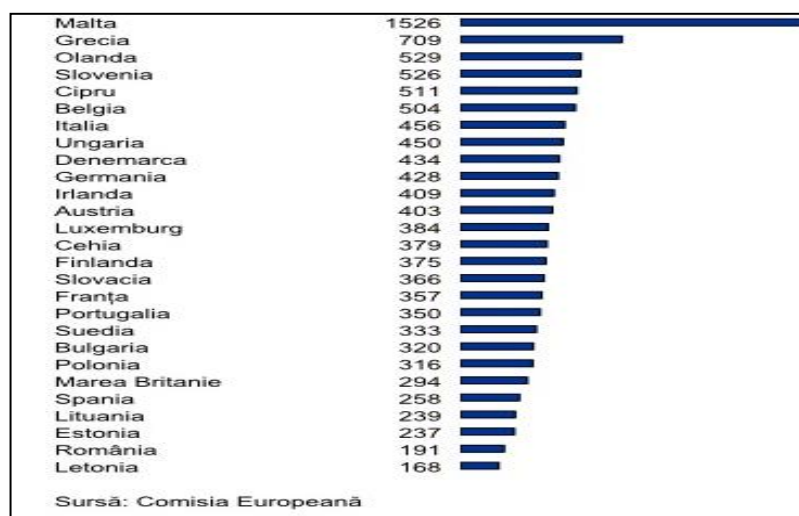
[1] *Assistant research ICEADR - email: surca.elena@iceadr.ro*

MATERIALS AND METHODS

In the economic and financial analysis using multiple methods and specific or borrowed from other sciences.

The methods used are the following:
• Methods of quantitative analysis.
• Economic Modeling;
• Interpretation of results;
• generalization or evaluation of results.
• Indicators economic - financial;
• indices;

RESULTS AND DISCUSSIONS

The present work refers to the economic situation of agricultural exploitation from vegeteal sector and mid - size, highlighting the importance that it has to subsidize the farms in Romania in 2010-2015.

Total area across the entire analyzed period varies between 234.3 ha and 268.2 ha.

Table 1
Cultivated area during 2011-2015 (ha) with this cultures

Culture	2011	2012	2013	2014	2015
Wheat	142, 3	142, 74	148, 6	223, 9	171, 3
Rapeseed	123, 9	-	-	-	37, 8
SunFlower	-	106, 6	53, 1	-	-
Corn	-	-	36. 6	33	48, 5
Barley	2	-	-	-	-
Total	268, 2	249, 34	238, 3	256, 9	257, 6

As seen from the data above, the surface with wheat is the largest and is present every year, in the year 2014 is a decrease of 23, 5% compared to year 2013, the area of the year 2013 is the largest. Rapeseed crop area decreases in 2014 with 69, 49% compared to 2010, these two years being the single years in which it was cultivated plant.

Sunflower crop is grown two years in a row (2011-2012), but, surface in 2012, is lower than in 2011 by 50, 1%.

The largest area planted to corn is recorded in 2014- 48, 5 hectares with 15. 5 hectares more than 2013.

At the opposite end with the smallest barley crop acreage it is present only in 2010 with only 2 0. Ha - representing 74% of total area

Fig. 2.
Graphical representation of the surface structure
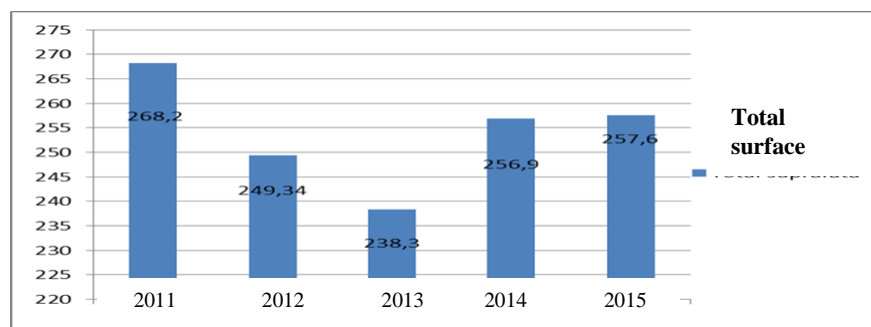
2012 is the year that the holding had the smallest area of 238, 3 hectares
At the opposite end, the year 2011 has the largest surface in the entire period

Table 2
The situation average yields on crops during 2011-2015 (kg / ha)

Year \ Culture	2011	2012	2013	2014	2015
	Kg/ha				
Wheat	3720	4231	3815	4532	4520
Rapeseed	2362	-	-	-	2610
SunFlower	-	2530	2362	-	-
Corn	-	-	4670	4550	5023
Barley	3210	-	-	-	-

As can be seen from the above table are rising average yield, the highest yield of wheat was recorded in 2014 with 4.53 t / ha, and most sunflower production was recorded in 2015 to 5.02 tonnes / ha.

Table 3
Total production on crops during 2011-2015 (tons)

Year \ Culture	2011	2012	2013	2014	2015
	tone/suprafață				
Wheat	529, 4	603, 9	566, 9	1014, 7	774, 3
Rapeseed	292, 7	-	-	-	98, 7
SunFlower	-	269, 7	125, 4	-	-
Corn	-	-	170, 9	150, 2	243, 6
Barley	6, 42	-	-	-	-

As shown in the table above the highest wheat production recorded in the year 2014 a production of 1014, 7 tons at the opposite end is the year 2011 with a production of 529.4 tons.

The next crop production recorded at the largest is sunflower with a production of 243.6 tons in the year 2015

Expenditure is the consumption of manpower and materialized in any activity.

- **Indirect expenses** is the cost of production which do not change in relation to the production level such as work expenses plowing, disking, planting, herbicide.

- **Direct expenses** are those expenses as a proportion of production that vary depending on the level of production, such as expenses for raw materials, labor, fuel and power. Direct expenses are those expenses that change, directly, with the number of units produced

Table 4
Statement of expenditure on wheat in the period 2011-2015 (lei)

Total expenses on wheat crop		M.U.	Years					2015/ 2011	2015/ 2014
			2011	2012	2013	2014	2015	%	
		Lei	482666, 3	486509	506482	763131, 4	583851, 8	20, 9	-23, 4
which	**Direct expenditure**	Lei	468608, 1	470057	489354, 6	737325, 0	564108	20, 4	-23, 4
	Indirect expences	Lei	14058, 2	16451, 9	17127, 41	25806, 3	19743, 7	40, 4	-23, 4

Table 5
Statement of expenditure on maize during 2011-2015 (lei)

Total expenditure on maize		M.U.	Years					2015/ 2011	2015/ 2014
			2011	2012	2013	2014	2015	%	
		Lei	-	-	**122.802, 6**	**110.723, 6**	**162.730, 2**	32, 51	46, 96
which:	Direct expenditure	Lei	-	-	118.649, 8	10.6979, 4	157.227, 3		
	Indirect expences	Lei	-	-	4.152, 74	3.744, 2	5.502, 95		

Table 6
Statement of expenditure sunflower crop during 2011-2015(lei)

Total expenses on sunflower crop		M.U.	Years					2015/ 2011	2015/2014
			2011	2012	2013	2014	2015	%	
		Lei	-	**322.596, 8**	**160.693, 1**	-	-	**-50, 18**	
which:	Direct expenditure	Lei	-	311.687, 7	155.259, 1	--	-	-50, 18	-
	Indirect expences	Lei	-	10.909	5.434, 1	-	-	-50, 18	-

Table 7
The statement of expenditure to the culture of rape during 2011-2015 (lei)

Total expenses on rape crop		M.U.	Years					2015/2011	2015/2014
			2011	**2012**	**2013**	**2014**	**2015**	%	
		Lei	**347245, 8**	-	-	-	**106453, 6**	**-69, 34**	-
which:	Direct expenditure	Lei	337131, 9	-	-	-	102853, 8	-69, 49	-
	Indirect expences	Lei	10113, 9	-	-	-	3599, 8	-64, 41	-

Table 8
The statement of expenditure for barley in the period 2011-2015 (lei)

Total expenditure on culture barley		M.U.	Years					2015/2011	2015/2014
			2011	**2012**	**2013**	**2014**	**2015**	%	
		Lei	**6820, 66**	-	-	-	-	-	-
which:	Direct expenditure	Lei	6622	-	-	-	-	-	-
	Indirect expenes	Lei	198, 66	-	-	-	-	-	-

Table 9
The situation of total farm spending during 2011-2015(lei):

Total expenses per farm		M.U.	Years					2015/ 2011	2015/ 2014
			2011	**2012**	**2013**	**2014**	**2015**	%	
		Lei	836732	809105	789977	873855	853035	1, 95	-2, 38
which:	Direct expenditure	Lei	812362	781744	763263	844304	824189	1. 46	-2, 38
	Indirect expenses	Lei	24370	27361	26714	29550	28846	18. 37	-2, 38

Analyzing the data we observed that total expenditure per farm increased by 1, 95% in 2015 compared to 2011 and decreased by 2, 38% in 2015 compared to 2014. Also, indirect costs vary little from year to year, this variation is influenced by the increase or decrease in raw material prices, they increased in 2015 by 18, 37% compared to 2011 and decreased by 2.38%. Direct expenses increased in 2015 by 1, 46% compared to 2011 and decreased by 2. 38% since 2014.

Table 10
Total farm income situation during 2011-2015 (lei)

Culture	Years						
	2011	**2012**	**2013**	**2014**	**2015**	**2015/2011**	**2015/2014**
Wheat	317. 613, 6	392. 556, 4	396. 836, 3	811. 771, 8	580. 707	82, 8	-28, 4
Rapeseed	365. 814, 8	-	-	-	157852, 8	-56, 8	
						2012/2011	
SunFlower	-	350. 607, 4	158. 032	-	-	-54,9	**-**
						2014/2012	
Corn	-	-	128. 191, 5	142. 642, 5	194. 892, 4	52. 3	36, 6
Barley	3. 402, 6	-	-	-	-	--	-
						2014/2010	
TOTAL INCOME	686. 831, 0	743. 163, 8	683. 059, 8	954. 414, 3	933. 452, 2	35, 91	-2, 19

Total income per farm is growing at record wheat crop in 2015 compared to 2011 increased by 82.8% but the highest income from this crop recorded in 2014

Table 11

Culture	Years				
	2011	**2012**	**2013**	**2014**	**2015**
Wheat	399. 635, 3	480. 541, 3	494. 377, 3	967. 695, 7	121. 587
Rapeseed	437. 230, 7				184. 554, 7
SunFlower	-	363. 932, 4	7. 379, 63	-	-
Corn	-	-	151. 432, 5	164. 092, 5	227. 775, 4
Barley	156. 276, 6	-	-	-	-
TOTAL INCOME	993.160,6	844.473,7	653.189,43	1.131.788,2	533.917,1

Total farm income situation during 2011-2015 with subsidies (lei)

In 2015 there is an increase in total income by 35, 91% compared to 2011 and a decrease of 2, 19% compared to 2014

The production cost represents all costs, proper use of inputs, which operators they perform for the production and sale of material goods or services.

Table 12
Analysis for production cost / kg, related income culture during 2011-2015 (lei/kg)

Culture	Years						
	2011	**2012**	**2013**	**2014**	**2015**	**2015/2011**	**2015/2014**
Wheat	0, 912	0, 806	0, 893	0, 752	0, 754	-17, 32	0, 26
Rapeseed	1, 186	-	-	-	1, 079	-9, 02	-
						2012/2011	
SunFlower	-	1, 196	1, 281	-	-	7, 10	
						2014/2012	
Corn	-	-	0, 719	0, 737	0, 668	-7, 09	-9, 3
Barley	1. 06	-	-	-	-	-	-

The largest cost production recorded in 2011 at wheat crop, it decreased in 2015 to 17.32% compared to year 2011, also for the culture of rapeseed decreased cost of production in 2015 with 9.02 % compared to year 2011.

The financial result is the difference between financial income and financial expenses in a year. With operating income from current year result

Table 13
Results of technical and economic situation of the farm exploatation 2011-2015 (lei) -WITHOUT SUBSIDIES

Culture	Years						
	2010	**2011**	**2012**	**2013**	**2014**	**2015/2011**	**2015/2014**
Wheat	-165052, 7	-93952, 6	-109645, 7	48640, 3	-3144, 8	-98, 09	-106, 47
Rapeseed	18568, 943	-	-	-	51399, 117	176, 80	
						2012/2011	
SunFlower	-	28010, 5	-2661, 1	-	-	-109, 5	
						2014/2012	
Corn	-	-	5388, 8	31918, 8	32162, 1	496, 83	0, 76
Barley	-3418, 06	-	-	-	-	-	-
						2014/2010	
Total	**-149901, 8**	**-65942, 1**	**-106918, 0**	**80559, 1**	**80416, 4**	**-153, 65**	**-0, 18**

The financial result for the analyzed farm decreased by 153.65% in 2015 compared to year 2011. In 2015 the financial result fell by 0.18% compared to year 2014. This decrease in profit is largely due to unfavorable weather conditions.

The grants pay, financing, usually non-refundable by the state or private individuals, given to companies, private industrial groups, state, mixed or private individuals to cover the difference between the cost of the manufacturer and the selling price, in principle, when price is lower than the marginal cost and to conduct specific actions and targets

Table 14
The situation of economic-financial for the analyzed exploitation, during 2011-2015 (lei) -WITH SUBSIDIES

Culture	Years				
	2011	**2012**	**2013**	**2014**	**2015**
Wheat	-83. 031, 0	-5. 967, 7	-12. 104, 7	204. 564, 2	117. 861, 51
Rapeseed	89. 984, 90				78. 101, 04
SunFlower	-	41. 335, 59	4. 560, 44		
Corn			28. 629, 8	53. 368, 8	65. 045, 1
Barley	149. 455, 9				
Total	**156.409,8**	**35.387,9**	**21.085,5**	**257.933**	**261.007,6**

Comparing the financial result on the farm without subsidies and financial result on the farm with subsidies found that subsidy plays an important role in making a profit for a farm of medium size, as can be seen in table number 12 financial results the holding is negative in the first three years registering losses wheat crop by using the grant to each culture we find that the financial result is positive registering profit from the first year of operation, less the wheat crop where there is a small loss . This is equated to the other two crops barley and rape.

CONCLUSIONS

Grant plays a very important role for Romanian farmers. Even in this paper highlights that some cultures without being subsidized would not be profitable for the farmer to cultivate, as is the case of wheat, which in 2015 would incur a loss of more than 3,100 lei at farm level of medium size, with all that this culture remains very popular in the country and the European Union.

Taking as reference the same year, we can say that the profit recorded by the same holding as over 117 thousand lei, where fallow an area of approximately 170 hectares. If rape would make a profit of over 78 thousand lei, according to the receipt of the grant, which means an increase of about 34% of the profit recorded where this culture would not be subsidized.

In the case of corn grown on an area of approximately 48 hectares profit recorded a middle-size farm would be superior financial results noting an increase of over 50%, except where it would not be subsidized.

On a farm of medium size having to use an area of approximately 260 hectares differences between the raw results would be significant so that after subsidization would make a profit of 261,000 lei, compared to 80,400 lei if not be subsidized.

It is clear that the grant from the European Union manages to keep afloat Romanian farmers and a possible removing it from future Common Agricultural Policy can not be viewed favorably both in terms of the future of Romanian agriculture, but also through light of the fact that Romania did not receive enough grant years to be able to think to reach an acceptable level the developed countries of the European Union.

Any increase subsidies to this sector vegetable, and not only will facilitate the possibility of developing these small farms and medium enterprises through more areas, but also work efficiently farmland, through high performance machines that can contribute to a better return on hectare and thus to better farm production.

Farmers are practically dependent on such subsidies for development without subsidy is necessary to purchase some high performance machines that reduce production costs.

Building space conditioning, sorting and processing necessary to obtain higher revenues, we are addicts subsidies for a positive result for the year

BIBLIOGRAPHY

1. Drăghici Manea și Colaboratorii, Manual de management al femei, Editura Atlas Press – București 2004;
2. Letiția Zahiu și colaboratorii – Agricultra în economia României, Editura Ceres, București 2010;
3. Revista Ferma – Plăți directe 2015 – 2020
4. *** www.madr.ro
5. *** www.revistaferma.ro/articoleactualitati
6. *** www.recolta.eu/financiar/subventii
7. *** www.apia.ro

INFLUENCE OF THE COUPLED SUPPORT TO THE PROFITABILITY OF THE VEGETABLE CROPS SECTOR

Ana URSU[1]

Abstract: *The purpose of this paper is to analyze the current state of vegetable sector and especially soybeans, rice, beets, hemp, hops receiving support coupled with subsidy on the surface as direct pay. The analysis takes into account a number of relevant indicators for both the performance of the sector in order to stimulate farmers for investments in certain crops and for farmers' incomes, meaning that coupled support may influence the profitability of crops to the detriment of crops declared as the profitable agricultural plant. In principle, each culture deals with analytical situation every technical and economic indicator focusing on highlighting gaps profitability. Examine where each culture in terms of the indicators considered in the study and make some concluding remarks about the current state of economic development of the vegetable sector and studied plants and the need to grant coupled support to maintain surfaces that are cultivated in present.*

INTRODUCTION

In Romania, agricultural policy measures for the agricultural sector are manifold: the Single Payment Scheme on the surface, transitional national aid 1 and 3, various forms of support for measures of market-intervention, other forms of support from the state budget for sectors and sensitive activities in relation to market requirements, etc. (1) is coupled support is granted a direct payment to farmers for certain crops important for Romania, for economic, social and environmental reasons. For the vegetable crops sector, was established a legislative act - Order no. 619/2015, which stipulates "approval of eligibility criteria, specific conditions and the implementation of the payment schemes", the coupled support is an additional form of financial support from European funds, and other direct payment schemes, namely: Scheme the single area payment, redistributive payment, payment for agricultural practices beneficial for the climate and the environment, payment for young farmers, as appropriate, coupled support scheme, aid for diesel used in agriculture, etc. Principal objective of farming subsidies is capitalization and increase the competitiveness of the agricultural sector, with explicit connection with rural development objectives (2).

MATERIAL AND METHOD

In drafting of this work were used the following research methods: quantitative analysis of statistics (for crops: soy, hemp, rice, hops, sugar beet), qualitative analysis of information on agricultural policy measures in Romania, constructive regulatory method - to design alternatives analysis, which was calculated based on a system of technical and economic indicators, which allowed choosing the optimal; detailed analysis of variants for calculating coupled support for crops referred. The information was complemented by those contained in articles and studies published in professional journals in 2014-2020 (PNDR) etc.

---

[1] Scientific researcher II, Research Institute for Agriculture Economy and Rural Development (ASAS), e-mail: ursu.ana@iceadr.ro

RESULTS AND DISCUSSIONS

SOYBEAN

Areas planted with soybeans fell annually after 2007, following the ban on GM soy. In 2008 and 2009 they were cultivated only 49 and 48 thousand hectares. From 2011 areas began to grow, reaching in 2015-127000 hectares. The average yields obtained on areas planted with soybeans ranged from 1,021 t/ha in 2007 to 2.5 t/ha in 2014, when the maximum yield for the period under review. Since the total production continued to be insufficient for domestic consumption is an increase in imports of soybeans in 2008 (93 400 t) and 2011-2015 (from 34 400 t la163,8 t). Values for quantities imported vary from 12.9 million euro in 2011 to 65.8 million euro in 2015. Coupled support for the soybean crop will maintain a certain level of production and reduce imports addicts Romania vegetable protein (7).

Coupled support for soybean
Since 2015 the supported coupled soybeans worth 325 euro/ha, will be increased by 10 euro every year until 2020. Coupled support for the soybean crop is given to active farmers who prove that achieves a minimum annual production of 1300 kg soy beans/ha (art. 42 of Decree 619/2015) (6).

Table no. 1: Influence of the coupled support on soybean crop profitability

INDICATORS	U.M	VALUES	
		Soybean 3 t/ha	Soybean 4,5 t/ha
A. PRODUCTION VALUE	lei	5730	8635
A_1. Of which the main production	lei	5490	8235
B (+) SUBSIDIES	lei	1944.1	1944.07
C (=)THE CRUDE PRODUCT	lei	7674.1	10579.07
D (-) TOTAL COSTS	lei	5500.1	6629.3
D_1. Of which for the main production	lei	5260.1	6229.3
I. VARIABILE COSTS	**lei**	4791.9	5774.9
II. FIXED COSTS	lei	708.1	854.4
E. (=)TAXABLE INCOME	lei	229.9	2005.7
(-) Taxes	lei	36.8	320.9
F. (=) NET INCOME	**lei**	193.1	1684.8
F.1 (=) NET INCOME + total subsidy	lei	2137.2	3628.8
F.2 (=)NET INCOME + notified subsidy	lei	1655.6	3147.3
F.3 (=)NET INCOME + awarded subsidy	lei	1403.6	2895.3
F.4 (=)NET INCOME + direct payments	lei	926.7	2418.3
G. RATE OF TAXABLE INCOME (%)	**%**	**4.4**	**32.2**
H. RATE OF NET INCOME (%)	**%**	**3.7**	**27.0**
H.1 RATE OF NET INCOME + total subsidy (%)	%	40.6	58.3
H.2 RATE OF NET INCOME + notified subsidy (%)	%	31.5	50.5
H.3 RATE OF NET INCOME + awarded subsidy (%)	%	26.7	46.5
H.4 RATE OF NET INCOME + direct payments (%)	%	17.6	38.8
COST OF PRODUCTION	**lei/to**	1753	1384
PREDICTABLE PRICE OF INTERNAL MARKET	**lei/to**	1830	1830

Source: Own calculations

Soybean crop production at two levels, 3 t/ha and 4.5 t/ha rate has a net income of between 3.7% and 27% (table no. 2). Explaining the action and to accurately assess the physical volume of the gross income soybean production may be regarded as positive in economic terms given that efficiency was observed correlation between spending index and

production index as physical effort effect. Where we consider the support schemes, the rate of return cultural changes, as follows:

- *Rate of net income + total subsidy*: it is estimated a rate of return of between 40.6% and 58.3% share of total support (1944.072 lei/ha / 432.0161 euro/ha) in net income (between 2137.2 lei/ha and 3628.8 lei/ha) was 91% for the production of 3 t/ha and 53.6% for the production of 4,5 t/ha%; **Option 1**: Direct payments + coupled support (163,0161 euro + 269 euro = 432,0161 euro/ha);

- *Rate of net income + notified subsidy*: it is estimated a rate of return of between 31.5% and 50.5% share of support notified (1462.5 lei/ha / 325 euro/ha) in net income (between 1655.6 lei/ha and 3147.3 lei/ha) was 68% for the production of 3 t/ha and 40.3% for the production of 4,5 t/ha%; **Option 2**: Support notified (325 euro/ha);

- *Rate of net income + awarded subsidy*: a rate of return is estimated between 26.7% and 46.5% share of support (1210.5 lei/ha / 269 euro/ha) in net income (between 1403.6 lei/ha and 2895.3 lei/ha) was 56.6% for the production of 3 t/ha and 33.4% for the production of 4,5 t/ha%; **Option 3**: The support (269 euro/ha);

- *Rate of net income + direct payment rate:* a rate of return is estimated between 17.6% and 38.8%, the share of direct payments (733.5725 lei/ha / 163.0161 euro/ha) in net income (between 926.7 lei/ha and 2418.3 lei/ha) was 34.3% for the production of 3 t/ha and 20.2% for the production of 4,5 t/ha%; **Option 4**: direct payments (163.0161 euro/ha = 79.7392 euro/ha - SAPS + 5 euro/ha payment redistributive + 59.1277 euro/ha - payment greening + 19,1492 ANT);

- *Taxable income rate:* it is estimated taxable income rate between 4.4% (229.9 lei/ha) and 32.2% (2005.7 lei/ha) soybean crop, the production level of 3 t/ha, not within the range of profitability in economically.

Conclusion: the conditions of granting coupled support soybean crop has low returns, and with that amount /ha of 269 euro/ha pays off so as to cultivate further.

HEMP OIL AND FIBER

Compared to 2010 when 23 hectares were cultivated textile plant in 2014 this area has increased 32 times, reaching 765 ha. 2015 to 2014 flats were reduced by about 17% (630 ha to 765 ha) and there is a need to encourage the cultivation of hemp sector as an alternative to cereal species. Coupled support the hemp was 194 euro/ha in 2015 and will grow by 10 euro each year by 2020 (7). Coupled support for growing hemp fiber and oil are granted active farmers proof that they have achieved a minimum production of 600 kg of seed/ha or 10,000 kg dried stems/ha (art. 47 of Decree 619/2015) (6).

Table no. 2: Influence of the coupled support on hemp crop profitability

INDICATORS	U.M	VALUES	
		Hemp 45 t/ha	Hemp 65 t/ha
A. PRODUCTION VALUE	lei	**5107.5**	**7377.5**
A_1. Of which the main production	lei	5107.5	7377.5
B (+) SUBSIDIES	lei	2142.1	2142.1
C (=)THE CRUDE PRODUCT	lei	6516.0	8786.0
D (-) TOTAL COSTS	lei	5820.9	5877.5
D_1. Of which for the main production	lei	5820.9	5877.5
I. VARIABILE COSTS	**lei**	**5536.5**	**5586.2**
II. FIXED COSTS	lei	284.3	291.3
E. (=)TAXABLE INCOME	lei	-713.4	1500.0
(-) Taxes	lei	-114.1	240.0
F. (=) NET INCOME	**lei**	**-599.2**	**1260.0**
F.1 (=) NET INCOME + total subsidy	lei	1542.8	3402.1
F.2 (=)NET INCOME + notified subsidy	lei	809.3	2668.5
F.3 (=)NET INCOME + awarded subsidy	lei	273.8	2133.0

F.4 (=)NET INCOME + direct payments	lei	134.3	1993.6
G. RATE OF TAXABLE INCOME (%)	**%**	**-12.3**	**25.5**
H. RATE OF NET INCOME (%)	**%**	**-10.3**	**21.4**
H.1 RATE OF NET INCOME + total subsidy (%)	%	26.5	57.9
H.2 RATE OF NET INCOME + notified subsidy (%)	%	13.9	45.4
H.3 RATE OF NET INCOME + awarded subsidy (%)	%	4.7	36.3
H.4 RATE OF NET INCOME + direct payments (%)	%	2.3	33.9
COST OF PRODUCTION	**lei/to**	**129.4**	**90.4**
PREDICTABLE PRICE OF INTERNAL MARKET	**lei/to**	**113.5**	**113.5**

Source: Own calculations

Culture hemp production at two levels, 45 t/ha and 65 t/ha rate has a net income of between -10.3% and 21.4% (table no. 3). Explanation and correct assessment of the action of physical volume of production of hemp on gross income (45 t/ha) can be considered as negative economic conditions has not been complied correlation efficiency of index expenditures that effort and production index physical effect. Where we consider the support schemes, the rate of return cultural changes, as follows:

- *Rate of net income + total subsidy:* it is estimated a rate of return of between 26.5% and 57.9% share of total support (2142,072lei/ha / 476 euro/ha) in net income (between 1542.8 lei/ha and 3402.1 RON / ha) being 138% for the production of 45 t/ha and 63% for the production of 65 t/ha%; **Option 1**: + Direct payments coupled support (163.0161 476.0161 euro = euro + 313 euro/ha);

- *Rate of net income + notified subsidy*: a rate of return is estimated between 13.9% and 45.4% share of support (1408,5lei/ha / 313 euro/ha) in net income (between 809.3lei/ha and 2,668.5 lei/ha) was 91% for the production of 45 t/ha and 41.4% for the production of 65 t/ha%; **Option 2**: The support (313 euro/ha);

- *Rate of net income + awarded subsidy:* it is estimated a rate of return of between 4.7% and 36.3% share of support notified (873 lei/ha / 194 euro/ha) in net income (between 273.8 lei/ha and 2133.0 RON / ha) was 56.6% for the production of 45 t/ha and 25.7% for the production of 65 t/ha%; **Option 3**: Support notified (194 euro/ha);

- *Rate of net income + direct payment rate:* it is estimated a rate of return of between 2.3% and 33.9%, the share of direct payments (733.5725 lei/ha / 163.0161 euro/ha) in net income (between 134.3 lei/ha and 1993.6 lei/ha) was 47.5% for the production of 45 t/ha and 21.6% for the production of 65 t/ha%; **Option 4**: direct payments (163.0161 euro/ha = 79.7392 EUR / ha - SAPS + 5 euro/ha payment redistributive + 59.1277 EUR / ha - Payment greening ANT + 19.1492); - *Taxable income rate:* a rate estimated taxable income of between -12.3% (-713.4 lei/ha) and 25.5% (1500 lei/ha) crop hemp production at 45 t/ha, do not fall within the profitability of economically.

Conclusion: In terms of granting coupled support hemp culture (45 t/ha) is economically inefficient. Award amount/ha of 313 euro/ha increases the profitability culture of -10.3% from 13.9% at.

RICE

Area under rice in the period 2007-2015 increased from 8,000 ha to 10,800 ha in 2015, reaching a maximum of 13,300 ha in 2009 correlated with a maximum production of 5,426 kg/ha. Rice culture has been supported in Romania and in the intervals 2007-2009 and 2012-2014 still cultivated (7). Unlike other cereals, rice production costs are much higher and coupled support complements the support necessary for this crop to be grown. Coupled support to rice (will be 450 euro/ha in 2015, is expected to grow annually by 2020), shall be granted to growers of rice farmers active, showing evidence-based tax invoice, the marketing of a minimum yield of 4,500 kg/ha rice (art. 47 of Decree 619/2015) (6).

Table no. 3: Influence of the coupled support on rice culture profitability

INDICATORS	U.M	VALUES	
		Rice 3,5 t/ha	Rice 6,0 t/ha
A. PRODUCTION VALUE	lei	3740	6400
A_1. Of which the main production	lei	3500	6000
B (+) SUBSIDIES	lei	3654.1	3654.1
C (=)THE CRUDE PRODUCT	lei	7394.1	10054.1
D (-) TOTAL COSTS	lei	5227.1	6069.4
D_1. Of which for the main production	lei	4987.1	5669.4
I. VARIABILE COSTS	**lei**	4923.0	5661.8
II. FIXED COSTS	lei	304.1	407.6
E. (=)TAXABLE INCOME	lei	-1487.1	330.6
(-) Taxes	lei	-237.9	52.9
F. (=) NET INCOME	**lei**	-1249.2	277.7
F.1 (=) NET INCOME + total subsidy	lei	2250.8	3931.7
F.2 (=)NET INCOME + notified subsidy	lei	1671.3	3198.2
F.3 (=)NET INCOME + awarded subsidy	lei	775.8	2302.7
F.4 (=)NET INCOME + direct payments	lei	-515.6	1011.2
G. RATE OF TAXABLE INCOME (%)	**%**	-29.8	5.8
H. RATE OF NET INCOME (%)	**%**	-25.0	4.9
H.1 RATE OF NET INCOME + total subsidy (%)	%	45.1	69.3
H.2 RATE OF NET INCOME + notified subsidy (%)	%	33.5	56.4
H.3 RATE OF NET INCOME + awarded subsidy (%)	%	15.6	40.6
H.4 RATE OF NET INCOME + direct payments (%)	%	-10.3	17.8
COST OF PRODUCTION	**lei/to**	1425	945
PREDICTABLE PRICE OF INTERNAL MARKET	**lei/to**	1000	1000

Source: Own calculations

Rice crop at the two production levels, 3.5 t/ha and 6 t/ha, has a rate of -25% in net income and 4,9% (table no. 4). Explanation and correct assessment of the action of physical volume of rice production on gross income (6 t/ha) can be assessed positively in terms of economic conditions has been observed correlation efficiency of index expenditures that effort and the index of physical production effect. Support schemes apply only to the production level of 4.5 t/ha (art. 47 of Decree 619/2015). Comparative analysis will be done for the two levels of coupled support production but will be considered only for the production of 6 t/ha. In this situation the rate of return culture is presented as follows:

- *Rate of net income + total subsidy:* an estimated rate of return of 69,3% share of total support (3,654.072 lei/ha / 812 euro/ha) in net income (3,931.7 lei/ha) was 92,9% for production 6 t/ha%; **Option 1**: + Direct payments coupled support (163,0161 euro + 649 euro = 812,0161 euro/ha);

- *Rate of net income + notified subsidy:* it is estimated a rate of return of 56,4% share of support (2,920.5 lei/ha / 659 euro/ha) in net income (3,198.2 lei/ha) being by 74,3% for production 6 t/ha%; **Option 2:** The support (649 euro/ha);

- *Rate of net income + awarded subsidy:* an estimated rate of return of 40,6% share of support notified (2,025 lei/ha / 450 euro/ha) in net income (2,302.7 lei/ha) was 51,1% for production 6 t/ha%; **Option 3:** Support notified (450 euro/ha);

- *Rate of net income + direct payment rate*: it is estimated a rate of return of between -10,3% and 17,8%, the share of direct payments (733,5725 lei/ha / 163,0161 euro/ha) in net income (-515,6 lei/ha and 1,011.2 lei/ha) was 32,6% for the production of 3,5 t/ha and 18,7% for the production of 6 t/ha%; **Option 4:** direct payments (163.0161 euro/ha = 79,7392 EUR / ha - SAPS + 5 euro/ha payment redistributive + 59,1277 EUR / ha - payment greening + 19,1492 ANT);

- Taxable income rate: a rate estimated taxable income of between -29,8% (-1487,1 lei/ha) and 5,8% (330,6 lei/ha), rice crop, the production level of 3.5 t/ha is economically inefficient. ***Conclusion:*** rice culture coupled support for 812 euro, conditional on the production level of 4.5 t/ha will help increase yields and production areas, but also to preserve the economic role of the culture of rice in areas affected by constraints natural.

HOP

Current status: hop culture was presented in the form of state aid as commodity production, but as a separate payment CNDP distinguished from other cultures. To hop record high maintenance costs because this culture requires the support of investment in the first 3 years. Currently, domestic production of hops can cover only 15% of the beer industry (7). Coupled support for hops is granted active farmers who have signed a contract with a brewery or processing plants for pharmaceutical purposes proof of minimum production 490 kg dry hop cones/ha (art. 47 of Decree 619/2015) (6). Area under hops in 2015 was 241 hectares.

Table no. 4: Influence of the coupled support on hop culture profitability

INDICATORS	U.M	VALUES	
		Hop 1,5 t/ha	Hop 2 t/ha
A. PRODUCTION VALUE	lei	47550	63400
A_1. Of which the main production	lei	47550	63400
B (+) SUBSIDIES	lei	3361.6	3361.6
C (=)THE CRUDE PRODUCT	lei	50911.6	66761.6
D (-) TOTAL COSTS	lei	45065.5	45686.3
D_1. Of which for the main production	lei	45065.5	45686.3
I. VARIABILE COSTS	**lei**	40361.1	40679.5
II. FIXED COSTS	lei	4704.4	5006.8
E. (=)TAXABLE INCOME	lei	2484.5	17713.7
(-) Taxes	lei	397.5	2834.2
F. (=) NET INCOME	**lei**	2087.0	14879.5
F.1 (=) NET INCOME + total subsidy	lei	5448.6	18241.1
F.2 (=)NET INCOME + notified subsidy	lei	4715.0	17507.5
F.3 (=)NET INCOME + awarded subsidy	lei	4337.0	17129.5
F.4 (=)NET INCOME + direct payments	lei	2820.6	15613.1
G. RATE OF TAXABLE INCOME (%)	**%**	5,51	38,8
H. RATE OF NET INCOME (%)	**%**	4.6	32.6
H.1 RATE OF NET INCOME + total subsidy (%)	%	12.1	39.9
H.2 RATE OF NET INCOME + notified subsidy (%)	%	10.5	38.3
H.3 RATE OF NET INCOME + awarded subsidy (%)	%	9.6	37.5
H.4 RATE OF NET INCOME + direct payments (%)	%	6.3	34.2
COST OF PRODUCTION	**lei/to**	30044	22843
PREDICTABLE PRICE OF INTERNAL MARKET	**lei/to**	31700	31700

Source: Own calculations

Hop culture at the two production levels, 1.5 t/ha and 2 t/ha rate has a net income of between 4.6% and 32.6% (table no. 5). Explaining the action and to accurately assess the physical volume of production of hemp (1.5 t/ha and 2 t/ha) on gross income can be assessed positively in terms of economic conditions in which efficiency was observed correlation between index costs as effort and physical production index effect. Where are taken into account and support schemes, the rate of return cultural changes, as follows:
- Rate of net income + total subsidy: it is estimated a rate of return of between 12.1% and 39.9% share of total support (3,654.072lei/ha / 747.0161 euro/ha) in net income (between 5,448.6 lei/ha and 18,241.1 lei/ha) was 61.7% for the production of 1.5 t/ha and 18.4% for the production of 2 t/ha%; **Option 1**: + Direct payments coupled support (163,0161 euro + 584 euro = 747,0161 euro/ha);

- Rate of net income + notified subsidy: a rate of return is estimated between 10.5% and 38.3% share of support (2628lei/ha / 584 euro/ha) in net income (between 4715.0 lei/ha and 17507.5 RON / ha) was 48.2% for the production of 1.5 t/ha and 14.4% for the production of 2 t/ha%; **Option 2:** The support (584 euro/ha);

- Rate of net income + awarded subsidy: it is estimated a rate of return of between 9.6% and 37.5% share of support notified (2250 lei/ha / 500 euro/ha) in net income (between 4,337.0 lei/ha and 17,129.5 lei/ha) was 41.3% for the production of 1,5 t/ha and 12.3% for the production of 2 t/ha%; **Option 3:** Support notified (500 euro/ ha);

- Rate of net income + direct payment rate: it is estimated a rate of return of between 6.3% and 34.2%, the share of direct payments (733,5725 lei/ha / 163,0161 euro/ha) in net income (between 2820.6 lei/ha and 15613.1 lei/ha) was 13.5% for the production of 1,5 t/ha and 4% for the production of 2 t/ha%;

Option 4: direct payments (163,0161 euro/ha = 79,7392 euro/ ha - SAPS + 5 euro/ha payment redistributive + 59.1277 euro/ ha - payment greening + 19.1492 ANT);

- Taxable income rate: it is estimated taxable income rate between 5.51% (-2,484.5 lei/ha) and 38.8% (17,713.7 lei/ha), hop culture at the production level of 1.5 t/ha, it has a lower profitability.

Conclusion: support coupled hop culture 747,0161 for euro/ha conditioned production level of 490 kg / ha, will help ensure the necessary production for the brewing industry.

SUGAR BEET

Current status: area planted with sugar beet in the period 2007-2015, ranging from 18 000 ha in 2011 (when, because of unfavorable conditions for the period under review recorded minimum) to 31 000 ha in 2014, year in which obtained the highest average production per hectare 43.7 t/ha, which may be explained by better use of technology and more efficient use of land suitable for this crop. Romania financial support for sugar beet tends to keep them in culture in order to achieve the quota allocated to Romania. Through this support farmers incentive for maintaining and expanding cultivated areas, given that 2017 will be eliminated quotas on sugar. Currently, the consumption need of Romania is about 500,000 tons of sugar / year (1). Reducing the production of sugar beet due to favorable raw sugar import could not be offset by increased subsidies per hectare beet cultivation. Foreign trade in sugar is characterized by negative trade balance, since Romania is a net importer of raw sugar and white sugar. An agricultural policy measure were intended to expand areas under sugar beet, but has not succeeded relaunching this culture. Romania imports still mostly of the need for sugar. Coupled support for growing sugar beet growers are given rice farmers active, showing evidence proving commercialization of a minimum yield of 26,400 kg / ha (art. 50 of Decree 619/2015). Area planted with sugar beet in 2015 was 29,300 hectares.

Table no. 5: Influence of the coupled support on sugar beet culture profitability

INDICATORS	U.M	VALUES	
		Sugar beet 40 t/ha	Sugar beet 70 t/ha
A. PRODUCTION VALUE	lei	6600.0	11550.0
A$_1$. Of which the main production	lei	6600.0	11550.0
B (+) SUBSIDIES	lei	4270.6	4270.6
C (=)THE CRUDE PRODUCT	lei	10870.6	15820.6
D (-) TOTAL COSTS	lei	6407.8	7483.4
D$_1$. Of which for the main production	lei	6407.8	7483.4
I. VARIABILE COSTS	lei	6100.0	6738.8
II. FIXED COSTS	lei	307.8	744.6
E. (=)TAXABLE INCOME	lei	192.2	4066.6

(-) Taxes	lei	30.8	650.7
F. (=) NET INCOME	lei	161.5	3415.9
F.1 (=) NET INCOME + total subsidy	lei	4432.0	7686.5
F.2 (=)NET INCOME + notified subsidy	lei	3698.5	6952.9
F.3 (=)NET INCOME + awarded subsidy	lei	2861.5	6115.9
F.4 (=)NET INCOME + direct payments	lei	895.0	4149.5
G. RATE OF TAXABLE INCOME (%)	%	3.0	54.3
H. RATE OF NET INCOME (%)	%	2.5	45.6
H.1 RATE OF NET INCOME + total subsidy (%)	%	69.2	102.7
H.2 RATE OF NET INCOME + notified subsidy (%)	%	57.7	92.9
H.3 RATE OF NET INCOME + awarded subsidy (%)	%	44.7	81.7
H.4 RATE OF NET INCOME + direct payments (%)	%	14.0	55.4
COST OF PRODUCTION	lei/to	160.2	106,9
PREDICTABLE PRICE OF INTERNAL MARKET	lei/to	165.0	165.0

Source: Own calculations

Culture sugar beet production at two levels, 40 t/ha and 70 t/ha rate has a net income of between 2.5% and 45.6% (table no. 6). Explaining the action and to accurately assess the physical volume of production of hemp (40 t/ha and 70 t/ha) on gross income can be considered as economically positive.

Where are taken into account and support schemes, the rate of return cultural changes, as follows:

- *Rate of net income + total subsidy*: it is estimated a rate of return of between 69.2% and 102.7% share of total support (4,270.5 lei/ha / 949,0161euro/ha) Net income (between 4,432.0 lei/ha and 7,686.5 lei/ha) was 96.4% for the production of 40 t/ha and 55.6% for the production of 70 t/ha%; **Option 1**: + Direct payments coupled support (163,0161 euro + 786 euro = 941,0161 euro/ha);

- *Rate of net income + notified subsidy:* a rate of return is estimated between 57.7% and 92.9% share of support (3,537 lei/ha / 786 euro/ha) in net income (between 3,698.5 lei/ha and 6,952.9 lei/ ha) was 78.9% for the production of 40 t/ha and 46% for the production of 70 t/ha%; **Option 2:** The support (786 euro/ha);

- *Rate of net income + awarded subsidy:* it is estimated a rate of return of between 44.7% and 81.7% share of support notified (2,700 lei/ha / 600 euro/ha) in net income (between 2,861.5 lei/ha and 6,115.9 lei/ ha) was 60.9% for the production of 40 t/ha and 35.1% for the production of 70 t/ha%; **Option 3:** Support notified (600 euro/ha);

- *Rate of net income + direct payment rate:* it is estimated a rate of return between 14% and 55.4%, the share of direct payments (733,5725 lei/ha / 163,0161 euro/ha) in net income (between 895.0 lei/ha , and ROL 4149.5 / ha) was 16.6% for the production of 40 t/ha and 9.5% for the production of 70 t/ha%; **Option 4**: direct payments (163,0161 euro/ha = 79,7392 EUR / ha - SAPS + 5 euro/ha payment redistributive + 59.1277 euro/ha - payment greening + 19.1492 ANT);

- *Taxable income rate:* it is estimated taxable income rate between 3% (895.0 lei/ha) and 54.3% (4,149.5 lei/ha), sugar beet crop, the production level of 40 t/ha, It has a lower return. ***Conclusion:*** the support coupled for hop culture worth 949,0161euro/ha, who is conditioned by a minimum yield level of 26,400 kg / ha, will help maintain and expand the area under sugar beet.

CONCLUSIONS

Agricultural policy measures applied in Romania aimed, on one hand, to maintaining production at the current level in order to ensure food security, and on the other hand, to

income support for farmers. Coupled support scheme, subject to obtaining certain production levels that will apply during the period 2015-2020 in the vegetable sector provides crop profitability analysis (as demonstrated) and will contribute to:

- Reducing imports of vegetable proteins and ensuring quality feed for the livestock sector (soybean);
- Re-launch domestic production of plant fibers (hemp);
- Increased raw material provenance insurance industry of local beer (hops);
- Maintaining and expanding cultivated areas (rice, sugar).

BIBLIOGRAFIE

1. Elena Toma (2010), *Agricultura României în procesul de integrare europeană. Evaluări și prognoze*, Editura ARS Academica.
2. Ana Ursu, Elena Cofas (2016), *"Research on forms of financial support for producers in Romanian agriculture. Case study: 2011-2015"*
3. L. Zahiu, E. Toma, A. Dachin, C Alexandri (2010) *"Agricultura in Economia Romaniei – între asteptari si realitati"*, Editura Ceres, Bucuresti 2010.
4. C Alexandri, L. Luca (2009*) "Finantarea agriculturii romanesti dupa aderare*", Editura ARS Academica.
5. APIA (2016) *"Ghid pentru solicitanţii de plăţi directe şi ajutoare naţionale tranzitorii în sectorul vegetal – Campania 2016 -* Versiunea 1. 0
6. MADR (2015) - Ministerul Agriculturii şi Dezvoltării Rurale –*"Ordinul nr. 619/2015 pentru aprobarea criteriilor de eligibilitate, condiţiilor specifice şi a modului de implementare a schemelor de plăţi prevăzute la art. 1 alin. (2) şi (3) din Ordonanţa de urgenţă a Guvernului nr. 3/2015 pentru aprobarea schemelor de plăţi care se aplică în agricultură în perioada 2015-2020 şi pentru modificarea art. 2 din Legea nr. 36/1991 privind societăţile agricole şi alte forme de asociere în agricultură, precum şi a condiţiilor specifice de implementare pentru măsurile compensatorii de dezvoltare rurală aplicabile pe terenurile agricole, prevăzute în Programul Naţional de Dezvoltare Rurală 2014-2020"*
7. http://agrointel.ro/28591/sprijin-cuplat-in-sectorul-vegetal-in-2015

SENSITIVITY OF GROSS MARGIN FOR FIELD CROPS

ANCA DACHIN[1], ANA URSU[2]

Abstract. A major issue of agriculture in Romania is to achieve the level of profitability of farms which ensures their economic viability. In this respect farms seek profitability of each product. The gross margin is a measure of profitability, which for the field crops is determined by the producer price, yield per hectare and variable costs. Since some of the crops are not profitable every year, subsidies also play an important role in economic calculation. The paper aims to estimate the sensitivity of the gross margin to changes of these factors in the case of cereals, sunflower, soybean, potato and beet. The sensitivity analysis relies on estimated data regarding the crop in 2015/2016 and has the purpose to explore the impact of assumptions of changes in determinants on the results measured by gross margin. The sensitivity of gross margin is the highest and also similar in relation to the producer price and the yield per hectare.

Key words: *gross margin, sensitivity, field crops*

JEL classification: Q02, C63, H25

INTRODUCTION

The main reason for carrying out the sensitivity analysis is the necessity to identify key sources of variability and uncertainty for the variation of an expected result in order to take the best decisions. The literature provides models and techniques for the analysis of the most important input factors which generate uncertainty in achieving the output. These models may use multidimensional uncertainty parameters (Saltelli et al., 2004). The sensitivity analysis is commonly used in the cost-benefit analysis for projects financed from European funds (Stoian și Gligor, 2012), including the projects with application in agriculture (Vârlănuță et al, 2010).

The gross margin of the farm is a measure of output, respectively of the farm profitability, which is a useful indicator in planning at enterprise level (Farm Gross Margin Guide, 2015). A key issue is the comparative analysis of the impact of various parameters on the agricultural output. Since the parameters and the output have different measurement units and therefore are not directly comparable, this problem can be overcome by calculating the "elasticity" or the percentage change in output to a percentage change in other parameters (Pannell, 1997). The paper aims to estimate the sensitivity of the gross margin achieved from the field crops in Romania.

MATERIAL AND METHODS

The sensitivity analysis is a technique used to determine the effect of different values of input parameters (independent variables) on a certain dependent variable in predetermined conditions. Such an analysis allows the evaluation of results when the input parameters progress through the confidence intervals and these changes are translated into a range of economic results, also within confidence intervals. The sensitivity analysis takes into account various possible input variables with impact on the result, while separating these variables and the corresponding range of outcomes. The method used in this paper is the *determinist sensitivity analysis*, which can be applied by means of a step by step calculation.

For a numerical input and a numerical output the usual option is for the "one input – one output" method in order to evaluate the effects on the output. This approach requires:
-   the change of one factor at a time;

[1] PhD Anca Dachin, The Bucharest University of Economic Studies, ancadachin@yahoo.com

[2] PhD Ana Ursu, Institute for Agricultural Economy and Rural Development, ursu.ana@iceadr.ro

- the return to the reference values after each range of changes of the selected factor.

In this case, each change of the outcome is due to the variation of a single factor, while all others are fixed at the reference value. In the paper the outcome is the gross margin (dependent variable). The sensitivity analysis allows the identification of the "critical" variables of the model, respectively the parameters which have positive or negative variations with the highest impact on the gross margin.

The sensitivity analysis is possible also when two determinant factors change simultaneously step by step. Thus the organization of data in matrix form is suitable for the calculation of the gross margin as a result of successive values of the input factors.

The standard gross margin is calculated as:

Standard gross margin = Gross income – variable costs

Considering the importance of subsidies granted per hectare, in the present paper this component of income is included in the calculation. Thus the detailed formula of the gross margin is:

Gross margin per hectare = p×q – vc + s

where:

p = price of the main crop (lei/ton)
q = average yield per hectare of the main crop (ton/ha)
vc = average variable costs per hectare (lei/ha)
s = subsidies per hectare (lei/ha)

According to this formula, the gross margin is influenced decisively by the sales price of the main product, yield, variable costs and subsidies (independent variables). The sensitivity is calculated to explore the impact of assumptions regarding the changes of these determinant factors on the gross margin, by using the principle "what if".

The break-even-price and the break-even yield are calculated as follows:

Break-even price = variable cost/yield
Break-even yield = variable cost/price

The break even yield is needed to cover variable costs and it provides some indication of the exposure of the farm.

The calculations rely on data from the technological sheets of field crops (wheat, maize, barley, sunflower, soybean, potato and sugar beet) produced in a non-irrigated conventional system, data provided by the Institute for Agricultural Economy and Rural Development (IAERD).

In the first part of the paper the sensitivity is interpreted as the elasticity of gross margin to changes of the determinant factors by +/- 10% for each crop. The second part presents th estimated the impact of the simultaneous change of price and yield on the absolute values of gross margin.

RESULTS AND DISCUSSIONS

1. Data estimations of the crop production in 2015/2016

The reference data for the sensitivity analysis is the estimation of the crop production in 2015/2016 (table 1). The main determinants as well as the gross margin are calculated per hectare. Since the influence of the secondary production on the gross income is low, this factor has not been taken into consideration.

Table 1: Calculation of the gross margin related to the crop production in Romania,2015/2016

	Wheat	Corn	Barley	Sun-flower	Soybean	Potato	Sugar beet
Independent variables							
Sales price (lei/t)	681	681	681	1600	1830	750	165
Average yield (t/ha)	4	5	4	2.5	3	30	40
Variable costs (lei/ha)	2846.7	3417.5	4404.1	3305.9	4791.9	16086	6100
Subsidies (lei/ha)	733,6	733,6	733,6	733,6	1944,072	733,6	4270,7
Dependent variable (results)							
Gross margin (lei/ha)	-122.7	-12.5	-1680.1	694.1	698.1	6414	500
Gross margin with subsidies (lei/ha)	610.9	721.1	-946.5	1427.7	2642.2	7147.6	4770.7

Note:

1. Subsidies for wheat, barley, maize, sunflower, potatoes = SAPS subsidies 161,0161 euro (SAPS 79,7392 lei/ha + 5 euro/ha redistributive payment first interval + 59,1277 euro/ha for greening + 19,1492 euro/ha TNA) = 733,6 lei/ha

2. Subsidies for soybean = SAPS subsidies + coupled support granted = 161,0161 euro/ha + 269 euro/ha = 432 euro/ha (1944,072 lei/ha)

3. Subsidies for sugar beet = SAPS subsidies + coupled support granted = 161,0161 euro/ha + 786 euro/ha = 949,0161 euro/ha (4270,572 lei/ha)

Source: IAERD calculations

2. Effects of changing one factor at a time on the gross margin

The sales price is one of the independent variables in this research which is assumed to increase/decrease step by step by 10%, while other factors remain constant. The generated variation in the price of wheat, maize and barley, according to the "what if" principle, is 362 – 1207 lei/t (80.5 – 268.2 euro/t) which is falling in the range of real prices recorded in the period 2007-2016 in the EU statistics and is therefore a confidence interval.

Data calculated and represented in fig.1 regarding the sensitivity of gross margin obtained from the cereal production show the following:

- The sensitivity of gross margin to changes in the determinant factors is very similar for wheat and maize;
- The gross margin is sensitive when changing the sales price. Taking wheat for example, an increase by 10% of the price results in an increase of more than 10% of the gross margin for the entire range of generated values. The sensitivity enters the inelastic area only when the price exceeds 4500 lei/t, which is outside the confidence interval. The same situation is observed regarding maize and barley, with slight differences in the size of coefficients. On the other hand, the decrease of the wheat price by 10% results in a major decrease of the gross margin, especially when the price reaches levels below 500 lei/t.
- The sensitivity of gross margin related to the yield changes is identical compared to price changes for all crops;
- When the wheat yield decreases and reaches levels below 3.2 t/ha, the sensitivity of gross margin becomes very high;
- Barley had a special situation in 2015/2016, taking into consideration the highly negative values of the gross margin, due mainly to high average costs per hectare;
- The variation of costs has an important impact on the economic results in the case of all cereals. An increase by 10% in the first step of the variable costs means already a decrease by 46% of the gross margin.

- Sensitivity of the gross margin is much lower related to the subsidies. A change by 10% of subsidies results in a change of gross margin by about the same size or lower.

Fig.1: Sensitivity of gross margin to changes in determinant factors, by field crop
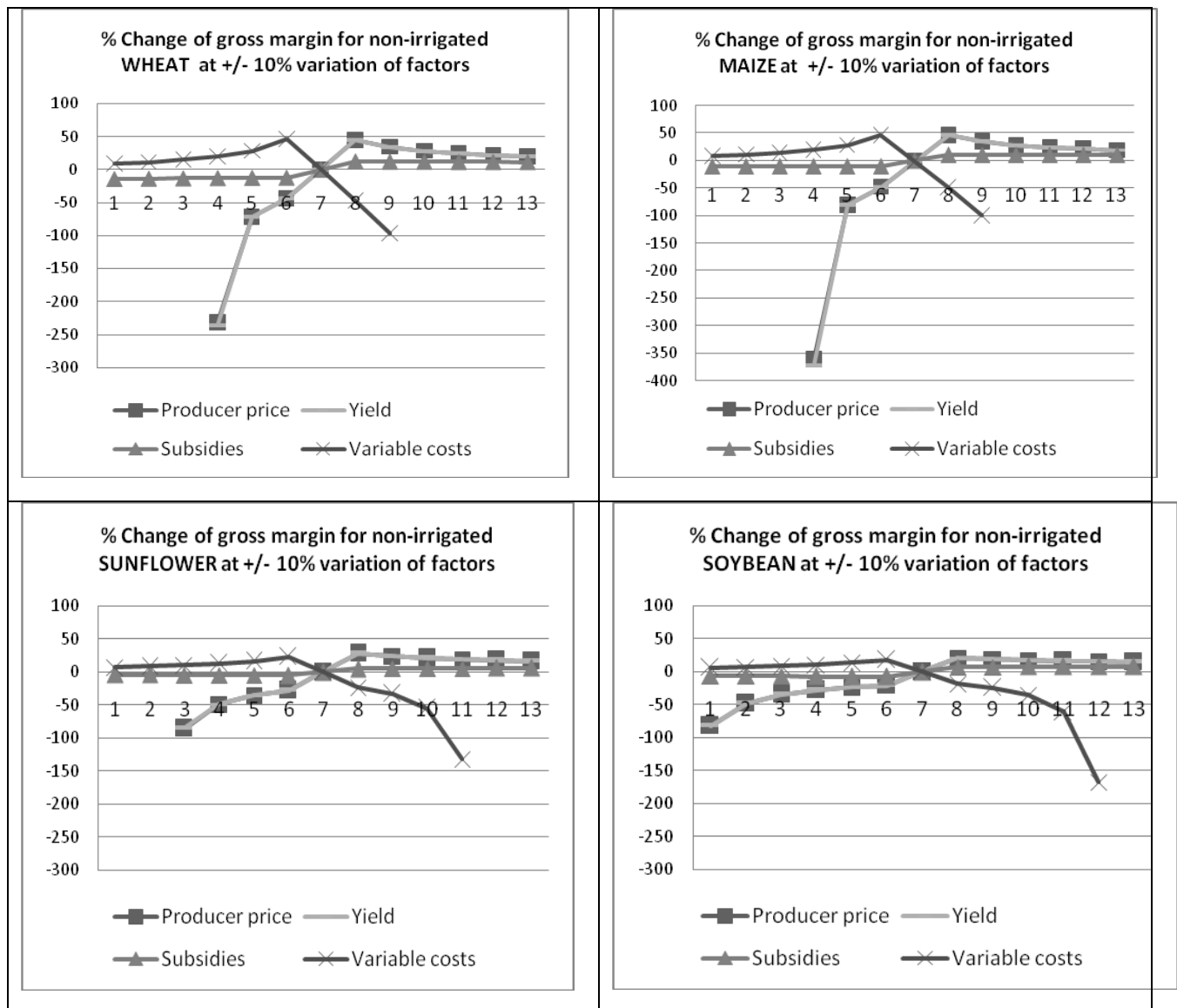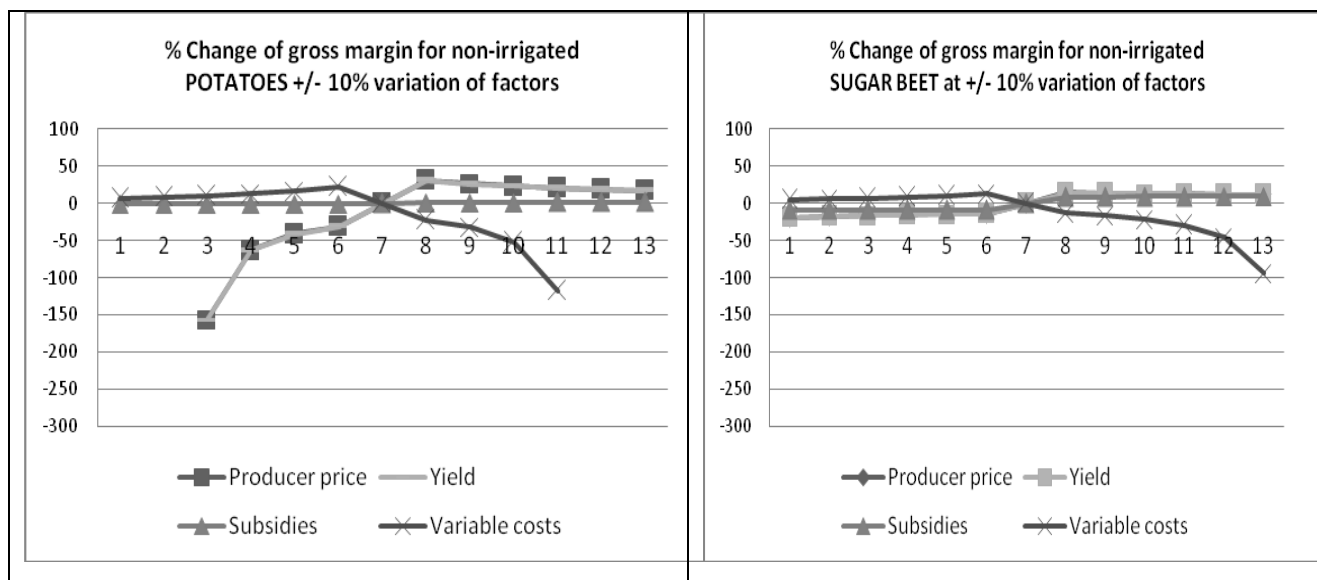
Source: own calculations

A similar analysis for sunflower and soybean represented in fig.1 shows that the gross margin obtained from these crops is less sensitive compared to cereals. One of the reasons is that in these cases even the gross margin without subsidies has high positive values.

When analysing the cases of potato and sugar beet, most obvious is that the sensitivity of gross margin to subsidy changes is low. Sugar beet has all together the lowest sensitivity of gross margin resulting from changes of all input items.

It is worth mentioning that the comparability between cereals, oilseed crops, potatoes and sugar beet is limited, since there are differences in the types of fertilizers, weed control and other elements of the technology which vary for different locations and situations of farms.

3. Effects of simultaneous changes of two factors on the gross margin

Knowing that the elasticity of gross margin to changes in price and yield is actually the same, it is of real interest to estimate the impact of simultaneous changes of these two factors on the absolute changes of the standard gross margin.

The variation of gross margin for cereal crops is available in tables 2-4. The values result from the increase/decrease of sales price and yield per hectare according to the "what if" principle and show the favourable possible combinations of the two independent variables needed to reach positive values of the standard gross margin. For example, when the price of wheat is higher than the break-even price of 711.6 lei/t and the yield per hectare is higher than the break-even yield of 4.18 t/ha, the gross margin is always positive. Regarding the calculations for barley, both price and yield in 2015/2016 were below the break-even values. At the given high average costs, the break-even price is 1101 lei/t and break-even yield de 6.47 t/ha. The break-even values for maize are close to the reference values.

Tables 5-8 refer to oilseed production, potatoes and sugar beet, which were profitable crops in 2015/2016, according to the levels of standard gross margin. The calculations provide useful information about the effect of possible changes of factors, especially of those with high volatility such as the sales price.

Table 2: Effects of changes in sales price and average yield per hectare of wheat on the gross margin

WHEAT– 2015-2016					
Average yield (t/ha)	4.0				
Price at the farm gate (lei/t)	681	**Break-even yield (t/ha)**			**4.18**
A. Income from the main crop (lei/ha)	2724	**Gross margin (A-B) (lei/ha)**			**-123**
B. Variable costs - total (lei/ha)	2846.8				
Average yield t/ha	**Price at the farm gate (lei/t)**				
	550	**600**	**681**	**750**	**850**
2.50	-1472	-1347	-1144	-972	-722
3.00	-1197	-1047	-804	-597	-297
3.50	-922	-747	-463	-222	128
4.00	-647	-447	**-123**	153	553
4.50	-372	-147	218	528	978
5.00	-97	153	558	903	1403
5.50	178	453	899	1278	1828

Source: IAERD calculations

Table 3: Effects of changes in sales price and average yield per hectare of barley on the gross margin

BARLEY – 2015-2016					
Average yield (t/ha)	4.0				
Price at the farm gate (lei/t)	681	**Break-even yield (t/ha)**			**6.47**
A. Income from the main crop (lei/ha)	2724	**Gross margin (A-B) (lei/ha)**			**-1680**
B. Variable costs - total (lei/ha)	4404.1				
Average yield t/ha	**Price at the farm gate (lei/t)**				
	500	**600**	**681**	**850**	**900**
3.20	-2804	-2484	-2225	-1684	-1524
3.50	-2654	-2304	-2021	-1429	-1254
3.80	-2504	-2124	-1816	-1174	-984
4.00	-2404	-2004	**-1680**	-1004	-804
4.20	-2304	-1884	-1544	-834	-624
4.60	-2104	-1644	-1272	-494	-264
4.80	-2004	-1524	-1135	-324	-84

Source: IAERD calculations

Table 4: Effect of changes in sales price and average yield per hectare of maize on the gross margin

MAIZE – 2015-2016					
Average yield (t/ha)	5.0				
Price at the farm gate (lei/t)	681	**Break-even yield (t/ha)**		5.02	
A. Income from the main crop (lei/ha)	3405	**Gross margin (A-B) (lei/ha)**		-13	
B. Variable costs - total (lei/ha)	3417.5				
Average yield t/ha	**Price at the farm gate (lei/t)**				
	550	**600**	**681**	**750**	**850**
4.00	-1218	-1018	-694	-418	-18
4.40	-998	-778	-421	-118	323
4.80	-778	-538	-149	183	663
5.00	-668	-418	**-13**	333	833
5.40	-448	-178	260	633	1173
5.80	-228	63	532	933	1513
6.00	-118	183	669	1083	1683

Source: IAERD calculations

Table 5: Effect of changes in sales price and average yield per hectare of sunflower on the gross margin

SUNFLOWER– 2015-2016					
Average yield (t/ha)	2.5				
Price at the farm gate (lei/t)	1600	**Break-even yield (t/ha)**			**2.07**
A. Income from the main crop (lei/ha)	4000	**Gross margin (A-B) (lei/ha)**			**694**
B. Variable costs - total (lei/ha)	3305.9				
Average yield t/ha	**Price at the farm gate (lei/t)**				
	1000	1400	**1600**	1650	1700
2.00	-1306	-506	-106	-6	94
2.20	-1106	-226	214	324	434
2.40	-906	54	534	654	774
2.50	-806	194	**694**	819	944
2.65	-656	404	934	1067	1199
2.85	-456	684	1254	1397	1539
3.00	-306	894	1494	1644	1794

Source: IAERD calculations

Table 6: Effect of changes in sales price and average yield per hectare of soybean on the gross margin

SOYBEAN – 2015-2016					
Average yield (t/ha)	3.0				
Price at the farm gate (lei/t)	1830	**Break-even yield (t/ha)**			2.62
A. Income from the main crop (lei/ha)	5490	**Gross margin (A-B) (lei/ha)**			689
B. Variable costs - total (lei/ha)	4791.9				
Average yield t/ha	**Price at the farm gate (lei/t)**				
	1200	**1400**	**1830**	**1870**	**1900**
2.40	-1912	-1432	-400	-304	-232
2.60	-1672	-1152	-34	70	148
2.80	-1432	-872	332	444	528
3.00	-1192	-592	**698**	818	908
3.20	-952	-312	1064	1192	1288
3.40	-712	-32	1430	1566	1668
3.60	-472	248	1796	1940	2048

Source: IAERD calculations

Table 7: Effect of changes in sales price and average yield per hectare of potatoes on the gross margin

POTATOES – 2015-2016					
Average yield (t/ha)	30.0				
Price at the farm gate (lei/t)	750	**Break-even yield (t/ha)**			**21.45**
A. Income from the main crop (lei/ha)	22500	**Gross margin (A-B) (lei/ha)**			**6414**
B. Variable costs - total (lei/ha)	16086.4				
Average yield t/ha	**Price at the farm gate (lei/t)**				
	650	**700**	**750**	**800**	**850**
24.00	-486	714	1914	3114	4314
26.00	814	2114	3414	4714	6014
28.00	2114	3514	4914	6314	7714
30.00	3414	4914	**6414**	7914	9414
32.00	4714	6314	7914	9514	11114
34.00	6014	7714	9414	11114	12814
36.00	7314	9114	10914	12714	14514

Source: IAERD calculations

Table 8: Effect of changes in sales price and average yield per hectare of sugar beet on the gross margin

SUGAR BEET – 2015-2016				
Average yield (t/ha)	40.0			
Price at the farm gate (lei/t)	165	**Break-even yield (t/ha)**		**36.97**
A. Income from the main crop (lei/ha)	6600	**Gross margin (A-B) (lei/ha)**		**500**
B. Variable costs - total (lei/ha)	6100			
Average yield **t/ha**	**Price at the farm gate (lei/t)**				
	120	**135**	**165**	**200**	**250**
32.00	-2260	-1780	-820	300	1900
35.00	-1900	-1375	-325	900	2650
38.00	-1540	-970	170	1500	3400
40.00	-1300	-700	**500**	1900	3900
43.00	-940	-295	995	2500	4650
46.00	-580	110	1490	3100	5400
48.00	-340	380	1820	3500	5900

Source: IAERD calculations

CONCLUSIONS

The gross margin is a measure for economic results dependent mainly on the sales price of the main crop, yield and variable costs. The gross margin is sensitive to price changes and to changes in yield per hectare in the same proportion, which means that an increase in productivity has the same effect as an increase in price. If yield per hectare would raise and reach a stable level, then the main source of uncertainty would be the price, which generally has a high volatility. The sensitivity of the gross margin is higher in relation to the average costs per hectare. Since fixed (overhead) costs are ignored when calculating the gross margin and there is no information about the specialization and size of the farms, the comparability between crops is limited. The sensitivity of the gross margin to changes in subsidies is low, especially when the crop production is profitable.

BIBLIOGRAPHY

*** (2015), Farm Gross Margin Guide. A gross margin template for crop and livestock enterprises, SAGIT, GRDC, A Rural Solution publication, South Australia

Pannell, D.J. (1997), Sensitivity analysis of normative economic models: Theoretical framework and practical strategies. *Agricultural Economics* 16: 139-152

Saltelii, A., Tarantola, S. & Campolongo, F., Ratto, M. (2004), Sensitivity Analysis in Practice. A Guide to Assessing Scientific Models. Joint Research Centre of The European Commission, England: John Wiley&Sons.

Stoian, A., Gligor, L. (2012), Elaborarea analizei de senzitivitate în cadrul analizei cost-beneficiu a proiectlor finanțate din FEDR și FC, Lucrare clarificatoare nr.9, http://old.fonduri-ue.ro/res/filepicker_users/cd25a597fd-62/Documente_Suport/Studii/0_Studii_Instrumente_Structurale/Pag.3_ACB/16_Analiza_Senzitivitate_ACB.pdf

Vârlănuță, (2010), The status of Romanian agriculture and some measures to take, Propuneri de îmbunătățire a metodologiei de elaborare si fundamentare economico-financiara a proiectelor de investiții în agricultură, Economie Teoretică și Aplicată, vol VII nr.11, pg.82-94 http://store.ectap.ro/articole/531_ro.pdf

ACKNOWLEDGEMENT

DETERMINANT FACTORS FOR THE LEVEL AND VALORIFICATION OF WHEAT PRODUCTION IN THE EUROPEAN UNION

RUXANDRA – EUGENIA POP[1]

Abstract: *The wheat crop is very important worldwide and the wheat demand is expected to increase in the future, as a result of the population number growth and dietary changes. So, the wheat production grow represents a significant challenge that the agriculture must face with, in order to ensure the food security at the global level. In the European Union there are important concerns to identify and assess the current factors that influence and determine the wheat production level and it's efficient valorification.*
In this paper are presented such significant factors, of different types, as follows: environmental, technological, management, market, taken into consideration producers and farmers current points of view.
The personal contribution of the author includes graphical representations, which are useful for technological factors modeling and assessment, realized using adequate software tools.

Key words: wheat production, technological factors reprezentation

INTRODUCTION

The European Union is the main actor in the wheat market, the producer and the main supplier of wheat worldwide, recording yields above the world average. However, in many Member States wheat production is steady and the lack of improvements in this area can endanger the wheat consumption in the future. One of the main challenges that agriculture has faced in the last 20 years is to increase the production of wheat, due to the dramatic increase in demand for wheat as a result of population growth worldwide and how changes the population diet. According to the statistical database of the Food and Agriculture Organization of the United Nations (FAOSTAT 3), world wheat production recorded in 2015, 936.2 million tons.

Wheat crop productivity may involve all inputs or just some of them. Agricultural productivity is influenced by a number of factors, important as both inputs, crop biology, environmental conditions and characteristics of the agricultural market and agricultural policies. Such a classification can shape the determinants of productivity at the farm level crop: farmers and farm characteristics; management practices and innovation; climatic changes; political reforms and market fluctuations; risks facing farmers, and technological factors macroecologici.

Farmers and farm characteristics are primarily concerned with their social characteristics (age, education, etc.) that influence agricultural activity on the farm and the farm sizes, ownership of it, etc.

Management practices and innovation have particularly contributed to increasing agricultural productivity, registered in the last century, innovations emerging in fertilizers, protection products (pesticides, fungicides, herbicides), machinery mechanization (tractors equipped with GPS), that compensating resource constraints.

Climate change include changes in exogenous nature (rainfall, temperature, carbon dioxide levels, variability in heat), these long-term have a direct impact on crop yields of wheat and indirectly through changes at ground level.

Political factors influencing a relative measure agricultural productivity, particularly through reform to support farmers by providing subsidies and reducing commodity prices in the European Union.

---

[1] ASC Pop Ruxandra – Eugenia, ICEADR, București, pop.ruxandra@iceadr.ro

Farmers may also face risks, some of which derive from market uncertainties regarding the level of production, price, political factors.

MATERIALS AND METHODS

In this paper I will analyze how factors stated in the introduction affecting wheat production and farming to farmers at European level, following documentation using international literature by using a SWOT (Strength, Weknesses, Opportunities, Threats).

SWOT analysis is a tool commonly used to analyze and assess the status of an organization or project. By SWOT analysis we can identified key issues that determine the performance of a project and facilitate the adoption of effective strategies within it. Can be monitored important factors that may influence the project:

• strengths and weaknesses of the organization (areas of value and vulnerability), inherent in the development project;

• external opportunities that can have a positive impact on the project, which may help developing strategies to exploit them;

• external threats, risks that may have a negative impact on the project, which may help develop strategies to remove or minimize them;

The purpose of this analysis is to maximize the potential of strengths and opportunities, while minimizing the impact of risks and weaknesses of the project / activity.

RESULTS AND DISCUSSIONS

From the farmers point of view, taking as reference their age and level of education, we can say that older farmers are more conservative and less oriented to technology that the young farmers. In turn, farmers with a young age can be more productive because they are willing to use innovative practices and modern technological factors in their work. However, we can say that the larger experience of farmers with higher age can compensate the lack of experience in the field of modern technology appeared novelty.

It is noted that the specialization of farmers, especially graduating higher education institutions agriculture may be the consequence of an inclination higher to innovation, they adapts more easily to market changes brought by new technology trends, resulting in an increase in productivity by adopting new practices and / or technologies.

Also, the level of education influences farmers decision to join or to join agricultural associations, cooperatives or unions. The higher the level of education is, more they understand the importance of linking groups mentioned. So, they can accumulate technical knowledge, by organizing specialized training sessions for farmers. Also they can attend classes from which to acquire the ability to use new equipment, to acquire information on practices and innovative services. Being in an agricultural association, farmers can enter into partnerships which benefit from contracts for the purchase of plant protection products for more advantageous than individual farms. Such costs are lower, resulting in higher revenues. As can be seen in Table 1, the number of graduates in agriculture is quite small, occupying the penultimate position in the ranking that dropped from year to year, gradually.

Among the innovative practices that improve management in the wheat crop adaptation to macroecologici factors it is particularly important. They represent the natural conditions that allow and affects plant growth and development of wheat, of which the most important are the geographical position and sunlight, climate, soil water, all of which are favorable wheat crop.

Chart 1

GRADUATES IN ROMANIA STATE + PRIVATE									
DOMENIUL	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**TOTAL GRADUATES IN AREAS**
Technic	24.605	24.758	23,949	49,342	30,287	25,493	27,190	25,317	230,941
Agricol	3.200	3.750	2,087	3,336	2,228	2,453	2,499	2,396	21,949
Medical and pharma	6.292	6.633	6,596	8,122	7,763	9,729	9,434	9,437	64,006
Economics	32.098	37.211	91,884	67,420	72,641	62,685	34,415	25,724	424,078
Legal sciences	10.175	12.568	14,458	21,418	17,954	26,404	19,215	12,521	134,713
Pedagogical university	36.502	42.093	92,118	66,140	60,198	57,507	41,514	33,430	429,502
Artistic and journalistic	2.572	2.236	3,880	2,384	2,448	2,629	2,404	2,203	20,756
TOTAL GRADUATES /YEAR	**112.244**	**125,499**	**232,885**	**214,826**	**191,291**	**186,900**	**136,671**	**111,028**	**1,311,344**

Marin A. – Agricultural economics and rural development , Ed. ASE, 2014

There are a variety of technological factors and, of these, crop density has particular importance for achieving superior and consistent yields of wheat. Theoretically, to capture as much solar energy transformed into grain production, the ideal would be that the entire surface is covered sown with wheat ears, thick, the same height and of similar size.

The fertilization and fine wheat is also very important technological factors, wheat treatment with appropriate fertilizers at the right time can lead to a significant increase in wheat production. From this point of view, to wheat fertilizer requirements are very high. This stems from the fact that on an average production of 4000 kg and 8000 kg grain per hectare straw, wheat plants extract from the soil 100 kg nitrogen, 50 kg phosphorus and 92 kg potassium, which must be supplemented by fertilization.

Nitrogen is necessary for plant growth, development and improvement of grain production composition (quality) of their structure favors plant phosphorus and potassium helps to strengthen the supporting tissues especially in the basal part of the plant.

Nitrogen fertilization should be done at the right time and in appropriate amounts, excess nitrogen result in pollution of groundwater, which promotes overgrowth fall, extending the growing season and raising the plant pathogenic fungi.

The experiments carried out show that plants absorb from the soil of wheat small amounts of nitrogen in the period from the germination to twinning, most of the nitrogen is absorbed during the twinning until flowering (Fig. 1). In Fig. 2 presents the recommended rate of nitrogen in the SC 25 (SC = "growth stage") for fertilizer, depending on the number of siblings of wheat plants. (After Alley 2009).

Therefore it is recommended doses of nitrogen in the nitrogen absorption curve of the wheat plants, shown in Fig. 1 and Fig. 2. In so doing, the flow of nitrogen administered in various stages of development of the plants are completely absorbed relatively quickly by them in the ground nemairămânând large quantities of nitrogen that is leached into ground water or causing pollution thereof.
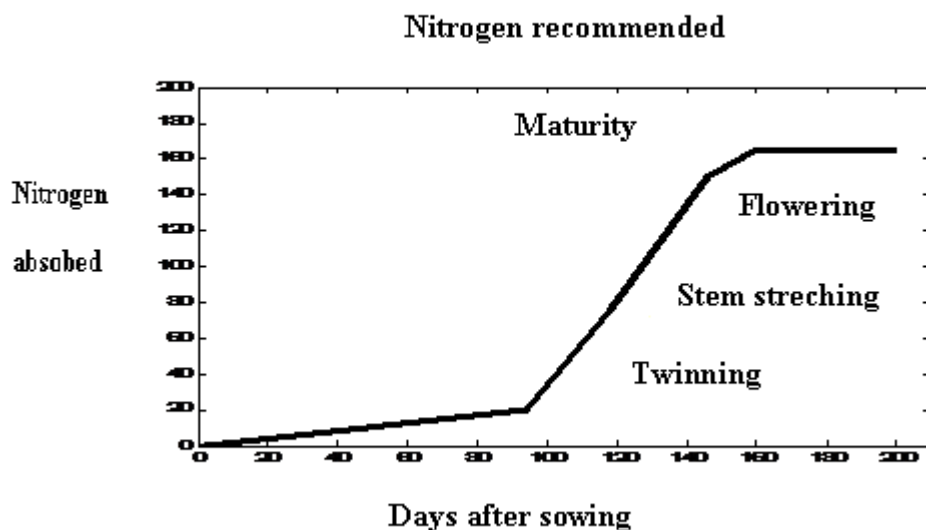
Fig. 1 Curve of the nitrogen plant wheat (McGuire, 1998)
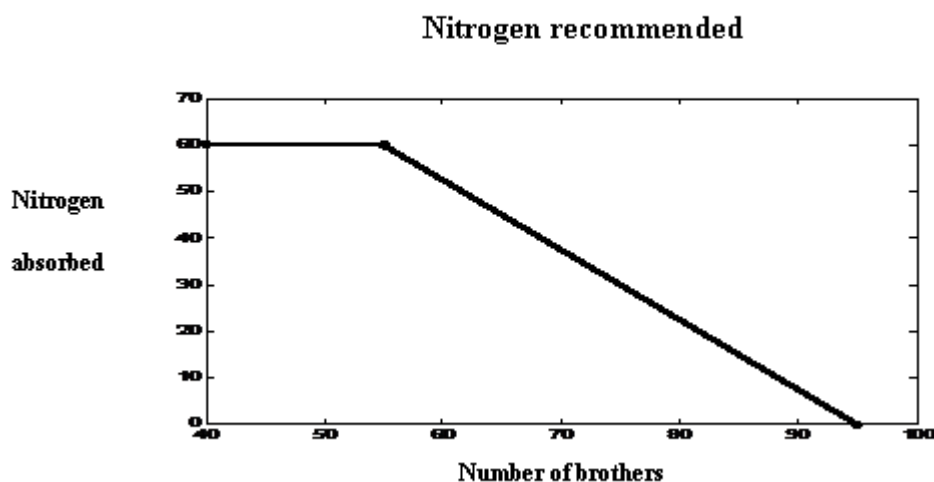
Fig.2 Recommended N rate in SC 25 based on the number of brothers (Alley, 2009)

Technological factors affecting wheat production in the sense that, since farmers are more open to innovative practices, the more productivity wins. Availability for innovation, however, is influenced by the level of implementation results from conduct programs of Research and Development and Innovation in the public sector or the private sector. Average spending in developed countries decreased compared to the period 1960 - 1970, from 9% to 1% in the period 2013 - 2014. It is estimated that in the future, increasing crop productivity of wheat would see a slowdown due failures in developing innovative tools for major issues (eg development of new pesticides to combat new pests or diseases).

SWOT analysis (Chart 1) of the determinants for the level of wheat production and exploitation is necessary for agricultural activity takes place, in terms of efficiency and performance in an organization or wheat producing farms.

As shown in Chart2, determinants that influence wheat production, both at national and European level, can be evaluated through the SWOT analysis so that farmers can gain an overview of the conditions of culture they have to defend their strengths, improve their weaknesses and to know the threats they may encounter in their work. The most important aspect is that they know the existing market opportunities and to exploit the work that it carries.

Chart 2

Determinant factors	Strenght	Wekness	Opportunities	Threas
Socio-demographic	*Age:* young farmers have a greater inclination to technology *Education:* specialization in agriculture affects the initiative of farmers to associate	*Age:* High age is associated with lack of innovation *Education:* lack of specialization in agriculture	*Education:* farmers can participate in sessions specialized in agriculture	
Macroecological	Owing to geographic and solar radiation in Romania, climate, soil and water are favorable wheat crop.	Water scarcity; Heavy rain; Global warming; Drought; Pollution;	Farmers can apply for European funds meant to support farmers who operate in areas that are faced with this kind (climate change, floods, droughts etc.). Farmers can receive direct support for commodity wheat production	Forecasts specialists on macro ecological factors throughout the European continental waters.
Technological	Tools, treatments and innovative practices emerging in wheat crop (eg pests or other diseases, different types of fertilization)	It is possible that the cost of innovative treatments have a higher price in direct proportion to the effects they produce.	Progress in agriculture, following steps taken in Research - Innovation	Diseases commonly found in wheat (powdery mildew, brown rust, yellow rust, black rust, fusarium, septoria)
Political			Subventions to farmers by the	Approval, publication of

			state; eurpean funds for farmers may apply;	new laws, implementation of policies that could adversely affect wheat sector;
Market fluctuations	Wheat production market is very dynamic and the demand for wheat is in constant growth	Input costs are quite high, which is reflected in the prices in our country, which is above the European average	Diversification of crops in the light of new emerging markets and developing	Difficulties in adjusting to the European Union and integration of farming in the PAC. Existing market uncertainties about production, price and political factors.

CONCLUSIONS

Wheat is one of the most cultivated cereal, especially in the European area, the European Union give productions above the world average. In recent decades, globally, we have made great progress in various sectors of wheat production, thereby achieving: varieties and hybrids of wheat with new features, improved administration schedules of fertilizers, correlating the number grains sown in m2 capacity twinning soil, progress in identification of pathogens and pests and to combat them. Thus, using advanced technologies at European level are achieved average yields of 6,000 kg / ha, but the biological potential of these soils is over 10,000 kg / ha. Due segmentation agricultural areas in our country there are areas which during 2015 achieved only 2000-3000 kg per hectare, and also areas where the average production recorded 7000-8000 kg per hectare.

To improve wheat production per hectare, farmers should exploit the opportunity currently available primarily in terms of technological innovations emerging on the plan. Secondly, you should have access to all information on rural development programs and in respect of subsidies granted by the state. Currently, they can apply for numerous grants, being able to obtain significant support from a financial standpoint. On the other hand, most farmers still have reservations about the agricultural cooperative associations or unions, although it could benefit in this way, many advantages. It is also desirable that they should seek the advice of a specialist when applying treatment against diseases or pests, for it to give the best results and to be administered in a fair and economically.

Last but not least, an important aspect is that farmers to document on innovations emerging technology wheat to carrying out their farming in an environmentally and economically, in order to use environmental elements macroecologic in an efficient manner.

BIBLIOGRAPHY

1. Di Falco, S., Chavas, J.P.,The role of agricultural cooperatives in sustaining the wheat diversitz and productivity: the case of southem Italy. Environmental and Resources Economics, 39,161-174, 2007.
2. European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the The CAP towards 2020: Meeting the food, natural resources and territorial challenges of the future. COM(2010) 672 final, 2010.
3. Hennessy, T., CAP 2014–2020 tools to enhance family farming: opportunities and limits. European Parliament, Directorate-General for Internal Policies, Policy Department B: Structural and Cohesion Policies, Agriculture. Available online: http://www.europarl.europa.eu/studies, 2014.
4. Marin A. – Economie și dezvoltare rurală, Editura Cermaprint, București, 2013
5. Marin A. – Economie agrară și dezvoltare rurală, Editura ASE, București, 2014
6. Nix, J.,Farm management pocketbook. Agro Businness Consultants Ltd, Leicester, UK, 2015.
7. Pardey, P.G., Alston, J.M., Chan-Kang, C., Agricultural production, productivity and R&D over the past half century: an emerging new world order. Invited plenary paper presented at the International Association of Agricultural Economists (IAAE) Triennial Conference, Foz do Iguacu, Brazil, 18–24 August, 2012.
8. Pop, I., Wheat technology, Printech Bucharest 2016.
9. Rakotoarisoa, M.A., The impact of agricultural policy distortions on the productivity gap: Evidence from rice production. Food Policy, 36, 147–157, 2011.
10. Ray, D., 2004. Development economics. Oxford University Press, New Delhi, India, 2004.
11. Rizov, M., Pokrivcak, J., Ciaian, P.,CAP subsidies and productivity of the EU farms. Journal of Agricultural Economics, 64, 537–557,2013.
12. Vigani, M., Dillen, K., Rodriguez-Cerezo, E., Proceedings of a workshop on Wheat Productivity in the EU: Determinants and Challenges for Food Security and for Climate Change. JRC Scientific and Policy Reports. Office for Official Publications of the European Communities, Luxembourg, 2013.
13. http://faostat.fao.org/.

ANALYSIS ON THE PRODUCTIVITY OF MAIZE HYBRIDS IN 2016

DUMITRU EDUARD ALEXANDRU[1], MICU ANA-RUXANDRA[2], REBEGA DANA[3]

Summary: *The yield per hectare in agricultural products is influenced by many factors, from the type of soil, plants seed, the precipitates level, climate, culture technologies, and hybrid genetic potential of it is cultivated. So in the case of maize, these criteria can influence yields per hectare, which can cause redaction of farmer profitability. Currently on the market in Romania, farmers can choose from a wide range of hybrids, depending on the factors affecting the productivity of the farm.*

Keywords: *hybrid, maize hybrids performance*

INTRODUCTION

The importance of global corn is undeniable, being in the top three of the most cultivated plants in the world, this being determined by a number of characteristics which confer preferential status among those who cultivate it. One of these features would be great manufacturing capacity by about 50% higher than other cereals, given that the world population is continuously growing.

Also of great ecological plasticity corn, realizing high yields and constant caused by lower deviations influence climate, and a payment being good run for a broad spectrum of cultures. Farmers in Romania prefer this culture because itcan be grown in monoculture, but also by the fact that it allows seeding later in the spring, which enables better scheduling of agricultural operations.

Mechanized harvesting can be done without danger of shaking and capitalize well organic and mineral fertilizers, providing higher yields when irrigated.

In enforcing production uses are multiple and essential, so that the corn used in human food, by grinding the beans, which are intended various products valued by consumers as: corn flour, corn flakes, milk artificially and syrups rich, mainly consumed by people with diabetes, beer, lozenges, etc.

Of particular importance it has in animal nutrition, with a rich nutritional value. From the resulting cobs after removing grain can be used to feed ruminants. All of this product can be obtained furfural (oily substance, colorless or pale yellow, with different uses, helping to refine oils, insecticides and fungicides to obtain), or vitamins are used as fuels. Strains of maize (cobs) are used in animal feed after a preliminary chopping and preparation (by pickling, mixed with molasses, etc.)

Regarding technologists corn itself, it can be grown on different soils, but its cultivation soils should be avoided extremes. Among plants a good seed, may include perennial legumes, cereal grains, flax, hemp. Although it can be cultivated in monoculture, should not follow the same field more than 2-3 years.

To obtain a high production is necessary to apply large amounts of nutrients, capitalizing well both organic fertilizers and chemical ones. Plowing occurs immediately after releasing land to a depth of 25-30 cm. Seedbed preparation consists in leveling the land and produce a layer of loose soil and ground the depth at which incorporates seed.

The seeding is achieved when the depth of 10 cm there is a temperature of 8-10 degrees C. The maintenance of the plant is to achieve 3-4 mechanical hoeing between the rows, so that the working depth varies depending on the state of vegetation and development of the root system.

---

[1] ASC. Eduard Alexandru Dumitru: Research Institute for Agriculture Economy and Rural Development;

[2] PhD Candidate, MICU Ana-Ruxandra, University of Agronomic Sciences and Veterinary Medicine from Bucharest, email: micuanaruxandra@yahoo.com;

[3]PhD Candidate, REBEGA Elena Daniela, Academy of Economic Studies from Bucharest, email: dana.rebega@yahoo.com;

In Romania, the best known is harmful maize leaf weevil (Tanumescus dillaticolis) that occurs especially where it is grown in monoculture, crop rotation therefore has an important role in combating this pest.

Mechanical harvesting corn is done when grain moisture is below 25% and observe black layer which separates the grain cobs.

MATERIALS AND METHODS

The research is based on information taken from the village farm Elsit Orezu city Ciochina, Ialomita county who tested a series of 84 types of hybrids belonging to different companies producing seed, which sells this product in Romania.

The farm has provided two batches for each type of hybrid (lot 1 and lot 2 = 3.281 square meters = 3360 square meters) each benefiting from the same factors of production, the only difference being given by the genetic hybrid.

Also, it has been used the same production technology as follows::
- ➢ Previous plant 2015: wheat
- ➢ Previous plant 2014: sunflower
- ➢ Seeding density: 70000 grains/ha
- ➢ Precipitations: 330 L/ms between Marc hand August 2016
- ➢ Soil works:
  - Stubble in July – August 2015;
  - Plowing 30 cm in October 2015;
  - discing in October 2015;
  - Fertilize with ammonium nitrate 281.5 kg / ha, on 18/03/2016;
  - Prepare germinative bed using combiner in April 2016;
  - sowing and fertilized simultaneously with application of complex fertilizer 18.46.0 in the amount of 95 kg / ha of commercial product between 03/04/2016 - 04/07/2016;
  - herbicide Adengo 0.35 l / ha preemergence 10/04/2016;
  - Universal Buctril herbicide 0,7 l / ha 4-6 leaf stage of corn on 05/12/2016;
  - herbicide EQUIP 2 l / ha during 8-10 leaf stage of corn and 10-15 cm height costreiului on 05/31/2016;
  - No mechanical weeding;
  - No insecticide treatments;
  - No treatments with fungicides.

RESULTS AND DISCUSSION

Taking into consideration the yields obtained in the two sole reference in the same conditions of growth factors, it was able to express productivity cultivate hybrids, resulting in their genetic performance.

The yields of maize hybrids on the part of the field no. 1.

Clasament	Producer	Hybrids	70000 (plants / ha) Quantity harvested 1 (kg / 3281 sqm)	70000 (plants / ha) Humidity (%) lot 1 at harvest time
1	Monsanto	DKC 5141	3274	15.5
2	Pionner	P 9903	3080	14.4
3	Pionner	P 0023	3078	14.4
4	Pionner	P 9241	3068	14.3
5	Monsanto	DKC 3969	3056	13.8
6	Pionner	P 9537	3026	14.6
7	Monsanto	DKC 4541	3010	13.7
8	Euralis	ES LAGOON	2986	14.3
9	Pionner	P 9911	2962	15.8
10	Limagrain	LG 30389	2918	15.0
11	Pionner	P 0216	2916	15.6
12	IF Porumbeni	PORUMBENI 458 MRF	2882	14.1
13	Monsanto	DKC 5068	2874	14.5
14	Euralis	ES CORTES	2870	13.3
15	Limagrain	LG 3350	2866	13.9

Source: Farm Elsit, village Orezu, Ciochina commune, Ialomita County;

Portion of land no. 1, he returned each type of hybrid (a total of 84 hybrids), 3281 square meters of land which was cultivated, which has higher production was recorded by hybrid DKC 5141 (Monsanto) with a production of 3274 kg / 3281 sqm to 15.5% grain moisture at harvest time. Second place in terms of production was located P9903 hybrid (Pioneer) with 3,080 kg / 3,281 sq m and a moisture content of grain 14.4% *(Table no. 1.).*

The yields of maize hybrids on the part of the field no. 2.

Clasament	Producer	Hybrids	70000 (plants / ha) Quantity harvested 1 (kg / 3281 sqm)	70000 (plants / ha) Humidity (%) lot 1 at harvest time
1	Monsanto	DKC 5141	3244	12.8
2	Monsanto	DKC 3969	3168	12.4
3	Pionner	P 9537	3164	12.6
4	Euralis	ES LAGOON	3162	12.9
5	Caussade	LOUBAZI	3154	12.6
6	IF Porumbeni	PORUMBENI 458 MRF	3118	13.2
7	Pionner	P 0216	3106	13.3
8	Syngenta	IRRIDIUM	3100	13.0
9	Monsanto	DKC 4717	3090	12.9
10	Pionner	P 0023	3088	12.9
11	Pionner	P 9911	3086	13.4
12	Monsanto	DKC 4541	3084	12.8
13	Syngenta	COBALT	3080	12.6
14	Pionner	P 9903	3062	12.9
15	Euralis	ES CORTES	3062	12.5

Source: Farm Elsit, village Orezu, Ciochina commune, Ialomita County;

Portion of land number 2, with an area of 3,360 square meters which returned each hybrid, the first place was occupied by the same hybrid DKC 5141 (Monsanto) with a production of 3244 kg / 3360 sqm, but with a moisture content lower and namely 12.8%, while the second was another hybrid from Monsanto DKC 3969, which received a production of 3168 kg / 3360 sqm humidity of 12.4% *(Table no. 2).*

Achieved total production of hybrids (filed no. 1 + filed no. 2)

Clasament	Producer	Hybrids	70000 (plants / ha) Production (kg / ha) - Average lot 1 and lot 2	70000 (plants / ha) 14% humidity amount (kg / ha)
1	Monsanto	DKC 5141	9814.79	9800.06
2	Monsanto	DKC 3969	9372.08	9456.43
3	Pionner	P 9537	9320.89	9358.17
4	Pionner	P 0023	9284.75	9317.24
5	Euralis	ES LAGOON	9257.64	9294.67
6	Pionner	P 9903	9248.61	9280.98
7	Pionner	P 9241	9206.44	9261.68
8	Monsanto	DKC 4541	9176.33	9245.15
9	IF Porumbeni	PORUMBENI 458 MRF	9034.78	9066.41
10	Pionner	P 9911	9107.06	9052.42
11	Caussade	LOUBAZI	8962.51	9047.65
12	Euralis	ES CORTES	8932.39	9030.65
13	Pionner	P 0216	9067.91	9027.11
14	Monsanto	DKC 4717	8929.38	8987.42
15	Syngenta	COBALT	8863.12	8965.05

Source: Farm Elsit, village Orezu, Ciochina commune, Ialomita County;

Regarding the yields obtained by the best hybrids made available by the participating companies, taking into account the humidity Stas productions, we can say that the product DKC 5141 won the best production of 9.8 t per hectare, product followed by DKC 3969 with a production of about 9.4 t per hectare both Monsanto, a production by almost 4% lower than the product DKC 5141 (*Table no. 3*).

Total production obtained from the group of maturity (filed no. 1 + filed no. 2)

Producer	Hybrids	70000 (plants/ha) 14% humidity amount (kg/ha)
Grupa FAO 200		
Donau Saat	DANUBIO	8171.06
As Hibridi	AS 201	7697.03
Grupa FAO 300		
Pionner	P 9537	9358.17
Pionner	P 9903	9280.98
Pionner	P 9241	9261.68
Monsanto	DKC 4541	9245.15
Caussade	LOUBAZI	9047.65
Grupa FAO 400		
Monsanto	DKC 5141	9800.06
Pionner	P 0023	9317.24
Euralis	ES LAGOON	9294.67
IF Porumbeni	PORUMBENI 458 MRF	9066.41
Pionner	P 9911	9052.42
Grupa FAO 500		
Donau Saat	CORASANO	8014.79
As Hibridi	AS 507	7118.89
Grupa FAO 600		
Maisadour	MAS 70 F	4912.37

Source: Farm Elsit, village Orezu, Ciochina commune, Ialomita County;

Analyzing the 84 hybrids by group of maturity where the Group FAO 200 (whose SUTU must be 1300 degrees C and a maximum of growing season of 143 days), the best result obtained hybrid Danubio 8.1 t / ha. Also FAO 300 Group category (whose SUTU must be 1340 degrees C and a maximum 144-day growing season), the most productive hybrid was 9.3 t / ha, and in terms hybrids from FAO group 400, the highest production was obtained by DKC 5141 with a production of 9.8 t / ha (SUTU 1365 degrees Celsius and a maximum of 145 days vegetation) (*Table no. 4.*).

CONCLUSIONS AND RECOMMENDATIONS

In terms of factors like production and application technologies same culture, different productions of the hybrid is the result of genetic dowry use. Also hybrids differ depending on the Group and FAO, depending on the requirements of farmers choosing a hybrid as they take into account the climatic conditions they encountered on the farm.

The product with the highest yield, DKC 5141, who managed a productivity of 9.8 t/ha is found at a US company Monsanto, is a hybrid semi-tardy, part of the FAO 460 group with high production potential and a tolerance to stressors water and temperature and is recommended for areas south, west and southeast.

So in addition to a number of factors that influence the productivity of maize crop as soil type, amount of rainfall in the areas culture technology applied which differ from one farmer to another specific temperature zone, a decisive factor is the quality hybrid, representing, among others, the criterion for distinguishing between seed companies on the domestic market and the Romanian farmers can compete on equal footing with yields obtained in other European countries.

Hybrids of experience, differentiation yields obtained inter area was determined by maturity group to which it belongs, and the manufacturer has chosen, covering as many possible customers requirements, depending on their requirements. Also be taken into account by the regime of culture, if land area is irrigated or not, sensitivity to herbicides hormonal growth rate in the first vegetation, thus indicating its ability to fight weeds mode harvest, and the destination of the crop (if used in animal feed or human food).

BIBLIOGRAPHY

1. Burcea Mariana, Tudor Valentina, Impactul lucrărilor tehnologice asupra solului, Editura Ceres București, 2007
2. Enciu Mihai, Victor Ploae, Vasile Valsan (1983), Tehnologia de cultivare a porumbului în sud-estul țării, Editura Ceres;
3. Micu M.M., Tudor Valentina, Sterghiu N., Pandelea Monica, 2012, Studiu privind perspectivele agricole ale județului Argeș, prin viziunea agricultorilor, Lucrări Științifice, Seria Agronomie, vol. 55, nr. 1, Print ISSN: 1454-7414, Electronic ISSN: 2069-6727, Editura „Ion Ionescu de la Brad", U.S.A.M.V Iași.
4. Oancea Ioan – Tehnologii agricole performante, Editura Ceres, București, 2003;
5. Roman Valentin și colab. Vol. 1 – Cereale și leguminoase pentru boabe, Editura Universitară, 2011;
6. Sin Gheorghe – coordonator, Tehnologii moderne pentru cultura plantelor de câmp, Editura Ceres, București, 2005;
7. Tudor Valentina, Alecu Ioan Niculae, Managementul producției, Editura Ceres București, 2013;
8. ***Institutul de cercetare pentru cereale - Fundulea (1995), Tehnologia producerii semințelor hibride de porumb, Editura Albatros;

DETERMINING THE TECHNOLOGY INFLUENCE OF SOY ON THE SOIL, PRODUCTION AND ECONOMIC EFFICIENCY ON TURDA AREA

FELICIA CHEŢAN[1], CORNEL CHEŢAN[2], FELICIA MURESAN[3]

Abstract: *This paper aims to address the problem of achieving soybean production and how technological factors influence the realization of production. Was choosing the most efficient technological variants of crop. We compared in the experiment realized at ARDS Turda how the two systems works: classic and minimum. Soybean crop has responded favorably to the unconventional technology, the registered production being almost equal with the one obtained in the classic system. Production obtained in the the conservative system was 2709 kg/ha and 2671 kg/ha in the classical system. The soil resistance to penetration in the conservative system below the depth of 30 cm, the force values (kPa) are lower in the conservative system (1438,50 kPa) as compared to the classic system where the force values are higher (1521,50 kPa).*

Key words: *climatic condition, compaction, economic efficiency, soil minimum works system, soybean production.*

Clasificare JEL: Q 01, Q 15, Q 16.

INTRODUCTION

The conservative agriculture tries to improve, conserved and usage more efficient of natural resources and water (Guş and collab., 2008; Rusu and collab., 2009). By eliminating plowing, totally or periodically, the rationalization of the number of passes and the maintainance at the soil surface of at least 30% of the total of vegetal remains (Ibanez and collab., 2008; Carter, 1994; Tianu and Guş, 1991; Cheţan and collab., 2015) the soil is protected against surface erosion, thus eliminating its compaction. The negative effects of soil compaction are numerous, and they are also reflected at the cultivated plants, decreasing the production capacity (Rusu and Guş, 2007). The research starts from the possible relation that exists between the soil tillage system, soil compaction, as well as the productions that can be achieved at a lower cost.

MATERIAL AND METODS

The experiment conducted in the years 2012-2014 at ARDS Turda, situated in Transylvania Plain, on a preluvosol with texture sandy loam-clay type, pH-neutral, supply good and very good with mobile phosphorus (more than 4.5% mg P_2O_5/100 g soil) and potassium (more than 30 mg K_2O/100 g soil), soil in humus content is medium (3.5%). Characteristic of this type of soil is typing fast, when passing with of heavy aggregates on surface or where the tillage is carried out under conditions of high humidity. The experiment realised is the polyfactorial type AxBxC-R:2x2x2-3. Each experimental plot has of 48 m^2

The experiment included the factors:

Factor (A) the system of soil work: 2 graduation: a_1 – conventional (CS) with plowghing – preparation of the soil – seeding + fertilizing; a_2 – minimum tillage (MT) work with chisel.

Factor (B) treatments on vegetation: 2 graduation: b_1, b_2, after a complex diagram of application in 3 distinct phenofhases: 3-4 leaves trifoliate, early blooming stage, start of training pods (Table 1).

---

[1]PhD Eng. Cheţan Felicia, SR, Agricultural Research and Development Station Turda, e-mail: felice_fely@yahoo.com

[2]PhD Eng. Cheţan Cornel, SR, Agricultural Research and Development Station Turda, e-mail: cornel_chetan@yahoo.com

[3] PhD Eng. Felicia Muresan, SR, Agricultural Research and Development Station Turda, e-mail: diabrotica22@yahoo.com

Factor (C) fertilizing: 2 graduation: c_1 fertilization with $N_{40}P_{40}$ concomitances with sowing; c_2 fertilization with $N_{40}P_{40}$ concomitance with additional sowing a fertilisation with $N_{40}P_{40}$ in vegetative phase 3-4 trifoliate leaves.

Factor (D) the agricultural year with 3 graduation : d_1-2012; d_2-2013; d_3-2014.

The sowing was done with ("Onix" variety creation ARDS Turda) precision seeder Gaspardo - Direct 400 (sowing concomitant with fertilizing, thus avoiding repeated passages with heavy units on the soil surface), to 18 cm spacing between rows, the depth of incorporation of seed 5 cm, the quantity of seed per hectare 110 kg.

Plowing and chisel work was performed at 30 cm depth. To determine the soil humidity (U%) was utilized gravimetric method; the most the root system it is on the first 30-40 cm soil, compaction determination was performed on the same depth, register concomitantly temperature and soil moisture, the penetration resistance was determined with digital penetrometer Field Scout SC900; the economic efficiency of the application of the conservative soil tillage system (unconventional) was determined in comparison to the classic system (conventional), acording to the number of technological tillage applied, the fuel consumption (diesel) and materials (fertilizers, pesticides).

The results were statistically analyzed by ANOVA test.

Table 1. Scheme of treatments

The variable	3-4 leafs	The starting blooming	The beginning the pods formation
b_1 -1 treatment	FF (foliar fertiliser: Polyfeed 5 kg/ha) + FG (fungicide: Amistar 0.5 l/ha)	-	-
b_2 - 2 treatments	-	FF (foliar fertiliser: Polyfeed 3 kg/ha) + FG (fungicide: Amistar 0.5 l/ha)	FF (foliar fertiliser: Polyfeed 3 kg/ha) + FG (fungicide: Amistar 0.5 l/ha) + IS (insecticide: Neoron 0.3 l/ha)

Analysis of the evolution of periodical climatic factors is fully justified especially in the current context, when lots of information from literature draw attention to changes what founded, both globally and locally.

The evolution of temperature and rainfall regime to ARDS Turda, for the period of vegetation of soy, in the years of 2012-2014 experience is shown in Table 2 and Table 3 (Meteorological Station Turda, longitude: 23°47', latitude 46°35'; altitude 427 m).

The months April and May of 2012, they had a warm character and in summer period June-August has installed a permanent drought that lasted for consecutive 21days, days with temperatures above 32°C, temperature at which biological processes of the plant is stopped. In terms of rainfall all months were very dry. Rains fallen in two months, April and May, have restored a certain proportion of soil water reserve, which has helped the plants to achieve good yields.

Specific to the year 2013 it was the succession heat waves with waves of something cooler temperatures, with large differences from one period to another which resulted in disruption biological cycles at some species of plants. Temperature values have strayed from the multi-annual average +2.1 to +2.5°C, generating two warm months in April and May, the months in which the thermal values exceeded 29°C, is a hot spring. During the summer, although for several years the monthly averages, heat values have exceeded the multi-annual average of +1.7 and respectively +2.9°C in August, the months in general is warm, the maximum temperature values are often

exceeded the threshold of the heat. The late of month July brought two days of strong sunlight and extended in August in which there have been seven days of heat at the same time and which, in conjunction with very low relative humidity (around 20-29%) indicates the settlement stabilization of atmospheric droughts. The highest temperature was +35.8°C on 9.08.2013. In July and August was installed a strong drought that caused the stress plants, intensity rains came late, at the end of august, after the date of 25.08.2013.

The most favorable year for soybean crop, in climatic condition was 2014. April is characterized as warm average monthly temperature of 11.4°C over the last 55 years average which was 9.8°C with offense +1.6°C; and while rainfall fell 72 l, compared of average 44.7 l, with the departure of +27.3 characterize excessive as rainy month. Application of treatments and additional fertilization to soybean, in May had a beneficial effect on growth and development of plants, dissolution of the mineral fertilizer this is due to the thermal regime with the monthly mean temperature 15.1°C, with the departure of +0.4°C on average 55 years that is 14.7°C and hydric regime with precipitation of 66.2 m^3/ha and the amount of the monthly deviation -1.5 m^3/ha unto average rainfall over the past 55 years is 67.7 m^3/ha. The other months of vegetation period of soybean taken into account: June, July, August and September were the hot months with temperature values between 15.1ºC and 19.9ºC near values of average 55 years: 14.7º C-19.6ºC.

Table 2.The thermal regime ARDS Turda, 2012-2014

Years/ months	Monthly - average temperature (ºC)												Average annual
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2012	-2.3	-6.1	4.7	11.8	16.2	21.0	24.0	22.3	19.1	11.4	5.2	-2.6	10.4
2013	-2.4	2.0	3.5	12.3	16.8	19.4	20.9	22.1	13.8	11.2	7.1	-1.7	10.4
2014	0.5	3.8	8.8	11.4	15.1	18.5	20.4	19.9	16.6	10.8	5.7	1.3	11.1
Average 10 years	-2.1	-0.4	5.2	12.2	17.3	20.8	23.0	22.5	17.4	11.0	4.8	-0.8	9.8
Average 57 years	-3.5	-0.9	4.1	9.9	14.8	17.8	19.7	19.3	15.0	9.6	3.8	-1.5	9.0

Table 3.The rainfall regime ARDS Turda, 2012-2014

Years / months	Precipitation - monthly amount (mm)												Annual amount
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2012	26.2	30.7	5.3	78.4	89.2	67.4	52.4	28.0	30.2	42.0	9.6	45.0	504.4
2013	19.8	10.3	57.9	53.3	79.3	86.2	37.6	44.0	57.8	67.8	5.9	3.3	523.2
2014	51.6	15.5	23.1	72.0	66.2	48.4	144.4	83.8	48.4	67.4	34.2	86.8	741.5
Average10 years	26.0	21.3	30.6	55.3	78.9	111.7	94.2	76.8	49.1	49.1	21.6	29.0	598.2
Average 57 years	21.4	18.8	23.4	45.4	68.3	84.2	75.6	55.2	40.4	32.8	28.0	26.8	520.4

RESULTS AND DISCUSSIONS

From Table 4, it can be seen that in the two technological variant until the depth 0-5 cm the penetration resistance value does not exceed 1226 kPa.

Soil penetration resistance in the variant tillage with moldboards plow has values below 1000 kPa on the depth 0-15 cm, on the depth 20-40 cm was 1174-1483 kPa., the force values are higher on the depth 30 cm, therefore it is advisable to alternate the depth of plowing to prevent hardpand.

The values obtained in unconventional tillage systems, below 2000 kPa, does not adversely affect the penetration of plant roots grown, the soil compaction is less dependent on technological variant, more than depth and weather conditions.

Soil moisture on the classic on the first 25 cm depth not exceed 28 mm, increased by 3 percent to 31 mm 25-30 cm depth followed then fall by 2 percent (29 mm) depth 30-40 cm. In reduced version works (chisel) soil moisture shows similar values 24 to 25 mm, these values

increase to 20 cm depth. At the depth 25-40 cm soil moisture is equal to the classic version. The influence of conservative system the accumulation and preservation of soil water it can be seen from the values obtained the depth increase, 0-40 cm.

Temperature was in the normal limits for the period when measurements were made, grouped around 21-23°C whatever depth, in both technologies.

Table 4. The influence of the interaction between system and ground penetration

Tillage system	Depth (cm)	T (°C)	U (%)	kPa	%	Differences	Signification
CS	0-5	23.3	25.3	642	100	0.00	Mt.
MT		23.1	25.9	1064	166	422	***
CS	5-10	23.1	28.8	512	100	0.00	Mt.
MT		23.4	25.7	898	176	386	***
CS	10-15	23.3	24.2	851	100	0.00	Mt.
MT		23.0	24.6	1101	129	250	***
CS	15-20	23.2	24.4	1070	100	0.00	Mt.
MT		22.9	25.8	1244	116	173	**
CS	20-25	23.1	27.8	1174	100	0.00	Mt.
MT		22.8	27.3	1294	110	120	*
CS	25-30	23.2	31.5	1293	100	0.00	Mt.
MT		22.8	31.4	1335	103	43	-
CS	30-35	23.1	29.9	1447	100	0.00	Mt.
MT		23.0	29.7	1404	97	-43	-
CS	35-40	23.1	29.5	1483	100	0.00	Mt.
MT		22.7	29.8	1460	98	-23	-
LSD (p 5%) = 110; LSD (p 1%) = 155; LSD (0.1%) = 225.							

Orografic and ecological conditions that characterise Transylvania Plain, leads to a favorable microclimat festivity mantain of diseases to soya bean (ex. bacterial burn produced by the bacterium, *Pseudomonas glycinae*, passing through infected seed and by plant debris, remained after the harvest).

The determintion of the degree of attack of the bacteriological burn installed in the soybean experiment was done in the month of July during the three experimental years.

In Table 5, can be noticed that the most favorable influence was in the year 2014, regarding the intensity and the degree of attack of the bacteriological burn.

The degree of attack (DA) is higher in the conservative system, both in the variant with a single treatentt, where the DA values were of 0,3% in 2012; of 1,1% in 2013 and 2,05% in 2014.

Table 5. The influence of the soil tillage system and treatments on the bacteriological burn attack (DA) at soybean crop, 2012-2014

System of work /treatment		Year		
		2012	2013	2014
		DA%	DA%	DA%
CS	a_1b_1	0.3	0.5	1.5
	a_1b_2	0.2	0.3	1.2
MT	a_2b_1	0.3	1.1	2.05
	a_2b_2	0.1	0.8	1.7

The evolution of the soybean yields according to the soil tillage system and to the number of fertilizations and treatments are presented in Table 6. A less favorable influence in the formation

of the soybean yield can be attributed to the year 2013, when the soybean yield did not succeed 1700 kg/ha.

The values of the average soybean yields in the three experimental years point out that between the two soil tillage systems there are no many significant differences under this aspect. However, it can be noticed a slight increase of soybean yield, reacting favorably in the case of the minimum soil tillage as well.

Table 6. The average production obtained at soybean according to the system tillage, treatments and fertilizations, 2012-2014

Variant tillage	Yield (kg/ha)		
	2012	2013	2014
$a_1b_1c_1$ (classic, 1 treatment + 1 fertilizing)	2093	1600	3255
$a_2b_1c_1$ (minimum tillage, 1 treatment + 1 fertilizing)	2271	1583	3269
$a_1b_1c_2$ (classic, 1 treatment + 2 fertilization)	2099	1552	3273
$a_2b_1c_2$ (minimum tillage, 1 treatment + 2 fertilization)	2248	1710	3520
$a_1b_2c_1$ (classic, 2 treatments + 1 fertilizing)	2125	1585	3484
$a_2b_2c_1$ (minimum tillage, 2 treatments + 1 fertilizing)	2236	1684	3277
$a_1b_2c_2$ (classic, 2 treatments + 2 fertilization)	2163	1561	3382
$a_2b_2c_2$ (minimum tillage, 2 treatments + 2 fertilization)	2342	1679	3212

The economic efficiency of the conservative systems with the soybean crop is rendered by the number of tillage done which require a fuel consumption calculated at 84,4 l/ha at a cost of 481,08 lei/ha, thus achieving an economy of 17,1 l/ha at a cost of 97,47 lei/ha. In the classic system the technology applied requires a consumption of 101,5 l/ha at a cost of 578,55 lei/ha. The price of the materials used, mostly of pesticides for the protection of soybean crops in both tillage systems, is quite high, thus the economy made is of only 94,47 lei/ha (Table 7).

Table 7. Efficiency technologies culture for 1 hectares soya, 2012-2014

Technology expenses	System of work	
	CS	MT
Consumption diesel fuel, l/ha	101,5	84,4
lei/ha	578,55	481,08
Expenditure with materials, lei /ha	1896,7	1896,7
Total lei/ha	2475,25	2377,78

CONCLUSSIONS

Out of this study we can deduce the idea of the major influence on the soybean yield of the year factor with a decissive role in the formation and the quantitative expression of the yield. Also, we can infer that the second fertilization has a remarkable impact on the soybean yield.

In the three experimental years we can conclude that soybean reacts favorably in the minimum tillage system.

The economic efficiency of the conservative systems with the soybean crop is rendered by the number of tillage done which require a fuel consumption.

The values of soil depth penetration do not go beyond 3000 kPa and they indicate that the development of the radicular system with soybean is not restricted up to 40 cm depth.

The unconventional system (MT) brings along a yield increase of 1,4%.

BIBLIOGRAPHY

1. Carter, M., R., (1994), *Conservation Tillage in Temperatur Agrosystems*. Lewis Publishers an Arbor London;

2. Cheţan, Felicia, Cheţan, C., Rusu, T., Alina, Şimon, (2015). *Effects of the winter wheat cultivation, in system without plowing, on the soil properties,* ARDS Turda, 2005-2014, The 8 th International Symposium Soil Minimum Tillage System, Cluj-Napoca, 25-26 June, 2015, Vol.8, No.22, June 2015, pg.119-125, p ISSN:1844-6698, ISSN:ISSN 2006-1363;

3. Gus, P., T. Rusu, I. Bogdan, (2008). *Factors which impose completing preserving effects of minimum soil tillage systems on arable fields situated on slopes*. The 5th International Symposium - Soil Minimum Tillage System, p. 155-161, Ed. Risoprint Cluj-Napoca;

4. Ibanez, J. J., W. R. Effland, P. V. Krasilnikov, H. Cacovean, T. Rusu, (2008). *Pedodiversity analysis and soil conservation*. The 5th International Symposium Soil Minimum Tillage System, p. 134-154. Ed. Risoprint Cluj-Napoca;

5. Rusu, T., Guş, P., (2007). Soil compaction,processes and consequences, Risoprint ed., Cluj - Napoca;

6. Rusu, T., P. Gus, I. Bogdan, P. I. Moraru, A. I. Pop, D. Clapa, D. I. Marin, I. Oroian, L. I. Pop, (2009). *Implications of Minimum Tillage Systems on Sustainability of Agricultural Production and Soil Conservation. Journal of Food, Agriculture & Environment, vol. 7 (2): 335-338;*

7. Tianu, A., Guş, P., (1991).*The development of the minimum tillage sysytems on world and national scale, in „National Symposium on minimum soil tillage system"*, Cluj-Napoca, p. 25-52.

*** Meteorological Station Turda, longitude: 23°47', latitude 46°35'; altitude 427 m

*** ANOVA statistically program

AGROTECHNICAL AND ECONOMICAL ALTERNATIVES FOR PEA CULTURE IN TURDA AREA

ŞIMON ALINA[1], RUSU TEODOR[2]

Abstract: *The aims of this experiment are to evaluate the yield of pea cultivated in conventional and reduced tillage and the economy of minimum tillage systems application. Soil is the primary factor determining the plants yield of a particular area. Yield of pea is determined by multiple factors and the yield variability may be difficult to predict. The experimental factors are: factor A-the experimental years 2014 and 2015, factor B-three tillage systems: conventional, minimum and no tillage. In 2014 was obtained a higher production than in 2015, with a very significant difference. Pea production decreases after applying conservative systems, with 204 kg/ha in minimum system and 611 kg/ha in no tillage system. Fuel consumption used for to perform basic works is higher in the variant to which the soil is plowed compared with minimum tillage systems. The highest costs in achieving the yield/1 ha are recorded in the classical tillage variant, with 12.78% respectively 19.31% higher than in minimum tillage systems. Seedbed preparation is the element of the culture technology where by applying minimum tillage systems can reduce the cost, in no tillage system this technological stage being eliminated.*

Keywords: *climatic condition, economy, pea, tillage systems, yield.*

Clasificare JEL: Q 01, Q15, Q16.

INTRODUCTION

Climate change is one of the most important factors that influence agricultural production and food, by blocking the natural energy flows of the plant systems (Berca, 1998).

Tillage is considered to be one of the basic elements modifying soil physical, chemical and biological properties and determining the germination, growth and development of both cropped vegetation and weeds (Haliniarz, 2014).

The most agro-technical factors (fertilization, protect plant and tillage) are highly energy-consuming and therefore solutions are sought after that would reduce production expenditures (Woźniak, 2013).

Peas is a culture with great agronomic importance, helping to develop the agricultural systems through nitrogen fixation (Şimon et al., 2014). Seed yield in field pea is a quantitative trait affected by many genetic and environmental factors (Ranjan et al., 2006) such as temperature, precipitations or soil type and moisture.

The advantages of reduced tillage over conventional tillage include the control of soil erosion (Allmaras et al., 1973), enhanced crop performance, soil water conservation (Griffith et al., 1986), reduced time of work and reduced labor requirements (Frye et al., 1981; Phillips, 1984).

Disadvantages include the greater weed control problems and herbicide dependency (Standifer and Beste, 1985), long-term reduced tillage leads to the accumulation of weed seeds in the topsoil (0-10 cm), which has a significant influence on weed infestation and increased the pest problems.

The conservation of soil fertility requires a tillage system that optimizes the plant needs in accordance with the soil modifications, that ensures the improvement of soil features and the obtainment of big and constant crops. (Rusu and al., 2009).

[1] CS Drd. Ing. Şimon Alina, Staţiunea de Cercetare şi Dezvoltare Agricolă Turda, Cluj, România, maralys84@yahoo.com

[2] Prof. Dr. Rusu Teodor, Universitatea de Ştiinţe Agricole şi Medicină Veterinară Cluj-Napoca, România, rusuteodor23@yahoo.com

MATERIALS AND METHODS

The experiment was conducted in the period 2014-2015 at the Agricultural Research-Development Station Turda (ARDS), on soil type vertic faeozem, pH neutral, with loam-clay texture, medium humus content, good supply in mobile phosphorus and potassium.

Pea was sown in the third decade of the March in the quantity of 100 seeds per 1 m^2, with the distance between rows 18 cm with Gaspardo Directa 400 drills.

The experimental factors were: factor A - the experimental years: A_1-2014, A_2-2015; factor B - Tillage system: B_1-Conventional tillage system included ploughing at 25 cm depth after harvest of the previous crop and processing with rotary harrow before sowing; B_2-Minimum tillage system involved the use of a chisel at 25 cm depth after harvest of the previous crop and processing with rotary harrow before sowing; B_3-No tillage system included the direct sowing.

To evaluate the yielding of pea cultivated in the three tillage systems we are studied one genotype of afila pea: Tudor. Pea was grown in a crop rotation for 3 years, the precursory plant being winter wheat.

After sowing it was made one treatment with gliphosate (4l/ha) in the three systems. Monocotyledonous and dicotyledonous weeds control was made with Tender (1.5 l/ha), Pulsar (1.0 l/ha) and Agil (1.0 l/ha) herbicide in a weeds rosette phenophase.

For pea protection against pests, at the early flowering stage of plants it was made a treatment with Calypso (0.1 l/ha) insecticide and at the 10 days after early flowering it was made another treatment.

Results achieved were elaborated statistically with the method of analysis of variance and setting up the Least Significant Difference - LSD - (5%, 1%, and 0.1%) (ANOVA, 2015).

The climatic condition of the years 2014 and 2015 were presented according to the Weather Station ARDS Turda (Table 1). During the last 55 years, the annual means of temperature were 9^{0}C and total amount of precipitation were 520.6 mm. The temperatures recorded in the two years studied are higher than the average of 57 years. In 2015 rainfall was lower than in 2014, and their absence in optimum moments for culture development has resulted in significant loss of yielding. In 2014 the temperatures and rainfall were beneficial to the crop of peas, yield being the result of the interaction optimum climatic conditions.

Table 1. Thermic and pluviometric regime in the vegetation period of pea culture,
Turda 2014-2015

Years		Months					Average or amount
		March	April	May	June	July	
Air temperature (^{0}C)	2014	8.8	11.4	15.1	18.5	20.4	14.8
	2015	5.5	9.6	15.8	19.4	22.3	14.5
	Average 57 years	4.1	9.8	14.7	17.7	19.6	13.2
Precipitation (mm)	2014	23.1	72.0	66.2	48.4	144.4	354.1
	2015	12.8	32.2	66.0	115.7	52.2	278.9
	Average 57 years	23.1	44.7	67.7	84.5	76.7	296.7

RESULTS AND DISCUSSIONS

Yields obtained in minimum tillage system are smaller compared with conventional tillage system, but the long-term benefits obtained (reduction of air pollution, reduction wind and rain erosion, economy of fossil fuels non-renewable, conservation of soil structure and fertility) are the most important.

Climatic conditions from those two experimental years had a great influence on the yield achieved, statistically in 2014 the yield was higher, the difference from the average of the two years

(control variant) being very significant and in 2015 difference from a control variant was very significantly negative (Table 2).

Table 2. The influence of the experimental years on the pea yield

Year	Yield (kg/ha)	Difference
Average (control variant)	2736	-
2014	3113***	376
2015	2360^{000}	-376
LSD (p 5%) 73	LSD (1%) 168	LSD (p 0.1%) 373

A great influence on the yield has the soil tillage system, following the application of unconventional tillage systems register a decrease in yield of 204 kg/ha at application of the minimum tillage system, respectively 611 kg/ha at application of no tillage system, differences from the conventional tillage system (control variant) is very significant (Table 3). The yielding of plants cultivated in no-tillage systems is, generally, slightly lower than of plants from conventional tillage systems. The conservation tillage increases weeds infestation and consequently lowers yield.

Table 3. The influence of the tillage system on the pea yield

Year	Yield (kg/ha)	Difference
Conventional tillage system (control variant)	3008	-
Minimum tillage system	2804^{000}	-204
No tillage system	2397^{000}	-611
LSD (p 5%) 73	LSD (1%) 102	LSD (p 0.1%) 144

Agrotechnical foactors (tillage, fertilization, plant protection) are highly energy consuming and therefore are sough solution to reduce costs. In the case of fertilization through the introduction of legumes in crop rotation is achieved an economy, the legumes need small amounts of fertilizer. In terms of the quantity of fuel used for tillage, by introducing minimum systems reduces the number of works, consequently decreases fuel consumption used. Fuel consuming is influenced by some factors: soil, working depth, weather, therefore it is recommended that tillage to be performed in the optimal climate conditions. At the application of conservative systems is achieved a fuel economy of 22,3 l/ha in the case of minimum tillage system and 23 l/ha in the no tillage system (Table 4).

Table 4 . Fuel consumption depending on the tillage

Tillage	Consumption (l/ha)	Percent (%)	Economy (l/ha)
Plowing (control variant)	28	100	-
Processing with chisel	5.7	20.3	22.3
Direct sowing	5	17.9	23

For effective implementation of minimum tillage systems in economically and environmental suitability is necessary to know the pretability level of the soil at different tillage systems.

After the experiences made by Kőller (2003), which compared several systems of tillage, it can make a saving of 73% of the fuel needed by applying of the direct sowing system and in minumum tillage systems is recorded lower fuel consumption by up to 19%, in the version with chisel plough compared to conventional tillage system by ploughing following experiments conducted by Stănilă

et al., (2008), in our experience is saving 79,7% of the fuel consumed in the minimum tillage system and 82.1% in the no tillage system.

Basic work, ploughing, consumes the largest amount of mechanical energy, representing 35% of the total energy consumed for the execution of the vegetal production of plant (Berca, 1999). The economy achieved by reducing the amount of fuel per unit area is an indicator of the efficiency at the minimum tillage systems application.

Reducing production costs can be a major contributor to maximising output per unit area and savings made during the crop establishment phase can be a vital part in cost reduction (Knight, 2004).

Table 5. Costs made at the soil tillage systems application

Conventional tillage system		Minimum tillage system		No tillage system	
Tillage performed	Cost/ha (RON)	Tillage performed	Cost/ha (RON)	Tillage performed	Cost/ha (RON)
Plowing	168	Processing with chisel	34.2	-	-
Processing with harrow	34.2	Processing with harrow	34.2	-	-
Sowing	30	Sowing	30	Sowing	30
Sprayer	9.6	Sprayer	9.6	Sprayer	9.6
Treatments applying	19.2	Treatments applying	19.2	Treatments applying	19.2
Total works	261	Total works	127.2	Total works	58.8
Materials	786	Materials	786	Materials	786
Total	1047	Total	913.2	Total	844.8

At the application of minimum tillage systems it is realizing an economy of 133.8 ron/ha (12.78%), and at the application of no tillage system, the economy is 202.2 ron/ha (19.31%) compared to classical tillage system, if we refer to all the technological elements involved in yield obtained per 1 hectare (Table 5).

The highest costs of technology (786 ron/ha) are recorded in case of necessary materials (insecticides, herbicides, seeds), the costs being equal in the three systems, the largest economy are realized in fact by reducing the amount of fuel.

At the minimum application is realized an important saving of fuels, lubricants, a lower wear of the machine and reduce the human work consumption.

Table 6. Percentage evaluation of the most important technological works
according to tillage system

Technological works	Tillage system		
	Conventional tillage (%)	Minimum tillage (%)	No tillage (%)
Seedbed preparation (including seeding)	47.40	27.60	10.40
Total treatments	9.80	13.50	16.70
Harvesting	42.80	58.90	72.90

By percentage reporting of the most important technological steps to the total costs of technology culture at pea, as seen from table 6, in conventional tillage system predominated the consumption in the stage of preparing the seedbed (including sowing) compared with the minimum tillage systems where this percentage decreases depending on the number of works.

In minimum tillage systems were registers the highest costs in the harvesting of the crop, the stage has the same costs in all three systems, but that percentage is change at the application of the minimum tillage systems in relation to total expenditure.

In technology of pea culture there are elements where applying minimum tillage systems can reduce costs and working time. Seedbed preparation is the element of the culture technology where by applying minimum tillage systems can reduce the cost and time, and fertilization is the element in which is possible to make the economy through the use of legumes in crop rotation.

For seedbed preparation costs geting at 232.2 ron/ha in conventional tillage system and 98.7 ron/ha in minimum tillage system, in no tillage system this technological stage being eliminated.

CONCLUSIONS

The favorable climatic conditions of the 2014 influenced the yield of peas, the differences being very significant positive compared to the average of the two years, while the 2015 has registered very significant yield declines.

Soil tillage system affects the yield, in unconventional tillage systems (minimum tillage and no tillage) is obtained a lowering of values with very significant differences compared to the classical system.

In the system with a minimum tillage is savings of 133.8 ron/ha respectively 202.2 ron/ha as compared to the classical system, if we relate to all factors involved in technology, compared with the conventional system, where is recording a cost of 1047 ron/ha.

After applying minimum tillage systems reduces the amount of fuel used, at the tillage soil with chisel using only 20.3% of the total fuel required in the case of plowing, and at directly sowing is register a low percentage of 17.9 compared to plowing.

By reducing or eliminating the number of works required to prepare the seedbed is achieved significant savings in fuel and time.

BIBLIOGRAPHY

1. Allmaras, R. R., Black, A. L., & Rickman, R. W. (1973). Tillage, soil environment and root growth. In Proc. Natl. Conserv. Tillage Conf.., Des Moines, IA. Soil Conservation Soc. of Am., Ankeny, IA, pag: 62-86.
2. Berca, M. (1998). Strategii pentru protecţia mediului şi gestiunea resurselor, Editura Grand, Bucureşti;
3. Berca, M. (1999). Optimizarea tehnologiilor la culturile agricole, Editura Ceres, Bucureşti.
4. Frye, W. W., Blevins, R. L., Murdock, L. W., & Wells, K. L. (1981). Energy conservation in no-tillage production of corn. Crop production with conservation in the 80s. Amer. Soc. Agr. Eng., St. Joseph, Mich. Publ., pag: 7-81;
5. Griffith, D. R., Mannering, J. V., & Box, J. E. (1986). Soil and moisture management with reduced tillage, p. 19-55. In M.A. Sprague and G.B. Triplett (ed.). No-tillage and surface-tillage agriculture. Wiley, New York.
6. Haliniarz, M., Gawęda, D., Kwiatkowski, C., Frant, M., & Różańska-Boczula, M. (2014). Weed biodiversity in field pea under reduced tillage and different mineral fertilization conditions, Bulgarian Journal of Agricultural Science, 20 (No 6), pag: 1340-1348.
7. Knight, S. M. (2004). Plough, minimal till or direct drill? Establishment method and production efficiency. In: Anon. (Eds.), HGCA Conference 2004: Managing Soil and Roots for Profitable Production. London, Home Grown Cereals Authority.
8. Köller, K. (2003). Conservation tillage- technical, ecological and economic aspects, Conservation Tillage and Direct Seeding Workshop, Izmir, pag: 9-34.
9. Phillips, S. H. (1984). Introduction. In No-tillage agriculture: Principles and practice. Van Nostrand Reinhold, New York, pag: l-10.
10. Ranjan, S., Kumar, M., & Pandey, S.S. (2006). Genetic variability in peas (*Pisum sativum* L.). Legume Res 29, pag: 311-312.
11. Rusu, T., Guş, P., Bogdan, I., Moraru, P. I., Pop, A. I., Clapa, D., Marin, D. I., Oroian, I., & Pop, L.I. (2009). Implications of minimum tillage systems on sustainability of agricultural production and soil conservation, Journal of Food, Agriculture & Environment Vol.7 (2), pag: 335-338.
12. Standifer, L. C., & Beste, C. E. (1985). Weed control methods for vegetable production with limited-tillage, Weed control in limited tillage systems. Weed Sci. Soc. Amer. Monogr. 2., Ed. A.F. Wiese, pag: 93-100.
13. Stănilă, S., Drocaş, I., Molnar, A., & Ranta, O. (2008). Analiza comparativă a consumurilor energetice la prelucrarea solului cu tehnologia clasică şi tehnologia de conservare a solului, Sisteme de Lucrări Minime ale Solului, al 5-lea Simpozion cu Participare Internaţională, Ed. Risoprint, Cluj-Napoca, pag: 61-65.

14. Şimon, A., Cheţan, F., Cheţan, C., Ignea, M., & Deac, V. (2014). Rezultate privind influenţa densităţii şi a fertilizării asupra producţiei la soiurile de mazăre de tip afila, AN. I.N.C.D.A. Fundulea, Vol. LXXXII, pag. 227-232.

15. Woźniak, A. (2013). The Yielding of Pea (*Pisum sativum* L.) Under Different Tillage Conditions Acta Sci. Pol., Hortorum Cultus 12(2), pag: 133-141.

16. ***ANOVA (2015). PC program for variant analyses made for completely randomized polifactorial experiences. USAMV Cluj-Napoca, Romania.

POTATO IN THE AGRICULTURE OF COVASNA COUNTY, IN THE CONTEXT OF MUTATIONS WITHIN THE ROMANIAN AGRICULTURAL SECTOR

ALECU IOAN-NICULAE[1], GYORGY SZABO[2], NAGY CAROLY[3], ANGELESCU IRINA[4]

Abstract

This paper represents an analysis of the way in which the potato-growing areas and yields obtained in Covasna County have evolved, compared to the situation existent at national level. In the introduction and in the first part of the paper, the global and European situation is also mentioned, taking into account the special importance of potato in the human diet in different areas of the world. The period between 2006 and 2014 is analysed, with a special focus on the situation existent in 2014 and with references to the national situation, as it was mentioned before. The evolution of potato-growing areas and yields is also analysed, in comparison with other crops in the production structure of the county, with the aim to explain the meaning of this evolution and taking into account the special importance this crop has always had in the economy of the county. Although the potato-growing areas in the Covasna County have registered, similar to the national situation, a sharp decline, potato continues to have a special significance in the agricultural economy of the county, as well as in the agricultural economy of the entire country, that continues to be ranked the third place among the potato-growing countries at the European level.

Key words*: potato, cropped areas, yields, area diminishing, climatic conditions*

INTRODUCTION

Due to the particular importance potato has in human diet, globally, it has a large spreading area. In the last years, the trend has been to diminish the potato-growing areas, in the context of a spectacular growth of the yield per ha, and of the development of a food industry that offers a different value to the processed potato. The data from FAO indicate that, globally, the potato-growing areas have stabilized around the level of 18-19 million ha, and in 2014, the global production was of 385 million tons. One third of this production is obtained in Europe (122.6 million tons), and as regards this quantity, half is obtained in the European Union countries, meaning 58.6 million tons.

As at the global level, at the European Union level, a decrease of potato-growing areas has been registered, at the same time with an increase of the yield/ha, especially in countries with a technology-based agriculture, but also in countries such as Poland, where the agriculture was supported post-accession.

MATERIAL AND METHOD

In the European developed countries, that use a high degree of technology in agriculture, the potato-growing areas have decreased considerably in the last years, but, in exchange, the yields per hectare have increased. Romania has also indicated a decrease of the potato-growing areas, but the increase of the yield per hectare has had much lower values than in the European states with a developed agriculture. In the analysis of the general situation of Romania, focused mainly on Covasna County, statistical data from the Romanian National Statistics Institute, Ministry of Agriculture and Rural Development and FAO have been compared and interpreted. The conclusions at the end of this article are also based on the interpretation of the statistical data provided by these sources.

---

[1] Prof. Alecu Ioan-Niculae, Ph.D., U.S.A.M.V. Bucharest, alecuioannicolae@yahoo.com
[2] Gyorgy Szabo, engineer, Ph.D. student. U.S.A.M.V. Bucharest, szabogyorgy68@yahoo.com
[3] Nagy Caroly, engineer, Ph.D. student. U.S.A.M.V. Bucharest, nagycaroly@yahoo.com
[4] Angelescu Irina, engineer, Ph.D. student, USAMV Bucharest, anda_irina@yahoo.com

RESULTS AND DISCUSSIONS

According to FAO, in 2014, Romania was the third potato grower in Europe, according to the area, preceded by Poland and Germany, and the seventh, according to the production, preceded by Germany, France, Poland, the Netherlands, Belgium and the United Kingdom.

Table 1. Potato-growing areas and total yields in the European Union, in 2014

No.	Country	Cropped area (ha)	Total yield (tons)
1	Austria	21,400	750,600
2	Bulgaria	10,205	132,651
3	Cyprus	4,741	126,080
4	Denmark	40,200	1,733,400
5	Estonia	6,400	117,300
6	Finland	22,000	600,300
7	France	168,000	8,054,500
8	Germany	244,800	11,607,300
9	Greece	23,700	642,200
10	Hungary	20,980	567,430
11	Croatia	10,310	160,847
12	Ireland	9,500	383,000
13	Italy	52,349	1,365,440
14	Latvia	11,100	209,900
15	Lithuania	27,300	468,500
16	Malta	700	12,559
17	the Netherlands	155,502	7,100,258
18	Czech Republic	23,993	697,539
19	Poland	276,927	7,689,180
20	Portugal	27,200	534,200
21	Romania	202,657	3,519,329
22	Slovenia	3,600	96,844
23	Slovakia	9,105	178,817
24	Spain	75,800	2,467,600
25	Sweden	23,800	822,100
26	United Kingdom	140,000	4,213,000
27	Belgium	81,121	4,380,556
28	Luxembourg	607	18,979

Potato yield in Romania amounts yearly between three and four million tons, a quantity sufficient for ensuring the domestic consumption - of approximately two million tons per year - and also for seeds (approximately one million tons), processing and fodder (almost 40,000 tons).

The Romanians eat annually in average 92.2 kg of potatoes/inhabitant, ranking fourth in EU. On the first places were ranked Portugal, with 126.9 kg/inhabitant/year, Ireland - 118.7 kg/inhabitant/year and Great Britain with 112.4 kg/inhabitant/year.

The most suitable areas for potato-growing are Brașov, Covasna, Harghita, Neamț, Suceava, Botoșani Counties, closed area for seed potatoes, and for the early potatoes, some areas in Dâmbovița Counties (Lunguleţu, Brezoaiele), Teleorman (Peretu), Olt and Constanța Counties.

Covasna County has always been known as the "Potato County", and the Covasna people, traditionally, are important potato-growers.

In general, agriculture has played - traditionally - an important part not only in Romanian economy, but also in the economy of Covasna County.

46% of the Romanian population lives in the rural area, and 60% of the civilian employed population of the rural area works in the agricultural sector as independent farmers. In Covasna County, in 2014, the weight of rural population is of 50.7%, higher than the national average (Table 2). Consequently, the rural specific is more pronounced in Covasna County than in the rest of the country, in general.

Table 2. Evolution of Covasna County population, in average, in the period 2010-2014

Years	Total (number of persons)	Urban		Rural	
		Number of persons	%	Number of persons	%
2010	231,887	114,330	49.3	117,557	50.7
2011	231,186	113,963	49.2	117,223	50.8
2012	230,600	113,637	49.2	116,963	50.8
2013	230,226	113,556	49.3	116,670	50.7
2014	229,563	113,262	49.3	116,301	50.7

The number of persons employed in agriculture, pisciculture, and forestry was of 3 million in Romania, representing 32.8% of the total employed population. In Covasna County, in 2014, the weight of persons employed in agriculture was of 27.8%, decreasing compared to 2011, when the highest weight of the analysed period was registered, meaning 29%. It also has to be noticed that, since 2012, the weight of population employed in agriculture has started to be slightly lower than the population employed in industry, agriculture and industry being the branches with the highest weight in the economy of Covasna County.

Table 3. Employed population, by activities of the national economy

Covasna County	2009		2010		2011		2012		2013		2014	
	Thousand persons	%	Thousand persons	%	Thousand persons	%	Thousand persons	%	Thousand persons	%	Thousand persons	%
TOTAL economy	83.1	100	80.7	100	81.9	100	84.4	100	83.2	100	83.0	100
Agriculture, forestry and fishing	23.7	**28.5**	23.2	**28.7**	23.8	**29.0**	24.4	**28.9**	23.2	**27.8**	23.1	**27.8**
Industry	23.1	27.8	22.9	28.3	22.9	27.9	23.6	27.9	23.5	28.4	24.6	29.6
Wholesale and retail trade; repair of motor vehicles	12.1	14.5	11.8	14.6	12.1	14.7	12.7	15.0	13.2	15.8	11.8	14.2
Other branches of the economy, cumulated	24.2	29.2	22.8	28.2	23.1	28.2	23.7	28.0	23.3	28.0	23.5	28.3

If in Romania, in 2013, the total agricultural area was of 14.6 million ha, representing 61.29% of the total land resources of 23.8 million hectares, in Covasna County, the weight of the agricultural area was below the national average. The analysis of the mutational indexes of the weight of the agricultural area indicates a decrease both in the EU pre-accession, and post-accession periods, in case of Romania and of Covasna County.

The ratio between the arable land area of Romania and the number of inhabitants indicates that there are approximately 0.41 ha of arable land per each inhabitant in Romania. This value is higher than in many countries in the European Union and almost double compared to the EU-27 average, of 0.21 ha/inhabitant (MARD, 2014).

Table 4. Comparative situation regarding the evolution of the agricultural area in the period 2000-2013

		Romania		Covasna County	
		ha	%	ha	%
Agricultural area	**2000**	14,856,845	62.32%	186,416	50.25%
	2007	14,709,299	61.70%	186,269	50.21%
	2013	14,611,883	61.29%	185,939	50.12%
Mutational index I (2007/2000)		**99.01**		**99.92**	
Mutational index II (2013/2007)		**99.34**		**99.82**	
Total area of the land resources	**2000**	23,839,071		370,980	
	2007	23,839,071		370,980	
	2013	23,839,071		370,980	

Source: Júlia Bíró Boróka, Locul și rolul fermelor mici în ruralul românesc și evoluția acestora sub impactul politicii agricole comune, Editura ASE, București, 2015

It can be said with certainty that the agriculture of Covasna County has a significant potential, with arable lands of more than 83 thousand ha, grazing lands of approximately 61 thousand ha, grassland of approximately 41 thousand ha, and orchards of approximately 592 ha. The arable lands are located mainly in the central part of the county, meaning in the vast Brașov depression and in the river meadows.

Table 5. Land resources, by their use, in Covasna County (hectare)

Covasna County	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total area	**370980**	**370980**	**370980**	**370980**	**370980**	**370980**	**370980**	**370980**	**370980**
Agricultural area - total	**186289**	**186269**	**186289**	**186172**	**186139**	**186114**	**186067**	**185939**	**185939**
out of which, by use category:									
Arable land	83428	86308	83428	83327	83305	83290	83251	83151	83151
Grazing land	60941	58863	60941	60932	60931	60930	60928	60915	60915
Grassland	40906	40092	40906	40899	41311	41302	41296	41281	41281
Orchards	1014	1006	1014	1014	592	592	592	592	592

Source: INSSE Covasna

The largest part of the soils is included in the average fertility class and, a smaller part, in the high fertility class, and the climate conditions allow the majority of cereals, fodder, vegetables and industrial crops to be grown. Traditionally, Covasna County is one of the most important potato and sugar beet growers at the national level, here, the pedo-climatic conditions being ideal for the development of these plants. The orchard grown area has diminished significantly in the last 15 years, currently, it is of approximately 600 hectares.

As regards the weight of agricultural area in the total land resources of Covasna County, it is below the national average of 61.29%, being of 50.12%.

As regards the use of the agricultural land in Covasna County, the arable lands are predominant, being of 45% and having a descending trend during the analysed period.

The weight of grazing lands is between 32 and 35%, having also a descending trend in the entire county. The weight of grasslands varies between 18 and 22%, having an ascending trend between 2000 and 2013. As regards the orchard weight, they occupy less than 1% within OR in Covasna County, while at the national level, it varies between 1.5 and 1.7%. The climatic conditions of

Covasna County result in orchards and vineyards having an extremely low weight in the agricultural economy of the county. Besides, the orchard areas have decreased considerably, from 2006 and until now, being halved.

As regards the structure of the areas cultivated with the main crops, the situation is shown in the next table:

**Table 6. Cropped area, with the main crops (hectare)**

Covasna County	2006	2007	2008	2009	2010	2011	2012	2013	2014
Cropped area - total	**81051**	**79492**	**73571**	**80501**	**73180**	**88635**	**71959**	**75901**	**73709**
Out of which:									
Cereals for the production of grain	38699	33501	37317	40984	32595	42943	33429	36633	36269
▪Wheat and rye	18572	18855	20364	22741	17695	23828	17757	20692	19805
▪Barley and row-barley	11661	8234	10201	11319	8143	9066	7420	5580	5667
▪Grain maize	5893	3908	4403	4564	3858	6644	5577	7276	7039
Oilseed rape	69	97	107	41	294	1142	145	1282	1701
Sugar beet	2688	1943	3050	2585	2952	4204	3036	4169	4157
Potatoes	19631	22388	13550	16497	14904	18299	13153	12889	11937
Vegetables	1845	1939	1522	1426	1055	1497	1403	1280	1238

It can be seen that the largest cropped area was registered in 2011, meaning 88,635 ha. Afterwards, the weight of the cropped areas has started to decline, in 2014 being of 73,709 ha.

From the total of the cropped area, the highest weight is of the cereal crops, with 49.2% of the total cropped area, in 2014. This weight was relatively constant over time.

The cereals are followed, with a significant weight, by the potato-growing areas. However, the weight of this areas has decreased over time, thus, if in 2006 there were 19,631 ha (24.22%), and in the next year 22,388 ha (28.16%), in 2014 their weight has decreased to 16.19% (11,937 ha).

Figure 1. Evolution of the areas under cultivation with the main crops (hectare)
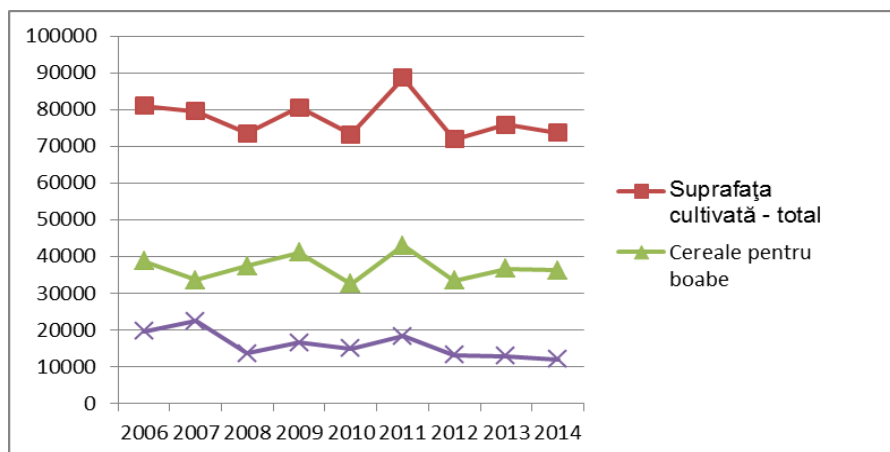
Other important areas are cultivated with sugar beet and vegetables, sugar beet being the only crop the area of which has almost doubled in the analysed period, from 2688 ha in 2006, to 4157 ha in 2014.

Having yields per hectare above the national average for most of the crops, the crop production has registered important variations year by year, being dependent on the climatic factors.

Table 7. Average yield per ha by the main crops and unit categories

(kg/ha)

Covasna County	2006	2007	2008	2009	2010	2011	2012	2013	2014
Cereals for the production of grain	3146	2453	3655	3073	2741	3608	2489	3314	3510
Wheat and rye	3232	2776	4094	3272	2644	3858	2563	2990	3266
Barley and row-barley	2567	1890	2648	2306	2197	2482	2340	2623	2240
Grain maize	4077	2384	4520	4566	4680	4775	2839	5020	5497
Sugar beet	34173	29396	34701	46771	32160	29923	27834	41357	47025
Oilseed rape	1957	1206	1981	2512	1670	2317	2317	2289	2771
Potatoes	15058	15099	17790	19233	19071	20592	11213	22914	25147
Tomatoes	10145	20169	18517	11849	14056	17455	16133	14326	14023
Onions, dried	12172	11324	12099	12093	10182	11510	9673	11137	11832
Garlic, dried	3024	4450	3674	5250	5250	9000	9000	10000	7700
White cabbage	32259	24156	26233	31674	30327	27000	23541	20887	25132
Peppers	8438	7900	8333	8000	14000	11000	12333	6222	7667

**Figure 2. Evolution of yields per hectare, for potato crop,
during the period 2006-2014 (kg/ha)**
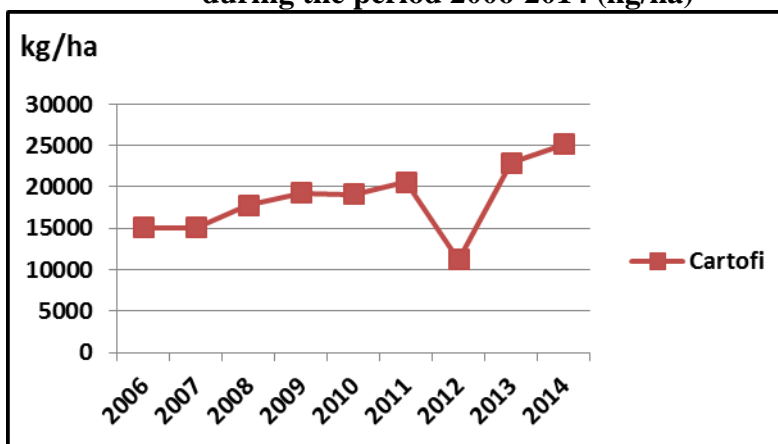
The analysis indicates that the yields are varying year by year, the climatic factor being decisive. For potato, the lowest year was 2012, which was the most unfavourable year for agriculture in general, as regards the climate. However, the main feature of this crop was the increase of yields per hectare. Thus, if in 2006 was of 15,058 kg/ha, in 2014 it was of 25,147 kg/ha.

As regards the agricultural economy of the county and potato crop, the following have to be noticed:

- Until recently, in Covasna County, the potato-growing areas were vast, but in the last years, they have reduced drastically; for Covasna people, potatoes represent more than a plain food, because the welfare of their family depends to a large extent on potatoes.
- The structural post-accession mutations in agriculture have impacted the evolution of the potato-growing areas in Covasna County and elsewhere.
- The problems resulted from the fact that potato growing is very demanding, with high investments and uncertain profits, have determined the farmers in the county to diminish the potato-growing areas or to abandon for good its growing, in favour of more profitable crops.
- The level of yields is also influenced by the efficient technologies, high quality seeds and, to a great extent, by the climatic factors. The dry summers, more frequent in the last years, and also the lack of an irrigation system have resulted in loss of productivity as regards potato, a large water consumer.
- In the last years, the Potato Research and Development Station, Târgu Secuiesc has created more productive and disease- and climate change-resistant varieties that have been patented and awarded at the international exhibitions, but the problem is that "In Romania, the potato seeds are grown only on extremely small areas. As a result, the majority of the farmers are currently forced to buy imported seeds, at a three times higher price than the seeds produced in Romania" (Mike Luiza-Director S.C.D.C. Tg. Secuiesc).
- Many of the seed potato growers could not benefit from the payment of coupled support of EUR 950/ha, because they did not manage to reach the minimum cap of 20,200 kg/ha. Officials of the Ministry of Agriculture consider that the condition imposed to the seed potato growers in order to benefit from the coupled support, meaning the minimum cap of 20,200 tons/ha, is a mistake. It has been assured that the wrong decision will be eliminated in 2017, and the maximum production level will be lowered to approximately 12 tons of seed potatoes per hectare.
- In the last years, the main producers in the county have invested in machineries, have built modern storage areas and have managed to set-up sales channels for potatoes. Thus, they manage to sell their production for supermarkets or processing plants. However, the problem is with the small farmers that are less organized and use less technologies and who struggle to collect their money to be used for the next crop. They are not included in a sale and distribution system, they sell their products by intermediaries in markets or directly in front of their houses. Before the year 1989, the entire yield that was not used for consumption was sold to the Ozun and Tg. Secuiesc starch plants, that were decommissioned after their privatisation.
- The potatoes imported from Germany, Poland, France and other countries in which this crop is subsidised have a lower price than that of the domestic potato.

CONCLUSIONS

The analysis indicated that, although it has a long tradition in Covasna area, in the last years, the potato growing has declined, as regards the cropped areas, the causes being specified above. All these problems have determined the farmers to abandon the potato growing, that is considered unprofitable, and to focus on other more profitable crops.

In order to prevent the problems caused by the lack of water in the vegetation period, determined by the dry summers and the lack of irrigation, the experts suggest the farmers to focus on

early varieties, with a smaller vegetation period and that need less water. Thus, the production costs are diminished and the large losses of production are avoided.

Also, with the aim of streamlining this crop and a profitable valorisation, especially for the small producers, the authorities declare that their own solution is to create associations in view of potato growing and yield valorisation.

To support the seed potato growers and to help diminishing the costs of seeds in order to be used on a large scale by the Romanian farmers, the competent authorities will request the diminishing of the minimum production cap to 12,000 kg/ha in view of obtaining the coupled support.

REFERENCES

1. Bîlteanu Gh., *Fitotehnie*, Editura Ceres, 2001, pag. 215-218
2. Bârnaure V., 1991, *Cartoful în Fitotehnie*, Editura Didactică şi Pedagogică, Bucureşti
3. L. S. Muntean, Mic tratat de fitotehnie, Editura Ceres, 1997, pag. 159-165
4. Júlia Bíró Boróka*, Locul şi rolul fermelor mici în ruralul românesc şi evoluţia acestora sub impactul politicii agricole comune*, Editura ASE, Bucureşti, 2015
5. Eurostat, *Statistical books - Agriculture, forestry and fishery statistics*, 2014 edition
6. FAO Report 2010, part. 3 - *Feeding the world*
7. Anuarele statistice ale României, 2000-2014
8. http://faostat.fao.org/site/567/DesktopDefault.aspx?PageID=567#ancor
9. http://www.fao.org/potato-2008/en/world/index.html
10. http://www.agerpres.ro/social/2014/04/08/destinatie-romania-cartoful-principala-moneda-de-schimb-a-covasnenilor-13-14-31
11. http://www.realitatea.net/suprafe-ele-cultivate-cu-cartofi-in-romania-au-scazut-alarmant-dispare-in-ca-iva-ani_1416655.html#ixzz4MZKlIlUB
12. http://www.romaniatv.net/record-in-agricultura-romaneasca-subventie-de-1-5-milioane-de-euro-pentru-60-de-hectare-de-cartofi_311770.html#ixzz4MZMRnAL2
13. http://www.revista-ferma.ro/articole-horticultura/gheorghe-botoman-cultivatorii-de-cartof-din-romania-simt-ca-li-se-misca-nisipul-de-sub-picioare.html
14. http://www.agroinfo.ro/vegetal/fructe-si-legume/exclusiv-irimescu-recunoaste-ca-plafonul-de-productie-impus-pentru-cartof-e-o-greseala
15. INSSE Covasna – statistici regionale

THE DOMESTIC FRUIT SUPPLY – EVOLUTIONS AND TRENDS

GAVRILĂ VIORICA[1]

Abstract

Domestic fruit supply stability is evaluated taking into consideration the dynamic interactions between production and consumption and testing the synchronization of the supply flow with the consumption demand. The statistical data series from the period 2002-2014 were used, and the forecast of fruit consumption, of the areas under orchards and of average yields was made through the exponential levelling method. The estimates indicate an increase of fruit consumption, except for apples, a decrease of areas and a slight increase of average yields. It can be noticed that under the background of decreasing areas, the slight increase of yields represents only an attenuation factor of foreseeable deficit.

Key words: fruit, supply, demand

JEL Classification: Q 11

INTRODUCTION

Agri-food supply availability and stability depends on domestic agricultural production, on world market conjuncture, on prices and trade policies, on food imports availability, on the level of stocks and on the existing of financial resources for these.

The continuous evolution of food security as operational concept in the public policy reflected the broader recognition of the complexity of involved technical and political problems (Clay, 2002). There is a long-lasting debate on whether food autonomy is a useful strategy to ensure food security. The supporters of this thesis consider that relying on the market to satisfy the food needs is quite a risky strategy due to food price volatility and to a possible interruption in the supply of foodstuffs. The opposite point of view claims that it is costly for a household (or country) to focus on food autonomy, rather than to produce in conformity with its comparative advantages and to procure only certain food commodities from the market (Minot & Pelijor, 2010). From the economic point of view, food security largely relies on the international trade. However, food crises and food price increases worldwide encouraged certain countries to aspire towards higher self-sufficiency levels.

Food supply stability and availability assessment is essential for the determination of the population's food security status in Romania, where agriculture is still facing serious competitiveness problems, a large part of the population is living on very low incomes and the domestic agricultural production is still far from satisfying the population's consumption needs.

Agricultural and food commodity market stability is important both for producers and for consumers: a stable market makes it possible for farmers to plan their production and grow their business and confers access to food at constant prices. An unstable market is characterized by high agricultural price and supply volatility, limiting the consumers' access to food. A stable supply with agricultural products presupposes constant quantities and quality, delivered on time and at relatively stable prices.

MATERIAL AND METHOD

The multidimensional aspects of food security that can be taken into consideration, as regards both food quantity and food quality, are conform with four characteristics:

---

[1] Dr. CSIII VIORICA GAVRILA, Institute of Agricultural Economics, NIER, Romanian Academy, Calea 13 Septembrie no. 13, sector 5, Bucharest, tel/fax:021/3182411; e-mail: vio.gavrila@yahoo.com

1. Food availability – food in sufficient amounts and at adequate quality, supplied by domestic production or from imports (food aid included).
2. Food access – everybody has access (right) to adequate resources to get adequate and nutritious food; from the economic perspective, accessibility represents the possibility of individuals and households to procure food (either self-produced or bought food), without sacrificing other basic needs; physical access implies access to food of all persons, including the physically vulnerable persons such as children, sick people, disabled or elderly people.
3. Stability in availability and access – access to food should not be threatened by the occurrence of sudden shocks (economic crisis or weather factors, for instance) or cyclical events (e.g. seasonal food insecurity).
4. Nutritional health – the food products should respond to the nutritional needs, taking into consideration people's age, living conditions, health, etc.

The nutrition security concept completes the food security concept. Adding the health dimension, nutrition security implies the elimination of any major deficits in minerals and vitamins that most often affect the people who suffer from food deprivation.

The importance of fresh fruit consumption derives from the beneficial effects upon health. Fresh fruit are recommended due to their biochemical composition, mainly due to the content in complex carbohydrates, which are more difficult to digest. Unlike simple carbohydrates, these have multiple beneficial effects: they avoid the high glycemic variations, providing longer satiety and delay the sensation of being hungry. At the same time, it has been proved that on longer term fruit consumption positively influences the levels of "good" cholesterol and hence decreases the incidence of cardiovascular events (Graur, 2006).

Food security assessment is necessary for any development project from the very beginning, in order to identify the unsafe foodstuffs, to evaluate the food shortage and to characterize the nature of food insecurity (seasonal versus chronic food insecurity) (Hoddinott, 1999). Knowing the population's food and nutritional situation presupposes the existence of a set of information with regard to the availability of agri-food products nationwide. The food balance sheet represents the source of statistical data that provides a global framework in ensuring this set of information. By its nature, the food balance sheet represents a synthesis of quantitative information establishing an equilibrium between the resources of agri-food products and their utilization. The analyses of the consumers' real demand patterns for fruit are based on quantitative statistical data coming from the Household Budget Survey.

Fruit supply, as component part of food security, is investigated by two pillars of food security: *availability* and *stability*. Fruit availability presupposes a sufficient amount of fruit of adequate quality, supplied from domestic production of from imports. As stability factor, "food autonomy" is had in view, which reduces the vulnerability to the fluctuations on the foreign markets.

Domestic fruit supply stability is investigated from the perspective of the volatility of yields and prices, using the variation coefficient, calculated as the ratio of the standard deviation to the mean. The higher the variation coefficient, the more volatile are the supply and the prices.

For the estimation of target indicators, the statistical data series from the period 2002-2014 were used, and the forecast of fruit consumption, of areas under orchards and of average yields was possible by using the exponential levelling method.

RESULTS AND DISCUSSIONS

According to Eurostat statistics, in the year 1990, the area cultivated with fruit trees in Romania totalled 230.8 thousand hectares, out of which 90.8 thousand hectares were under apple tree orchards, 8.4 thousand hectares pear tree orchards, 8.0 thousand hectares peach trees, 6.7 thousand hectares apricot trees, 12.2 thousand hectares cherry trees and 101.1 thousand hectares plum trees. The area cultivated with fruit shrubs totalled 3.3 thousand hectares.

In the investigated period, the total area of orchards was down by 86.7 thousand hectares

(-37.6%). The greatest decrease of areas was produced in the apple tree orchards by 34.7 thousand hectares (-38.2%) and in the plum tree orchards, which decreased by 34.5 thousand hectares (-34.1%).

As share in the area of the year 1990, the most drastic diminution of areas was noticed in the area cultivated with fruit shrubs, by almost 91% (3.0 thousand hectares), in the pear tree orchards by 58.3% (4.9 thousand hectares) and in all species of stone fruit, as follows: the area under peach trees was down by 6.3 thousand hectares, i.e. by 78.8%, the area under apricot tree orchards decreased by more than 3.7 thousand hectares (-55,2%), while the area under cherry orchards by 5.8 thousand hectares, by -47.5% respectively.

The establishment of a fruit tree plantation implies high investments, which add to the high maintenance costs until the fruit trees are on bearing. The decreasing trend of areas under orchards has been maintained for most species in the recent period, too, as the renewal rate of new plantations is lower than that of clearings.

Table 1. Evolution of areas under fruit tree plantations

Orchards:	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Apple trees	72.4	71.6	73.4	81.7	59.3	59	54.7	52.6	56.4	52.7	55	60.3	56.1
Pear trees	6.1	5.9	5.3	6.1	4.4	4.6	4.6	4.5	5.1	4.3	3.9	3.9	3.5
Peach trees	3.3	2.9	2.8	2.6	1.9	1.8	1.6	1.6	1.9	1.7	1.9	1.9	1.7
Apricot trees	3.9	3.8	3.5	4.2	2.9	3.3	2.9	2.6	2.6	2.5	2.5	2.8	2.9
Cherry trees	11.7	9.9	9.6	8.7	7.2	7.7	7.6	6.8	6.9	6.9	6.8	7.1	6.4

Source: Eurostat, [apro_acs_a]

The average yields in fruit are fluctuating, largely influenced by the weather conditions and the low yielding potential of orchards. For instance, in the case of apple-trees, 64% of the structure of orchards in Romania is represented by classical orchards, with a density of up to 400 trees/hectare and by old-aged orchards (55% of total area).

Table 2. Evolution of yields in the fruit-tree orchards -100 kg/ha

Orchards:	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Apple trees	67	112	150	75	98	80	83	98	97	116	82	95	99
Pear trees	107	172	86	135	136	134	113	143	114	151	133	145	167
Peach trees	39	61	63	106	88	93	101	99	55	121	84	85	137
Apricot trees	43	108	60	104	127	81	106	122	85	127	111	103	139
Cherry trees	55	97	53	120	141	84	87	97	98	116	100	119	125

Source: Eurostat, [apro_acs_a]

Yields feature instability in all the investigated fruit-tree species, with a high dispersion of the recorded values. In apple trees for instance, the range from the lowest to the highest value is almost twice the lowest yield. For the period 2002-2014, the variation coefficient of yields reveals a high heterogeneity of values in peach trees, of more than 31%, and a medium heterogeneity in the other species. By time intervals, the lowest variability was in the period 2006-2009. These high variations of yields are materialized into a fluctuating supply and consequently, into a high level of instability in supply.

Table 3. Variation coefficient of yields, %

	2002-2014	2002-2005	2006-2009	2010-2013
Apple trees	**22.21**	38	11	14
Pear trees	**17.96**	12	7	5
Peach trees	**31.43**	42	6	31
Apricot trees	**27.24**	41	19	16
Cherry trees	**25.98**	40	26	10

Source: calculations based on NIS data, Tempo online

Apple price is characterized by moderate volatility. However, under the background of the decreasing trend of domestic production, prices have the tendency to increase.

The total fruit production is fluctuating, with years with production peaks and years with poor harvests. The 2004-2014 average was 1372.3 thousand tons, but in the years with poor harvests the production is up to half of that in the very good years. This evolution is also the result of weather conditions (late frosts, drought and hail) and of the low yielding potential of orchards.

The diversification of the fruit production structure is weak. The assortment range is dominated by the production of apples and plums, which together represent almost 80% of the total quantity of fruit.

More than 99% of the fruit production is obtained in the private sector. Extending our analysis by assortments and types of farms, it can be noticed that in the year 2014, 92% of the total fruit production was obtained on the individual farms, as follows: more than 85% of apple production, more than 98% of the pear production; these produce almost 97% of the plum production, mainly used as raw material for distillation. The individual holdings produce 94% of the quantity of cherries and sour cherries and 86% of the quantity of apricots and peaches. The rest of production comes from the commercial companies and other types of holdings.

The supply is highly fragmented at the level of fruit producers, and consequently the production is non-homogenous, non-attractive for the great retail stores and for processors. Among the structural modifications of interest for the increase of self-supply in fruit, we can notice an increasing tendency of the number of holdings ranging in the size category 30-50 hectares.

The quantity of fruit available for consumption is fluctuating, generally following the trend of yearly production. The human consumption availability for fruit varies from year to year, with minimum values of 65.7 kg/capita to 78.2 kg/capita. By types of fruit, we can notice a decrease of consumption availabilities in apples and an increase of meridional and exotic fruit consumption. For the other types of fruit that are produced in Romania, the consumption availabilities are increasing.

Table 4. Average yearly fruit consumption - kg/capita

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Fruit - total	78.2	77.0	84.7	69.9	69.8	65.7	67	74.7	71.1	<u>73.7</u>
Apples	35.2	36.9	34.5	23.6	17.7	20.3	22.5	26.2	24.3	<u>23.5</u>
Peaches	1.8	2.9	2.8	2.3	2.2	1.6	1.6	4	3.4	<u>3.1</u>
Apricots	2.1	2.3	2	1.5	1.6	1.6	1.3	1.8	1.6	<u>1.6</u>
Meridional, exotic fruit	18.1	16.2	24.7	22.8	26.1	19.4	20.9	19.2	20.6	<u>23.1</u>

Source: calculations based on NIS data, Tempo online

Self-sufficiency in fruit decreased over time, from 91% in 2004 to 79% in 2013; this phenomenon is manifested in all types of fruit. However, the most drastic decline was noticed in peaches, where, under the background of orchard ageing and clearings, self-sufficiency decreased from 58% to 32%.

Graph 1. Self-sufficiency in fruit, in the period 2004-2013
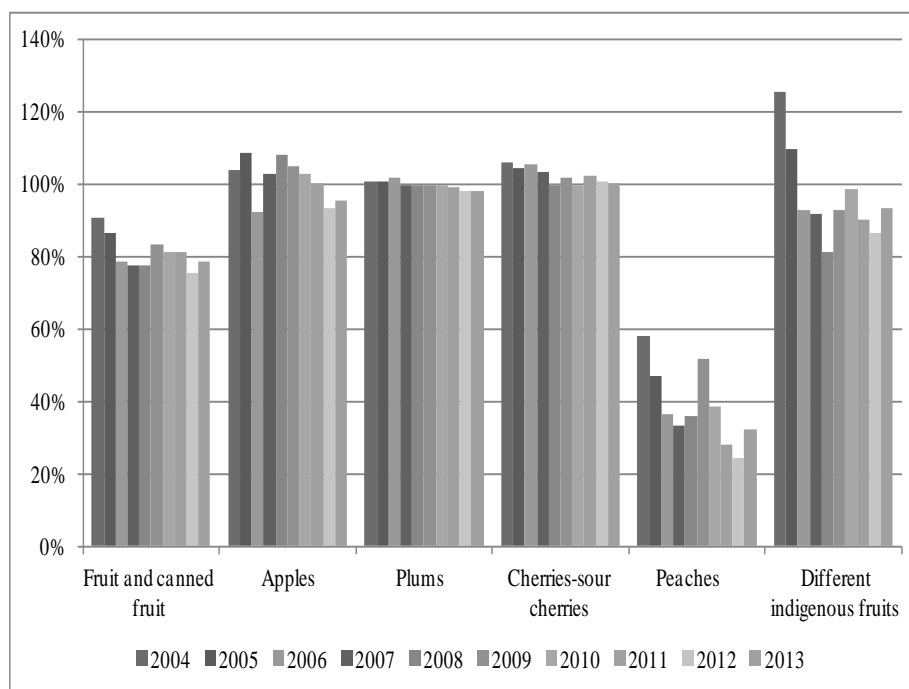
Source: calculations based on NIS data, Supply balance sheets, 2004-2013

The estimates for the next ten years reveal fruit consumption increase, except for apple consumption, a diminution of areas and a slight increase of average yields. It is estimated that the consumption of meridional and exotic fruits will increase by 19%, while the apple consumption tends to decrease (by 16%). We estimate that the decreasing trend of apple consumption can be reversed, if the supply is adapted to the new market requirements. For peaches, the forecast indicates consumption increase by 44%, while for cherries and sour cherries by 13%.

Graph 2. Forecast evolution of fruit consumption
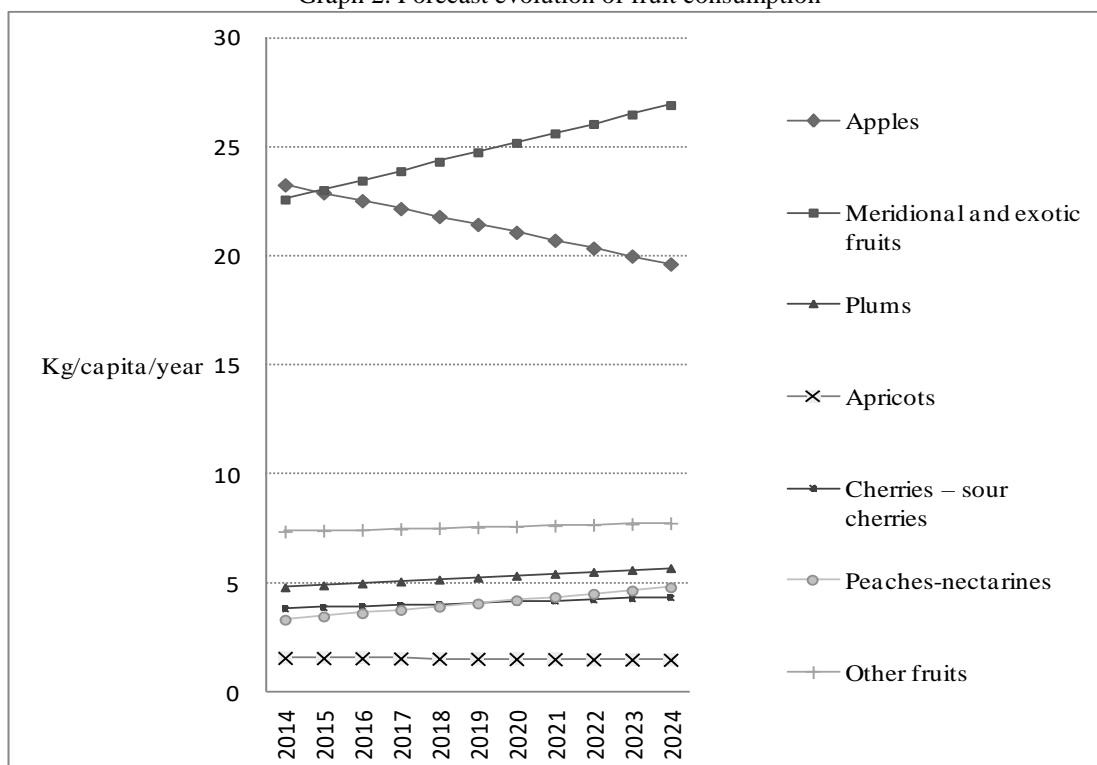
Source: calculations based on NIS data, Tempo online

The forecast evolution of areas and yields reveals the diminution of areas under orchards and a slight increase of average yields. The quite slow increase of fruit production will be accompanied by demand increase. In this context, under the background of decreasing areas, the slight increase of yields will offset the foreseeable deficits, yet it cannot fully cover the consumption needs.

Fruit production can increase mainly by the replacement of existing orchards and less by the enlargement of cultivated areas. The necessary investments for reaching the proposed targets can be made under the National Rural Development Plan 2014-2020, the Fruit-tree Subprogram, consisting of a set of specific measures that respond to the sectoral needs: increase of old orchards renewal rate, farm technical endowment, renewal of farmers' generations, adding value to products through processing, increasing the organization and cooperation level.

We estimate that in the period 2016-2020, the investments in new plantations should cover about four thousand hectares of apple and peach orchards respectively, while for cherry and sour cherry orchards about one thousand hectares so as to reach a self-sufficiency level of 86.5% for total fruit, while consumption per capita should increase up to 89 kg/capita, including the meridional and exotic fruits.

CONCLUSIONS

The importance of fresh fruit consumption derives from the beneficial effects upon health, while in the multicriterial analysis of food security, nutrition quality increasingly influences people's heath condition.

At present, the efforts for increasing the food security level focus on supply stability and stability of access to food. The autonomy provided by domestic production, excluding exports as a main supply source contributes to food security level increase.

Depending on the two criteria of productive potential evaluation, i.e. age and density classes, Romania's situation is quite unfavourable. This adds to the sector organization modality. There is a high fragmentation of fruit supply at producer level and consequently the production is non-homogenous, non-attractive for the large retailers and for processors.

So far, the main financing measure of the sector was represented by the financial support provided to the producer groups. As the support is devoted to the commercialization component, this measure has not responded to the concrete sectoral needs represented by great structural constraints.

Domestic supply stability is mainly disturbed by the high variability of yields and to a less extent by price volatility.

The estimates reveal the increase of fruit consumption, except for apple consumption, the diminution of areas and a slight increase of average yields. The apple consumption diminishing trend has taken place under the background of production diminution and price increase. This trend can be reversed, on the condition of constant supply and at relatively stable prices.

It can be noticed that under the background of decreasing areas under orchards, the slight increase of yields only attenuates the foreseeable deficits, and the successful implementation of the Fruit-tree Subprogram is crucial for the increase of self-sufficiency in fruit.

REFERENCES

1. Clay, E. (2002). *Food Security: Concepts and Measurement* . Rome: Paper for FAO.
2. Graur, M. (2006). *Ghid pentru alimentaţia sănătoasă,*. Iaşi: Editura Performantica.
3. Hoddinott, J. (1999.). *Choosing outcome indicators of household food security. .* Washington, DC: International Food Policy Research Institute, .
4. Minot, N., & Pelijor, N. (2010). *Food security and food self sufficiency in Bhutan.* Washington, D.C.: International Food Policy Research Institute (IFPRI) and Ministry of Agriculture and Forests.

INTERNATIONAL, EUROPEAN AND ROMANIAN DEVELOPMENTS RELATED TO THE DAIRY COWS: LIVESTOCK AND PRODUCTION OBTAINED

ALECU IOAN-NICULAE[1], NAGY CAROLY [2], GYORGY SZABO [3], ANGELESCU IRINA[4]

Abstract: *Considering the population growth and the need to ensure food security, and also the fact that milk represents one of the basic foods in the diet of children and of adults, this paper seeks to obtain an image that is as accurate as possible of the evolution of dairy cow sector, at the global and European level and also in Romania. By using as working method the direct observation without intervention and by consulting the specialized bibliographical references, we have tried to select the most representative statistical data allowing us a proper analysis of the development of dairy cow sector. The analysis of the development of this sector at the international and European level indicated that the results obtained are decisively influenced by the production potential of the biological material and by the development of the exploitation technologies. Over time, the evolution of livestock was different, according to the development level of countries located in different geographical areas. While in areas such as North America and Europe, a decrease of livestock was noticed, at the same time a s a significant increase of production, in Africa and Asia, the increase of milk production was almost exclusively accomplished by increasing the cattle herd. In Romania, since 1989, the dairy cow sector has been undergoing a strengthening and development process, and the Ministry of Agriculture and Rural Development, by the National Strategy for the Development of the Livestock Sector establishes clear objectives and priorities for its support. The analysis performed allows us to consider that, at least for Romania, the dairy cow sector is yet an inadequately capitalized opportunity that could place our country as a front-runner on the European market.*

Key words*: dairy cows, livestock evolution, milk production, modern technologies, biologic material*

INTRODUCTION

Considering the special attention given to the food safety and the fact that milk is a basic food product, with a special impact on the harmonious growth of children, and also on the healthy diet of adults, the importance of raising dairy cattle has increased in the last years, being also aa significant source of income for the producers.

At global level, the bovine milk production is ranked at the first place, followed by ovine and caprine milk production. However, it has to be noticed that in some areas around the globe, other sources of milk exist, such as mare, llama, yak, zebu, camel, donkey and others.

It also has to be mentioned that, while in the developed countries, milk is produced in intensive exploitations for dairy cattle raising, with modern technologies and high efficiency, in the developing countries, milk is produced by small producers for which this activity represents an important source of income.

The developed countries accomplish approximately 70% of the global milk production and only 30% are produced in the developing countries, being also noticed that, in the last years, while in the developed countries, there has been a tendency to diminish cow milk production, in the developing countries, it has highly increased.

[1] Prof. Alecu Ioan-Niculae, Ph.D., U.S.A.M.V. Bucharest, alecuioannicolae@yahoo.com
[2] Nagy Caroly, engineer, Ph.D. student. U.S.A.M.V. Bucharest, nagycaroly@yahoo.com.
[3] Gyorgy Szabo, engineer, Ph.D. student. U.S.A.M.V. Bucharest, szabogyorgy68@yahoo.com
[4] Angelescu Anda-Irina, engineer, Ph.D student, USAMV Bucharest, anda_irina@yahoo.com

MATERIAL AND METHOD

Livestock farming is an important component of a sustainable agriculture, contributing to the general development of agriculture and the long term evolution of rural area. Starting from its current and prospective importance, this paper analysed and explained the evolution of dairy cow herds and yield, at global, European and Romanian level, from 1980 to 2012. This analysis is based on statistical data offered by the Ministry of Agriculture and Rural Development in Romania, FAO and EUROSTAT.

RESULTS AND DISCUSSIONS

Currently, at global level, the trends regarding cattle raising and exploitation are related to two issues: on one hand, the increase of livestock, and on the other hand, the continuous increase of production. Results obtained in cattle farming are mainly determined, more than in other sectors, by the production potential of the biologic material and streamlining the exploitation technology by concentration, specialisation and increasing of intensiveness.

The fast rate of agricultural development in the last decades, as a result of intensiveness increase, continuous upgrading of the exploitation technologies etc. has led undoubtedly in the developed countries to individual average productions of more than 8,000 kg of milk for the majority of specialized dairy breeds, with a possible future increase to 9,000 kg. Unfortunately, the gap in comparison to the less developed countries is very wide.

The requirements and the development pace of society have imposed different directions to the breeders regarding the evolution of livestock and milk production. But, in general, the accentuated population growth has also led to the increase of foodstuff demand, that may be solved only by increasing the production supported by the use of modern production technologies.

Global and European current situation of dairy cow raising

In the last 20 years, the bovine herds have increased with 12.6%, with an average of 0.74% per years, being noticed that this value has decreased during that period (Table 1). During this period, in Africa, South America and Asia, the increase was of 45.3%, 18.44% and 16.6% respectively, compared to 1995. The situation was different in North America and Europe where, due to the political and economic changes in the majority of ex-communist countries, a decrease of the total bovine herds is noticed in the developed countries, at the same time as the increase of their production potential.

The most numerous herds are in Asia, namely 34.44% of the total bovine herds existent at global level in 2012, fact that is undoubtedly determined by the large area of this continent compared to the other continents. Asia is followed by South America (23.46%), Africa (20.15%), Europa (8.2%), North America (6.9%), and Oceania (2.6%). (Table 1)

Table 1. Evolution of cowherds, total and by continents during the period 1995-2012 (thousand head)

COWS	YEARS					Increase in 2012 compared to 1995	
	1995	2000	2005	2010	2012	Thousand head	%
TOTAL GLOBAL	1,313,094	1,302,894	1,355,947	1,371,166	1,478,720	165,626	12.6
AFRICA	202,942	226,624	250,492	285,504	297,987	95,045	45.3
NORTH AMERICA	115,494	111,400	110,363	106,895	103,074	-12,420	-
SOUTH	293,005	292,797	315,057	322,791	347,055	54,050	18.44

AMERICA							
ASIA	436,743	463,260	471,327	480,312	509,297	126,604	16.6
EUROPE	178,332	150,647	140,749	138,300	121,797	-56,535	-
OCEANIA	35,778	36,094	38,220	37,586	39,345	3,567	9.9

The increase trend was also registered for bovines raised and exploited for milk, the differences between areas being maintained, but in different proportions, by continents. Thus, the number of dairy cattle has increased from 1980 to 2012 with 56,685 thousand head, namely with 26.58% in average per year, at global level (Table 2). The highest increase is noticed in the developing countries also, in Africa (304.05%), Asia (220.76%) and South America (44.58%). The most important livestock decrease was in North America (-48.49%) and Europe (-40.29) (Table 2).

Table 2. Evolution of cowherds raised for milk production at the global level in the period 1980-2012 (thousand head)

SPECIFICATIONS	YEARS					2012/ 1980	Out of total (%)
	1980	1990	2000	2010	2012		
TOTAL GLOBAL	213,192	223,296	226,863	262,773	269,877	56,685	26.58
AFRICA	21,993	29,047	41,742	64,497	66,870	44,877	304.05
NORTH AMERICA	21,015	19,556	20,484	10,090	10,192	-10,823	-48.49
SOUTH AMERICA	25,203	28,698	31,224	36,304	36,441	11,238	44.58
ASIA	47,531	55,032	77,134	99,969	104,933	57,402	220.76
EUROPE	93,536	87,022	50,714	38,745	37,693	-55,843	-40.29
OCEANIA	3,914	3,941	5,563	6,285	6,763	2,879	173.55

In the European Union, the only states that have registered increases of livestock during the period 2000-2012 were: Croatia, Cyprus, Greece, Latvia and Portugal. However, we may consider that these increases were not significant, compared to the decrease of livestock in the other member states. The highest livestock decrease was registered in Germany, namely 2,181 thousand head. It can be noticed that our country is ranked at the second place, with 1,062 thousand head. (Table 3)

Table 3. Evolution of cow livestock in the European Union during the period 2000-2012 (thousand head)

Country	2000	2005	2010	2012
Total EU	98,063	91,779	89,864	88,137
Austria	2,172	2,011	2,026	1,976
Belgium	3,041	2,699	2,593	2,484
Bulgaria	682	671	563	558
Croatia	426	471	444	452
Cyprus	54	61	54	57
Czech Republic	1,573	1,397	1,328	1,354
Denmark	1,868	1,570	1,571	1,607
Estonia	267	250	235	246
Finland	1,057	959	926	913
France	20,310	19,310	19,546	19,005
Germany	14,658	13,034	12,809	12,477
Greece	602	605	679	685
Ireland	7,037	6,982	6,606	6,754
Italy	7,162	6,304	6,103	6,252
Latvia	378	371	378	381
Lithuania	898	792	759	752

Luxembourg	205	185	199	188
Malta	19	19	15	15
Great Britain	11,133	10,770	10,112	9,900
the Netherlands	4,070	3,799	3,975	3,879
Poland	6,083	5,483	5,724	5,777
Portugal	1,421	1,443	1,447	1,497
Romania	3,051	2,808	2,512	1,989
Slovakia	665	540	472	463
Slovenia	471	451	473	462
Spain	6,217	6,463	6,075	5,813
Sweden	1,687	1,605	1,537	1,500
Hungary	857	723	700	698

Source: FAOSTAT data processing

Global and European milk production

As regards milk production increase, in the developing countries, it was based mainly on the increase of cow livestock, compared to the developed countries where this increase was based especially on a continuous development at the individual level of production, resulted from advanced breeding and exploitation techniques, biologic material of high quality etc. Hence, in the highly industrialised countries, a drastic drop of livestock was registered, at the same time with a strong growth of average milk production (Table 4).

Table 4. Evolution of average cow milk production at the global level (kg/head)

SPECIFICATIONS	1980	1990	2000	2010	2012	EVOLUTION 2012/1980	
						Kg/head	%
TOTAL GLOBAL	**1957**	**2129**	**2162**	2292	2318	361	18.44
AFRICA	483	487	473	503	513	30	6.2
NORTH AMERICA	3638	4334	4749	9485	9744	6106	267.8
SOUTH AMERICA	956	1073	1432	1720	1816	1899	89.9
ASIA	695	987	1241	1626	1617	922	232.6
EUROPE	3385	3771	4133	5348	5380	1995	58.9
OCEANIA	3128	3633	4221	4152	4377	1249	39.9

Source: FAOSTAT data processing

Figure 1. Dynamics of average milk production at the global level
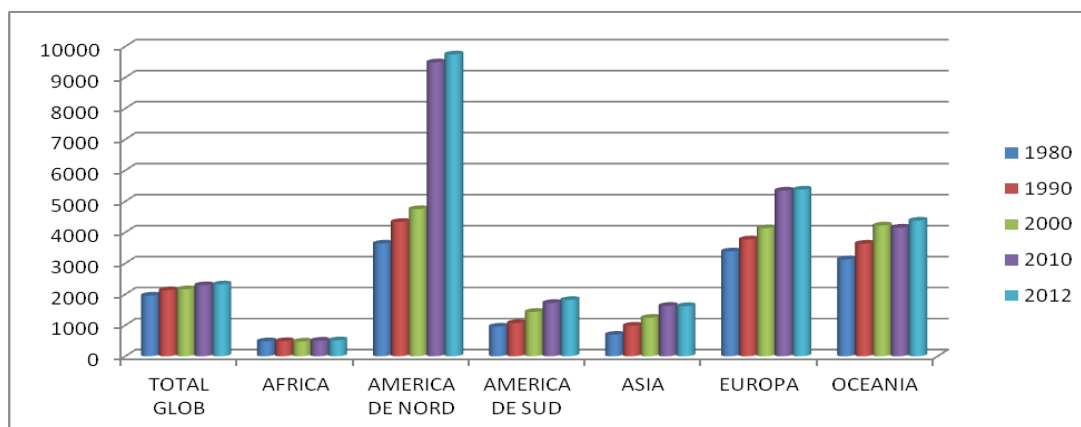
Following the analysis of total milk production, the conclusion is that it is determined mostly by the evolution of the cow livestock, but with significant differences resulted from the development level of the states located in the reference area.

In 2012, compared to 1980, the total global milk production has registered an increase of 49.9 but with a different repartition by continents. Thus, the milk production in Asia has increased 4 times compared to 1980, with 457%. In the last three decades, there are also production increases in South America - 274.6%, Africa - 322.9% etc. (Table 5)

Table 5. Evolution of total milk production by continent (thousand ton)

Area	YEARS				EVOLUTION 2012/1980	
	1980	2000	2010	2012	2012/1980	%
TOTAL GLOBAL	417,216	490,610	602,444	625,754	208,538	49.9
AFRICA	10,622	19,762	32,496	34,306	23,684	322.9
NORTH AMERICA	76,452	97,290	95,718	99,316	-22,864	-22.0
SOUTH AMERICA	24,094	44,721	62,454	66,185	42,091	274.6
ASIA	37,137	94,449	162,552	169,765	132,628	457.1
EUROPE	316,619	209,718	207,235	210,336	-106,283	-66.4
OCEANIA	12,242	23,485	26,103	29,603	17,361	241.8

Source: FAOSTAT data processing

Figure 2. Evolution of total milk production by continent
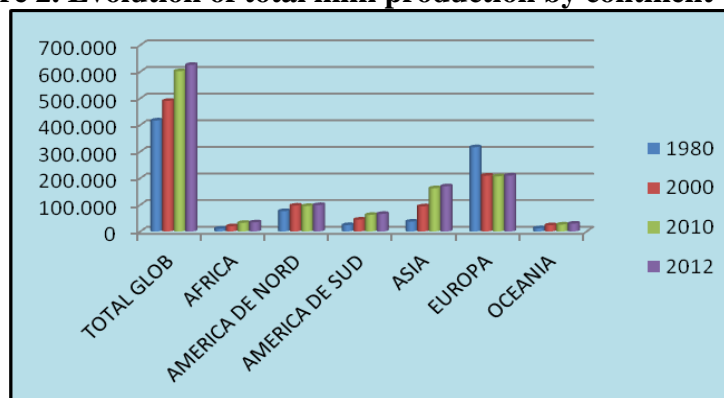
As regards the total milk production in the European Union, the variations are rather high. The sharpest decrease was in Poland (3813 thousand ton), France (3309), Great Britain (2090) and Germany (1553), in general due to livestock diminishing. It has to be noticed also that countries like Germany, France and Great Britain have compensated the livestock decrease by very high yields. The only countries that have registered increases are the ex-communist countries, such as Czech Republic, Estonia, Latvia, Lithuania, and also Portugal, Malta, Luxembourg. The highest increases are registered by Portugal, 1181 ton, and Romania, 334 ton. In general, the total production increases are closely connected to the livestock increases, but, as a positive fact for Romania, the increase is based on yield.

Table 6. Dynamics of total milk production in European Union (thousand ton)

Country	1980	1990	2000	2010	2012
Austria	3,430	3,350	3,340	3,258	3,382
Belgium			3,689	3,067	3,432
Belgium-	4,033	3,900			

Luxembourg					
Bulgaria	1,828	2,101	1,410	1,124	1,093
Croatia			606	769	786
Cyprus	33	100	146	151	153
Czech Republic			2,789	2,683	2,814
Denmark	5,117	4,741	4,719	4,909	5,008
Estonia			629	675	720
Finland	3,275	2,816	2,450	2,336	2,296
France	27,292	26,135	24,998	23,331	23,983
Germany	32,059	31,307	28,331	29,616	30,506
Greece	665	618	748	852	800
Hungary	2,544	2,846	2,142	1,684	1,798
Ireland	4,717	5,402	5,159	53,270	5,379
Italy	10,644	11,120	12,309	10,500	10,579
Latvia			823	831	870
Lithuania			1,713	1,732	1,774
Luxembourg			264	295	289
Malta	28	24	48	42	43
the Netherlands	11,785	11,226	11,155	11,626	11,675
Poland	16,480	15,832	11,889	12,278	12,667
Portugal	757	1,530	1,997	1,897	1,938
Romania	3,995	3,408	4,301	4,410	4,329
Slovakia			1,067	917	973
Slovenia			649	625	601
Spain	6,053	5,825	6,106	6,357	6,313
Sweden	3,465	3,508	3,348	2,902	2,901
Great Britain	15,974	15,251	14,488	14,071	13,884

Source: FAOSTAT data processing

Evolution of dairy cow livestock and of production in Romania

For Romania, bovines represent one of the most important species of the farm animals, and their breeding has to be analysed from two points of view: on one hand, the industrial, intensive exploitation, where livestock is concentrated in small areas and a high milk yield is obtained, and, on the other hand, the subsistence farms. The subsistence farms include the majority of cows in the country, cattle rearing being the base occupation in the rural areas, providing low, but regular family incomes, especially in the mountainous and semi-mountainous areas.

The current situation of the cattle farming sector and of others is the result of the social and economic changes that took place in Romania following the 1989 Revolution.

Until 1990, in the years of planned economy, the evolution had been characterized by the increase of livestock, the annual average being 2.89%. Since 1990, a sharp decline of livestock has started, currently having the lowest total livestock in 100 years. An important consequence of this radical transformation in Romania is the lowest bovine load per 100 ha of agricultural land among the European countries, of only 15 heads, out of which 11.74 are cows.

A positive feature has to be mentioned, that has been registered in the last years, namely the ascending evolution of the total milk production, as a result of the individual performances of cows. Although the production obtained from a suckling cow has a modest level compared to other European states, it registers an annual average increase of 4.07%.

The data from MARD show the following situation regarding the evolution of livestock and of yields from 1989 and until now:

Table 1. Dynamics of reproductive herds and of milk production during the period 1989-2001-2013

SPECIFICATIONS	MU	1989	2001	2002	2003	2004	2005	2006
Total livestock out of which:	thousand head	6,291	2,800	2,878	2,897	2,801	2,862	2,934
Reproductive herd		2,468	1,746	1,759	1,757	1,755	1,812	1,810
Average milk production	l/head	1,892	3,014	3,133	3,263	3,493	3,510	3,688
Total milk production, out of which:	thousand hl	41,195	51,000	52,761	55,288	55,444	55,334	58,307
Goods production		-	24,017	5,006	25,937	27,629	28,000	28,834
SPECIFICATIONS	MU	2007	2008	2009	2010	2011	2012	2013
Total livestock out of which:	thousand head	2,819	2,684	2,512	1,985	2,130	2,164	2197
Reproductive herd		1,732	1,639	1,569	1,282	1,312	1,352	1,369
Average milk production	l/head	3,564	3,653	3,807	2,595	3,529	3,417	3,385
Total milk production, out of which:	thousand hl	54,875	53,089	50,570	42,824	43,807	42,036	42,600
Goods production		26,868	28,197	25,310	17,433	22,321	21,462	21,894

Source: MARD

Figure 3. Evolution of livestock and milk production
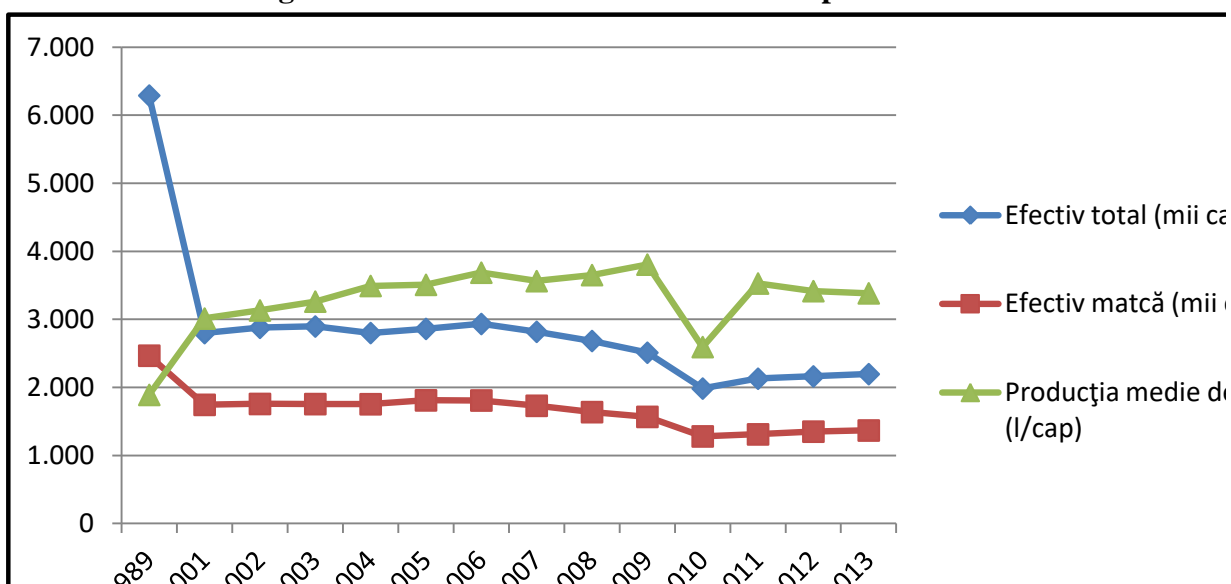
As regards the development of dairy cow sector in Romania, the National Strategy for the Development of Livestock Sector has the following main objectives:
-   Recovery of the cattle rearing sector, in view of stimulating cow milk production.
-   Providing the necessary of milk and dairy products at the level of European standards.
-   Ensuring the food security of population with milk and dairy products.
-   Accomplishing an optimum load of animals per area unit in view of using the production potential of the forage area.
-   Stimulating the setting up of efficient and competitive farms by switching from the production used for own consumption to the commercial production.
-   The financial support of milk production, in order to compensate the valuation price at the producer using the same criteria as in EU.

CONCLUSIONS

The analysis has shown the following features:
- At the global level, in the last 20 years, the cattle herds have increased with 12.6% per total.
- In areas such as Africa, South America and Asia, the increases have been higher than in the developed areas of the globe. However, in North America and Europe, a livestock diminishing phenomenon is noticed, at the same time as the increase of its production potential.
- In the developing countries, the increase of total milk production was accomplished mainly with the help of increasing the cattle herds, while in the developed countries, this increase was obtained mainly by the modernization and continuous upgrading of production and exploitation technologies
- At the level of the European Union, few states have registered increases of dairy cow herds. The same countries have also registered production increases, while countries like Germany, France and Great Britain have compensated the livestock decrease by very high yields.
- In Romania, the dairy cow sector still represents an inadequately capitalized resource.

BIBLIOGRAPHY:

1. Constantin Velea, Gheorghe Mărginean, Tratat de creşterea bovinelor, Editura Riscoprint, Cluj Napoca, 2012
2. Gheorghe Georgescu, Cartea producătorului şi procesatorului de lapte, vol. 2, Editura Ceres, 2007
3. Stelian Dinescu, Anne-Marie Tontsch, Creşterea vacilor pentru lapte, Editura Ceres, 2005
4. Tăpăloagă Dana, "Tehnologii de obţinere a laptelui şi a cărnii", 2012
5. Anuarul statistic al României, 2014
6. Dairy statistics, An insider's guide 2011., Agriculture and Horticulture Development Board, Stoneleigh Park Kenilworth Warwickshire CV8 2TL
7. http://www.viva.org.uk/white-lies/who-drinks-milk
8. http://www.ablefood.asia/milkconsumption
9. http://faostat.fao.org/site/535/default.aspx#ancor
10. http://faostat.fao.org/site/613/default.aspx#ancor
11. http://www.dairyco.org.uk
12. http://www.madr.ro/cresterea-animalelor/bovine.html
13. https://www.gazetadeagricultura.info/animale/bovine/18943-avantajele-si-dezavantajele-fermelor-de-vaci-de-lapte-din-romania.html
14. http://ec.europa.eu/eurostat

MILK PROCESSING AND COLLECTION IN ROMANIA – AN ANALYSIS ACROSS REGIONS

MARIANA GRODEA [1]

Abstract: *The excessive farm fragmentation and the permanent decrease of dairy cow herds resulted in the diminution of the milk quantities delivered to processing from 1.8 million tons (43.4%) in 1990 to 1.1 million tons in 2014 (24.3%). The results of the analysis reveal that the milk collection centers authorized for intra-community trade do not operate in all the counties of the country. Nationwide, there are 902 centers, out of which 39% are found in the counties Botoşani (215) and Mureş (139). By contrast, the milk processing factories authorized for intra-community trade operate in almost all the counties (except for Mehedinţi county), 171 in total, the highest concentration being found in the counties Suceava (17), Constanţa (14) and Mureş (12). The support to the milk sector is one of the priority directions of the new NRDP 2014-2020, through investments in the modernization of dairy farms and milk collection centers and distribution of finished products.*

INTRODUCTION

The global milk demand will increase by 36% in the next ten years, largely due to the population growth, increase of prosperity and urbanization in Africa, Asia and Latin America. However, milk demand and supply are facing disequilibrium worldwide, as the increasing demand on the emerging markets cannot be covered by domestic production, while the developed dairy markets that have surplus milk production are confronted with challenges as regards the competition for exports and a decreasing domestic consumption [1].

At the same time, the dairy companies increasingly focus on the importance of milk relevance revitalization among consumers of all ages, through the introduction of innovating products and of a new marketing and communication approach. Consumers consider that milk is "a nutritious", "healthy" food, "a good calcium source" and "tasty", yet for maintaining the relevance of this product in a modern world, the producers have to innovate and develop milk-based drinks adapted to the continuously changing lifestyle, to develop communication campaigns in order to show that milk has benefits, it is a savory food, even a delight and important for everybody [2]. This because worldwide mot consumers continue to have a strongly positive opinion on milk virtues, they understand its nutritional value, yet they consider that the diversity and advantages provided by this product cannot sufficiently keep pace with the modern lifestyle and their expectations.

According to *Euromonitor*, the consumption of simply packed marketed milk is only 36 ml/ person/ day, which is a low level compared to the recommended daily intake. Romania continues to be on the penultimate place in the European Union, its milk consumption being 4.4 times lower than the average milk consumption in Western Europe and 2.4 times lower compared to Eastern Europe. Ireland (356 ml/capita/day), Finland (338 ml/capita/day), Spain (242 ml/capita/day), Denmark (223 ml/capita/day) and Sweden (227 ml/capita/day) continue to be on the first places on this list [3].

MATERIAL AND METHOD

For the hierarchization of the eight statistical regions of Romania from the agricultural potential standpoint, we used a set of specific indicators in the analysis of dairy cow farms

---

[1] Dr. CSIII MARIANA GRODEA, Institute of Agricultural Economics, INCE, Romanian Academy, Calea 13 Septembrie no. 13, sector 5, Bucharest, phone/fax;021/3182411; e-mail: marianagrodea@yahoo.com

performance in Romania; these indicators reflect the regional economic development environment. These regional indicators refer to the average milk yield, dairy farm size, milk production collected by the processing units, the number of dairy factories and milk collection centers approved for intra-community trade. The data source used was the Tempo-online database – time series – NIS, as well as Eurostat, for the period 2007-2014.

The documentation and synthesis of the main ideas was based on the national and international literature on milk market evolution at European level (reports, studies, EUROSTAT, FAOSTAT publications), having in view the future agricultural reform, the European agricultural trade liberalization, the functioning of national markets, the management of risk induced by the current climate changes and the economic-financial crisis.

RESULTS AND DISCUSSIONS

An economically competitive milk production on the European market presupposes the design of production systems and technologies adapted to the various eco-economic-social conditions from our country. The improvement of dairy cattle exploitation systems is the main modality by which Romania can obtain a viable and competitive cattle production [4].

The strategic program for cattle raising and exploitation should lead to the increase in number of dairy herds and their concentration into commercial farms, and mainly to the **productivity increase per animal head**, i.e. the increase of average milk yield, of the protein and fat percentage in milk.

The average milk yield in Romania, among the lowest in Europe (3704 liters/cow head – 2014), can be explained by the low competitiveness of the sector. However, it is worth mentioning that in the period 2005-2014 the average milk yield had a positive evolution, both at national and regional level. Thus, under the background of average national increase by 11% (368 liters), the region Bucharest-Ilfov stands out with 36% (1376 liters). Smaller increases of average yields in the above-mentioned period can be found in the regions South-Muntenia (+3.4%) and South-East (+5.8%). In the zonal hierarchy, in the year 2014, the region Bucharest –Ilfov is on the first place, with an average milk yield of 5200 liters per cow head, followed by the region North-East with 3842 liters/cow head (Figure 1)

Figure 1. Average milk yield across regions, 2014 – liters/cow head
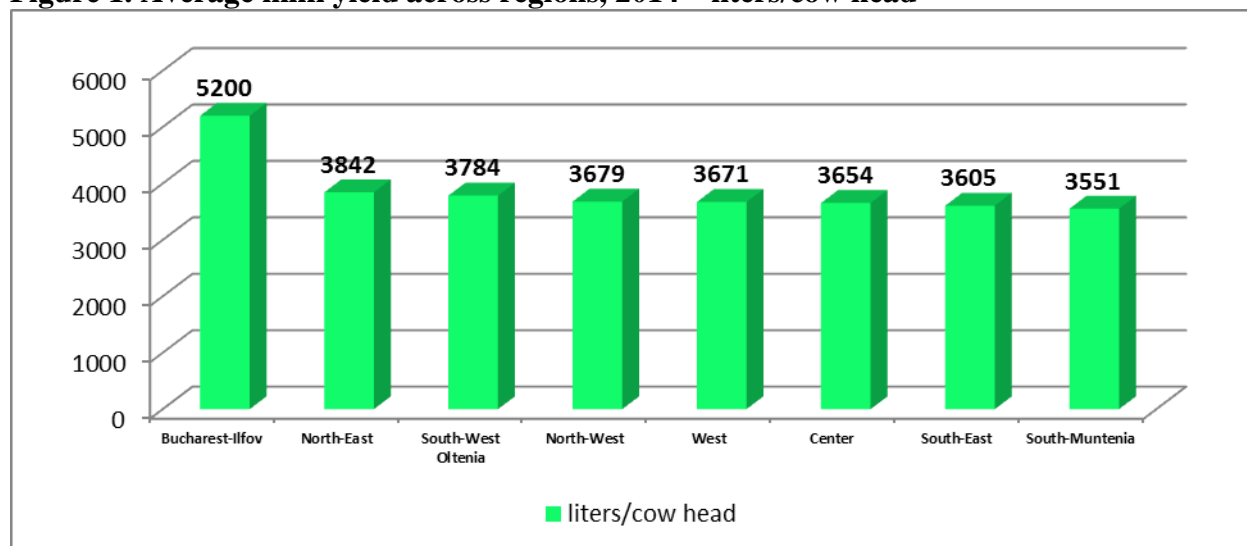
Source: NIS-Tempo-online

The economic size of farms is expressed by the level of standard output value – SO (Standard Output). Although this is not a new concept, the standard output coefficient is an essential instrument in the calculation of farm size and in most funding measures from the new NRDP, the standard production (SO) value is an important, even eliminatory criterion.

From this point of view, both at national and regional level, in the year 2013, the dairy cow farms with an **economic size** of 4000-7999 euro have the highest share (Table 1).

Table 1. Dairy farm size by regions – 2013 -%

	Total	North-West	Center	North-East	South-East	South-Muntenia	Bucharest - Ilfov	South-West Oltenia	West
under 2000 euro	**9.30**	7.28	5.58	12.34	7.70	12.63	14.02	6.63	4.72
2000-3999 euro	**33.00**	28.14	22.90	38.86	28.73	39.32	28.97	34.91	20.95
4000-7999 euro	**39.21**	**40.36**	**38.48**	**36.96**	**43.73**	**35.47**	**42.06**	**44.34**	**40.99**
8000-14999 euro	**12.87**	17.63	20.69	8.51	12.75	8.83	10.28	10.53	23.71
15000-24999 euro	**3.40**	4.33	6.67	2.11	3.68	2.38	1.87	2.45	5.93
25000-49999 euro	**1.56**	1.71	3.78	0.90	2.14	1.01	0.93	0.88	2.54
50000-99999 euro	**0.45**	0.39	1.31	0.22	0.81	0.25	0.93	0.19	0.76
100000-249000 euro	**0.15**	0.11	0.45	0.06	0.33	0.08	0.00	0.05	0.24
250000-499999 euro	**0.03**	0.02	0.09	0.02	0.07	0.02	0.00	0.00	0.06
over 500000 euro	**0.03**	0.02	0.05	0.02	0.05	0.04	0.00	0.02	0.06

Source: Eurostat

At the same time, the farms with an economic size of 2000-3999 euro also have a significant share, i.e. 33% at national level. This negative fact entails a low possibility to access the European funds for the development of holdings by many farmers, if we have in view the minimum threshold of 8000 euro. From this point of view, the low average dairy farm size reflects the subsistence character, which prevails in the milk production sector.

Milk collection and processing at regional level

After many years of continuous growth of milk industry in Romania, based on an ever increasing consumption demand, the global economic crisis, which was also noticeable in Romania, after 2008, led to the decrease of milk production each year, as reflected by figures, through the diminution of dairy cattle herds and of the collected milk quantity. After a short revigoration in the year 2014, when production unexpectedly recovered to a level close to that of the period 2008-2009, in the year 2015, when milk quotas were removed in EU, the amount of cow milk collected in the processing units sharply decreased by 7% compared to the previous year.

In the period 2007-2015, total raw milk production collected by the processing units (coming from domestic production and from imports) decreased by 133375 tons (-11.1%). In the investigated period, only the collected ewe and goat milk increased by 29650 tons (1.8 times). The cow and buffalo-cow collected in the country decreased instead by 217075 tons (-19.1%) and by 33272 tons (-69.8%) respectively. In 2015, the cow milk had the highest share in the milk collected for processing (95.1%), followed by the ewe milk (3.1%) and goat milk (1.7%) (Table 2).

Table 2. Evolution of raw milk collected for processing

Item	2007	2008	2009	2010	2011	2012	2013	2014	2015
Cow milk	1136372	1051481	991588	903750	897348	887854	882381	996653	919297
Buffalo cow milk	4689	3538	2139	1393	963	1111	1282	1400	1417
Goat milk	4250	4026	4008	3856	3366	4677	7116	15001	16829
Ewe milk	12608	13634	13729	16406	14345	15759	18122	27280	29679
**Total raw milk collected in the country **	**1157919**	**1072679**	**1011464**	**925405**	**916021**	**909401**	**908901**	**1040335**	**967222**
Imported raw milk	**43856**	**51707**	**80636**	**87309**	**82061**	**59267**	**96105**	**77396**	**101178**

Total raw milk for processing	1201775	1124386	1092100	1012714	998082	968668	1005006	1117731	1068400

Source: NIS-Tempo-online

The analysis by the two origin sources, i.e. milk collected in the country and imported milk, reveals that the share of imported raw milk increased from 3.6% in the year 2007 to 9.5% in 2015, while the share of the raw milk collected in the country constantly decreased from 96.3% in 2007 to 90.5%. Overall, in the period 2007-2015, the analysis reveals the decrease of the raw milk quantity collected from the farms in the country by 16.5%, while the imported raw milk quantity increased by 130.7%. This situation can be explained by the fact that in Romania the collection system is not very well organized, and the prices paid by the milk collectors are not attractive for farmers, so that these prefer to sell their production on their own, through family businesses.

Following the analysis of milk collection by development regions, we found out that the largest milk quantity was collected in the region Center, in the year 2014 this accounting for 37.2% of total collected milk (Table 3). The region Center is also the only region in which the collected milk quantity constantly increased in the period 2007 – 2014, by 16515 tons (4.7%).

Table 3. Milk production collected by the processing units by development regions – %

	2007	2008	2009	2010	2011	2012	2013	2014
Country total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
North – East	20.1	21.9	20.9	21.8	21.7	21.0	21.1	20.7
South – East	8.3	8.1	7.8	6.3	5.9	5.8	6.0	5.7
South – Muntenia	6.5	6.4	6.7	7.2	7.5	7.2	7.5	6.9
South - West Oltenia	n/a	n/a	n/a	n/a	0.7	n/a	n/a	n/a
West	2.4	2.6	2.7	2.9	2.7	3.2	3.0	3.8
North – West	23.2	22.6	22.7	22.3	22.2	22.1	19.5	20.7
Center	**31.2**	**29.7**	**30.3**	**30.5**	**29.9**	**32.3**	**36.4**	**37.2**
Bucharest – Ilfov	n/a	n/a	n/a	8.0	9.4	n/a	n/a	n/a

Source: NIS-Tempo-online

Figure 2. Distribution of processing factories approved for intra-community trade across counties – 2013
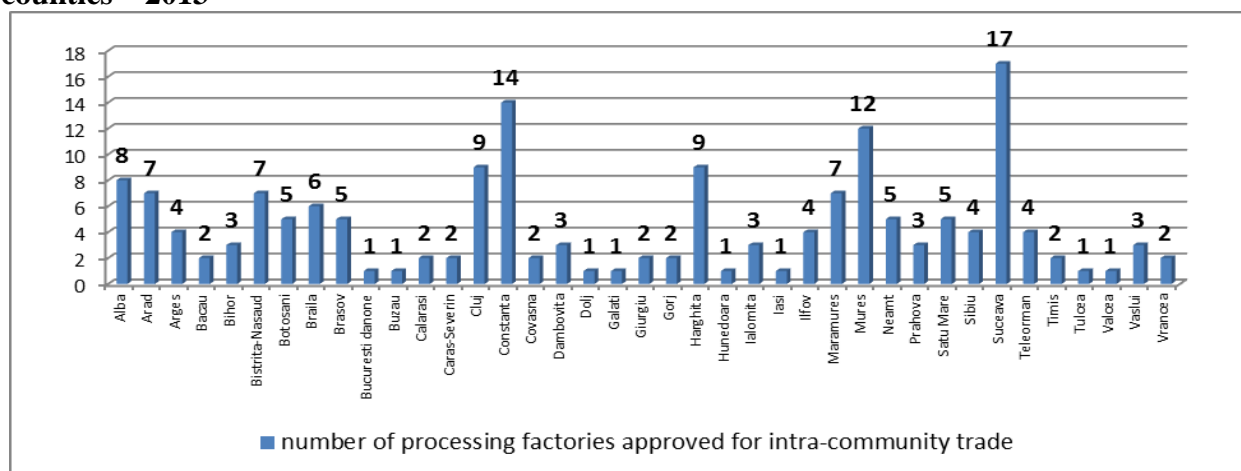
Source: processing of data from the National Sanitary-Veterinary and Food Safety Authority (NSVFSA)

The processing factories approved for intra-community trade are distributed in almost all counties (except for the counties Mehedinți and Olt), with a total number of 171; the highest concentration was found in the counties Suceava (17) in the region North-East, Constanța (14) in the region South-East and Mureș (12) in the region Center (Figure 2).

The region **Center** has 40 processing factories approved for intra-community trade (23.4% of total) and 307 collection centers approved for intra-community trade (34% of total). It is in this region, more exactly in the county Alba, that the largest dairy company with majority Romanian capital is located, namely "**Albalact SA**"; in the year 2014, this company became the dairy market leader by its turnover (475 million RON), thus surpassing the company Danone (456 million RON), whose portfolio mainly consists of yoghurts. Another important company that carries out its activity in the region Center, Mureș county, on the third place by its turnover in the year 2014 (400 million RON), is "**Friesland Campina Romania SA**" owned by the Dutch dairy group Friesland Campina; this reunited the operations carried out on the Romanian market, through **Napolact, Industrializarea Laptelui Mureş** and Friesland Campina Romania, into a single company. "**Fabrica de lapte Braşov**" (Dairy Factory Brasov) is also located in the region Center, local manufacturer of the brands *Olympus* and *Oly*, with a turnover of 306 million RON (fourth place), whose production is 60% directed to the foreign market and 40% goes to the domestic market. The company "**Delaco Distribution SA**" is also found in the county Brașov, region Center, mainly specialized in cheese production. This held the fifth place in the year 2014, according to its turnover (259 million RON). The sixth place, with 217 million RON turnover, is occupied by the "**Hochland România SRL**" group, in the region Center, Mureș county, market leader in cheese spread, cheese cream and kaschkaval, at considerable distance from its competitors. The company "**Covalact SA**" is on the eighth place by its turnover (156 million RON), located in the region Center, Covasna county, one of the greatest dairy producers in Romania, with a tradition of more than 40 years in the production of dairy products.

The second important region as share of dairy factories and milk collection centers is **North-East** with 33 dairy factories (19.3%) and 315 collection centers (35% of total). The company "**Dorna Lactate SA**" is based in this region, in the county Suceava, which ranks seventh place according to its turnover in the year 2014 (181 million RON), with processing factories throughout the region North-East, with tradition in this field. LaDORNA is one of the most developed brands on the dairy market in Romania, market leader in UHT milk, and even since its establishment, leader on the market of organically certified dairy products according to the EU standards.

The region **North-West** comes next, in terms of the share of dairy factories and milk collection centers, with 31 factories (18.1%) and 226 collection centers (25% of total).

One of the greatest companies from Romania, "**Danone SA**" has carried out its activity in the region **Bucharest-Ilfov** since 1999, market leader in yoghurts. In the year 2014, it occupied the second place according to its turnover (456 million RON), after being on the first place the previous year. Danone Romania is part of Danone Group, which is present in 120 countries, one of the world leaders in food industry, on the 1st place in the world for fresh dairy products and 2nd position in the world in bottled mineral waters and food for babies.

"**Simultan SRL**," commercial company with full private capital, located in the county Timiș, in the region **West,** was established in the year 1994, having as main activity object the manufacturing and sale of fresh dairy products, lactic acid products and cheeses, under its own trademark *"SIM"*. In the year 2014, it was on the ninth position, in top 10, as regards its turnover (106 million RON).

"**Lactag SA**" is also in "top 10" milk processing companies, according to its turnover (72 million RON); the company is located in the county Argeș, in the region **South-Muntenia,** the largest milk processing company in the southern part of Romania, with 50-year tradition and full private capital [5].

The milk collection centers authorized for intra-community trade do not currently operate in all the counties of the country (Figure 3). At national level, there are 902 centers, out of which 39% are located in the counties Botoșani (215) and Mureș (139).

Figure 3. Distribution of milk collection centers approved for intra-community trade across counties – 2013
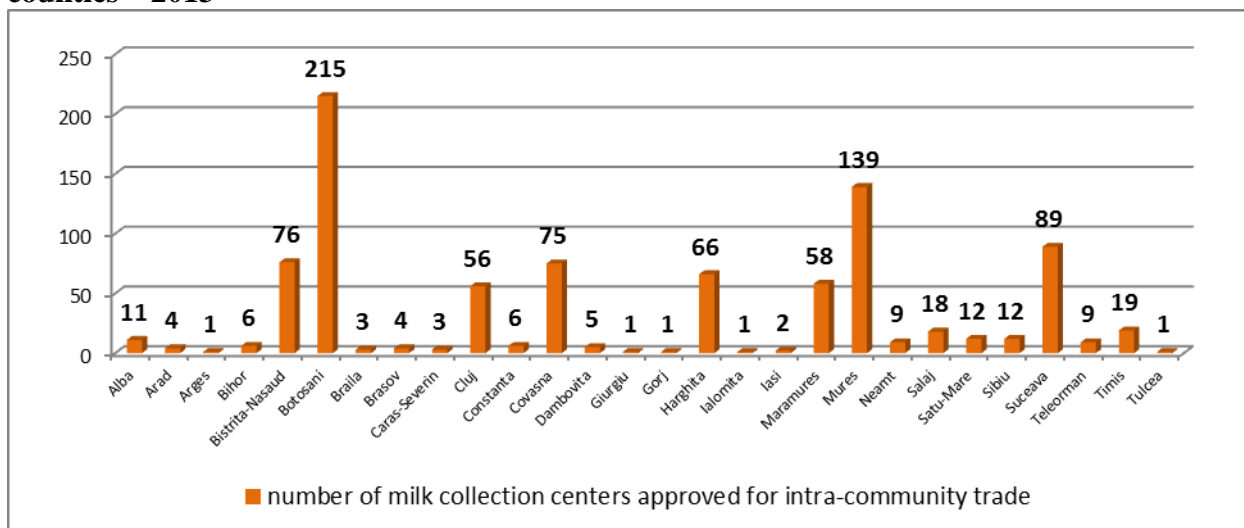
Source: author's processing of NSVFSA data

In the conditions in which more than 90% of the Romanian milk on the market comes from small, subsistence farms (the rest being covered by the large farms), the insufficient milk collection centers and cooling tanks) further impacts the development of the Romanian milk industry. This also as a result of the introduction of the embargo with Russia, when the dairy products with Russia destination were sent back to the border, which overturned many of the short-turn strategies and forecasts not only of the milk producers, but also of the large processors. The analysts' calculations estimated that 30% of the dairy production that had to reach Russia went to the Eastern European countries instead, which had to absorb the whole milk quantity, also helped by the favourable prices, much under the domestic production prices.

CONCLUSIONS

The average milk yield, one of the lowest in Europe (3704 liters/cow head-2014) is an explanation for the lack of sector competitiveness. In the territory, the region Bucharest-Ilfov is above the national average in this respect, with an average yield of 5200 liters/cow head in 2014.

The fact that the average farm size in Romania is 4000-7999 euro (39.2% at national level) results in the low possibility to access the EU funds for farm development by many farmers, as the minimum threshold is 8000 euro.

The analysis of milk collection and processing by development regions reveals that the region Center stands out in this respect, as the largest milk quantity for processing is collected in this region (37.2%). This region also concentrates the greatest number of dairy factories approved for intra-community trade (40 factories), accounting for 23.4% of total. In terms of turnover, six of the most important dairy companies operate in the region Center, which cumulated 1813 million RON turnover in the year 2014, i.e. 69% of total top 10 companies.

REFERENCES

1. Raportul Tetra Pak – Indexul Lactatelor, 2014 , http://tetrapak.com/ro/about/newsarchive/tetra-pak-dairy-index-rising-global-demand-requires-careful-balancing-act
2. Raportul Tetra Pak – Indexul Lactatelor, 2015, http://tetrapak.com/ro/about/newsarchive/tetra-pak-dairy-index-2015
3. www.tetrapak.com/dairyindex
4. Drăgănescu Condrea, Sisteme de exploatare a taurinelor: probleme ale maximizării eficienței biologice și mecanice, Revista de Zootehnie VI.1:19-33, 2009
5. http://www.zf.ro/zf-24/topul-celor-mai-mari-companii-din-industria-laptelui-doar-primii-trei-trec-de-400-mil-lei-anual-14461471

MILK MARKET AFTER ABOLITION OF MILK QUOTAS

IURCHEVICI LIDIA[1]

Summary: *In the past two years in Romania, it was recorded one of the sharpest decreases in the amount of cow's milk collected by processing units and at the same time a sharp decline in the price of milk, compared with the average price in the European Union. The obvious conclusion is that milk production in Romania is facing serious problems. This indicates that the milk processing industry and Romanian farmers were not prepared to face the barrier removal of milk quotas. Cattle breeders organizations indicates that many livestock farms in the country are in danger to close due to bad relationship of farmers with processors and repeated delays in paying subsidies from the state. These organizations also argued that the domestic market is flooded with milk imported by the processors, milk that is cheaper because the subsidies granted in countries of origin are higher and received on time. In this context, this study makes an analysis of the current situation of the sector growth of dairy cattle starting from its structure, milk supply (livestock, domestic production, costs of production, import) demand, price capitalization, and finally, based on the analyzed elements, resulting in a series of proposals and recommendations.*

Key words: *market, quots, milk, production, cattle*

JEL classification: Q11, Q13

INTRODUCTION

Abolition of milk quotas means, for many Romanian farmers, the end of an endeavor for many years and the future looks downright bleak. They argue that more than 60% of dairy farms in Romania will disappear because the state has not taken timely steps to support.

Milk production quotas were abolished in the European Union, after more than 30 years have tried to balance European industry and avoid flooding the market with milk and derived products from countries with developed agriculture. The news is good for large manufacturers in Western countries, but unplesant for the farmers of the new entrants Members who joind the EU.

European farmers consider that the main reason of this situation is caused by the attitude of processors, on the one hand, that does not offer the right price, and retail chains which in turn require certain takeover price of the finished product. While local farmers argue that repeated refusals to update the price of milk processors given that operating costs increased shelf price also recorded an increase, in which case the price at the farm gate is kept constant. Processors may progress to import so that, in a situation of overbid chances that the local farmers to sell their milk production decreases evan more.

Compared to previous years, farmgate milk prices dropped a lot. The cause is generated by overproduction of milk in the European market. In Romania imports of raw milk, half pasteurized, pasteurized or condensed, from the European Union have increased in recent years. According to the study conducted for the European Commission, the abolition of quotas has led to higher production at European level which caused a reduction in the price paid to farmers. From here the danger of de-capitalization, inability to make investments or even bankruptcy for small farmers in Romania who are severely affected whenever the quotation of milk decreases.

MATERIAL AND METHOD

Regarding the analysis method and instrumentation work used in this work was carried out a comparative analysis of milk production in Romania with some EU countries, supply and demand as well as analysis prices on the Romanian market in relation to the from the EU on a five

---

[1] Iurchevici Lidia, Researcher III, Research Institute for Agricultural Economics and Rural Development, e-mail: lidia.iurchevici@iceadr.ro

year period (2010-2015). In this approach have been used statistical data provided by: National Institute of Statistics, Ministry of Agriculture and Rural Development, Eurostat and FAOSTAT.

RESULTS AND DISCUSSIONS

In Romania, cattle breeding is a main branch of the agricultural economy, given the advantages due to natural factors and pedoclimatic, but this sector of agriculture shows a uneven configuration, continuing to record changes in terms of the operating structures and unstable in terms of formation of structures of production. These should respond to market requirements and efficient use of natural and human resources in rural areas.

According to FAOSTAT, in Table 1 it is shown the average milk production in EU countries, and shows that Romania has one of the lowest average milk production per cow, at less than half of the major producing (Denmark, Germany, Netherlands). According to the USDA study, the average milk production in our country was in 2014 of 3739 liter/cow, respectively 3535 liter/cow in 2015.

Table1 – Evolution of average milk production in 2010-2013 in Romania and EU countries - kg / cow / year

Country	2010	2011	2012	2013
Danmark	8640	8636	8507	8766
France	6278	4335	7687	6414
Germany	7082	4237	7280	7293
Greece	3691	3691	3827	3801
Hungary	5400	7835	7194	6869
Netherlands	7468	7546	7577	7644
Poland	4838	5019	5189	5388
Portugal	7809	7874	7846	7508
Romania	3060	3776	3701	3771

Source: FAOSTAT

Chart 1 - Average milk production in the EU countries (kg / cow / year)
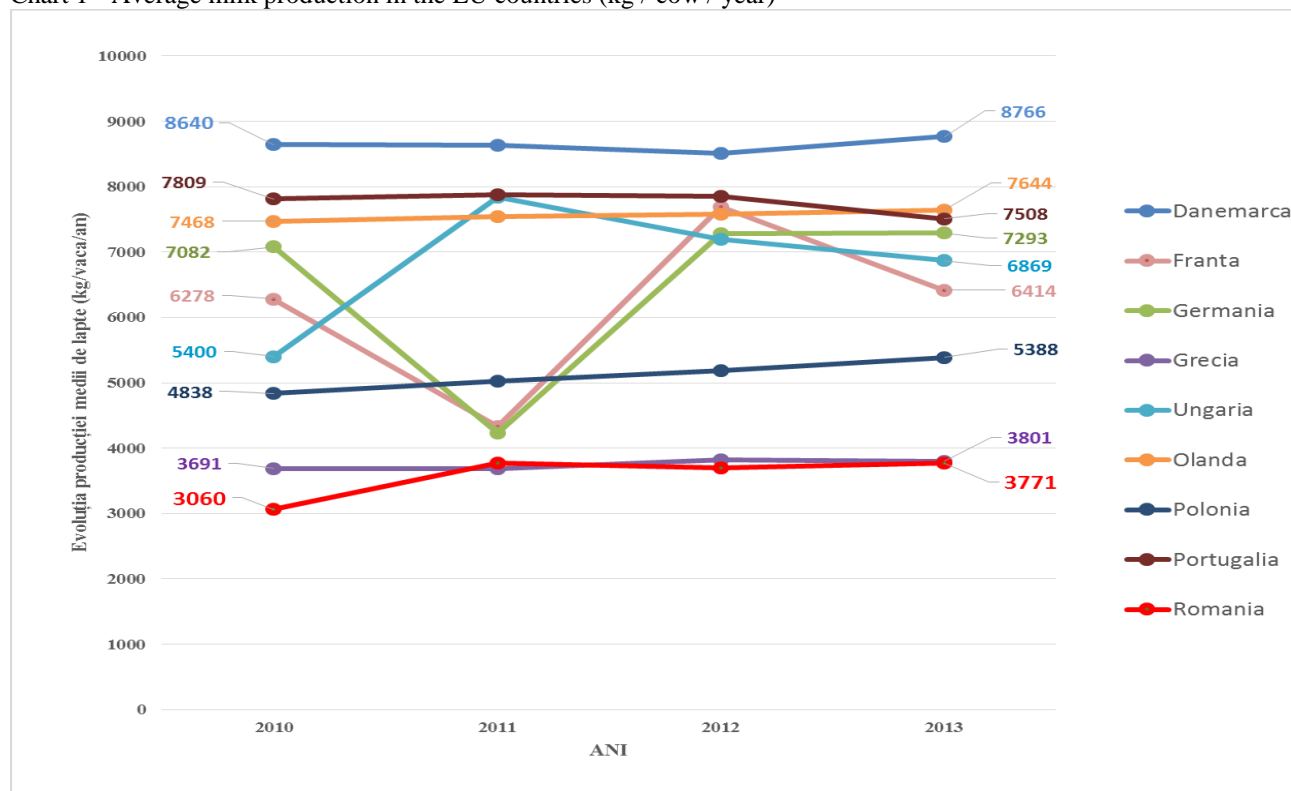
Low productivity in the production of milk entail the increased costs per product unit (kg milk). The data presented above indicate that average milk production in Romania is on a downward path from 2013. Fortunately, there are, however, in our country, farm cattle for milk which exceed as production on the large producers of cow's milk from the EU, but these examples few have the power to raise the indicators at national level, which are influenced overwhelmingly by more than 83% of holdings that record low yields and determining policies and allocations of factors disadvantaging the developed farms.

DEMAND AND SUPPLY OF MILK. FOOD BALANCE

Table2 – Demand and supply of milk (cow) – thousands hl

Specification	2010	2011	2012	2013	2014	2015*
Domestic production of milk	42585	43729	41823	42382	43713	41782
Import	5263	5771	6627	7111	6278	7534**
Export	2023	2234	2498	2260	3361	3035**
Milk supply	45825	47266	45952	47233	46630	46281
Milk consumption – L/habitant/year	244,2	248,5	241,1	244,5	251,5	293,0
The share of domestic production of milk tender%	92,9	92,5	91,0	89,7	93,7	90,3

Source: INS
*operative data MADR; ** estimate ICEADR

Chart 2 - Demand and supply of milk (cow) – thousands hl
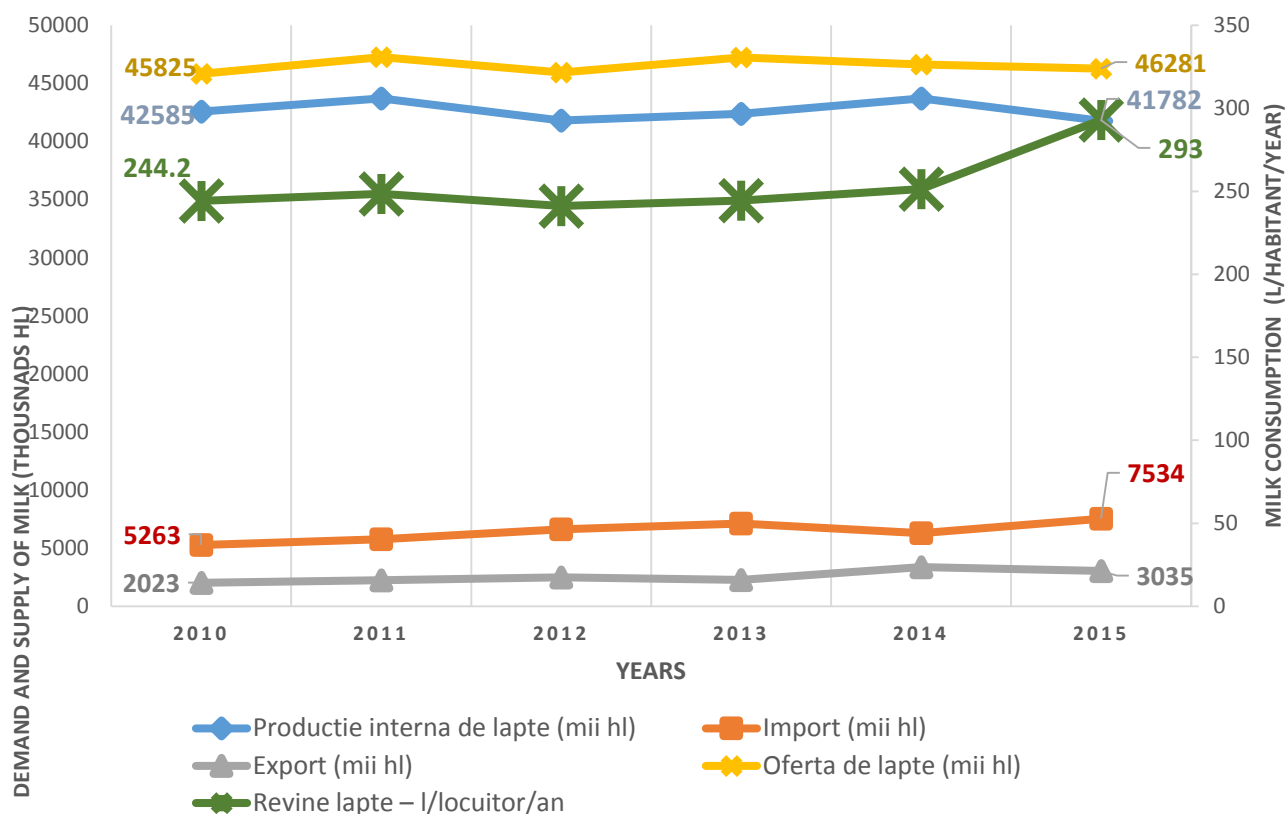
Capitalization of milk production takes place on four areas: consumption of farm technology, for family consumption and for direct delivery and processing. The largest amount is for family consumption (over one third), followed by direct deliveries (a quarter of production), and supplies for processing represents only 23% (Table 3). According to INS data, in 2015, processing units collected from farms and collection centers in our country only 780 338 tons of milk (with 26% less than the previous year).

Table3 – Way of capitalization of milk production

Year	Milk production (thousands hl)	Capitalizing production (thousnads hl)			
		Tehnological consumption	Family consumption	Direct deliveries	Processing deliveries
2010	42.824	4.222	16.343	12.320	9.939
2011	43.947	4.751	17.631	12.835	8.730
2012	42.036	4.166	16.263	12.974	8.633
2013	42.593	3.833	17.037	12.778	8.944
2014	44.015	5.595	16.651	11.525	10.244

Source: INS

Chart 3 - Way of capitalization of milk production
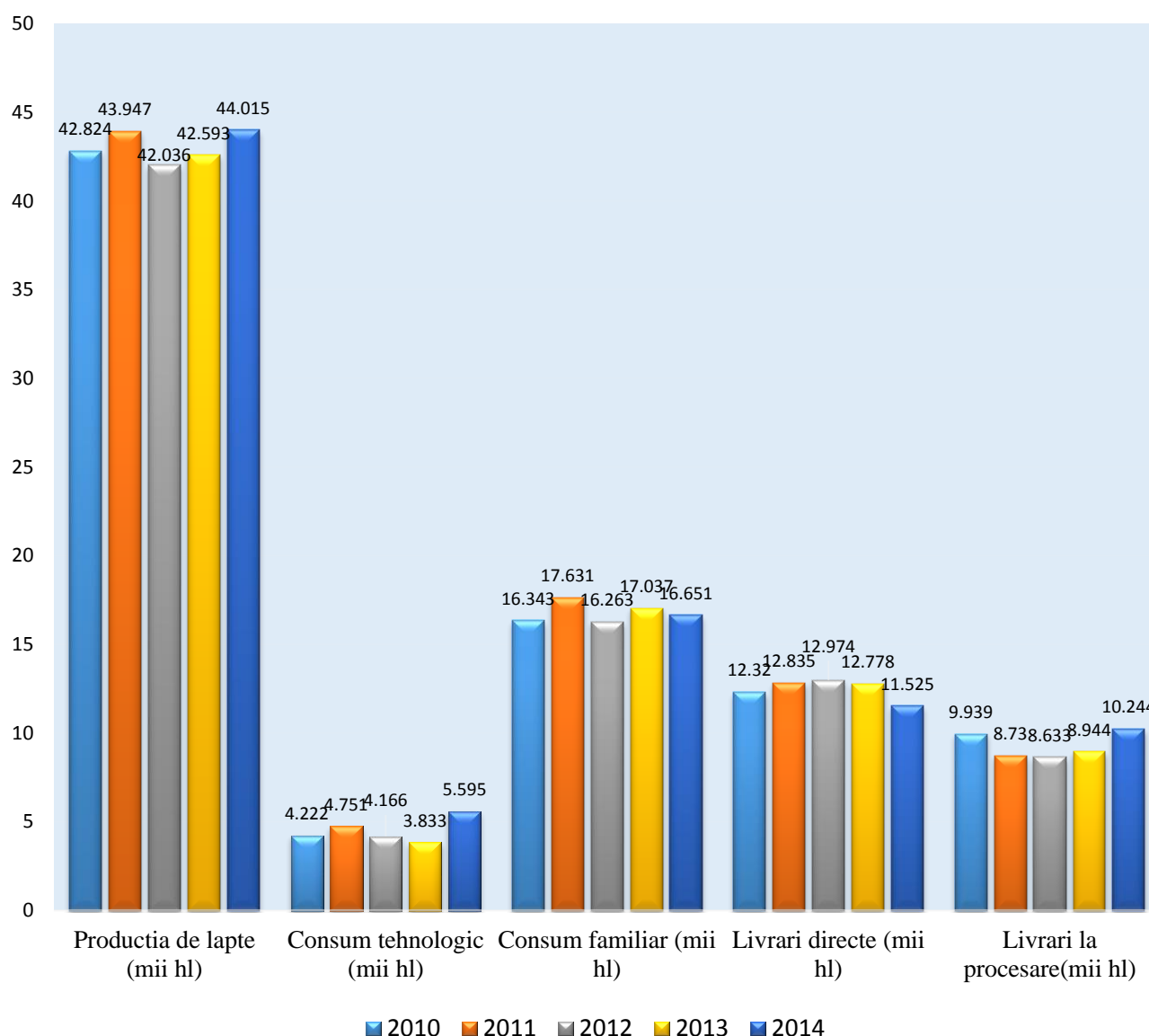
ROMANIAN MARKET PRICE ANALYSIS IN RELATION WITH THE EUROPEAN UNION

Data provided by FAOSTAT shows that Romania has the highest rates of recovery of milk in the EU countries (Table 4), while the lowest are in Poland.

Table 4 – Milk price developments recovery in Romania and EU countries, Euro / tonne

Country	2010	2011	2012	2013	2014
Bulgaria	260	310	319	311	327
Denmark	342	361	360	400	404
France	322	346	334	356	377
Germany	308	348	320	376	371
Greece	373	431	451	443	430
Hungary	264	315	305	333	341
Italy	375	434	423	431	442

Netherlands	302	343	319	373	388
Poland	269	296	288	322	326
Romania	472	502	512	476	468

Source: FAOSTAT

This does nothing to encourage EU countries to export milk in Romania, quashing even more the domestic production. Reaching thus a vicious cycle that must be stopped, it is necessary to take measures to protect domestic production from unfair competition of imports and guidance of the Romanian milk processors.

Regarding the price of raw milk between 2014 and early 2016, it decreased continuously, in Romania reaching from 33 cents / kg milk at 28 cents / kg milk. EU average in this period was 40 cents / kg milk in early 2014 and fell to 29 cents / kg milk at the beginning of 2016 (Table 5).

Table 5- Prices of raw milk in Romania and the EU countries (euro / 100kg)

	Belgium	Bulgaria	Czech Rep.	Denmark	Germany	Estonia	Ireland	Greece	Spain	France	Croatia	Italy	Cyprus	Latvia	Lithuania	Luxembourg	Hungary	Malta	Netherlands	Austria	Poland	Portugal	Romania	Slovenia	Slovakia	Finland	Sweden	U.K.	EU-15	EU-13	EU (weight. avg.)	% compared to previous month	
2014m01	40,54	36,93	34,24	43,00	41,26	39,52	42,34	45,24	38,16	39,13	37,21	40,35	57,78	34,20	36,45	40,99	35,73	46,58	43,00	42,60	35,80	36,50	33,06	37,22	35,80	45,57	41,87	39,62	40,75	35,91	40,08	-0,3%	Jan-14
2014m02	40,41	36,40	34,47	43,50	40,94	40,12	41,76	45,40	37,86	38,69	37,21	41,24	57,58	34,84	37,00	40,39	35,23	46,34	43,00	42,27	35,60	36,50	32,34	37,29	35,95	45,51	42,47	39,96	40,68	35,84	40,01	-0,2%	Feb-14
2014m03	40,14	37,02	34,64	43,50	40,55	40,33	39,04	44,38	37,96	36,69	36,64	41,79	57,44	35,15	36,21	40,55	35,09	45,78	42,50	42,24	35,16	36,48	31,44	36,99	35,80	43,48	42,52	39,33	39,93	35,54	39,32	-1,7%	Mar-14
2014m04	39,06	35,73	34,46	43,00	39,72	39,63	38,55	42,93	35,83	34,25	36,64	41,61	56,47	34,17	32,67	40,37	35,03	45,68	41,25	40,56	33,83	37,80	31,58	36,56	35,05	43,56	40,48	39,14	38,82	34,49	38,22	-2,8%	Apr-14
2014m05	38,01	34,89	34,11	41,00	38,87	36,75	37,10	42,73	35,44	33,89	36,31	41,21	55,86	31,76	27,74	38,75	34,43	46,21	42,00	39,57	32,94	34,65	29,87	35,61	34,47	43,35	40,37	38,40	38,21	33,29	37,53	-1,8%	May-14
2014m06	36,41	34,03	33,73	41,00	37,97	32,80	36,90	42,34	35,44	36,19	35,69	41,21	55,64	29,59	26,14	37,85	33,69	46,21	42,00	38,33	32,43	34,34	29,15	34,67	33,63	44,87	39,70	38,32	38,37	32,48	37,56	+0,1%	Jun-14
2014m07	35,11	33,94	33,54	39,00	37,18	32,31	35,25	42,36	33,98	37,29	34,06	39,89	54,56	29,32	26,07	36,87	32,35	46,85	39,50	38,21	32,04	33,26	28,85	34,27	33,18	44,60	37,92	38,69	37,76	32,04	36,97	-1,6%	Jul-14
2014m08	34,36	33,84	32,54	38,00	37,09	29,88	36,52	42,31	33,79	38,43	33,97	39,73	54,89	27,21	24,27	36,57	31,80	49,12	39,75	38,37	30,18	33,31	29,05	33,79	32,84	46,37	36,78	38,08	37,91	30,69	36,92	-0,2%	Aug-14
2014m09	33,29	33,57	31,99	37,50	36,44	25,15	35,45	42,63	34,08	38,84	34,56	39,17	55,62	23,36	22,78	36,02	32,08	49,12	38,00	39,02	29,74	33,45	29,19	33,46	32,63	43,81	36,76	37,81	37,47	30,04	36,45	-1,3%	Sep-14
2014m10	32,28	33,45	31,57	36,00	35,14	25,54	38,17	42,22	33,11	36,25	34,62	36,77	57,02	23,33	24,37	34,56	32,14	47,61	37,00	37,49	29,64	30,62	32,39	32,49	44,69	35,99	36,95	36,17	35,12	30,10	35,34	-3,0%	Oct-14
2014m11	31,28	32,58	31,19	36,00	33,99	25,36	37,58	42,77	33,11	34,93	34,78	36,77	57,62	23,84	25,33	34,03	32,20	47,43	34,50	37,33	29,61	33,88	31,04	32,03	32,06	42,86	35,40	35,63	35,12	30,10	34,43	-2,6%	Nov-14
2014m12	31,15	32,53	31,13	34,50	32,48	24,95	35,16	42,89	33,40	33,21	34,97	35,97	57,46	24,25	25,14	33,60	31,41	46,36	30,75	36,72	29,98	34,02	20,35	31,72	31,79	42,61	33,47	33,98	33,55	30,15	33,08	-3,9%	Dec-14
2015m01	29,09	31,72	29,76	31,00	30,89	24,13	33,50	42,57	31,84	31,64	34,54	35,54	57,80	22,79	22,91	31,01	28,64	46,17	30,25	35,14	28,55	31,91	30,01	29,65	30,79	42,24	31,33	33,35	32,20	28,72	31,72	-4,1%	Jan-15
2015m02	29,02	31,14	29,57	30,98	30,81	23,97	32,63	42,50	31,75	31,52	34,00	35,43	57,29	22,06	22,23	30,66	28,78	45,68	31,50	34,94	29,09	31,59	28,53	29,16	29,92	37,45	30,57	35,56	32,35	28,73	31,85	+0,4%	Feb-15
2015m03	28,49	30,67	29,55	31,23	30,73	25,12	30,11	42,28	31,36	30,33	34,01	35,46	56,65	22,36	23,27	29,95	28,75	45,40	34,00	34,81	29,57	31,31	27,28	28,89	29,41	37,18	31,35	33,54	31,96	28,97	31,55	-0,9%	Mar-15
2015m04	28,21	28,49	28,90	32,82	30,75	24,93	30,79	41,28	30,10	29,93	33,27	34,79	56,65	22,74	23,22	30,06	27,66	44,44	33,25	33,81	29,35	32,49	26,99	28,52	29,08	37,09	31,30	33,04	31,71	28,59	31,28	-0,9%	Apr-15
2015m05	27,89	26,62	27,57	32,81	29,80	24,43	28,75	41,79	29,64	32,92	34,75	55,47	22,41	21,50	29,52	25,68	43,93	32,00	33,17	28,23	29,00	24,53	28,00	27,89	36,98	32,33	32,33	31,05	27,35	30,54	-2,4%	May-15	
2015m06	27,35	26,56	26,60	30,90	28,83	23,26	28,16	41,58	29,42	30,11	32,24	34,85	55,78	21,33	20,71	28,80	24,29	44,96	30,50	32,69	26,98	28,79	23,56	27,65	27,00	36,91	31,71	31,89	30,55	26,29	29,96	-1,9%	Jun-15
2015m07	26,70	26,19	25,87	30,90	27,94	23,89	27,10	41,54	28,83	30,94	30,78	34,49	55,81	21,04	19,95	28,02	23,90	46,49	30,00	31,77	26,96	28,10	23,64	27,25	26,43	36,76	30,71	32,87	30,38	26,03	29,78	-0,6%	Jul-15
2015m08	27,21	27,22	25,32	29,92	27,77	22,36	27,97	41,58	29,03	32,46	31,05	34,24	54,97	20,40	19,08	28,48	24,03	48,20	28,50	32,04	26,54	28,18	24,21	27,36	26,25	37,26	29,76	31,66	30,36	25,69	29,72	-0,2%	Aug-15
2015m09	27,35	27,85	25,42	29,93	28,38	22,60	29,23	41,80	29,51	32,23	31,68	33,76	55,47	20,35	20,12	29,55	24,23	49,60	28,50	32,87	26,56	28,60	25,27	28,02	26,63	38,17	30,88	31,37	30,55	25,94	29,91	+0,7%	Sep-15
2015m10	28,27	28,44	26,01	30,58	29,43	22,87	31,08	41,86	30,00	31,52	32,04	33,93	56,45	20,97	22,06	30,75	24,99	49,34	29,00	34,12	27,31	28,65	26,96	28,52	27,08	38,52	32,73	33,05	31,16	26,74	30,55	+2,1%	Oct-15
2015m11	28,14	28,75	26,40	30,59	29,81	23,56	30,98	41,93	30,10	30,98	32,19	34,07	57,55	21,78	22,84	30,69	25,21	49,34	29,75	34,38	27,41	28,63	27,80	28,65	27,41	39,35	32,49	34,20	31,38	27,03	30,78	+0,7%	Nov-15
2015m12	27,41	28,85	26,70	30,69	29,74	23,44	29,43	41,36	30,10	30,16	31,92	34,75	58,13	21,96	22,14	30,33	25,02	48,85	30,00	35,14	27,39	28,71	27,01	28,33	27,43	38,98	32,98	32,69	31,03	26,95	30,47	-1,0%	Dec-15
2016m01	26,84	28,66	26,37	29,71	28,87	23,43	29,43	41,59	29,90	29,07	31,81	34,38	58,49	22,00	22,57	29,00	24,76	47,47	29,25	34,43	26,14	28,64	27,27	27,45	27,53	38,66	32,45	30,53	30,14	26,30	29,61	-2,8%	Jan-16
2016m02	26,70	28,32	25,78	29,56	28,87	23,20	29,28	41,65	29,75	28,93	31,92	34,36	58,49	21,45	21,64	28,61	25,07	47,23	29,11	33,70	25,90	28,64	27,96	26,52	27,50	38,50	31,55	30,38	30,01	26,04	29,47	-0,5%	Feb-16
2016m03																																	Mar-16

CONCLUSIONS

- Cattle milk has reached a deal increasingly less profitable for producers who sell their milk of farmgate with prices starting at 1-1.2 lei per liter and goes up to 1.30 -1 40 lei depending on the quantity, quality and distance to the processing factory which is buying.
- From factory to shelf processors the price rises almost 5 times, the price difference including analysis, processing, packaging, duties plus the addition of services practiced by supermarkets selling a liter of milk.
- The price of milk is influenced by processors at a rate of 25-30%, the rest is influenced by what happens in supermarkets.

- The price of milk has dropped for various reasons: raw and VAT decreased, milk quotas were abolished, and the offer has increased by 35% due to the Russian embargo as a consequence of the reorientation of EU producers by Romanian market.
- Small and medium producers will have to adapt on the fly to the conditions of a liberalized market, increasing imports that generates a high level of competition.
- Elimination of milk quotas means, for many Romanian farmers (small and medium) facing competition to which they can not cope. There is a protracted long-term perspective because, at European level milk supply is greater than demand. In this context, large processors have started to abandon contracts with local farmers, preferring to bring raw material from outside.

RECOMANDATIONS

- Develop a strategic program (for example, funded under the sectoral program) by the Central Authority, aimed at strengthening the mixed farms with less than 5 cows, support for setting up local centers for collecting and processing milk.

- Facilities explicit cooperative association (the smallest can be local collection centers - Milk processing) of small producers.
- Pair farmers to negotiate, planning and adaptation of production to market demand, optimizing production costs, ensuring inputs and services at reasonable prices, negotiating the sales price and terms of the contracts with processors etc.
- Creating a legal framework to allow negotiation of contractual agreements through the producer organizations.
- Modernization of productive technologies, which serve to improve the technical indicators, labor productivity growth, reflected ultimately in lower production costs; supporting programs to improve breeds and providing incentives to small farmers for access to genetic material performance, with higher production potential and direction specialized in milk production.
- Providing additional subsidies for the purchase of milk cooling tanks at dairy farms and supporting the creation of micro milk processing located in areas that focus small dairy farmers.
- Eliminations from the market of milk substitutes and counterfeited dairy products.
- Substantial improvement of the tax system by granting exemptions and facilities, by finding mechanisms to eliminate double taxation of association.

BIBLIOGRAFIE

1. Anuarele Statistice ale României, 2001-2014
2. Tempo-online –Institutul Național de Statistică 2002-2014, www.insse.ro
3. Eurostat: http://ec.europa.eu/eurostat/data/database
4. Faostat: http://faostat3.fao.org/home/E

THE PRODUCTION COST OF BIOLOGICAL MATERIAL FOR INTRODUCING TO FATTENING IN THE SWINE FARMS

CHETROIU RODICA[1]

Abstract: *The paper meets the pork producers, in terms of identifying the cost elements for biological material introduced at fattening, which is one of the most important categories of variable expenditures. In the specialized swine breeding systems (breeding farms), the first product value quantifiable is the piglet weaned. The cost elements that can be showed refers to the cost of maintenance and feeding of the sow during pregnancy and lactation, plus the cost of the same sows from weaning until the next fecund insemination. To these are added the investment for the feed consumed by piglet and its maintenance cost until the weight at that it can be introduced for fattening (25 kg). The paper presents an analysis of the main indicators reflecting the production cost of the piglet; thus, the highest share in the total expenditures are the fodder costs (66.7%), followed by biological material costs (share of insemination and maintenance costs for the gilt until weaning) representing 10.5%.*

Keywords: *meat, pork, expenditures, cost*

JEL Classification: Q12; Q16

INTRODUCTION

The evolution of pig farming in our country takes place in accordance with the feed-back resulted from the dynamics closely related to the European present realities. It is therefore self-evident the need of continuous adapting of the Romanian pig sector to the Community realities. Pig sector has gone through a crisis due to imbalances that manifest on the pork market, both under the influence of internal factors, but especially because of conjunctures in the European market.

The average price for pork is now at its lowest level in a decade, and European exporters have oriented large amounts of pork to the Romanian market. This has led to an increase in supply, which has resulted in falling prices. The situation of the domestic pork production sector is seriously affected, with the risk that some farms may not be able to continue the process of production.

MATERIAL AND METHOD

In this context in which it making efforts to redress the market, one of the important elements is to identify all the factors that can influence lower production costs for pork. Thus, given the fact that the biological material (piglet of 25 kg introduced for fattening) occupies the second place, after fodder, as a share of the cost of pork (in the case of farms with closed circuit) and even the first place where the piglet is bought, it was necessary to quantify the cost elements for this category of inputs, for which were also calculated the main technical and economic indicators.

RESULTS AND DISCUSSIONS

Table 1 presents the main indicators reflecting the cost of production of biological material (piglet up to 25 kg / head) which is introduced for fattening. Thus, the largest share in the production cost of a piglet is represented by feed costs (66.65%), followed by biological material costs (share of mating and maintenance costs for gilt until weaned) which represent 10.5%.

---

[1] Chetroiu Rodica, Scientific researcher III, Research Institute for Agriculture Economy and Rural Development, e-mail: rodica.chetroiu@iceadr.ro

Table 1 – Budget of biologic material – piglet of 25 kg

INDICATORS	Lei/head
A. VALUE OF PRODUCTION	276,89
A_1. Of which, main production	270,00
B. SUBSIDIES	0,00
C. RAW PRODUCT	276,89
D. TOTAL EXPENDITURES	216,69
D_1. Of which, for main production	209,66
I. VARIABLE EXPENDITURES	**183,64**
1. Fodder costs	129,27
2. Biologic material	21,95
3. Energy and fuel	15,00
4. Medicine and vet materials	14,00
5. Other materials + water	1,00
6. Supply quota	2,28
7. Insurance	0,14
II. FIXED EXPENDITURES	**33,05**
- Labour costs	20,00
- General costs	2,72
- Interest for credits	4,00
- Depreciation costs	6,33
E. TAXABLE INCOME	60,20
Txes and fees	9,6
F. NET INCOME	50,6
G. TAXABLE INCOME RATE (%)	28,71
H. NET INCOME RATE (%)	24,12
COST OF PRODUCTION	209,66
INTERNAL MARKET PRICE	270,00

Source: Own calculations

Graph 1 – Structure of variable costs for the piglet introduced to fattening
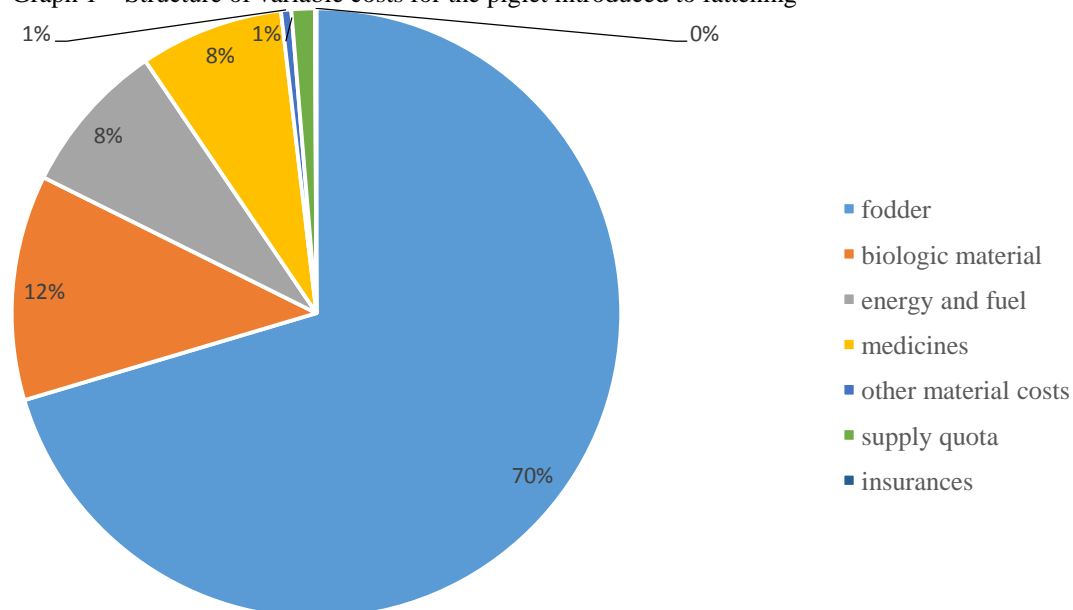
According to data from Table 1 and Graph 1, mostly of variable costs is represented by fodder costs (approximately 70%), followed by biological material costs (12%). Energy and medicines occupy about the same share of 8% in these expenditure categories.

The production cost of piglet of 25 kg reaches thus to 209.66 lei / head, and in terms of rate of return, this amounts to over 24%, given the average price of piglets sold in 2015 for introduction for fattening.

Compared to Romanian prices for the piglets of 25 kg, in European Union countries, they were in 2014 from 34.71 to 53.09 Euro / head (154-236 lei / head) and in 2015 from 36.2 to 44.12 Euro / head (161-196 lei / head). From this, has resulted the preference of autochthonous pork producers to import piglets for fattening farms.

In order to see what was the influence of biologic material (piglet of 25 kg) in the cost of live pigs in the crisis year 2015, there have been calculated two versions, the first with biologic material produced in the farm and the second with biologic material purchased. Technological parameters were an average daily gain of 600 g / day, the weight of 25 kg at introduction for fattening, 105 kg weight at delivery / head and specific fodder consumption of 3 kg / kg weight gain. Mentioning that it was considered the average sales price of live pigs at farm gate in 2015, as a price not covering the expenditures incurred.

The calculations have confirmed that, at both farms with closed circuit, as well as those that purchased piglets of 25 kg, the results were finalized with losses for producers, they requiring, in fact, financial support from the state. The losses were, however, diminished in the case of those that have produced biologic material in the own farm.

Thus, at the farm that produces the piglet of 25 kg, its share in the cost of a kilo of pork is 39.1%, meaning 22% less than in the case of farm which buys the biological material (Table 2).

Table 2 – Comparative situation of expenditures at live pigs in 2015, lei/kg live weight

| SPECIFICATION	CLOSED CIRCUIT FARM	FARM WITH BIOLOGIC MATERIAL BOUGHT
VARIABLE EXPENDITURES, of which:	4,63	5,24
Fodder	2,38	2,38
Biologic material	2,0	2,57
FIXED EXPENDITURES	0,48	0,49
COST OF PRODUCTION	5,11	5,73
PRICE*	4,97	4,97
NET INCOME RATE %	-2,70	-13,25

Source: Own calculations
*according to Committee of Classifying Carcasses

Graph 2 shows the monthly price evolution of live pigs during 2014-2015, highlighting their downward trend, which affected the financial results of producers. Noting that, during the period represented graphically, only in September 2014 sales of pork live were above cost of production achieved by farms that purchased the biological material for the introduction of fattening the rest of the period, sales prices very low have attracted negative economic results for farmers.

Noting that, during the period represented graphically, only in September 2014 the sales at live pigs were above the cost of production achieved by the farms that purchased biological material for introduction to fattening and the rest of the period, the very low sales prices have attracted negative economic results for farmers.

Graph 2 – Selling prices for live pigs in Romania, 2014-2015
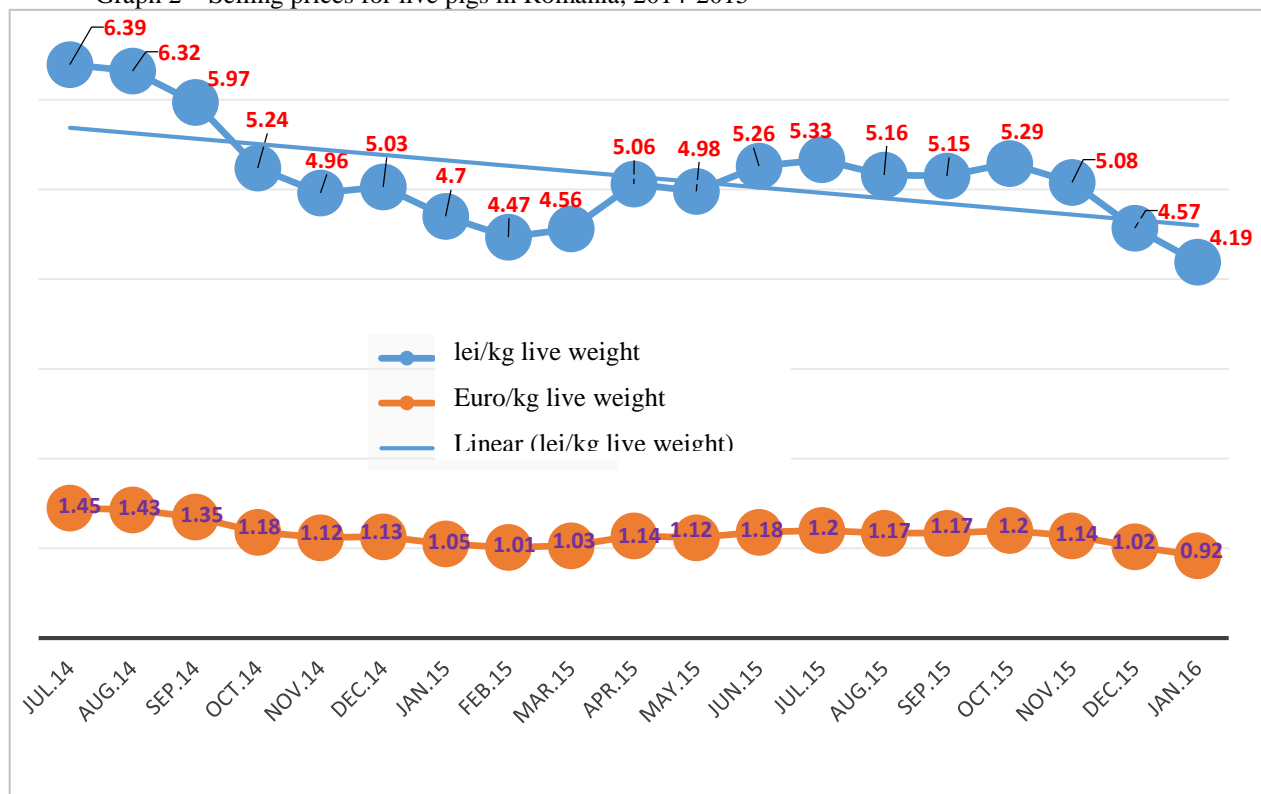
Source: Committee of Classifying Carcasses

CONCLUSIONS

The calculation results indicate that the performance of the pig meat sector should be improved, both in terms of weight gain and of price of biological material (which in the cost of pork has the largest share, after feeding costs, in the case of farm with closed circuit). Also, the increase in the number of births / year, in the number of piglets / farrowing are indicators that need to be improved.

The share of biological material in the pork prices (for 2015) is significant and is due to lack of real offer of piglets from domestic production. This shows an imbalance in the system development, which particularly affects the small producer, who is unable to support its own breeding farm sector. Given the importance of this category of producers, it results a great part of the negative effects on the domestic pork market.

It is obvious that the support in the production stage on the pork chain has effects on output volume, its quality and obviously on the profits of farmers and their elasticity to react to market fluctuations, by adapting the selling price.

Producers association for mutual support is necessary but, unfortunately, is still hampered by a callous attitude. Producing of biological material in specialized farms established by associations, cooperatives could be initiatives supported by a development program adapted to the needs of the sector.

BIBLIOGRAPHY

1. Institutul de Cercetare pentru Economia Agriculturii și Dezvoltare Rurală, (2016), *Studiu privind piața cărnii de porc*, Planul intern de cercetare
2. Comisia de Clasificare a Carcaselor, (2016), www.ccceurop.ro
3. Institutul de Cercetare pentru Economia Agriculturii și Dezvoltare Rurală, (2014), Proiect ADER ”Determinarea indicatorilor tehnico-economici ai țehnologiilor de producție la produsele vegetale și animale aplicate în vederea creșterii performanțelor de mediu (costuri, productivitate, rentabilitate, marja brută)”, Faza 9.

ECONOMIC IMPORTANCE OF ENSURING THE WELFARE FOR FARM PIGS

MATACHE CRISTINA – STEFANIA[1]

Abstract: *Lately it speaks a lot about ensuring animal welfare and about the influence of the environment on life and on animal performance. Pig farming depends heavily on the environment because pigs needs all the elements for the comfort (enough space for sleep and movement, enough food depending on nutritional requirements for the animal category, water ad libitum, and health insurance) for growth and to deposit bonus. When these needs are not respected, pigs begin to lose weight and that affect the production and the economic efficiency of the farm. The purpose of this study is to provide necessary information that have an important influence on the production and on the economic efficiency of the farm when animal requirements are not met, but also to known and combating stress factors. The material is addressed to farmers and both to those who want to set up a pig farm.*

Key words: *welfare, daily average gain, food, growth conditions,microclimate*

INTRODUCTION

The work brings in the attention of breeders and those who are interested in swine operation, all the necessary technological flow, such that animals to benefit all necessary requirements that have an important role in ensuring economic efficiency and for submitting spore growth.

Pig farming in our country, is a very important economic sector, which is characterized by intensification of production and use of the entire production circuit in a single holding, the breeding system, motherhood, growth and fattening to slaughter products.

Pigs operation is of great economic interest, which is the main source of animal protein used in human food. The products of this assortment of meat have increased energy, and particular organoleptic qualities, making it to be preferred by consumers.

The growth and pig exploitation is a profitable economic activity, because they recovere slightly any type of feed and industrial waste, hey have a high fecundity and the increase growth is superior to other species and have the best yield to sacrifice.

Swine are less demanding, and if they have provided all necessary conditions, they rapidly accumulating increase growth, and resulting an accelerated technological flow and therefore an economic efficiency of exploitation.

Animal welfare refers both to ensure the necessary space for rest and motion, ensuring microclimate, proper feeding depending on the animals nutritional requirements and watering ad libitum, and ensure hygiene and isolation of infectious agents.

In the UK, the Council for Animal Welfare has drafted the 5 freedoms for animal welfare:
- Freedom from hunger and thirst
- Freedom from discomfort
- Freedom from pain and illness
- Freedom to express natural behavior
- Freedom from stress.

MATERIALS AND METHODS

This study present the influence of ensuring the welfare of pigs in order to obtain quality carcasses with the aim to capitalize efficient the holding. Since pork meat is preferred by consumers because of its distinctive organoleptic qualities, farmers must have in regard, beside the

---

[1]Research assistant – ICEADR, matache.cristina@iceadr.ro

intensification of the production and ensuring all the elements needed to produce quality meat, because the pig is a sensitive animal to environmental factors.

Pigs should benefit, besides food, shelter and water, and of quiet and no noise to disturb his state. Stressed pigs gives an inferior quality and therefore, the farmer must take into account the physiological and ethological requirements of the animal. For the study were analyzed veterinary rules for animal welfare and livestock in a holding will be presented the technical and economic impacts of supplementing these conditions to improve animal welfare.

To ensure these welfare measures, the farmer should consider allocating space from a section based on the number of animals and age groups, to provide enough space for rest, lighting the shelter, eliminating noxious, avoid noise to not stress the animals, watering ad libitum and feed to be balanced in terms of nutrition for each age category.

RESULTS AND DISCUSSIONS

For welfare, housing and accommodation have an important role, animals needs shelter with enough space, made of quality materials that are not harmful, without sharp edges or protrusions to avoid injuring them and cleaning them rigorously and easily.

Table 1.

NECESSARY FREE TRADE FLOOR AREA FOR ONE PIG BY CATEGORY	
ANIMAL CATEGORY	**FREE FLOOR SURFACE / piglet**
Pigs with **maximum10 kg** bodyweight	0.15 m^2
Pigs with bodyweight between **10-20kg**	0.20 m^2
Pigs with bodyweight between **20-30KG**	0.30 m^2
Pigs with bodyweight between **30-50KG**	0.40 m^2
Pigs with bodyweight between **50-85KG**	0.55 m^2
Pigs with bodyweight between **85-110KG**	0.65 m^2
Pigs with more than **110kg** bodyweight	1.00 m^2

Table2.

PIG NEEDS FOR THE SLEEPING AREA	
SUPERIOR REQUIREMENT INDICATOR	**INDICATOR FOR MINIMUM REQUIREMENT NEED**
Rest area in higher welfare conditions must be dry at all times by using appropriate absorbent bedding material.	Buildings for pigs must be constructed so as to allow animals to have access to a comfortable rest area in physically and thermally, drained and cleaned properly and to allow all animals to rest at the same time.

The shelter must be kept within limits: air circulation, dust and pollutants levels, temperature and humidity.

Table 3.

THE LEVEL OF NOXIOUS IN THE SHELTER	
SUPERIOR REQUIREMENT INDICATOR	**INDICATOR FOR MINIMUM REQUIREMENT NEED**
Noxious level of higher welfare shelter conditions: -max. 10.5 mg / m^3 powder -max. 700 ppm CO_2	Noxious level of mandatory minimum shelter conditions: -max. 15 mg / m^3 powder -max. 1000 ppm CO_2

If natural light is insufficient or is not available in the shelter, then artificial lighting must be done according to the physiological and ethological requirements of the animal.

Table 4.

MINIMUM AND HIGHER REQUIREMENTS ON LIGHTING IN PIG FARMING	
SUPERIOR REQUIREMENT INDICATOR	**INDICATOR FOR MINIMUM REQUIREMENT NEED**
Superior lighting conditions: - Period exceeding 11 hours / day artificial lighting - 50 lumen illumination (at least one power 150W bulb every 33 m2, between the hours determined by the commitment)	Mandatory minimum lighting conditions: - Minimum of 8 hours / day lighting - 40 lumen illumination (at least one light bulb with the power of 100 W at 42 m2 each)

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

Food is an essential element of welfare, ensuring a good quality comfort food nutrition for good health. Animals must receive a nutritious food, properly balanced as required age, which is fed to them in sufficient quantities to keep them in good health and to satisfy their need for nutrients. The main objective is to establish the most accurate nutrition intake of nutrients and use them as efficiently as possible, so as to enable superior performance.

The pig is the animal that produces more meat quality at a reasonable cost, it is the animal that harness best the food. The profitability of pig breeding is determined primarily by rational and balanced feeding. Swine nutrition is a very complex issue that depends on many factors, such as race, sex of animal, age, degree of amelioration and breeding technology.

To provide the necessary nutrients, feed rations are calculated according to the physiological requirements of the animal and the group to which it belongs (mass group or gender group). For feeding pigs, providing essential aminos concentration is the most important basic requirement in achieving rations.

A food in sufficient quantities and poor quality induce loss of bioproductive performance, irritation, abnormal behavior and pathological consequences. In light of livestock for good quality products, for food safety reasons it is reasonable to eliminate stress factors that can have negative effects on meat quality at slaughter.

Table 5.

NUTRIENT REQUIREMENTS FOR GROWING PIGS DEPENDING ON WEIGHT					
Weight (kg)	5-10	10-20	20-35	35-60	60-100
Daily gain (kg)	0,300	0,500	0,600	0,750	0,900
Energy and protein					
Digestible energy (kcal)	3500	3500	3300	3300	3300
Metabolizable energy (kcal)	3360	3360	3170	3170	3170
Gross protein (%)	22	18	16	14	13
Mineral salts					
Calcium (%)	0,80	0,65	0,65	0,50	0,50
Phosphorus (%)	0,60	0,50	0,50	0,40	0,40
Sodium (%)	-	0,10	0,10	-	-
Chlorine (%)	-	0,13	0,13	-	-
Vitamins					
Beta-carotene (mg)	4,4	3,5	2,6	2,6	2,6
Vitamin A (IU)	2200	1750	1300	1300	1300
Vitamin D (IU)	220	200	200	125	125

NUTRIENT REQUIREMENTS FOR GROWING PIGS DEPENDING ON WEIGHT					
Weight (kg)	5-10	10-20	20-35	35-60	60-100
Vitamin E (mg)	11	11	11	11	11
Thiamine (mg)	1,3	1,1	1,1	1,1	1,1
Riboflavin (mg)	3,0	3,0	2,0	2,2	2,2
Niacin (mg)	22,0	18,0	14,0	10,0	10,0
Pantothenic acid (mg)	13,0	11,0	11,0	11,0	11,0
Vitamin B6 (mg)	1,5	1,5	1,1	-	-
Choline (mg)	1100	900	-	-	-
Vitamin B12 (mg)	22	15	11	11	11
Amino					
Arginine (%)	0,28	0,23	0,20	0,18	0,16
Histidine (%)	0,25	0,20	0,18	0,16	0,15
Isoleucine (%)	0,69	0,56	0,50	0,44	0,41
Leucine (%)	0,83	0,68	0,60	0,52	0,48
Lysine (%)	0,96	0,79	0,70	0,61	0,57
Methionine and Cystine (%)	0,69	0,56	0,50	0,44	0,41
Phenylalanine, and tyrosine (%)	0,69	0,56	0,50	0,44	0,41
Threonine (%)	0,62	0,51	0,45	0,39	0,37
Tryptophan (%)	0,18	0,15	0,13	0,11	0,11
Valine (%)	0,69	0,56	0,50	0,44	0,41

To ensure the welfare the food and the water should not contain any substances that could harm the animal. Watering is preferable to make at their discretion, animals having access to a suitable water source.

CONCLUSIONS

Given the above, the farmer must have regard to all the rules of ensuring the welfare of pigs to achieve qualitative and quantitative pork production. Today, we hear more and more about animal welfare and the meat from stressed animals, which does not have special features for consumers and therefore, the state is trying to help pig farmers with some minimum grant to improve animal welfare.

To ensure these rules, the state will provide a grant of 23.30 to 41.40 Eur / year to increase resting space for animals, from 15.80 to 19.10 Eur / year to provide 11 hours of light daily, from 4.80 to 5.40 EUR / year to improve the welfare conditions during transport, to reduce the quantities of pollutants by 30% will be offered a grant of 16.80 to 22.90 Eur / year and for increasing the sleeping space 7.20 to 15.90 Eur / year.

In conclusion, animal welfare is an important factor in the growth and exploitation of animals, contributing to economic efficiency of the enterprise.

BIBLIOGRAPHY

1. Dinu I. (2002). Suinicultură - Treaty swine breeding, Ed. Coral Sanivet, Bucharest
2. MARD General Management - Policies in Animal Husbandry and Food Industry
3. Order no. 202 of 25 August 2006 - ANSVSA
4. Order no. 75 of August 15, 2005 - ANSVSA

THE FOOD BALANCE DYNAMICS OF THE POULTRY MEAT

CHETROIU RODICA[1]

Abstract: *The paper performs an analysis of the food balance evolution for poultry meat, taking into account the internal production, imports, exports, consumption levels for this food product. Thus, the food balance had a favourable evolution in the recent years, the market supply of poultry having as a source both domestic production and quantities from imports. The amount of poultry meat from domestic production performed generally positive from year to year, so that in 2015 was by 16.5% more meat than in 2010. Also, the imports registered a significant increase of 34.3% during 2010-2015, completing the market demand, but, at the same time, being a factor of competition for the producers in our country. The highest growth was noted in exports, which were 58.9% higher in 2015 compared to 2010, demonstrating that domestic production of poultry meat has become more competitive in the international market, which managed to enter through increase technological performance and product quality. The result of these evolutions is the increased supply of poultry on the Romanian market, leading, in 2015, to find on the market an amount of 14.5% higher compared to 2010. At the same time, the meat poultry consumption increased, reaching in 2015, at 22.7 kg / capita, 24.7% higher compared to 2010.*

Keywords: *meat, poultry, balance, production, import*

JEL Classification: Q11; Q18

INTRODUCTION

The Romanian aviculture has a specific characteristic which has not been used in other countries: it is fully integrated. It produces its own fodder in factories of high performance, and some companies produce through their agricultural activities even the necessary foodstuff ingredients. At the same time, it holds the entire production chain, from breeding farms and incubation units for the production of chicks, to high performance growing of broilers, but also has a major involvement in the activity of industrialization, in slaughterhouses and top facilities for meat processing, as well as in distribution and marketing networks through own stores. Moreover, it exports the surplus at better prices compared to domestic consumption.

The internal Romanian population does not have the capacity to consume, together with the domestic production, the large quantities from import, domestic producers being unable to sell the production and therefore having unsaleable stocks. The poultry meat sector was one of the domains that were able to recover faster than other segments of the meat industry.

MATERIAL AND METHOD

The present study provides a comparative analysis of the evolution of food balance at poultry meat, taking into account domestic production, imports, exports, consumption levels for this food product, using both data from statistical sources (NIS, FAOSTAT) and data from MARD and the Union of Poultry Breeders in Romania.

RESULTS AND DISCUSSIONS

The evolution of poultry stocks during 2010-2015, presented in the Table 1 and Chart 1 describes a sinuous curve, so that at the end of the interval, there were 76.862 thousand heads, 4.93% less than in 2010. These stocks are 99.9% in the private sector and inside this sector, 69.7% are registered in individual agricultural holdings.

---

[1] Chetroiu Rodica, Scientific researcher III, Research Institute for Agriculture Economy and Rural Development, e-mail: rodica.chetroiu@iceadr.ro

Table 1 – Evolution of poultry stocks during 2010 – 2015 (thousand heads)

Forms of ownership	2010	2011	2012	2013	2014	2015
Total, of which:	80845	79842	80136	79440	75447	76862*
Privat sector	80832	79832	80119	79428	75435	76850**
Of which: Individual agricultural holdings	53871	53727	54227	53757	52557	53543**

Source: NIS; *MARD; ** own estimation

Graph 1 – Total poultry stocks during 2010 – 2015 (thousand heads)
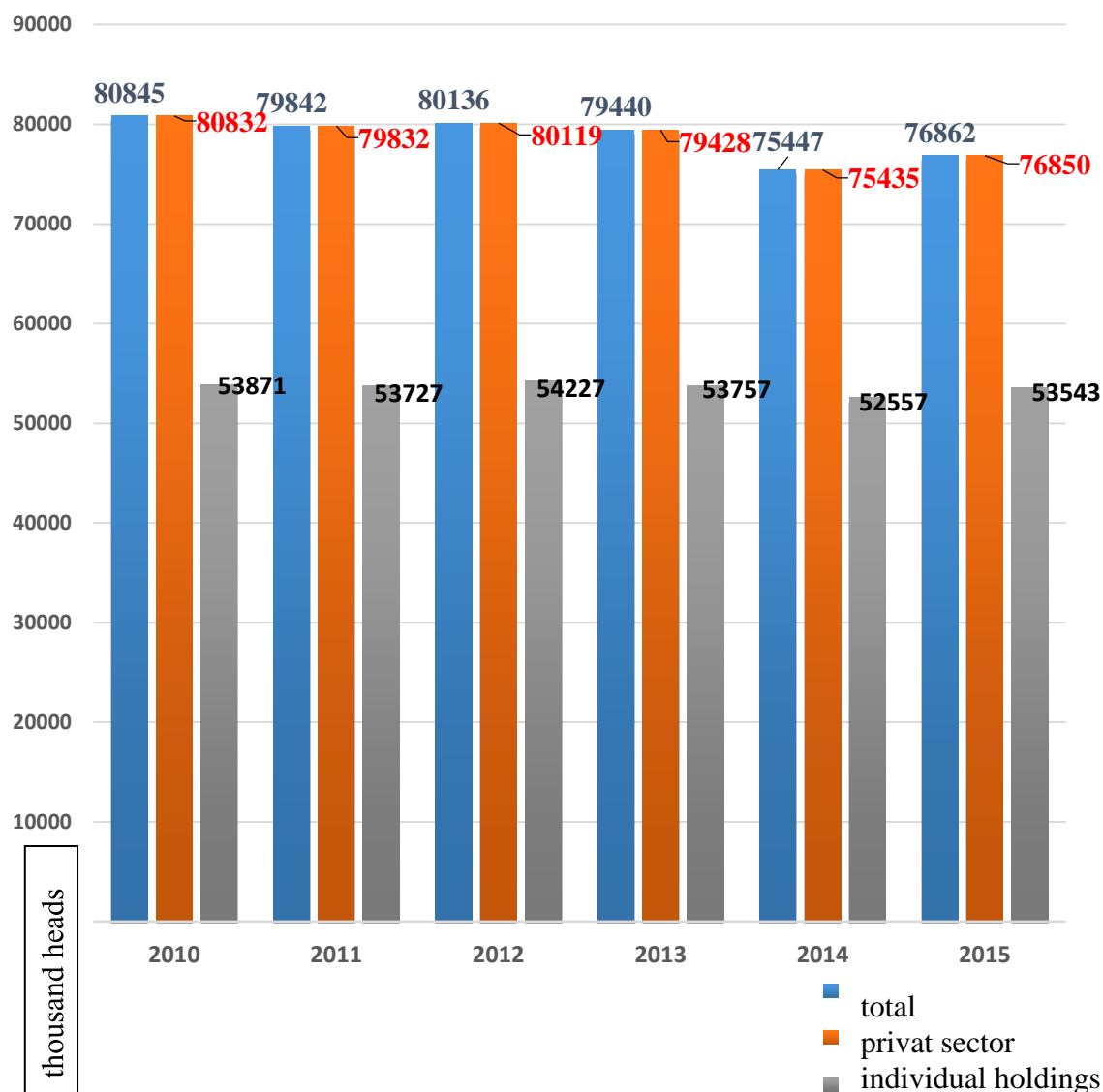
Raising broilers has experienced a favorable dynamics in the recent years, so that after the decrease in number in 2013, has followed a revival of them, reaching in 2015 to increase by 7.5% compared to 2012 (Graph 2).

Graph 2 - The number of meat poultry during 2012-2015, the end of year (thousand heads)
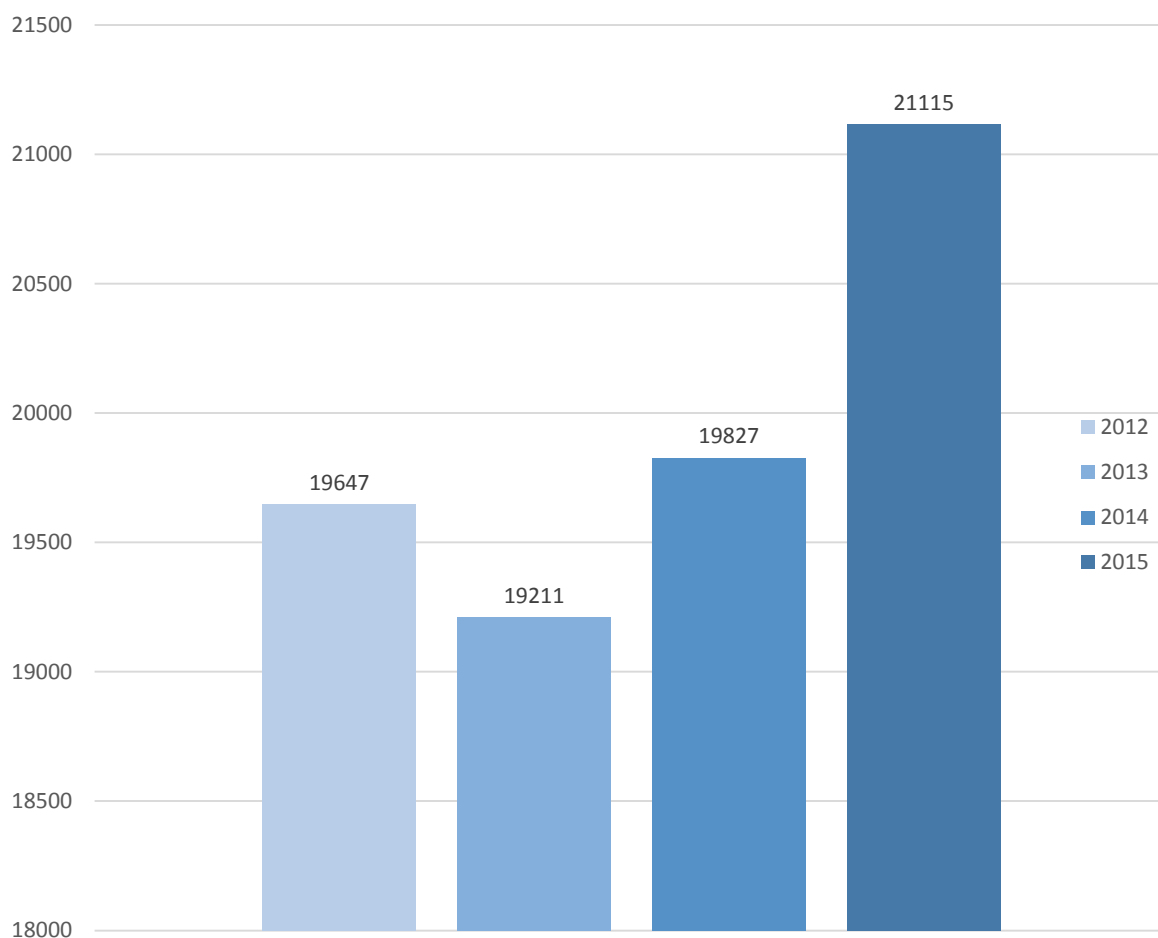
Source: Union of Poultry Breeders in Romania

Regarding the production of poultry meat, presented in Table 2, it is noted that this comes almost entirely from the private sector and has increased with 16.4% in 2015 compared to 2010. Also, inside this sector, only 25% of poultry meat comes from individual agricultural holdings, the rest coming from the industrial production.

Table 2 – Production of poultry meat by forms of ownership, tons live weight

Forms of ownership	2010	2011	2012	2013	2014	2015
Total	446387	477529	470528	456632	488361	519700*
Privat sector	446325	477455	470485	456585	488320	519656**
Of which: Individual holdings	138205	117490	116697	118134	122472	130331**

Source: NIS; *MARD; ** own estimation

Graph 3 – Production of poultry meat on forms of ownership, tons live weight

■ Total — total
■ Sector pr — privat sector
■ Exploata — individual holdings
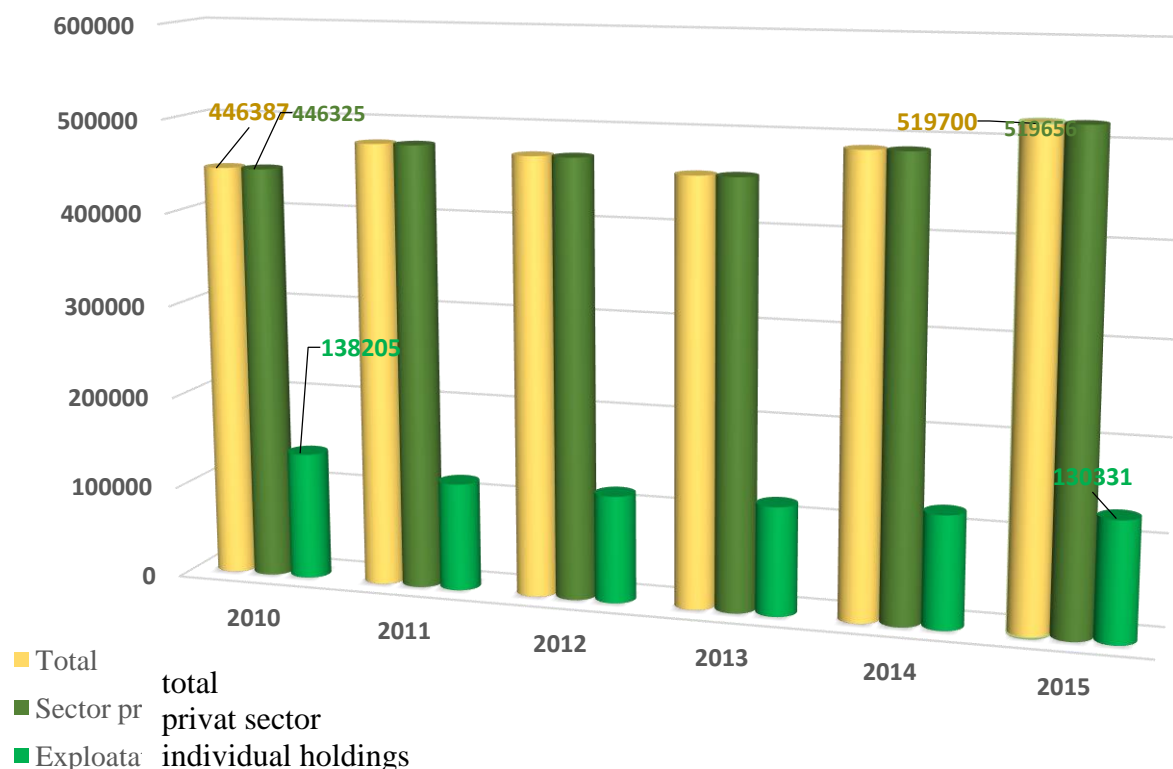
The offer of the poultry meat on market has as a source both the domestic production of poultry meat and the quantities supplied by imports. The amount of poultry meat from domestic production, expressed in carcass meat, has evolved generally positive from year to year, so that in 2015 was by 16.5% more meat than in 2010. Also, the imports recorded a significant growth of 34.3% during the same period, complementing the market demand, but at the same time being a factor of competition for the producers in our country.

The highest growth was noted in exports, which were 58.9% higher in 2015 compared to 2010, demonstrating that domestic production of poultry meat has become more competitive in the international market, which managed to break through increase technological performance and product quality.

The result of these developments is the increased supply of poultry meat on the Romanian market, leading, in 2015, to be on the market an amount 14.5% higher compared to 2010 (Table 3 and Graph 4).

At the same time, the consumption of poultry meat has increased, reaching in 2015, 22.7 kg / capita, 24.7% higher compared to 2010.

Table 3 – Demand and supply of poultry meat (thousand tons)

Specification	2010	2011	2012	2013	2014	2015
Domestic production (meat in carcass)	356,8	381,6	376,8	365,6	390,4	415,8*
Import	96,1	93,7	115,1	100,1	123,3	129,1
Export	58,7	79,0	91,8	83,3	76,0	93,3
Poultry meat supply	394,2	396,3	400,1	382,4	437,7	451,6*
Consumption of poultry meat - kg/capita/year	18,2	17,5	18,2	17,5	20,1	22,7
Domestic production share of supply %	90,5	96,3	94,2	95,6	89,2	92,1

Source: NIS; *MARD data

Graph 4 – Balance of poultry meat

Internal production
Import
Export
Meat supply
Consumption of poultry meat (kg/capita/day)
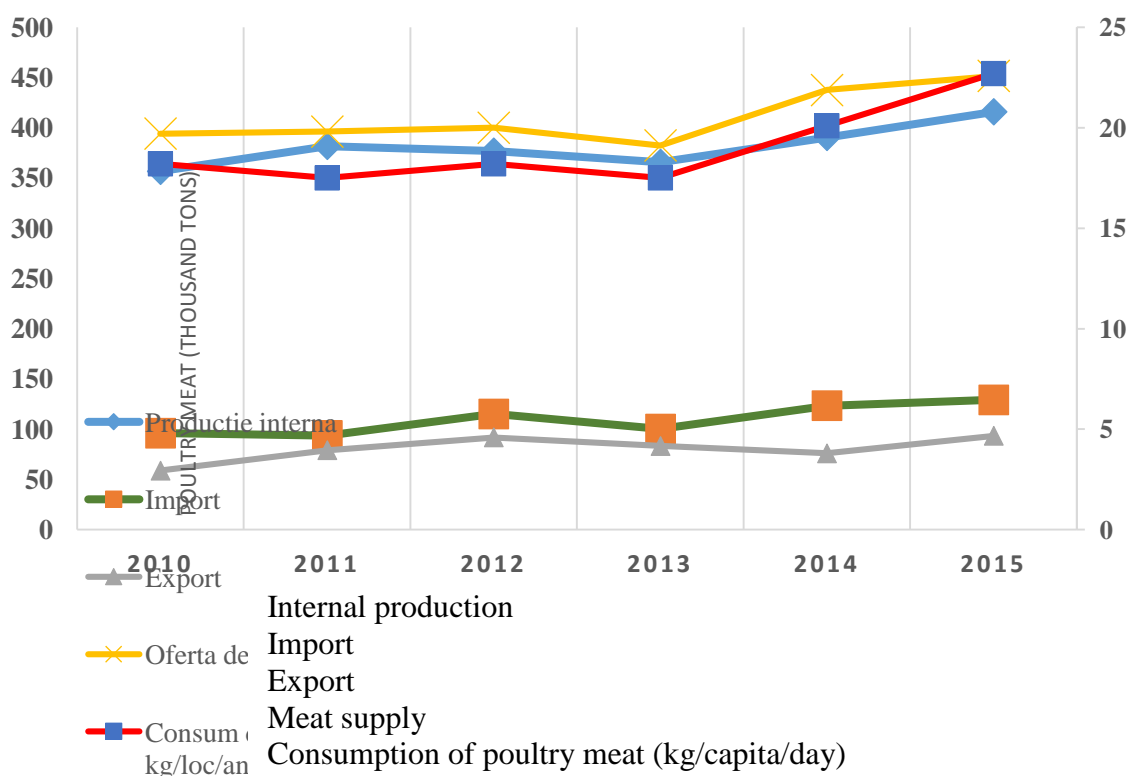
CONCLUSIONS

In conclusion, the balance dynamic of the poultry meat in our country has generally a positive trend towards increasing of the quantitative and qualitative offer on market, which has led to an increase in the consumption of this product in the period analyzed. Also, in the supply structure, the domestic production is the main source, which is a guarantee that the internal producers sell predominantly their production on the internal market.

The chain of poultry meat production in Romania is similar to those found in other European countries, but shorter, proving the integration of processors within this flow, which strengthens the position of producers in the production chain by shortening the path from production to consumer plate.

Regarding the imports of poultry meat, the producers have to face considerable pressure from the surplus of producers in the EU, the US and the region. Since it is possible that these pressures to continue, they must be counteracted by the efforts to unite and increase the efficiency of producers and processors of poultry. This may require removing barriers to foreign investment and technology transfer, in order to improve productivity and efficiency in these subsectors.

BIBLIOGRAPHY

1. Institutul de Cercetare pentru Economia Agriculturii şi Dezvoltare Rurală, (2016), *Studiu privind piaţa cărnii de pasăre*, Planul intern de cercetare
2. Uniunea Crescătorilor de Păsări, (2016), *Buletin informativ ianuarie 2016*
3. *Avicultorul Magazin,* nr.1 (5) / ianuarie-martie 2016
4. www.insse.ro
5. MADR, (2016), date operative.

DEFINITION OF TERMS AND PRESENTATION OF PROCESSES REGARDING THE COLLECTION, RECYCLING AND CAPITALIZATION OF WASTE PACKAGING FROM AGRICULTURAL ACTIVITIES

ALIN-ANGELIN IORGA[1]

Abstract: Packaging, packaging waste and agriculture are separate, distinct concepts for Romania in 2015; they seem to have nothing in common. By bringing these words together and thoroughly studying the areas which they represent, we noticed that they are the starting point in defining a new concept: "Agriculture Waste Packaging". This concept is in fact a new issue which Romania will have to face and can bring great harm to the country's natural heritage no later than in 2020.

Keywords: packaging, packaging waste, packaging waste from agriculture

INTRODUCTION

The need to feed the growing global population and the pressure that it exerts on agriculture has become a serious issue.

In this context, although currently Romanian agriculture is rather extensive than intensive, as is the case in most Western countries, there are certain signs showing that on medium term mechanization and innovations in this field will be similar to the Western ones. This clear shift from extensive agriculture to the intensive system will have both a positive impact, expressed in terms of agricultural productivity, and a negative aspect, in terms of environmental protection.

Thus, while economically Romania will benefit and will become an increasingly important exporter of agricultural goods, intensive farming impoverishes soil nutrients, reduces humus and at the same time its performance affected.

This problem is already reported by numerous European countries; unfortunately, the only natural and sustainable solution is to "let the soil rest." However, this method requires a significant level of financial losses due to the non-usage of agricultural areas annually allowed "to rest". In these circumstances, we can say with certainty that if the highly industrialized Western countries cannot afford to do so, or do not want to apply these measures which will inevitably lead to some economic losses, Romania will not use this method either.

Another less sustainable option, but with a less visible economic impact, is the permanent supply with fertilizers, herbicides and chemical pesticides. The problem is that using these chemicals, which are more or less dangerous, involves a number of risks which generate, in turn, a series of obligations on persons, companies or institutions who resort to the use of these chemicals.[1]

The biggest risk is polluting the soil, water and air by letting packaging waste from these products in nature, temporary or permanently. Therefore, packaging waste arising from the use of chemical fertilizers should be subject to strict regulation which obviously should be observed. In reality, however, due to the fact that these packages are subject to special regulation, producers, users and even the authorities are not cautious with this regard; they all prove to be ignorant rather than interested in this matter as they should be. What is even worse is that some manufacturers or users do not know what they are supposed to do with waste packaging from the activities they carry out.

This is why research and documentation on "Improving the collection, capitalization and recycling management of packaging waste from agricultural activities" is necessary for the sustainable development of the agricultural industry in Romania, affecting as little as possible the natural heritage of the country.

---

[1] PhD student, U.A.S.M.V. Bucharest

MATERIALS AND METHODS

In terms of defining specific terms that can be found in the concept of integrated management of packaging waste, there are several definitions in the literature. The definitions which the Romanian law is based on are also included in the Government Decision No. 621/2005 on the management of packaging and packaging waste with additions and amendments represent the starting point of the personal research.

RESULTS AND DISCUSSION

Packaging is any object, regardless of the material which it is made of or its nature, whose purpose is the retention, protection, handling, distribution and presentation of products, from raw materials to processed goods, from the producer to the user or consumer. Non returnable items made for the same purposes are also considered packaging. The criteria defining an object as packaging are [6]:

a) Items shall be considered packaging if they meet the definition without prejudice to other functions they may additionally perform, provided that it is not part of the product, being necessary to contain, support or preserve the product throughout its lifetime and all elements are intended to be used, consumed or disposed of with the product.

b) Items designed and intended to be filled at the point of sale, as well as "disposable" items sold filled or designed to be filled at the point of sale, shall be considered packaging if they have a packaging function.

c) Packaging components and other elements integrated into packaging shall be considered as part of that packaging. Other elements directly hung or attached to this product, fulfilling a packaging function, shall be considered packaging if they are not part of the product and if not all the elements are intended to be used, consumed or disposed of with the product.

Categories of packages considering their *use* are:[8]

- **Primary packaging** - sales packaging - packaging designed and made to act as a sales unit, for the final user or consumer, at the point of purchase;

- **Secondary packaging** - grouped packaging, over packaging designed to constitute a grouping of a number of units for sale at the point of purchase, whether it is sold as such to the final user or consumer; it can be separated from the product without affecting the product's characteristics

- **Tertiary packaging** - transport packaging - packaging designed to facilitate handling and transport of a number of sales units or grouped packaging, to prevent damage during handling or transport.

- **Reusable packaging** - packaging reused for the same purpose, whose return by the consumer or trader is ensured by paying a sum as a deposit system, through repurchases or otherwise.

Reusable packaging shall be considered packaging waste when it is removed at the end of its useful life. Reusable packaging shall not be considered packaging waste when it is returned to be reused.

Waste is represented by any substance or object which the holder disposes of or intends to throw away or is required to discard.

Packaging waste is defined as packaging or materials that do not satisfy the requirements and purpose which they were designed and manufactured for and which remain after the packaged product was used.

Generated packaging waste is the packaging that becomes waste after being used.

Integrated management of packaging waste means all activities of organizing and managing waste

Packaging waste management involves waste prevention, collection, transportation, capitalization, recycling and disposal, including the supervision of such operations and subsequent maintenance of the collection and disposal sites.

Prevention means measures taken before a substance, material or product becomes waste, thus reducing:

a) the amount of waste, including reuse of products or extending their life;

b) the adverse impacts of the generated waste on the environment

c) the content of harmful substances in materials and products

Pre-collection is the activity that takes place prior to collection. This comprises all actions necessary for the disposal of waste to the place where the collection services lift it up.

Collection consists of lifting up, composting and / or regrouping, including preliminary waste storage prior to transport to a waste treatment facility;

Selective (separate) collection is collecting packaging waste by type of material and / or material - a waste stream is kept separately by type and nature of the waste in order to facilitate a specific treatment

Waste transportation represents all processes that start after waste collection and end with handing them over to the point of treatment, recycling and capitalization.

Treatment is all physical, chemical and biological processes performed at the collection centres, which change the waste characteristics in order to reduce the volume and dangerous nature with a view to capitalize, recycle or dispose of them.

Recovery of packaging waste consists of any process applied to packaging waste by industrial procedures so as to turn it into a secondary raw material which helps replace other raw materials that are used in the production process.

Energy recovery of packaging waste requires the use of combustible packaging waste as a means to generate energy through direct incineration, with or without other waste, but with energy recovery.

The recovery or incineration objective at waste incineration plants with energy recovery is the total amount of packaging waste recovered or incinerated at waste incineration plants with energy recovery, reported to the total amount of packaging waste generated.

Packaging waste recycling is the reprocessing operation in a production process for packaging waste to be reused for the original purpose or for other purposes.

The recycling target is the total quantity of recycled packaging waste, reported to the total amount of packaging waste generated;

Presentation of the packaging waste collection processes, capitalization and recycling

Waste management is one of the major issues Romania faces in terms of environmental protection. Waste management includes the following: collection, transport, recycling, capitalization, disposal of waste, including the supervision of such operations and care after closing their storage areas, and, as a final process, elimination of amounts that cannot be recycled or capitalized.[9]

The packaging waste collection - collection and transport of waste and recyclable materials is an important link in the waste management; although it is often undervalued, it represents between 60% -80% of the total cost of waste and recyclables management, therefore any improvement to this element can greatly reduce this cost.

For the efficient and optimal organization of the collection and transport of waste and recyclables certain characteristics of reference will be considered, namely: the size of the collection area, the economic structure of the collection area, urban conditions, customer requirements, choosing the suitable collection scheme.

The container type, its volume, the container combination and frequency of waste collection waste affect the composition, the quantity and quality of recyclables collected separately.

Packaging waste transportation[7]

Waste transportation means all processes that start after waste collection and end with delivering them to recycling, treatment or disposal plants. Waste transportation is of two kinds: short distance transport and long distance transport. After collecting the waste from the place where it was generated follows a short transport to the nearby waste recycling treatment and / or disposal facility or at a transfer station. From the transfer station waste gets to a central facility for recycling, treatment and / or disposal by sea transport.

Material recycling involves: intermediate processing, such as sorting, shredding and / or compacting; transportation, material recovery; final processing.

The recycling benefits are preserving natural resources and reducing storage space. However the collection, transport, capitalization and the final processing require additional energy and most recycling programs would economically subsidize.

Fundamental recycling problems are related to: identification of recyclable materials; identification of reuse and recycle opportunities; identification of markets for recovered materials.

A primary goal in waste management is to maximize the service life and minimize waste deposits. To this end, materials that can be withdrawn from the waste stream to achieve this objective have to be identified.

Recycling and development programs should consider markets for recovered materials, collection infrastructure and general costs. In most cases, recovered materials are of inferior quality compared to the original ones, so that the market price should be attractive to potential buyers.[2]

Waste incineration capitalization

Waste packaging that cannot be reused or recycled are not considered raw material for industrial combustion systems but can be used as alternative fuels. Using industrial waste combustion systems is called co-incineration.

Waste and alternative fuels produced from it through various methods of treatment are accepted as energy sources and are increasingly used as substitutes in industrial processes, mainly in cement factories and power plants.

Co-incineration in cement kilns - A key aspect in making cement is clinker production in rotary kiln. [1] The starting material for the production of clinker is dried and heated to 1400 ° C and due to chemical reactions cement clinker forms. Whichever method of manufacture, obtaining clinker is a conversion process in which used materials (fuels and raw materials) are consumed or integrated into the final product.

Due to high temperatures in the cement kiln, the organic content of alternative fuels is totally destroyed. Some characteristics of clinker manufacturing, in case of using alternative fuels, are:

- extending the residence time of waste gases in the rotary furnace at temperatures of over 1200 ° C;
- using the ash resulting from burning alternative fuels as part of clinker with other materials;
- chemical and mineralogical fixing in the clinker of the elements found in very low concentrations.

Burning in power plants - power plants as electricity producing plants are designed for efficient use of conventional fuels. However they can be adapted to alternative fuels.

Using waste and alternative fuels is limited by the following elements:[3]

- storage possibilities in power stations;
- waste pre-treatment requirements to bring them into a usable form of particular combustion systems used in power plants;
- waste behaviour during the combustion process, respectively reducing the combustion process by filing the kiln walls, corrosion and influencing waste gas abatement systems.

Incineration of waste in Romania is used mainly in the cement industry. This is due to increasing demand from the cement manufacturing industry and relatively small demand from electric power industry, as electricity is mainly produced by the numerous hydropower plant located on the main rivers of the country. The advantages of co-incineration are:

- reducing waste deposited;
- waste energy recovery where material recovery is not possible;
- conservation of raw materials needed to produce energy.

CONCLUSIONS

Waste management is a major issue that Romania will face in terms of increasing intensive agriculture.

The activities related to waste management should be carried out with due regard to environmental standards that are consistent with the requirements of EU legislation.

EU policies in the field of waste management highlight the importance and as such they need an integrated approach to waste management.[5]

Waste management involves the collection, transport, treatment, capitalization and disposal of generated waste.

The collection, recycling, recovery through incineration are waste processing methods commonly used in most countries. Such methods are intended both for factors such as environment protection and for the rational and effective economical exploitation of natural resources.

Recycling focused on two fundamental objectives: - neutralize toxic waste in order to reduce air, water and soil pollution as much as possible, and cause no harm to living organisms as well as reduce waste mass and volume for safe storage.

Total or partial capitalization of packaging waste from agriculture can be made by obtaining fuel or secondary energy that can be used in other industries.[10]

In conclusion, the issue of the negative environmental impacts resulting from the constant trend to increase the quantities of packed chemicals and hence the rise in volume of the used packaging waste and will be used in modern agriculture by increasing intensiveness will be the challenge for which Romania needs to be prepared to sustainably manage considering its natural heritage.

BIBLIOGRAPHY

□1□. Bălăneanu Oana Andra – Formal ecological education and its importance for sustainable development, published in COLUMNA, no.2, 2013

□2□. Berca Mihai - Environmental Management, Ed. Ceres, Bucharest, 2008

□3□. Berca Mihai - Environment And Natural Resources Management Theory, Grand Publishing House, 1998

□4□. Bran Florina - Elements of Environmental Economics and Management, Ed. Economica, Bucharest, 2004

□5□. *** The National Institute of Economic Research - http://www.revistacalitateavietii.ro /2012/CV-1-2012/02.pdf

□6□. *** European Commission - http://ec.europa.eu/news/environment/index_ro.htm(2014)

□7□. *** European Commission - http://ec.europa.eu/news/agriculture/index_ro.htm(2013)

□8□. *** G.D. 621/2005 on packaging and packaging waste

□9□. ***Law 426/18/06/2001 approval of GEO No.78 / 2000 on waste regime – Official Bulletin No. 411/25/July/2001

□10□. *** G.D. 856/2002 record of waste management and approval of the waste list incl. hazardous waste -Official Bulletin No. 659/5/September/2002

MODEL OF VEGETATION EXTENSIVE SYSTEM OF FILTERS USED IRRIGATE CROPS

BĂDAN DANIELA NICOLETA[1]

Abstract: *This paper is based on the design of an extensive system of filters vegetation that serves a town with 1,400 inhabitants. In this work I present methods of water purification in rural / urban and viable solutions to implement filters planted with macrophytes based on biological treatment. Depending on the throughput rates of the village wastewater system parameters are established extensive filters. Sewage plants are lower in rural areas usually experiencing considerable seasonal and even daily variations in terms laden with pollutants and sewage flow. The adoption of such methods would bring many benefits to rural areas locally to reduce without the consumption of energy costs if the topography makes it possible plant location and thus decreasing the risks of environmental pollution with the possibility of effective treatment of wastewater. These sewage treatment plants in rural and urban areas must be manageable and exploitable. Ensuring good quality and quantity, purified water is considered a valuable especially in rural areas being reused in agriculture.*

Keywords: *extensive systems, water treatment, sewage plants, rural*

JEL classification: Q15, Q25

INTRODUCTION

Romania ranks twenty-first in Europe, being a country rich in water resources, so that an inhabitant has 1,700 m3 of water for one year. For a good use the water used for drinking, industrial, recreation, agriculture, resources, both underground and surface waters, can not be used without investment for river improvement works and treatment plants.

The composition and quantity of wastewater, determines to a large extent, both the size of treatment plants and the quality of surface waters, emissaries, the most commonly used, which can intervene in the election process and purification scheme.

After the receipt into receptors, polluted waters are subjected to natural processes of self-purification, which means gradually reducing the harmful effects on the environment, including self-professed receptors.

Through self-purification means all natural treatment processes by which receptors are brought back to their qualitative characteristics that you had before receiving wastewater. Self-cleaning ranges, water features remain constant even if. Self-purification capacity is not unlimited receptors. For this reason, there is an ongoing decline of this capability, especially when the ground is envisaged for irrigation or infiltration, or even surface and especially lakes.

Extensive purification processes are processes for purification of waste water are very close to natural water purification processes (processes of self-cleaning) to which, as the was previously indicated, the main role is played by micro-organisms (bacteria).

Extensive wastewater treatment systems have a very natural (no aspect of industrial plant) fits perfectly into the natural landscape without it affecting anything. Such systems Extensive wastewater treatment were developed in different European countries (France, Germany, Spain, Holland, etc.) generally to serve certain objectives (eg small communities) with a population of less than 500 population equivalent. Establishment of extensive water treatment plant to serve the village with a population of more than 500 pe up to 5000 pe can be considered possible but taking into account some specific precautions. In our country, the research in this field is at an early stage.

In extensive systems of vegetation wastewater treatment principle is achieved mainly aerobic biological treatment occurs in the granular particles from fine to coarse. There is to be a renewal regular washing of the filtering layer or to be evacuated sludge produced in the biological

---

[1] Assistant research , ICEADR, email: badan.daniela@iceadr.ro

filters. Instead sludge produced upstream of the filters (filter surface or primary sedimentation facilities) must be evacuated.

MATERIALS AND METHODS

This paper is a synthesis of data and materials of thesis based on an extensive bibliography "Extensive filters vegetation systems" developed at the University Politehnica Bucharest, Faculty of Biotechnical Systems Engineering.

This work represents a synthesis of data and materials from diploma thesis based on an extensive bibliography "Extensive filters vegetation systems" elaborated at the University Politehnica Bucharest, Faculty of Biotechnical Systems Engineering.Schedule according to which we calculate water flow is MathCad, which is a software mathematically in the category of advanced devoted to solving mathematical problems with procedures symbolic computation and methods numerical analysis having an robust option programming and interactivity very fluid with other software: Matlab, Origin, MS Excel, Office, etc.

RESULTS AND DISCUSSIONS

In the the research aspect was designed treatment plant that treats wastewater from extensive in a town with a population of 1400 inhabitants. The village is divided into two areas within the locality runs sales:

Table 1. Industrial area

Data	Milk and cheese factory	Fur factory
Production [of / day]	7 t/day	1 t/day
Personal [person]	120 pers	180 pers
Offices	10	10
Group I	40	60
Group II	40	60
Group III	-	50
Group IV	-	-
Group V	-	-
Group VI	30	-
Buildings	7	9
Maximum volume	20 000 m^2	16 000 m^2

Table 2. Zoological-technical area

Date	Cattle breeding	Farmed birds
heads	1000	40 000
Personal [person]	120	70
Offices	10	5
Group I	50	20
Group II	60	45
Buildings	25	7
Maximum volume	10000 m^2	12000 m^2

In order to determine wastewater flows to rural center taken extensive system of treatment shall be taken into account:
• consumption of drinking water of the village;
• characteristic values of requirements and requirements of water supply from residential areas, industrial and agricultural areas of the center;
• characteristic values of total water supply requirement of the center areas.

Current wastewater flow taken over in urban centers and urban processed by treatment plants is not constant during the day, showing fluctuations depending on the manner in which water

supply is consumed in urban centers. Therefore using multiple characteristic values that define this notion fluctuating flow namely:

• $Q_{u\,zi\,med}$ - the average daily flow expressed in the unit feature [m³ / day] or the unit S.I. [m³ / s] is the average value daily flow rates of a waste water produced in the urban center during a year;

• $Q_{u\,zi\,max}$ [m³ / day, m³ / s]- maximum daily flow rate is the maximum value daily flow rates of wastewater produced in the urban center over one year;

• $Q_{u\,orar\,max}$ [m³ / h, m³ / s] Hourly maximum flow of wastewater is the maximum value hourly flow rates of wastewater produced in the urban center throughout the day;

• $Q_{u\,orar\,min}$ [m³ / h, m³ / s]- Hourly minimum flow of wastewater is the maximum value hourly flow rates of wastewater produced in the urban center throughout the day.

Wastewater flow of the center urban / rural is determined by the consumption of drinking water to the urban center, its characteristic values successive following algorithm: : is calculated characteristic values of requirements and requirements of water supply in residential areas, industrial and agricultural center's urbanis calculated the characteristic values of of the requirement total water supply to the urban center, then calculate the characteristic values of the wastewater flow to urban center.

The needs for water supply for populated residential area of the center is expressed by the following characteristic values are be calculated as follows:

$$Q_{zi\,max}= \frac{1}{1000}\left(\sum_i\sum_j N(i) * q_j(i) * K_{zi}(i)\right) + Q_{ci}$$

$$Q_{zi\,med}= \frac{1}{1000}\left(\sum_i\sum_j N(i) * q_j(i) * K_{zi}(i)\right) + Q_{ci}$$

$$Q_{orar\,max} = \frac{1}{24}\left(\frac{1}{1000}\left(\sum_i\sum_j N(i) * q_j(i) * K_{zi}(i) * K_o(i)\right) + Q_{ci}\right)$$

where,

K_{zi}- the coefficient of daily flow unevenness;

K_o - the coefficient of hourly variation is adopted for each of the differentiated areas of the village;

$q_{(i)}$ [l / day person] - medium daily flow specific category j of needs water for area residents and the village;

Q_{CI} [m³ / day] - water flow necessary for fire; it can be calculated analytically based on the provisions of STAS 1478-90 taking into account the configuration of systems for fire.

Table 3. Throughput rates of needs and of the requirement of the village water supply

Fluctuating water flow	Industrial area (Milk and cheese factory + Factory fur)	Zoological-technical area (Cattle Breeders + aviary)	Residential area
medium daily flow (Q zi med)	396.107 m³/day	180.411 m³/day	992.503 m³/day
Maximum daily flow (Q zi max)	399.044 m³/day	246.852 m³/day	1049.330 m³/day
Maximum hourly flow (Q orar max)	18.315 m³/h	22.078 m³/h	75.361 m³/h

The flow of water needs for animal care should include supplies water to use biological animal needs technological water for manure removal, washing and disinfection halls, cooking, maintenance of technical installations, the necessary objects annex the halls of farming.

The characteristic values of flow requirement of total water supply of populated areas respectively total flow rate average daily $Q_{s\,tot\,zi\,med}$ [m³ / day, m³ / s], debit total maximum daily

$Q_{s\,tot\,zi}$ [m³ / day, m³ / s] hourly maximum total flow $Q_{s\,tot\,orar\,max}$[m³ / h, m³ / s] is determined by the following relationship:

$$Q_{s\,tot\,zi\,med} = Q_{s\,zi\,med} + Q_{sI\,zi\,med} + Q_{sZ\,zi\,med}$$

$$Q_{s\,tot\,zi\,max} = Q_{s\,zi\,max} + Q_{sI\,zi\,max} + Q_{sZ\,zi\,max}$$

$$Q_{s\,tot\,orar\,max} = Q_{s\,orar\,max} + Q_{sI\,orar\,max} + Q_{sZ\,orar\,max}$$

Where,

$Q_{s\,zi\,med}$, $Q_{s\,zi\,max}$ şi $Q_{s\,orar\,max}$- debits daily of the requirement of water supply to population centers;

$Q_{sI\,zi\,med}$, $Q_{sI\,zi\,max}$ $Q_{sI\,orar\,max}$ - debits daily of the requirement of water supply for industrial area;

$Q_{sZ\,zi\,med}$, $Q_{sZ\,zi\,max}$ $Q_{sZ\,orar\,max}$ - flow daily of the requirement of water supply in the area inhabited zoological-technical center.

Table 4. Flows characteristic requirement total water supply of populated center

Water flow	Population center
Total average daily flow	1569 m³/day
Total maximum daily flow	1695 m³/day
Hourly maximum total flow	115,754 m³/hour

Waste- water flow of the center urban / rural is determined by the consumption of drinking water to the urban center, the characteristic values of its being performed following algorithm successively calculating characteristic values of requirements and requirements of water supply in residential areas, industrial and agricultural areas of the center is calculated the characteristic values of total water supply of the requirement of the urban center, then calculate the characteristic values calculated wastewater flow of the center urban / rural.

The characteristic values of the flow of wastewater in central urban / rural are established by similar characteristic values of total water supply of the requirement of the center populated with the following relationship:

$$Q_{u\,zi\,med} = 0,8 * Q_{s\,tot\,zi\,med}$$

$$Q_{u\,zi\,max} = 0,8 * Q_{s\,tot\,zi\,max}$$

$$Q_{u\,orar\,max} = 0,8 * Q_{s\,tot\,orar\,max}$$

$$Q_{u\,orar\,min} = \frac{1}{24} * p * Q_{u\,zi\,max}$$

Where,

p = a dimensional coefficient depending on the number of inhabitants of the populous center.

Table 5. Wastewater flows characteristics of the locality

Wastewater flow	Populated center
Average daily wastewater flow	1255 m³/day
Maximum daily wastewater flow	1356 m³/day
Hourly maximum wastewater flow	92.603 m³/hour
Minimum hourly wastewater flow	14.127 m³/hour

Following wastewater flows whereabouts of the village taken from the extensive system of treatment is determining the dimensional parameters of the system.

Designing an extensive system of filters vegetation consists of two steps. Each stage is divided into 3 groups and 2 groups .A group is divided into 10 compartments.

For higher efficiency of these systems is required in advance a good mechanical treatment. Pre-treatment can be performed by primary sedimentation in decanter.

In stage I of vegetation filters with vertical flow granular filler material is used with various grain gravel placed in layers. The active layer has a thickness of 40 cm, and a particle size between 2-8 mm gravel supporting layer is made up of gravel with an intermediary grain size

between 10 - 20 mm, and is based on the drainage layer, consisting of gravel all but a coarse grain size between 20-40 mm.

In the second stage refines the treatment of the first stage. Said filler layer of sand with a thickness of at least 30 cm.

First step surface is determined by the relationship:

$S_{tr\,I\,fw} = S_{Ifw} * p$
$S_{tr\,I\,fw} = 1,5 * 1400 = 2100\ m^2$

in which :
S_{Ifw}- Specific surface for stage I

Second step surface to determine the relationship

$S_{tr\,II\,fw} = S_{IIfw} * p$
$S_{tr\,II\,fw} = 1 * 1400 = 1400\ m^2$

in which :
S_{IIfw}- Specific surface for stage I

Plants that can be grown on the granular layer: ScirpusTypha, Reed (especially the variety Phragmites australis) is best used in temperate climates because of resistance to the conditions encountered (periods of flooding water filter, periods of dryness waters high organic load) and the rapid development of roots and rhizomes systems. Vegetation filters are also known commonly used filters with reeds. The recommended planting density is 4 plants / m^2.

From the analytical data shows that 1,400 residents average daily wastewater flow is 1255 m^3 / day which is evenly distributed over an area of 3,500 m^2. In vegetation filters the research in various bibliographic reference sources in the field found that these treatment systems implemented (eg Sveti Tomaž, Slovenia such an area was built for 250 people with an average daily flow of 38 m^3 / day of wastewater) seem to be a reasonable solution to the settlements below 2,000 inhabitants.

SWOT analysis

Strong points
• Technology a little costly;
• Low or zero energy consumption (the use a pump can be avoided if natural inclination is sufficient);
• The possibility of effective treatment of domestic wastewater;
• Adaptation good at servicing locations with seasonal variations in production of domestic wastewater (locations holiday, camping, caravans, hotels);
• There is no need for personnel highly trained maintenance;
• Easy operation and maintenance;
• Lack of electromechanical equipment (possibly a pump);
• Adaptable to seasonal changes;
• Removal of pathogens good;
• Partially removing nutrients;
• Fit harmoniously into the landscape;
• Lack of noise pollution;
• Minimum sludge management.

Weaknesses
• It is a large area of land required for establishment;
• The risk of insects and rodents within plants;
• The need for regular maintenance (cutting annual plant exposed part, manual removal of weeds before emergence and growth of plants);
• Use filter systems with vegetation vertical flow to service targets greater than 2,000 pe remains unchecked, in terms of control of hydraulic and cost compared to traditional methods that focus on building a water treatment system with filters vegetation with high capacity vertical flow can be

considered only after serious studies related to adaptation base model and after setting the conditions to be met to ensure the hydraulic control system;

• The construction of treatment systems with extensive horizontal flow filters vegetation location or objectives to serve over 4,000 pe can be considered only if they have thoroughly analyzed all the design parameters, in particular hydraulic parameters.

Opportunities

• Method of wastewater treatment without energy (natural);

• To successfully adapt to climate change is necessary concepts and approaches for sustainable water saving and closing the water cycle locally;

• The use of sludge as fertilizer in agriculture and irrigation of treated water system which leads to lower costs for maintenance crops.

Threats

• Barriers to implementing application technologies include difficulties in obtaining local permits required for construction, because currently there are no guidelines and regulations regarding treatment systems Decentralized wastewater and reuse of treated wastewater.

CONCLUSIONS

In the current context of climate change with periods of drought, low rainfall areas can be provided with water necessary to irrigate crops using this method. These systems are an alternative that should be developed, promoted and implemented to provide advanced water treatment in both rural and urban areas.

For small towns in rural areas is enough raw water to be treated naturally: lagoons, filter systems with vegetation, such systems use extensive treatment to improve the quality of waste water for agglomerations of over 2000 inhabitants is pending technology Development. At the same time their use is quite effective solution for treating wastewater originating from settlements rural / urban small capacity, it is considered a method which treat wastewater sufficiently used in households and reused in agriculture.

Promoting wastewater for irrigation of crops in Romania is still not very developed idea is not knowing the meaning of it pursuits. Test runs on experimental fields were held in Bulgaria, France, Germany, Italy, Poland and Hungary on the assumption that this method is optimal in terms of maintenance and protection of the environment and to cover the deficit of water / rain.

BIBLIOGRAPHY

1. Bădan Daniela Nicoleta –Lucrare de licenţă-Sisteme extensive de filtre cu vegetaţie, Bucureşti, 2015

2. Oprean Letiţia –Apa-Resursă fundamentală a dezvoltării durabile –Metode si tehnici neconventionale de epurare si tratare a apei , Editura Academiei Române, Bucuresti , 2012

3. Rojanschi V., Ognean Th. – *Cartea operatorului din staţii de epurare a apelor uzate* - Editura Tehnică, Bucureşti, 1997

4. Safta V.V., Magdalena–Laura Toma - Elemente de proiectare a echipamentelor şi instalaţiilor din treapta mecanică a staţiilor de epurare a apelor uzate – Printech, 2003

5. Safta V.V.–Note de curs - Dezvoltare rurală durabilă și protecția mediului - Politehnica Bucuresti, 2015

6. ***http://cnsp.md/wp-content/uploads/2015/04/Proiect-Ghid-ZUC.pdf

7. ***http://www.gwp.org/Global/GWP-CEE_Files/Regional/Sustainable-sanitation-RO.pdf

LEGAL REGLEMENTATIONS IN THE EUROPEAN UNION AND ROMANIA REGARDING COLLECTION MANAGEMENT, RECOVERY AND RECYCLE OF THE WASTE PACKAGING

ALIN-ANGELIN IORGA[1], FELIX DIMITRIE CIOCAN[2], ANDA IRINA ANGELESCU[3], ŞTEFANIA MIHAELA LOSPA [4]

RESUME: Once with the Romania's adherence to the European Union, assuming some obligations and initiatives were imposed, from a national level to a local and a county level. Adherency to the European Union, made Romania assume its politics regarding the environment field and elaborate several plans of European directives implementations. All this plans lead to staging the directions which the European Union imposed by establishing the implementation method, delegating the component authorities and sanctioning all the implicated members, whom do not obey the environment legislation. Throughout these implementation plans, Romania requested transition and derogation periods, establishing clear terms of the implementation of all imposed requirements.

Thereby, the next implementation plans were proposed: Implementation of Council Regulation (EEC) No 259/93 on the supervision and control of shipments of waste within, into and out of the European Community,

Directive 2004/12/EC amending Directive 94/62/EC on packaging and packaging waste, Council Directive 1999/31/EC on the landfill of waste, Directive 2000/76/EC of the European Parliament and of the Council on the incineration of waste.

Key words*: environment legislation, shipments of waste, European directives, implementation plan.*

INTRODUCTION

Romania became a member state of the European Union on 1st January 2007, after the Accession Treaty, signed on the 25th April 2005, was ratified by all Member States. Romania submitted the adherence application to the European Union in 1995, then in 1999, the European Council, from Helsinki, decided to open negotiations with a part of the states whom submitted adherence applications, among them being Romania. Negotiations were opened in the first half of the year 2000 and lasted until the end of 2004, when the European Council had come to a conclusion. [2]

Negotiations have determined the integration conditions in the European Union of each candidate state. At the time when the adherence to the Union took place, these states had to adopt the acquis, meaning the legislation build on the Founding Treaties of the Union.

Negotiations concentrated especially on the terms through which the candidate state will assume, implement and apply the community acquis, but also on the transition periods (which will be clearly defined in time). This action took place in the context of a similar arrangement that some recently entered in the European Union states have benefited from, allowing the completion of several stages in order to meet the European laws and regulation completely.

For Romania, transposing the acquis regarding to the protection of the environment into the national legislation, represented a major task. The priority list included [3]:

-European Union framework legislation (including the access to information and evaluation of the environmental impact);

- measures imposed under international conventions to which the Community takes part to;

---

[1] Drd.ec. Iorga Alin Angelin. U.S.A.M.V. Bucureşti, iorgaalinangelin@gmail.com
[2] Drd.ing. Ciocan Felix Dimitrie U.S.A.M.V. Bucureşti, felix_dimitrie@yahoo.com
[3] Drd.ing. Angelescu Anda-Irina. U.S.A.M.V. Bucureşti, anda_irina@yahoo.com
[4] Drd.ing. Lospa Ştefania Mihaela U.S.A.M.V. Bucureşti, stefania.lospa@gmail.com

-reducing the global pollution and transborder;

-legislation regarding nature protection (which has purpose is the conservation of bio-diversity);

-measures which assure the good functioning of the internal Market (for example, production standards).

For this reasons, researching and documentation on "Legal regulation in the European Union comparing to the Romanian ones, regarding management, recovery and recycling of the shipments of waste" is useful in order to obtain a clear review on transposing the communitarian acquis in Romania.

MATERIALS AND METHODS

The materials and methods used in editing this article are: documentation, the analyzes and processing of data and secondary analyzes. All this methods are based on synthesis processes, analogy and benchmarking. I have studied in small detail the legal regulation from the European Union and from Romania, regarding management, recovery and recycling of the shipments of waste. The study and documentation for this field represented the starting point, which allowed me to obtain the first information in this field. The documentation represented a detailed analyzes on the actual legislation, but also a benchmarking on the studied resources.

RESULTS AND DISCUSSIONS

During the negotiations for the adherence of Romania to the European Union, in the field of management of shipments of waste have been elaborated several implementation plans, these being [4]:

- o **The Plan of Implementation for The Regulation (CEE) no. 259/93 regarding supervision and control of the packaging transport to, from and toward the European Union**

The main requests of the Regulation were:

- Assigning the competent authorities responsible for the implementation of the Regulation,
- Supervising and controlling, by the competent authorities, based on notification, the transportation of the shipments of waste in order to eliminate and reuse,
- Implementation of the procedure of supervision and control of the transportation of the waste according to the waste type (the Regulation has classified the shipments of waste in three categories: waste on the green list, on the yellow list and on the red list) and the destination of the waste for elimination or recovery.

The periods of transition which were requested are:

1.Romania reconsidered its position in the Position Paper CONF-RO 37/01 and solicitated a transition period until 31st December 2015, for notifying the competent authorities about all the shipments of waste transports into Romania used for recovery, listed in Annex II of Council Regulation (EEC) 259/93, according to the Articles 6,7 and 8 of the Regulation. [5]

2. By way of derogation from Article 7(4) of Council Regulation (EEC) 259/93, Romania requested, throughout the competent authorities, to object to shipments of waste for recovery listed in Annexes II, III and IV and shipments of waste for recovery not listed in those Annexes destined for a facility benefiting from a temporary derogation from certain provisions of Directive 96/61/EC regarding the prevention and integrated control of pollution (IPPC), Directive 2001/80/EC of the European Parliament on the limitation of emissions of certain pollutants into the air from large combustion plants,

and Directive 2000/76/EC of the European Parliament on the incineration of waste, during the period in which the temporary derogation is applied to the facility of destination.

3. By way of derogation from Article 7[5] of Council Regulation (EEC) 259/93, until 31st December 2011, the Romanian competent authorities may raise objections to shipments to Romania for recovery of the following waste, in conformity with the grounds for objection laid down in Article 4(3) of the Regulation. These kind of transportation should obey Article 10 of the Regulation.

The responsible authorities are: the Ministry of Environment, Ministry of Agriculture, Forests and Rural Development, Ministry of Health, National Authority for Control through National Authority of Customs, National Environmental Guard and National Comission on Materials Recycling from the Ministry of Economy.

- o **Implementation plan for Directive 2004/12/EC amending Directive 94/62/EC on packaging and packaging waste** [6]

The purpose of Directive 94/62/EC is to harmonize national measures concerning the management of packaging and packaging waste and to prevent or reduce its impact on the environment. The Directive also aims to ensure the functioning of the internal European market by avoiding obstacles to trade and distortion and restriction of competition.

Directive 94/62/EC established measures which purposes were:

a)prevention of producing packaging waste,

b)increase of the level of recovery of the packaging,

c)increase of the level of recycling waste packaging,

d)increase of the level of reuse of the waste packaging.

These measurements included essential requests for the materials from which the waste packages are made of and objectives for recovery and recycling the waste packages.

Directive 2004/12/EC has as purpose recycling targets for each specific waste material which should take account of life-cycle assessments and cost-benefit analysis, which have indicated clear differences both in the costs and in the benefits of recycling the various packaging materials, and should improve the coherence of the internal market for the recycling of these materials.

The implementation plan was based on the priorities for implementation established by the Ministry of Environment.

The strategy of reaching the Directive's targets basically refers to implementation of the separate collection, these being:

The separate collection scheme will be adapted to different areas and will be composed of [7]:

- specialized collect of the waste packaging, mostly throughout the voluntary deposit of the waste packaging, separated from the glass made ones (from technical reasons, the glass waste packaging will be exclusively collected by voluntary contribution);
- specialized collect of the biodegradable waste packaging , with exception of the ones in the rural environment;
- classic collect (household waste).

The separate collection of the waste packaging will take place such as:

- "door-to-door" – trash bins or garbage bags;
- civic amenity site – bring-point systems.

The waste packaging separately collected will be treated in sorting stations. The implement of the separate collection scheme was created as following:
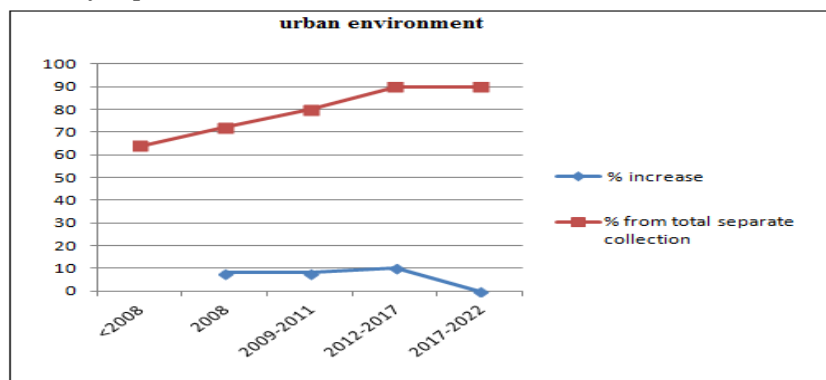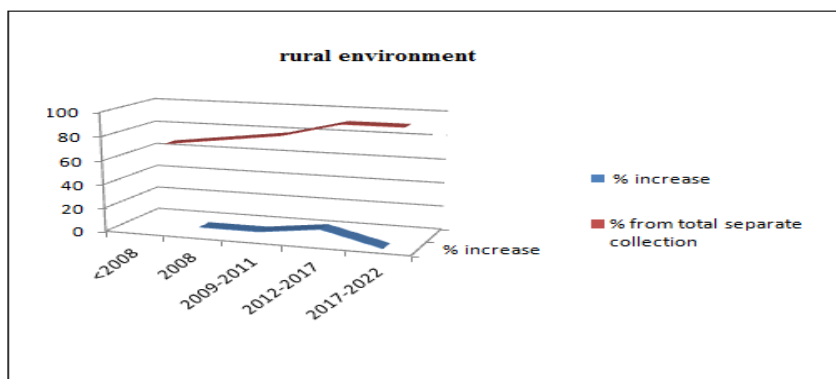
Fig. no. 1. Implementation of separate collection scheme in dense urban environment
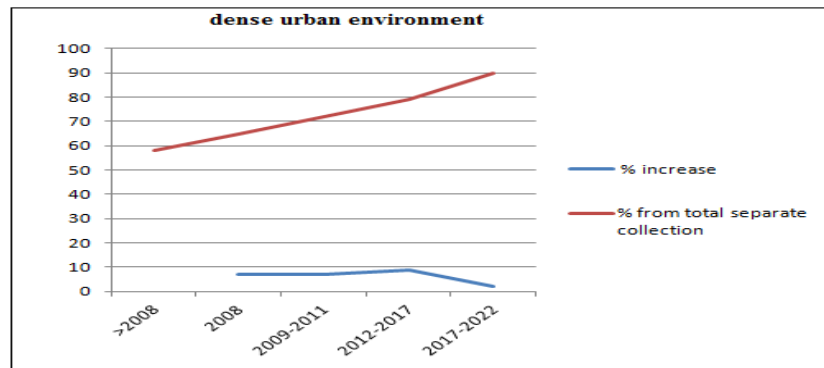
Source: Personal analizes

- dense urban environment – in 2008, the increase coefficient of separate collection was cca 7%, followed by a 7%/year increase until the year of 2011, by 9%/year between 2012 and 2017 and 2%/year between 2017 and 2022, when a coefficient of 90% of separate collection was reached;

Fig. no. 2 Implementation of separate collection scheme in urban environment

Source: Personal analizes

- urban environment – in 2008, the increase coefficient of separate collection was 8%, followed by a raise of 8% until de year 2011 and 10% between 2012 and 2017, when a 90% coeffiecient was reached, and remained constant until the year of 2022;

Fig. no. 3Implementation of separate collection in rural environment

Source: Personal analizes

236

- rural environment – in 2008 the increase coefficient of separate collection will be of 6%, followed by a raise of 6%/year until 2011 and 12%/year between 2012 and 2017, when a 90% coefficient will be reached and will remain constant until the year of 2022.

The implementation of separate collection will divided in three periods:
- 2004-2006: experimentation (pilot projects), acknowledging the population;
- 2007-2017: extending the separate collection at a national level;
- 2017-2022: implementing the separate collection in difficult areas (collective inhabitation, scattered rural environment, mountain areas).

Regarding the achieving of the recycling/recovery targets established so far, Romania solicited the next transition periods:

- ➢ Achieving the objectives of recycling of 15% of the weight for wood until 31stDecember 2011 (3 years transition period);
- ➢ Achieving the global recycling objective of 55%, the global recovery objective of 60%, the objectives of recycling of 22,5% of the weight for plastic (considering only the recycled material as plastic material) and the objectives of recycling of 60% of the weight for glass, until 31st December 2013 (5 years transition period).
- ➢ In order to achieve the recycling targets of waste packaging from paper and cardboard (60%) and metals (50%), Romania did not request a transition period. These targets must have been achieved, according to the Directive's provisions, until 31st December 2008.

Responsible authorities are the Ministry of Environment, Ministry of Economy.

- o **Council Directive 1999/31/EC on the landfill of waste**

Council Directive's 1999/31/EC [8] main objectives are: establishing the measures, procedures and recommendations for preventing or reducing the negative effects on the environment and health, determined by the landfill of waste. In order to achieve these objectives, the member states must apply measures, such as: treating the waste packages before depositing them, forbidding the mix of dangerous waste with not dangerous one, implementing activities of control of closing and monitorizing post-closing of waste.

The plan of implementation refers both to municipal deposits of waste and also industrial deposits of waste. In the implementation plan were presented 265 deposits of waste of class "b", the urban environment, as follows:
- 11 deposits of waste complied until 31st December 2006;
- 3 deposits of waste in accord with the request of the Directive 1999/31/EC were build in 2003
- 251 deposits of waste not in accord with the requests of Directive 1999/31/EC, which ceased and will cease the activity of gradually depositing, from which 10 deposits have ceased their activity until 16th July 2009, and 101 deposits (about 301 ha) will cease the depositing action between 16th July 2009 and 16th July 2017.

After 1st January 2007, the deposits which will cease the depositing process will be close according to the requests of Directive 1999/31/EC, in a period of maximum 2 years after ceasing the landfill. Taking in account the calendar previously presented, Romania has solicited a 8 years transition period for closing the 101 deposits of waste of class "b" not in accord with the urban environment, which will be gradually closed between 16th July 2009 and 16th July 2017.

Responsible authorities are the Ministry of Environment, National Environmental Protection Agency, National Environmental Guard, Ministry of Economy, Ministry of Internal Affairs, Ministry of Transports, Ministry of Health, local authorities.

- o **Directive 2002/96/EC of the European Parliament on waste electrical and electronic equipment**

Directive's objectives are [9]:

-preventing the appearance of waste electrical and electronic equipment and reusing, recycling and other forms of recovery of these types of waste in order to reduce a big quantity of eliminated waste;

-improving the environment performance of all operators involved in the life time cycle of the electrical and electronic equipments (producers, distributors and consumers) and especially of the economic agents directly implicated in treating the waste electric and electronic.

Romania solicited throughout the implementation plan:

- 2 years transition period, until 31st December 2008, for applying paragraph 5 of Article 5 regarding the objective of collecting a minimum of 4 kg of waste electrical and electronic equipment/resident and year;
- 2 year transition period, until 31st December 2008, for implementing paragraph 2 of Article 7 regarding the recycling/recovery objectives.

Responsible authorities are the Ministry of Environment, National Environmental Guard, local authorities.

- o **Directive 2000/76/EC on the incineration waste**

Directive 2000/76/EC on the incineration waste confines itself for deploying the activities of incineration and co-incineration and for control measures and supervising the incineration and co-incineration facilities. Regulation of these activities has as purpose preventing or reducing the negative effects they have on the environment, especially on air, soil, surface and underground waters pollution and any kinds of risks regarding the good health of the population. The Directive requires the Member States to accomplish all the measures imposed in order to accord with the Directive's requests, including the heat treatment of the waste.

Romania solicited a transition period until 31st December 2008 for closing 110 existent installations of dangerous waste incineration resulted from medical activities, which closed after 31st December 2006, as follows:

- ❖ in one year, until 31st December 2007, closing 52 existent installations of dangerous waste incineration from medical activities;
- ❖ in two years, until 31st December 2008, closing 58 existent installations of dangerous waste incineration from medical activities.

Romania did not requested a transition period for the existing installations of dangerous industrial waste incineration, for the incineration of municipal waste and for the existing installations of waste co-incineration.

Regarding the municipal waste incineration, the plan of implementation provides:

- planning an installation of waste incineration in Bucharest, with bigger capacity then 150.000 tones/year;
- planning several installations of waste incineration in three cities with a population larger than 300.000 residents, including the adjoining areas.

Responsible authorities are the Ministry of Environment, National Environmental Protection Agency, National Environmental Guard, Ministry of Economy, Ministry of Internal Affairs, Ministry of Transports, Ministry of Health, local authorities.

Waste and waste packaging management activity is based on general principles provided in Emergency Ordinance no. 78/2000 regarding waste treatment, approved with modifications and additions through Law no. 426/2001.

Main principles regarding waste and waste packaging are:

- preventing the producing of waste packaging;
- reusing the waste;
- recycling the waste packaging;
- other waste recovery methods which will lead to minimizing the eliminated through final landfill.

Recovery of waste packaging is included in the general principles which underlies the management of the groups of industrial recycling waste packaging (ferrous scrap metal, paper and cardboard waste, glass waste, plastic products, rubber, textiles) specified in Emergency Ordinance no. 16/2001, approved with addition and modifications through Law no. 465/2001, these being:

- only using procedures of industrial recycling waste management which are not a risk for the population health and for the environment;
- the polluter pays;
- the producer's responsibility;
- the use of the best actual techniques, without charging big costs.

National legislation in this field emphasizes that the waste and waste packaging management principles are available for all waste packaging produced in the marketing, no matter what the material they have been composed of is, and the use in the economical, commercial and household activities it has.

CONCLUSIONS

The environment is a responsibility which must be assumed conjointly. Regarding the ecological damage in the last period of time, it was noticed that the implication level and responsibility both on the national but also on the international plan has increased significantly. First concern in this field took place in 1970. The environment policy of the European Union was born in the European Community Treaty and has as target assuring the sustainability of the protection measures of the environment. Through the Maastricht Treaty, the environmental protection becomes a main priority for the European Union, where it was signaled the necessity of integrating and implementing the environment politics within a sectorial policy, such as agriculture, energy, industry, transport.

The main pylon of the environmental politics is the concept of lasting development, which creates a transversal policy which encapsulates all the other communitarian policy, highlighting the need to integrate the environment protection requests into defining and implementing all the European policy. [12]

Concluding, it comes out that for accomplishing the national and European objectives regarding management, recovery and recycling of waste and waste packaging it is necessary that the whole

community involves, from the public and central authorities, to the waste generators and researching-developing institutes and consumers, NGO (reunited as a civil society).

The condition of waste packaging was governed in our country as laws, ministerial order, decisions which involved the European directives. Once transposed, Romania assumed its obligation to monitories the stages which our country has to go through mentioned in the Accession Treaty of the European Union. [13]

Romanian legislation is harmonized with the European Directive 94/62/EC regarding waste and waste packaging. The management of waste and waste packaging has legislative support in all fields of activity – from producing, using/reusing, recovery, recycling – so that the managerial results will quantify in restoration and protection of the environment throughout the country.

In the field of waste and waste packaging management, the central authority has the obligation to monitories the activity of protection of the environment. There were and still are implemented studies and resources which must consider finding the most efficient methods of respecting the requirements of the European Union, but also intensifying the selective collection of waste packaging.

The principles regarding waste and waste packaging management are available for all the waste packages introduced in the market, no matter what the material they were created from is and their way of use in economic, commercial and household activities of the population or any other activities, such as all the waste which do not match the purpose they were created for, no matter what their generation, recovery or recycling method is. [14]

BIBLIOGRAFIE

[1] Iorga Alin Angelin, Definition of terms and presentation of processes regarding the collection, recycling and capitalization of waste packaging from agricultural activities, 6th Edition of the International Symposium Agrarian Economy and Rural Development Realities and Perspectives for Romania, 2015, ISSN 2285-6803, ISSN-L 2285-6803,pg 241-245
[2]***http://ec.europa.eu/romania/documents/eu_romania/tema_20.pdf, pg1
[3]***http://ec.europa.eu/romania/documents/eu_romania/tema_20.pdf, pg15
[4]***http://www.mmediu.ro/articol/planuri-de-implementare/74
[5]***http://eur-lex.europa.eu/legal-content/RO/TXT/?uri=CELEX%3A02006R1013-20100516
[6]***http://apmag.anpm.ro/ro/deseuri
[7]***http://www.mdrl.ro/_documente/scheme_grant/doc_referinta/deseuri_Metode_tehnologii.pdf
[8]***http://www.anpm.ro/depozitare-deseuri/-
/asset_publisher/cl5PkWPV69Ml/content/directiva_1999_31privind_depozitarea_deseurilor
[9]***http://www.mmediu.ro/articol/planuri-de-implementare/74
[10]***https://www.eed.usv.ro/eco-usv/gestiune_deseuri.php
[11]***http://www.intermanagement.eu/stire/MANAGEMENTUL+AMBALAJELOR+SI+DESEURILOR+DE+AMBALAJE
[12]***http://www.ier.ro/sites/default/files/pdf/politica_de_mediu_brosura_nr.4_.pdf
[13]***http://www.intermanagement.eu/stire/MANAGEMENTUL+AMBALAJELOR+SI+DESEURILOR+DE+AMBAL AJE
[14]*** http://www.ecologic.rec.ro/articol/read/legislatie/10573/

THE USE OF BIOFUELS AND BIOLIQUIDS IN THE EUROPEAN UNION IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT AND FOOD SECURITY`S CONSTRAINTS

CATALIN VOICA[1], CORINA ENE, MIRELA PANAIT

Abstract: *The sectors of transport and energy are at a turning point, which is generated by various factors such as climate change, population growth and its reliance on classic fuels , the necessity of access to modern energy services for the rural population . The solution would be widespread use of renewable sources in final consumption and in transport. Based on these considerations , the authors aim to present their analysis of the situation of the EU market for biofuels and bioliquids. On the one hand , the use of biomass ensures a sustainable approach to energy consumption , but , on the other hand, it raises the issue of food security.*

Keywords : *biofuels , sustainable development , food security , renewable energy*

JEL Classification: Q1 , Q2

INTRODUCTION

The climate change generated by the human activities have many socio-economic implications on national economies (Zaman, 2005). Taking in account the amplitude of these implications, many measures have been taken on multiple levels: United Nation Framework Convention on Climatic Changes , Kyoto Protocol or Emission Trading Scheme (ETS) adopted in European Union etc. (Vasile & Balan, 2008). The importance of the energy sector`s impact on sustainable development is demonstrated by the efforts made at international level. So, the United Nation launched in 2011 the Strategy Sustainable Energy for All (SE4All) and declared the period of 2014-2024 as the Decade of Sustainable Energy for All. This strategy has three objectives that must meet until 2030: "ensure universal access to modern energy services, double the global rate of improvement in energy efficiency and double the share of renewable energy in the global energy mix" (UN, 2014). Another step was done at the beginning of 2016 by the adoption of energy as a UN Sustainable Development Goal. This goal supposes to ensure the access to affordable, reliable, sustainable and modern energy for all. In fact, this goal has two dimensions: to reduce the carbon intensity of energy and make energy available for everyone (1.1 billion people have no access to electricity). So, energy is considered a "golden thread" that interconnect "the economic growth, social equity and environment" and create complex concept: phenomenon of sustainable development (UN, 2012).

The energy raises two major problems: on the one hand, we notice the limited access to modern energy services in developing countries and rural areas that involves poverty and a low standard of civilization; on the other hand, in developed countries, especially in urban areas, the energy use involves waste and environmental pollution. So, depending on the issues raised by energy use, different strategies for solving the problems are required.

Energy resources have a major impact on sustainable development in view of their use both in households and for producing of goods and services. Renewable energy resources have little or even zero contribution , in some cases, to the greenhouse gas emissions. Despite these advantages, the shift from conventional energy`s use to renewable sources is a process lasting and very complex because it involves the appearance of new consumption habits but also generates social problems that must be avoided. (Dusmanescu, 2015).

---

[1] Assistant professor PhD Catalin Voica, Petroleum-Gas University of Ploiesti, catalin.voica@upg-ploiesti.ro
Assoc. Professor PhD Corina Ene, Petroleum-Gas University of Ploiesti, corina.ene@upg.ploiesti.ro
Assoc. Professor PhD Mirela Panait, Petroleum-Gas University of Ploiesti, mirela.matei@upg-ploiesti.ro

The energy policy is an important instrument used in the European Union in order to face some major challenges like dependency on imported energy and the increase of greenhouse gas emissions in transport sector. To achieve the objectives at EU level, major changes are needed in the structure of the energy sector, the technologies used and consumption habits (Dusmanescu, Andrei & Subic, 2014). A solution to many problems existed in domains like transport, electricity and heating could be the use of biomass based on agricultural crops, wood and wastes. In residential and industrial heating, the use of biomass is a simple and cheap solution. Through the new rules like Directive 2015/1513 of the European Parliament and of the Council, the European authorities encourage the increased use of electricity from renewable sources in transport sector. So, basing economic growth on renewable sources can provide solutions to the challenges generated by the necessity of sustainable development` s promotion (Podasca, 2016).

Renewable energy production in the EU

Renewable energy represents the way to the future for the European Union. In order to catalyze the development of this field, the EU has implemented a system of quotas that must be achieved by 2020 and to get the EU to use 20% of its needed energy from renewable sources. These quotas vary from country to country and ranges from 10% in the case of Malta to 49% in the case of Sweden. In order to achieve their targets, the European member states put in place a system of national action plans in which they report annually the advances that they made towards the target and the changes in policy or any other related problem concerning renewable energy and the predicted path towards the completion of the national goal.

Next, we will provide an objective analysis of the EU primary production of renewable energy by country in the period 2003 – 2014 and the division by type of renewable energy for the year 2014. After we will approach the evolution of biogas, biodiesel and biogasoline production increase in the same period and we will explore the top producers from the EU.

Fig. 1 EU's primary production of renewable energy by country in 2014, 1 000 tones of oil equivalent
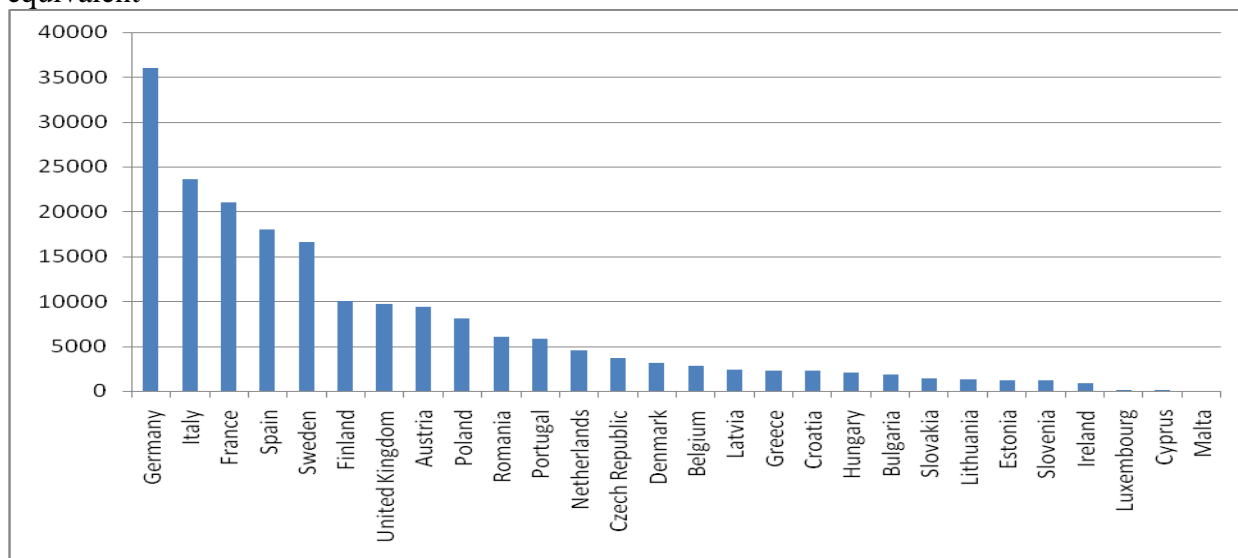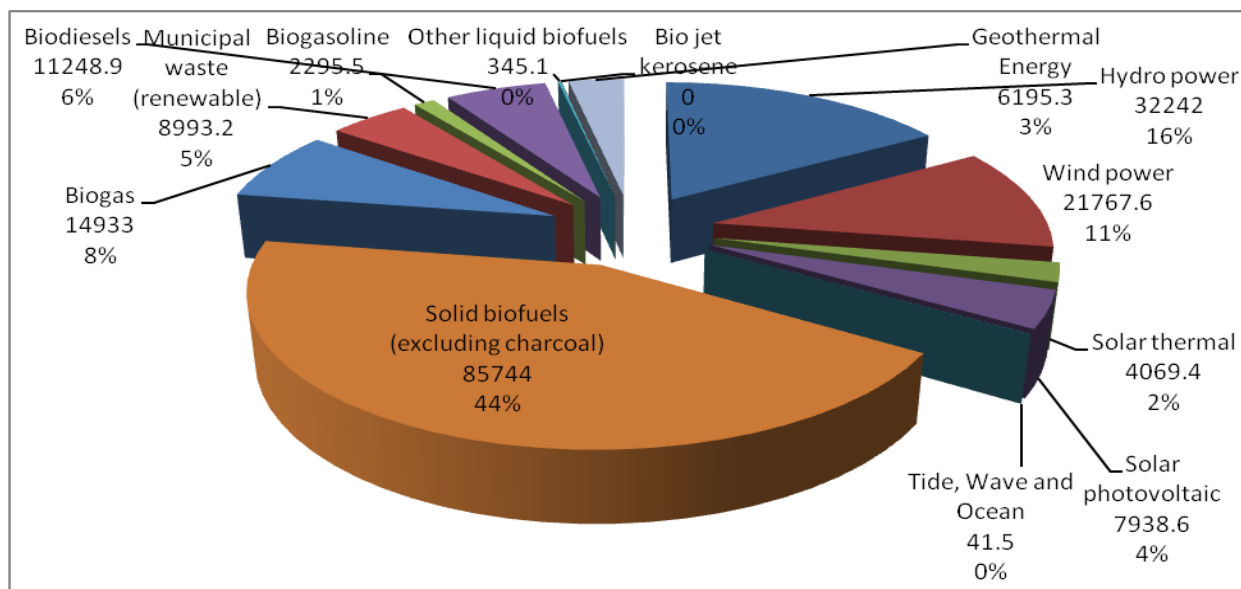

Source: EUROSTAT

In Fig. 1, we observe the primary production of renewable energy by country in the EU in 2014. We can see that Germany is the top producer from renewable sources with 36 017 900 tones of oil equivalent fallowed by Italy with 23 644 100 tones of oil equivalent, France with 21 002 100 tones of oil equivalent, Spain with 18 002 800 tones of oil equivalent and Sweden with 16 659 800 tones of oil equivalent. The top four countries are the biggest producers of energy in the EU and as

a result they must have a very high level of energy produced from renewable sources in order to achieve their targets of 18% for Germany, 17% for Italy, 23% for France and 20% for Spain.

In the case of Sweden, the target of 49% of energy from renewable energy sources boosts the country to fifth place in the EU. The countries with the lowest production of energy from renewable sources are Luxembourg, Cyprus and Malta which are small countries with a low energy production.

Fig. 2 EU's primary production of renewable energy by type in 2014, 1 000 tones of oil equivalent

Source: EUROSTAT

At EU level, the distribution of primary energy of renewable energy by type in 2014 can be observed in Fig. 2. 44% of the primary energy of renewable sources is produced from solid biofuels (excluding charcoal) with 85 744 000 tones of oil equivalent. We have to acknowledge that the term of solid biofuel can be any biological solid material used as fuel like wood and any byproducts resulted from lumber industry as well as animal dung, municipal waste and energy crops. All these are used for burning in their natural state or as pellets and other forms.

Hydropower represents 16% of the total renewable energy production with 32 242 000 tones of oil equivalent, followed by wind power with 11%, biogas with 8%, solar (thermal + photovoltaic) 6%, biodiesel with 6%, municipal waste with 5%, geothermal with 3% and biogasoline with 1%. The other three types: bio jet kerosene, tide wave and ocean and other liquid biofuels have less than 1% of total primary energy production from renewable sources.

The use of renewable energy is on an ascending trend and continuously developing. The technology is in an effervescent development and as a result new technologies and ways to collect, use or produce renewable energy are discovered. This can generate a step change of the repartition of renewable energy sources. This already happened when the problem of land use has been brought into attention as the biofuels cultures took the place of the food production ones. As a result some restraints were enforced in order to protect the food production.

Biogas, Biodiesels and Biogasoline evolution in the EU

Biogas, biodiesels and biogasoline account for around 15% of the EU's primary production of renewable energy in 2014. This is the result of on-going development and research realized in this field. As we can see in Fig. 3 iIn the period 2003 – 2014 all three types of renewable energy registered an ascendant trend. The biogas production increased 4.6 fold in the analyzed period from

3 227 500 tones of oil equivalent in 2003 to 14 933 000 tones of oil equivalent in 2014. The biodiesel production increased 9.5 fold in the analyzed period from 1 182 700 tones of oil equivalent in 2003 to 11 248 900 tones of oil equivalent in 2014. The biogasoline production increased 9.6 fold in the analyzed period from 239 100 tones of oil equivalent in 2003 to 2 295 500 tones of oil equivalent in 2014. Those trends are closely linked with the evolution of German production which is the largest producer form the EU.

Fig.3 EU's primary production of biogas, biogasoline and biodiesels in 2003-2014, 1 000 tones of oil equivalent
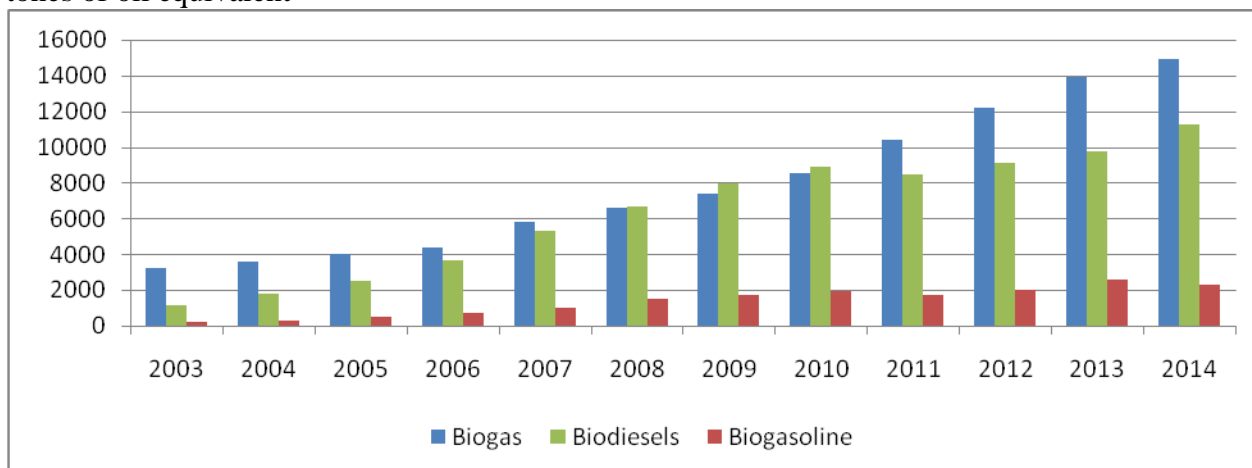
Source: EUROSTAT

In Fig. 4, it can be observed that there are a few countries of which's primary production of biogas, biogasoline and biodiesels are noticeably. Those are Germany, France, Italy, United Kingdom, Netherlands and Spain. In the case of biogas, Germany is the top producer with a production in 2014 of 7 434 300 tones of oil equivalent which is more than the production of the other 27 member states. On the second place, we find United Kingdom with 2 126 400 tones of oil equivalent and Italy with 1 961 000 tones of oil equivalent. In the case of biodiesels, Germany is on the first place, with 3 042 600 tones of oil equivalent followed by France with 2 074 500 tones of oil equivalent, Netherlands with 1 520 00 tones of oil equivalent and Spain with 1 070 800 tones of oil equivalent. In the case of biogasoline production, on the first place, we find France with 492 900 tone of oil equivalent followed by Germany with 449 400 tones of oil equivalent, United Kingdom with 262 700 tones of oil equivalent and Spain with 247 300 tones of oil equivalent.

Fig. 4 EU's primary production of biogas, biogasoline and biodiesels by country in 2014, 1 000 tones of oil equivalent
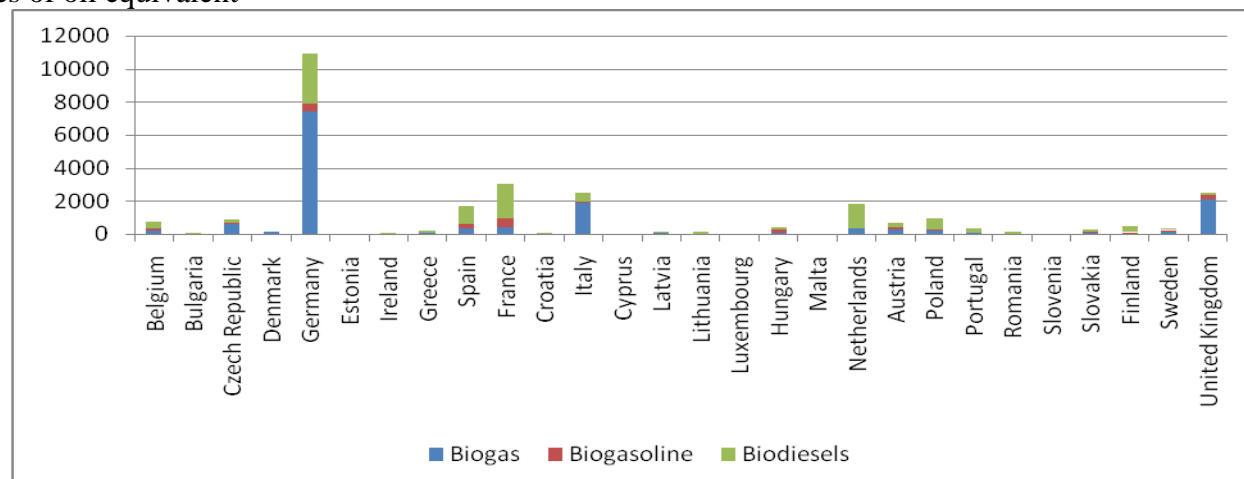
Source: EUROSTAT

The presented trends in the production of renewable energy in general and biogas, biodiesel biogasoline in special show us that this filed is going to develop furthermore in the future. This is promoted by the goal of the EU to achieve a share of 20% consumption of energy from renewable sources by 2020.

Energy vs. Food Security – a Problematic Challenge

In a world still trying to eradicate poverty, hunger and malnutrition, food security encompasses of the right of all people, at any time, to adequate food in the context of national food security and relies on four dimensions - availability, access, stability and utilization (Stancu, 2012). During recent years, the food security issue for the increasing world population re-emerged as a global challenge due to different reasons, including the increasing of non-food uses of agricultural production by producing biofuels, which adds to the impact of climate change on agricultural production and food supply. As agriculture's contribution to energy security through the green alternative is increasing, the actual controversy about the risks of transforming agricultural crops into biofuel crops, as well as on the possible reduction of food availability because of biofuel production can be summarized in the phrase "Food vs. fuel".

As biofuel production has increased significantly in recent years despite many uncertainties still existing on the subject, international discussions revealed various positions, with valid pros and cons (Greve et al., 2012).

Many international reports (Naylor et al. 2007; IFPRI, 2008; Greve et al., 2012; Hamelinck, 2013) estimate that measures to support the biofuels industry will contribute to the price increase for several food raw materials. Increases in food prices will lead to a decrease of the consumption and affect mostly the poorest and vulnerable people in terms of food security (IFPRI, 2008).

Koizumi (2015) shows that increased biofuel production may have a negative impact on food security, but in the same time it can create opportunities for agricultural development; in this context, price elasticity of feedstock supply should be considered a key factor in deciding the contribution of biofuel development on agricultural development.

On the other hand, higher future energy demand and regulations on the reduction of greenhouse gases will lead to increased demand for biofuels.

While first-generation biofuels are produced from valuable food resources (soy, palm, and rapeseed oils; starch and sugar crops) (Spiess, 2013), many specialists consider that a way of limiting the consequences of indirect land use change (ILUC) is switching to fuels of second and third generation, a process that has already begun in developed countries.

Research efforts in this field are currently oriented mainly towards second generation biofuels, which may be obtained from wastes or residues of agricultural crops and are believed that could solve this dilemma (Greve et al., 2012). Though, some authors consider that second generation biofuel impacts remains unclear, depending on production design, policy mechanisms and market context (Thomson & Mayer, 2013).

Addressing all these trends requires urgent research in order to answer a critical question about how global food systems can meet growing food, feed, and fuel needs while contributing to the reduction of poverty and hunger (IFPRI, 2008). To this end, there is an obvious need to properly assess the potential benefits and risks of biofuels and minimize resource degradation and food insecurity while providing income-generating opportunities ("cash crops") for the world's farmers.

Considering that the effects of crop-based biofuels on food security and the environment are not clear enough yet – fact showed by the diversity of opinions on this subject - it is urgent that they are precisely understood soon and taken into account with great care (Naylor, 2007) in designing development and investments policies which have to integrate food security as a major concern (HLPE, 2013).

At global level, this concern was approached on many occasions, international meetings and conferences, where organizations and scientists brought to the light the impact of biofuels on food access, trying to figure out the right way to balance energy needs with the right to food.

In this context, during its 40th Session, in 2013, The Committee on World Food Security (CFS) issued a series of recommendations on biofuels and food security (CFS, 2013). CFS noted that biofuel development involves both economic, social and environmental risks and benefits and is determined by different contributing factors (such as: energy security, climate change mitigation, export markets development, rural development by boosting farm incomes in developed countries (IFPRI, 2008; CFS, 2013).

Attempting to depict and enhance the current context, CFS highlighted that:
o agricultural commodity prices are influenced by the production and use of biofuels (besides other factors);
o biofuel production could generate a competition between biofuel crops and food crops, which increases the need for policies guidelines in order to minimize the risks biofuels in relation to food security;
o necessary actions should be taken in an integrative way (nationally and internationally);
o governments should coordinate their specific strategies accordingly, by sustainable management of natural resources.

Also, CFS recommended several action points that should be developed and implemented by the appropriate stakeholders (CFS, 2013):
o actions towards enhanced policy coherence for food security and biofuels
o actions to promote Research and Development (R&D) on biofuels and food security
o actions with regard to linkages between energy and food security.

A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security (HLPE) also endorsed several recommendations regarding food security policies and biofuel policies – which mutually interact, stating that the right to food should be priority concerns in the design of any biofuel policy. According to HLPE, governments should adopt a coordinated food security and energy security strategy which would require articulation around the following five axes/dimensions (HLPE, 2013):
1. Adapt to the change to global, market-driven dynamics;
2. Address the land, water and resource implications of biofuel policies;
3. Foster the transition from biofuels to comprehensive food-energy policies;
4. Promote Research and Development;
5. Develop methods and guidelines for coordinated food, biofuels, bio-energy policies at national and international levels.

European Union admits that his policies in this area create additional demand for energy crops, resulting in implications for land use in terms of conversion of agricultural land – including ILUC (Greve et al., 2012), so that public policies lead to increased consumption of biofuels. This will generate a significant increase in GHG emissions. In the same time, crops necessary for biofuels production will occupy food production land, and the latter will move on lands that were occupied by natural areas, causing an increased risk of deforestation and biodiversity loss.

European Commission studies show that ILUC can not be ignored if we do not want European policies on biofuels to have the exact opposite effect than expected.

As a result, this requires taking responsibility for the compliance with the climate change objectives through the implementation of sustainability criteria (Naylor, 2007; Greve et al., 2012).

As a result of environmental NGOs warning that biofuel production jeopardizes food security in some areas and that actual regulations encourages industry expansion, the European law requiring the use of "at least 10% renewable energy in the transport sector from 2020" could be changed.

Citing scientific work on this subject, Marc-Olivier Herman (EU economic justice policy lead, Oxfam International) ardently advocates that "ending support for harmful and costly biofuels

is the only right thing to do" (Herman, 2016), given the biofuels production impact on climate, land and consumers.

Conclusions: the Way to Go - Food Security Comes First

The use of renewable energies is on the rise all over the UE promoted by the 2020 Agenda in which it is stated 20% of the consumption of energy must be obtained from renewable sources. Biofuels and biogas represents 15% of all renewable energy produce in 2014 at the EU level.

The production of biogas and biodiesel is on a strong ascending trend which is supported by EU policy and the goal to transform into a greener economy and to reduce the use of fossil fuels. Another important aspect in the rise of the use of bio-combustibles is that they generate no net carbon dioxide because they absorb as much carbon dioxide in the growing stage as they produce in the energy conversion stage.

Germany is the leader in the bio fuels production in the EU. This can be explain by the fact that Germany is also the largest energy producer from the EU and by the fact that they are converting a lot of their traditional energy production units based on fossil and nuclear fuel into units based on renewable energy sources in order to achieve the 2020 Agenda goal.

Specialists and institutions worldwide begin to understand that the high demand for biofuels could endanger global food security, due to the risks resulting from the production and use of biofuels, as it generates (Dobrescu, 2011): (i) approximately the same degree of pollution as generated by classical fuels; (ii) food price increase; (iii) indirect impoverishment and hunger of a large population, especially in underdeveloped or developing countries.

In order to achieve its targets of reducing CO_2 emissions, the EU actually encouraged the conversion of agricultural land to biofuel crops, thus transferring food crops and pollution to developing countries. Taking into account many voices against biofuels production impact, the Commission understood there is an immediate need for changing regulations in this area.

A solution for the increasingly higher biofuels demand (which could be considered artificially sustained through funding and subsidies) could be productivity growth or marginal and degraded land cultivation, in this way reducing both the indirect impact of land use change and increasing food prices.

As Oxfam study highlights, this growing demand for biofuels must be stopped urgently as it endangers the right to food of millions of people. It is obvious that any development in the field should not compromise food security, and "should especially consider women and smallholders due to their high level of importance in achieving food security, while considering varied national contexts" (CFS, 2013). The biofuels - food security equation is multifaceted and complex and brings forward different specificities at geographic level, needing an integrated and environmentally-based approach in biofuel policy-making and investments. Prospects for this industry should be viewed with caution because the competition between food crops and energy crop could become increasingly fierce .

For the future, in order to ensure that biofuels will not compromise food security, biofuel production should certainly be based on non-food plant feedstock and should not interfere anymore with food and feed production.

BIBLIOGRAPHY

1. Committee on World Food Security (CFS) (2013). *CFS 40 Final Report*, Policy Recommendations, Biofuels and Food Security.
2. Dobrescu, E.M (2011)., *Biocarburanţii – formă atipică de energie regenerabilă*; available at http://www.caleaeuropeana.ro/biocarburantii-%E2%80%93-forma-atipica-de-energie-regenerabila/, accessed on 11th May 2016.
3. Dusmanescu, D., Andrei, J., & Subic, J. (2014). Scenario for implementation of renewable energy sources in Romania. *Procedia Economics and Finance*, vv8, 300-305, http://www.sciencedirect.com/science/article/pii/S221256711400094X

4. Dusmanescu, D. (2015). Solar Energy Potential as Support for Sustainable Development of Romanian Economy. *Agricultural Management Strategies in a Changing Economy*, 225.
5. Gabriela, R. I., & Catalin, P. (2015). Renewable Energy Strategies: Where European Union Headed?. *Annals-Economy Series*, 102-107.
6. Grevé, A., Barbanti, L. & Fazio, S., *Biocombustibilii, o soluţie controversată privind accesul la energie,* GVC, 2012, pp. 37-45; available at: *http://terramileniultrei.ro/biocombustibilii-%E2%80%93-o-solutie-controversata-privind-accesul-la-energie/*
7. Hamelinck, C. (2013), *Biofuels and food security, Risks and opportunities*, Ecofys, August; available at: http://www.ecofys.com/files/files/ecofys-2013-biofuels-and-food-security.pdf.
8. Haralambie, G.A. (2016), Implications of renewable energy production on energy prices in Romania, Proceedings of the International Conference "Information Society and Sustainable Development" ISSD 2016, IIIrd Edition, April 14-15, Polovragi, Gorj County, Romania
9. Hera, C., Otiman, P.I. (Coord.) (2015). *Strategia de dezvoltare a româniei în următorii 20 de ani, 2016-2035*, June; available at http://www.acad.ro/strategiaAR/strategiaAR_proiecte.htm
10. Herman, M. O. (2016), *Scrapping EU biofuels targets is the right thing to do, May 26, 2016* (updated: Jun 29, 2016), at http://www.euractiv.com/section/all/opinion/scrapping-eu-biofuels-targets-is-the-right-thing-to-do/
11. High Level Panel of Experts on Food Security and Nutrition (HLPE) (2013). *Biofuels and food security*. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome.
12. International Food Policy Research Institute (IFPRI) (2008)., *Biofuels and food security, Balancing needs for food, feed, and fuel* (Booklet); available at: https://www.ifpri.org/publication/biofuels-and-food-security
13. Jean-Vasile, A., & Alecu, A. (2016). Trends and Transformations in European Agricultural Economy, Rural Communities and Food Sustainability in Context of New Common Agricultural Policy (CAP) Reforms. In *Food Science, Production, and Engineering in Contemporary Economies* (pp. 1-24). IGI Global
14. Koizumi, T., Biofuels and food security (2015), *Renewable and Sustainable Energy Reviews*, Volume 52, December, pp. 829–841; available at http://www.sciencedirect.com/science/article/pii/S1364032115006139
15. Naylor, R. L., Liska, A., Burke, M. B., Falcon, W. P., Gaskell, J.C., Rozelle, S.D. & Cassman, K.G. (2007), The Ripple Effect: Biofuels, Food Security, and the Environment. *Agronomy & Horticulture – Faculty Publications.* Paper 386; available at http://digitalcommons.unl.edu/agronomyfacpub/386
16. Podasca, R. (2016). Sustainable development in the new economy. *Calitatea*, *17*(S1), 289.
17. Spiess, W. E.L. (2013), "Does Biofuel Production Threaten Food Security", in Stavros, Y., Petros, M. T.,Stoforos, G. N. & Karathanos, T. V., *Advances in Food Process Engineering Research and Applications*, Springer US, pp. 629-644.
18. Stancu, A. (2012). Food and Feed Safety in Romania in the European Union Context: Current Issues. *Petroleum-Gas University of Ploiesti Bulletin, Technical Series*, *64*(3).
19. Thompson, W. & Meyer, S. (2013), Second generation biofuels and food crops: Co-products or competitors?, *Global Food Security*, Volume 2, Issue 2, July, pp. 89-96; available at: http://www.sciencedirect.com/science/article/pii/S221191241300014X
20. http://www.greenfacts.org/en/biofuels/l-3/5-food-security-poverty.htm, accessed on 11th May 2016.
21. UE, Directive (EU) 2015/1513 of the European Parliament and of the Council of 9 September 2015 amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources (Text with EEA relevance)
22. Vasile, A. J., Popescu, C., Ion, R. A., & Dobre, I. (2015). From conventional to organic in Romanian agriculture– Impact assessment of a land use changing paradigm. *Land Use Policy*, *46*, 258-266. , http://www.sciencedirect.com/science/article/pii/S0264837715000599
23. Vasile, V., & Balan, M. (2008). Impact Of Greenhouse Effect Gases On Climatic Changes. Measurement Indicators And Forecast Models. *Annales Universitatis Apulensis Series Oeconomica*, *2*(10).
24. Zaman, G. (2005). The social-economic implications of the climate changes in Romania. *Romanian Journal of Economics*, *21*(2 (30)), 116-134.
25. http://www.un.org/sustainabledevelopment/ accessed on 11th May 2016.
26. http://www.un.org/press/en/2012/sgsm14242.doc.htm accessed on 11th May 2016.

CULTURE OF RAPESEED IN THE MANUFACTURE OF BIODIESEL

BĂDAN DANIELA NICOLETA[1], ŞURCĂ DANIELA-ELENA[2]

Abstract: *In this paper we highlight one of alternative solutions in the manufacture of biofuel, which will replace the classical fuels who are being exhausted with harmful effects on the environment and human health. There are solutions to reduce net emissions of carbon dioxide by 70% compared to petroleum-based fuels classics, and these solutions are found in vegetable oils / biofuels. Therefore we chose to analyze the evolution of culture rapeseed crop productions which will be studied in both Romania and the European Union, pursuing the the same time and productions of oil rapeseed constituting raw material for biofuels - biodiesel, fuel coniderati bioetanol- future.*

Keyword*s: biodiesel, rapeseed oil, production*

JEL Clasification: *Q16* -R&D; Agricultural technology; Biofuels; Agricultural Extension Services

INTRODUCTION

The high level of pollution of Earth is observed through the changes and the catastrophic weather events, which leads us increasingly to renewable energy resources that does not affect any environment and health / lifestyle human.

Because these non renewable resources fossil fuels - coal, oil, natural gas - have begun to be depleted, according to data from the World Energy Council (MIC) in the last two generations have been consumed about 80% of the oil resources of the planet and it is estimated that by 2030 demand for oil will increase by about 46% and coal mining by nearly 50%, their price on the world market and knowing a fast growing.

Considering the role of energy in society and all economic sectors dependent on this resource, its development is performed under the direct supervision of the state been set-up strategies.

For elaborating strategic objectives are chasing them to accommodate the changes and developments taking place at national and European level (European Union Energy Policy).

In the context of rising oil prices therefore presents an environmentally friendly alternative to replace fossil fuels with biofuels would have a major social impact.

Biofuel also called green fuel can be used as an alternative fuel made from petroleum disel, which is completely renewable affording animal fats, vegetable oils used or new.

Through processes of trans-esterification and estirificare it stabilizes fatty acids obtained by purifying glycerol and thus through reversible reaction that occurs between an acid and an alcohol (methanol), with removal of water and formation of ester methyl ester is obtained as a result of which the bio-molecule reprizinta a fatty acid methyl ester.

In the manufacture of biodiesel feedstock choice plays a very important, because usually it costs represent 60-80% of total cost of production.

You also need to take into account the the influence that has on the biodiesel market growth future costs and availability of raw materials on a long term as this.

Rapeseed oil is one of the oils used as raw material in obtaining biodiesel, this plant is represented worldwide as one of the most important species of oilseeds, with large food and industrial applications, through its processing it offers certain advantages to both the grower as and consumer.

An advantage of rapeseed oil as raw material in obtaining biodiesel is given the costs per hectare with this culture that are lower than other oil crops, that this plant can grow and winter shows another advantage in choosing them as matters first.

---

[1] Assistant Researcher. Bădan Daniela Nicoleta, Institutul de Cercetare pentru Economia Agriculturii si Dezvoltare Rurala, badan.daniela@iceadr.ro

[2] Assistant Researcher. Şurcă Daniela-Elena, Institutul de Cercetare pentru Economia Agriculturii si Dezvoltare Rurala, surca.elena@iceadr.ro

The country's economy can be improved if cultivation of rapeseed will aim to produce biodiesel.

Figure 1. Obtaining biodiesel from rapeseed
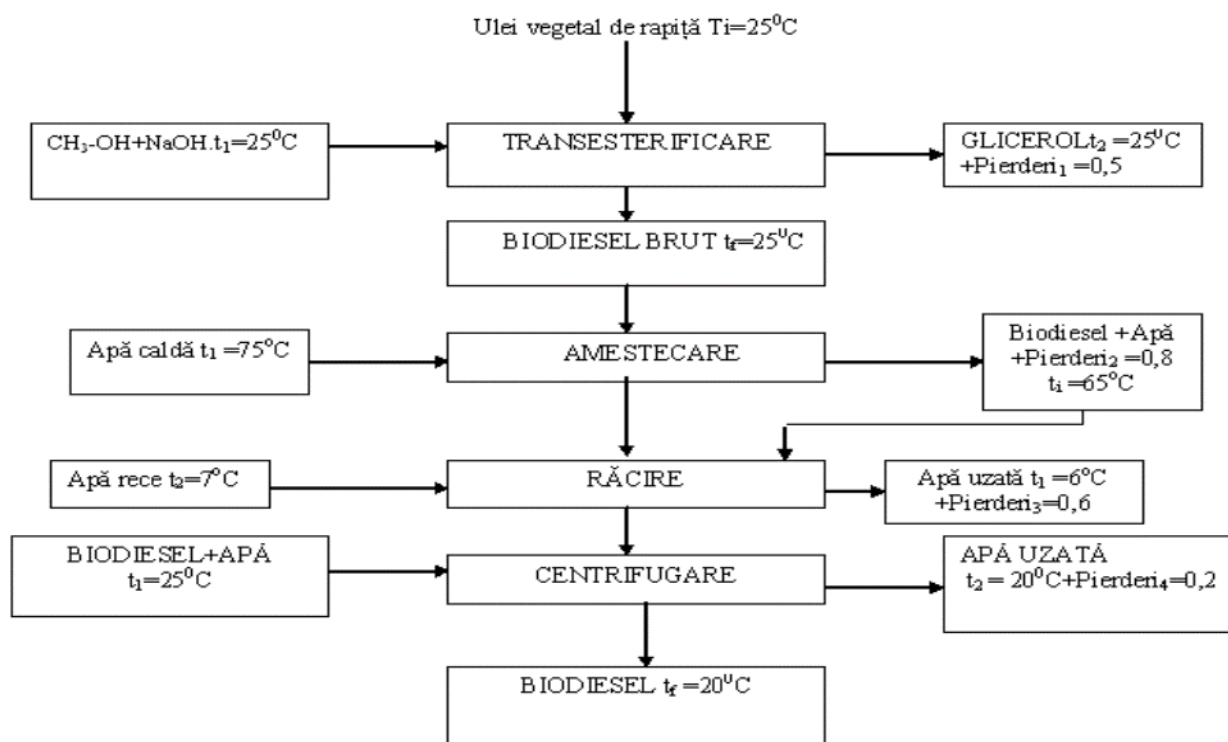
Rapeseed culture is used in food industry in Romania reglemantata by order no.22 / 2002 on the content, production, origin, preservation and quality of vegetable oils obtained from this culture.

MATERIAL AND METHOD

Using information provided by sites INS, Eurostat, FAOSTAT, Ministry of Agriculture and Rural Development and EBB (European biodiesel board) we will analyze productions of rape and default of rapeseed oil required in biofuel production using as research methods analysis quantitative, comparative analysis method and results.

With the help of comparative analysis we will present the strongest European countries producing biodiesel in parallel with Romania.

The research methods and literature will highlight the potential rape culture. The research results are expressed in the form of indicators (averages, percentages, graphs and tables).

RESULTS AND DISCUSSIONS

Romania's agricultural area is 13.3 million hectares of which 62.5% is arable land, oilseeds and cereals occupying 80%. Rapeseed acreage in 2015 is 383 thousand hectares representing 0.41% of the arable area of Romania.

Watching the evolution of total of rape production an increase of 12% in 2014 compared to 2010.

**Table 1. Evolution and production areas in Romania during 2010-2014**

Specification	UM	2010	2011	2012	2013	2014	2015
Surface	thousand ha	537,3	392,7	105,3	276,6	406,7	383
Average production	Kg/ha	1755	1882	1496	2408	2604	2530
	%	100	107.23	85.24	137.20	148.37	144.15
Total production	thousand tons	943,0	739,0	157,5	666,1	1059,1	959
	%	100	78.36	16.70	70.63	112.31	101.69

Source: 2007-2015 – Date INS – Crop production for main crops

Average production per ha in the country has known outstanding increases, from 1755 kg / ha in 2010 to 2604 kg / ha in 2014, with a steady increase in production around the average of 2029 kg / ha.

In 2010 suitable FAOSTAT, Romania registered 86.330 thousand tons of rapeseed oil

In the chart below you can see a steep drop in of rape production so it the exit of winter, 350,000 hectares of crops were destroyed by frost, rape being affected by surface producing only 77% of 157 511 tons in 2012.

Fig. 1. Rapeseed production in Romania thousand tons
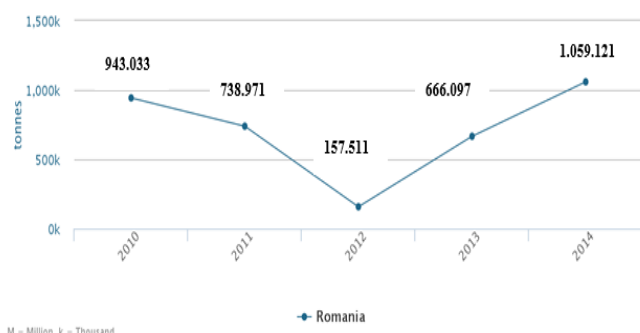
Fig. 2. Production of rapeseed oil in the Romania thousand liters
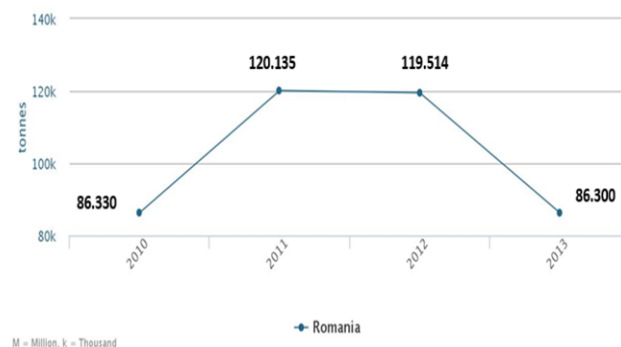
In 2013 was an increase rapeseed production of 4.3 times compared to 2012 due to increased planted area by 2.7 times and conditions favorable for plant development.

According to data submitted by MARD, rapeseed market in 2014 was estimated at EUR 350 million, around 80% of production being exported.

The main markets of Romania, in 2015 were: the Netherlands, Germany, France and Romania's main competitors on export markets were:

➢ In the Netherlands: in this market there is a net supplier dominant because the market is very diverse, Germany has the highest percentage in terms of imports of rapeseed Netherlands (36.8%) followed by France (9.6%) and Romania (6.8%);

➢ In Germany: Romania's presence in the German market of rape is very low with a share of only 2.3%, with France being the largest supplier of this market with a share of 35.4% in imports;

➢ In France: In the top suppliers rapeseed of this country Romania ranks 3rd with a share of 12%, Romania's main competitors on the French market is Bulgaria and Ukraine.

In most Member States of U.E. rapeseed production is very good, Germany is the largest producer of the 28 Member States followed closely by France, our country ranking among the last places with an average production 712 600 tons over the last 5 years.

The largest producer of rapeseed oil in Europe is Germany with a percentage of production 64% higher than the second country France.

Fig. 3. European rapeseed production at Germany, France
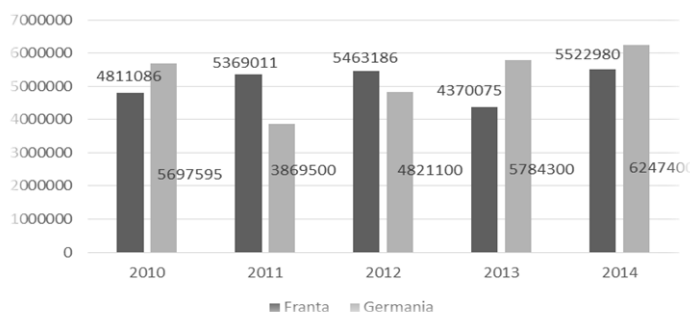
Fig. 4. Rapeseed oil production at European level in Germany, France thousand liters
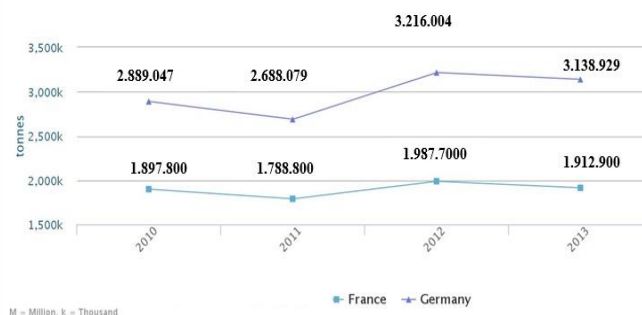
Because of unfavorable conditions in 2012, the production of rapeseed greatly decreased so the price has increased significantly reaching 406.7 euro / ton, the difference of 200 euros / tonne from the main European producing countries. Due to of large productions in the next two years the price of rapeseed decreased by 35%.

Table 2. The average price for rapeseed in Romania

Year	UM	Medium price	Price euro / ton
2010		1,25	277.7
2011		1,62	360
2012	Lei/kg	1,83	406,7
2013		1,57	348,9
2014		1,34	297,8

Fig. 5. Rapeseed prices per ton for the main producing countries in the European Union - Germany, France
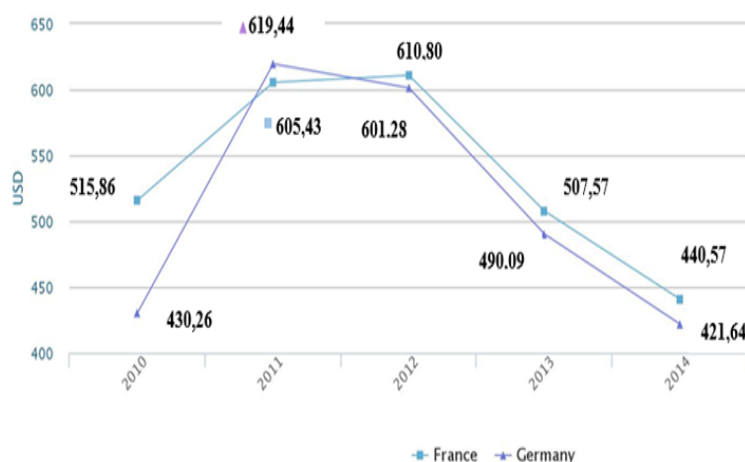
Since 1992 the biodiesel was produced on an industrial scale in the European Union, productions were made as a response to the positive signals given by the EU institutions.

In order to ensure the quality and performance of the European Union has published strict guidelines in accordance with the European standard EN 14214 which describes implementing the requirements and test methods biofuels Biodiesel is the most common type.

The European Union is the largest biodiesel producer in the world producing annually about 6058.75 million liters biodiesel obtained only from rapeseed.

Rapeseed are the raw material dominant in the production of biodiesel in the European Union with a 58% of the total production in 2015, although rapeseed hold the highest percentage in the obtained biodiesel they have lost ground to oil palm it became the second raw material used in the manufacture of biodiesel.

Analyzing the European Commission report on renewable energy for transport in 2013 we find that the most used biofuel is bioethanol Biodiesel followed.

Table 3.The production of biodiesel from rapeseed in Europe - thousand liters

geo\time	2010	2011	2012	2013	2014
EU (28 countries)	8907.3	8486.5	9102.4	9781.1	11248.9
Belgium	285.4	257.4	269.1	265.1	339.6
Bulgaria	11	14.1	7.1	39.1	54.5
Czech Republic	175	185.7	152.6	160.6	193.8
Denmark	68.7	70.8	0	0	0
Germany	2736	2721.9	2492	2667.7	3042.6
Estonia	0	0	0	0	0
Ireland	63.4	24	23.9	21.8	24.2
Greece	112.5	98	124.3	137.9	141.6
Spain	754.7	609	444.6	646.2	1070.8
France	1774	1618.6	1944.7	1915.6	2074.5
Croatia	12.2	6.7	34.7	29.6	31.2
Italy	706.1	522.5	253.6	405.8	512.1
Cyprus	4.9	5.7	5.8	1.6	0
Latvia	38.6	53.2	80.4	58.7	66.6
Lithuania	78.8	70.6	94.3	103.7	105.8
Luxembourg	0	0	0	0	0
Hungary	126.6	127	128.9	125.4	119.2
Malta	0.5	0.7	1	1	1
Netherlands	337.6	433.9	1040.1	1215.1	1520
Austria	241.9	208.5	181.8	154.5	234.4
Poland	348.1	333.2	555.2	578.2	653
Portugal	279.7	323.1	268.8	264.6	286.5
Romania	10.8	94.1	88.7	120.8	96.9
Slovenia	16.5	0.3	0.9	1.5	0
Slovakia	111.7	114.6	99.3	94.8	92.8
Finland	297.1	200.9	253.9	315.8	354.2
Sweden	177.4	232.9	335.2	218.9	106.8
United Kingdom	138	158.9	221.3	237.2	126.8

Source: 2007-2015 - the Eurostat data - database - Production of biofuels in the EU

From the table it can be seen that large producing biodiesel in Europe are countries like Germany, France, Netherlands.

The smaller producers are: Malta, Bulgaria, Croatia; Romania is among the last being exploited enough biofuel concept.

Production of biodiesel in the EU is on the rise supported by strong demand / consumption of biodiesel in the largest European countries, above.

The competitiveness biodiesel in the market of compared to the fossil fuels depends largely on policy and tax rates on fuel. In general bio-fuels production fees are higher than those for manufacturing fuel classical therefore can not yet speak of a total replacement of fossil fuels

CONCLUSIONS

Global development of renewable energy is a response to high energy prices, offering energy security, but above all, increase awareness of climate change. It is known that the Earth's energy resources are exhaustible so we should seek replacements for fuels and energy. Agriculture and rural areas have the potential to provide a significant proportion of renewable energy production. Grains that can not be used in the food industry may be effective in producing biofuels thus avoiding wastage.

Thanks to high production costs and low per hectare, rape is considered one of the most important energy crops both in Romania and and European countries.

It has been shown that the oil extracted from rapeseed is a valuable a substitute for obtaining good diesel technology is simple, and finished product meets European norms on environmental protection. Biodiesel is a biodegradable fuel four times more fuel than oil due to the natural properties of the data used oilseeds, Romania would need to take the example of powerful countries in U.E. and to turn increasingly toward the cultivation of this plant in order biodiesel producers

BIBLIOGRAPHY

1. Ayhan Demirbas, "Biodiesel: A Realistic Fuel Alternative for Diesel Engines", Editura Springer, an 2008
2. Bharat Singh, " Biofuel Crop Sustainability", editura wiley blackwell, an 2013
3. Jan CJ Bart, N Palmeri, Stefano Cavallaro, " Biodieselul Știință și Tehnologie: De la sol la petrol", editura CRC press, an 2010
4. *** www.insse.ro
5. ***www.madr.ro
6. *** www.eurostat.com
7. *** www.faostat.ro
8. *** http://environment.nationalgeographic.com/environment/global-warming/biofuel-profile/
9. *** http://www.pnas.org/content/103/30/11206.full#sec-6
10. *** http://www.pnas.org/content/103/30/11206.full
11. ***http://www.indexmundi.com/commodities/?commodity=agricultural-raw-materials-price-index&months=60

SECTION 3

"RURAL DEVELOPMENT AND AGRICULTURAL POLICIES"

THE ANALYSIS OF THE LIFESTYLE-RELATED RISK FACTORS WITH AN IMPACT ON HUMAN HEALTH IN ROMANIA

POPESCU CRISTIAN GEORGE[1]

Summary: *There's no doubt that the risk factors typical of a certain lifestyle which may have a negative impact on human health are numerous, especially considering that research in health (medicine, pharmacology etc) were focused on their determination, but especially on the cause-effect relationship. On the other hand, it's well known that people run a high economic risk when they don't invest in actions aiming to prevent certain diseases, especially when the disease risk grows. According to specialized studies, about 30% of all modern autoimmune diseases, among which there is cancer, are due to the eating habits. Considering that there are several risk factors, we realize the importance of studying the food factor, especially from the point of view of statistic research regarding food consumption in Romania and it's important to point out the dangers hiding behind these foods. The most important ones are: water and air, refreshments, meat and meat products, sugar, cigarettes and alcohol.*

Key words: *lifestyle, risk factors, habitats, pollution, food pollution*

MATERIAL AND METHODS

1. Water and air

Water is the basic nourishment which ensures the existence of life on Earth. Many studies have been conducted regarding the importance of water and its contribution to maintaining the health and the psychological balance in certain areas. Considering the origin of water, it may be: water coming from the subsoil layers (underground water), treated and pumped water (network water) and treated and bottled water (consumption water).

a. The water coming from the earth subsoil

According to specialized studies (Ana M. M., 2014), the pollution sources of underground water may located at the land surface or under the ground. According to the same source, the main pollution sources would be: excessive extraction from wells; the introduction of pollutants through surface waters (used water, insufficiently treated water, water polluted by solid waste, water polluted by household sewages or the treatment of used household water, the excessive use of chemicals in intensive agriculture or accidental drains); excessive salinity (in drought areas with little underground water); pollution due to defective sewage systems; pollution due to inadequately used water treatment plants.

b. Network water

The main problem of this type of water would be the excessive chlorination for the purification of water the removal of urban pollutants and the pollutants resulted from industrial and agricultural activities, according to point a. There is a series of authors (Vasilescu M., 1996) who confirm the carcinogenic effect of network water. Through a study of drinking water performed on 702 water samples during 1988-1996 (Vasilescu M., 1996), the same author shows that in most these samples the maximum admitted concentration of chlorine is exceeded, reaching 0.5 grams per cubic meter and pesticides. All this research shows that network water as well as surface water have a high degree of contamination, on one hand due to the numerous pollutants coming from industry and agriculture and on the other hand due to the treatments which are taken to the maximum level of concentration of the allowed substances, such as the chlorine from the network water.

c. Bottled water

The amount of daily water necessary for the body (Molnar I, Morar A., 2011) is 35 ml water/kilogram body weight, which means that the average for adults is 3.15 liters and considering the fact that by means of the daily diet, 1/3 of the water is provided through the consumption of foods, then there remain approx. 2 liters of water/day to be consumed by an adult.

---

[1] Associate Professor, PhD. Popescu Cristian George, The University of Bucharest, Administration and Business Faculty, cristian.popescu@faa.unibuc.ro

According to a simple calculation in order to estimate the volume of water necessary only for consumption for the Romanian population, we consider an average of 2 liters of water for adults and 1 liter of water/day for children (under 15 years of age). Considering that in 2011 the adult population was made up of 18111 thousand inhabitants and the population under 15 was made up of 3175 thousand inhabitants, through a simple calculation, we obtain approx. an amount of 14000 thousand cubic meters of water (or other liquids) necessary for the annual consumption in order to meet the water demands of the Romanian population. According to a report of the Romanian Center for the Promotion of Foreign Investment, in the year 2010 Romania had a domestic output of bottled mineral water dedicated to the domestic market which amounted to approx. 920 thousand cubic meters and, considering that in the same year, the consumption of non-alcoholic beverages per capita amounted to 163.7 liters, this means a consumption of approx. 3520 thousand cubic meters. All these calculations give us the following statistics regarding liquid consumption in 2010: the consumption of bottled water amounted to 920 thousand cubic meters and the consumption of network and well water amounted to 10,480 thousand cubic meters (only human consumption). This means that 75% of the population of the country consume network water or well water and these people are predisposed to diseases due to the pollution of these sources.

Air

Air is a component which is specific of lifestyle which may have a devastating impact on human health, especially in the heavily polluted areas.

Air is vital for health, and it is one of the main sources for the decline of the immune system in children and elderly people (WHO, World Cancer Report, 2014), according to a study called "The quality of air in Bucharest". The impact on the health of the population living in the capital presented in a study for the year 2010 which was carried out by the Center for Sustainable Policies - Ecopolis. According to this study, the capital of the country is deeply affected by air pollution, as the admitted limits of the main pollution indicators are exceeded in almost all Bucharest areas. For instance, on 23 December 2010, the inhabitants of Bucharest breathed an air with PM10 concentrations (powders in suspension whose diameter was below 10 micro meters) which were three times over the admitted limit and PM2,5 concentrations which were 6 times more than the admitted limit. The effects of pollution on the inhabitants of Bucharest are extremely serious; if during the 5-year period of monitoring, more precisely between 2004 and 2009, the admitted limits of pollutants had been observed, then over 800 adults and approx. 230 newborn babies would have been saved. According to the same study, the state would have saved over 400 thousand lei, but the indirect costs caused by pollution could not be quantified, such as the hospitalization of the people who got ill or their retirement. The effects of the pollution of the air in Bucharest (as the most representative place of Romania with the higher incidence on a numerous population) with an economically quantifiable impact on human health, may be enumerated in the table below.

Table - The economically quantifiable effects of air pollutants on health, according to WHO.

Tip de poluant	Efecte pe temen scurt cuantificabile economic	Efecte in expunerea pe termen lung
Pulberi in suspensie (PM10 si PM2,5)	Reactii inflamatorii la nivelul plamanului	Cresterea simptomelor respiratorii
	Efecte negative asupra sistemului cardiovascular	Scaderea functiei respiratorii la copii
	Cresterea consumului de medicamente	Cresterea prevalentei bolilor respiratorii obstructive
	Cresterea numarului de internari	Scaderea capacitatii vitale la adulti
	Cresterea mortalitatii	Scaderea sperantei de viata prin cresterea patologiei cardio-pulmonare li posibil a cancerului pulmonar
Ozon (O3)	Efecte adverse asupra functiilor plamanului	Diminueaza dezvoltarea normala a plamanului
	Reactii inflamatorii respiratorii	
	Efecte negative asupra sistemului respirator	
	Cresterea consumului de medicamente	
	Cresterea numarului de internari	
	Cresterea mortalitatii	
Dioxid de azot (NO2)	Scaderea functiilor respiratorii, mai ales la asmatici	Scaderea functiilor normale ale plamanului
	Cresterea reactiilor alergice respiratorii	Cresterea posibilitatii dezvoltarii unor simptome respiratorii
	Cresterea numarului de internari	
	Cresterea mortalitatii	

Source: WHO Air quality guidelines for particulate matter, ozones, nitrogen, dioxide and sulfur dioxide. Global update 2005, Geneva 2006, page 19

What stands out in this table would be the effect of pollution on the occurrence and evolution of lung cancer, a risk which is also specified in the study on cancer carried out in 2014 by WHO, World Cancer Report, 2014, through worldwide research. In the previous reports, assessing the costs of the treatment for lung cancer patients, considering both direct and indirect costs, the state and the patient's family have to pay approx. 45994 lei a year. Considering that in Romania there have been approx. 8367 new cases and 9549 deaths on average in the last 6 years, the costs for the oncologic therapy of cancer patients amounts to approx. 85.5 million Euros.

2. Refreshing drinks

The consumption of refreshing drinks in Romania has increased considerably in the last 20 years by 805%. Sodium benzoate E211 is used as an additive for the preservation of refreshing drinks in our country. This substance is prohibited in other UE states and worldwide and it is replaced by potassium sorbate E202, which is more expensive than the first one. From the point of view of the impact on the health, the specialists (Chirila P, 2010) consider sodium benzoate to be a carcinogenic substance which has other negative effects on the health, too, such as rash and it's prejudicial to bronchial asthma. This substance is on the list of powerful carcinogenic substances in some treaties on oncologic medicine (WHO, Oncology, 2015). There are also other dangerous substances which are part of the composition of refreshing drinks, such as : sugar or sugar substitutes, artificial coloring, synthetic aromas. All these substances which are found in high amounts in refreshing drinks make consumers more likely to become ill depending on the frequency of the exposure to this risk. We cannot enumerate the refreshing drinks which expose people to this risk because all of them contain these substances to a lesser or higher extent, and ecologic drinks are the only exception, for which the authorities that certify these products do not allow the use of non-ecologic harmful substances. Nevertheless, as the law of ecologic products allows up to 5% of non-ecologic substances to be introduced on the list of the products which are approved by the certification bodies through UE regulations, the interpretation of the law is abused and more similar harmful substances are introduced, with a negative impact on human health (where there are such substances in the ecologic products, they are in much lower amounts, up to 1/3 of the allowed

amount in conventional refreshing drinks). According to oncologic pathology treaties, the people who consume refreshing drinks run the risk of developing gastrointestinal cancer (liver, pancreas, colon, stomach) (WHO, Oncology, 2015). In Romania, gastrointestinal cancer has a high incidence, it's practically the second cause for disease after lung cancer; in the new cases which were diagnosed in only 5 years, between 2007 and 2012, it experienced a 10% increase.

3. Meat and meat products

Even if meat in itself is considered a basic food by many specialists, as it contains nutrients which are important for children or the treatment of anemia (Fauci A.O., 2000), the abuse of meat may cause health problems. The abuse of animal fats leads to ischemic diseases and the increase of mortality due to cardiovascular diseases (Fauci A.O., 2000); this effect is recognized by specialists through studies performed in various countries. According to specialists (Fauci A.O., 2000), the abuse of meat is also responsible for other diseases, such as gout, pancreatitis, uric acid lithiasis, dermatosis and others. According to the same source, the negative effects of meat consumption do not show at once, but after longer periods of time, especially later in life when several diseases induced by this abuse may appear. Based on this fact, after a long research on the relationship between lifestyle and cancer in Brazil , Dr. Annie Sasco concluded that the incidence of this disease is high in this country, even if the diet is poor, considering that the consumption of meat is very high, 3 times a day.

Meat products contain harmful substances which are used as preservers and may be very harmful to health, especially if the frequency of their consumption increases. The food industry includes also other substances which have nothing to do with meat, such as genetically modified soya, antibiotics and other harmful substances like the E type ones. All these substances which are introduced in meat products are very harmful, but we should mention the meat preservers which are used on a large scale in the entire food industry in the whole world, called nitrates or nitrites, E 240, E 250, E 252. Due to gastric acid (Fauci A.O., 2000) and high temperature, these substances turn into nitrosamine, which is the substance that is used in the lab in order to induce hepatic cancer in guinea pigs. The higher the consumption frequency is, the higher the risk of cancer is. In America, this substance was forbidden with lactic acid bacteria. In Europe, this substance is allowed, it's even compulsory to be used in the meat industry, and in Austria its use is compulsory even in ecologic products (it is used to a lesser extent, up to 1/3 of the admitted dose for conventional products).

Red meat and especially red meat products are associated with a high risk of colorectal cancer (World Cancer Research Fund/American Institute for Cancer Research, 2007). In Romania, the consumption of red meat and meat products has risen considerably by 12% in the last 20 years, and if we look at the statistics regarding the evolution of colorectal cancer, we notice a 5% increase in the last 10 years. There are also other animal meat products, such as milk products, which were associated with a low risk of colorectal cancer (WHO, World Cancer Report, 2014). The induction of the risk of obesity may result in the occurrence of a disease with every extra 10 kilos, according to figure 4, like male esophageal, colon, kidney and pancreas cancer or female uterus, esophageal, kidney, pancreas and colon cancer.

Figure - The relationship between the Body Mass Index with the risk of development of esophageal, pancreas, breast, endometrial (uterus) and kidney cancer.
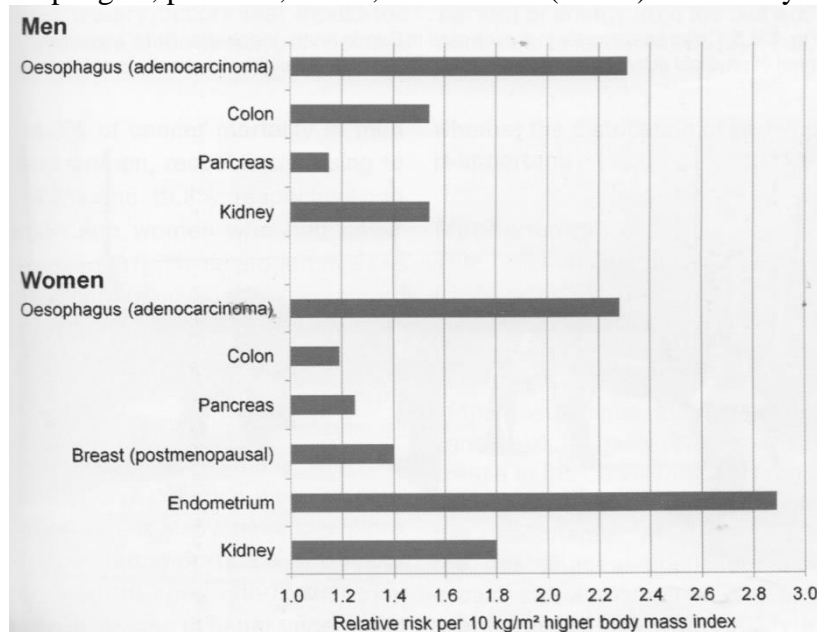
Source: World Cancer Report 2014, page 129

4. Sugar (and substitutes) and margarine

According to literature, sugar is also called " white death". This name appeared because of the serious problems it may induce through known diseases, such as diabetes or in connection with another factor such as the occurrence of fats in the blood, which increases the risk of cardiovascular (Fauci A.O., 2000) diseases or, as Dr. Schreiben (David S., 2008) would say, cancer is fed by sugar. Other risks of disease for sugar consumers would be: the increased frequency of caries (Burger G. C., 1985), the risk of microbial pollution, the rise in the number of patients with ulcero-hemorrhagic rectocolitis and Crohn disease (Gotschall E., 1994), but also obesity, involving other disease risk factors. Other substances which were invented in order to replace sugar are aspartam, saccharine, cyclamates. For the time being, due to their recent appearance, not all the effects on human health are known. The oldest product is aspartam which appeared in US in 1965, and today it is marketed all over the world, and its harmful effect is already known. According to some authors, aspartam is considered to be one of the most dangerous substances on the food market, which plays an important role in the appearance of many diseases, according to the same authors: it is responsible for the appearance of brain tumors (it's very used in chewing gums), multiple sclerosis, epilepsy, extrapiramidal syndromes, Alzheimer disease, mental retardation, lymphomas, malformations and diabetes. According to the US Food and Drug Administration (FDA), aspartam develops about 75% of the side effects of food additives. Saccharine was forbidden in USA in 1997 but subsequently it was reintroduced provided the label bore the marking "carcinogenic" and later, under the pressure of the food industry, this warning was dropped.

Margarine is a product which entered the market as a substitute for butter, but it has an extremely harmful effect on human health, as compared to butter. In order to understand better what a non-natural product is, the easiest way is to see how it's made, namely: the refined oil in combination with a nickel powder, heated at a temperature of approx. 400 degree C, are well shaken and then treated with industrial hydrogen. After cooling off, they result in margarine, to which all sort of organoleptic substances are added for taste, smell etc. The advantages of this product would be that it doesn't spoil as soon as butter, may be kept at room temperature, may be easily spread on bread and it doesn't get rancid. From the point of view of the impact on health, this food is a disaster. The negative effects manifest themselves through inflammatory processes, whose risk of occurrence is increased by the hydrogenation process (World Cancer Research Fund/American

Institute for Cancer Research, 2007). According to Schreiben (quoted paper), but also other specialized studies (World Cancer Report, 2014) margarine consumers have a high risk of developing breast cancer, obesity (as we showed, it may induce an entire series of other diseases) and inflammatory syndromes.

5. Cigarettes and alcohol

There are approx. 1.3 billion people in the world using cigarettes (Glynn T., Seffrin JR, Brawley OW, 2010) under different forms by smoking. According to specialized medical studies (World Cancer Report, 2014), cigarette consumption leads to numerous causes for disease, but with a significant impact, causing death from the following diseases: cardiovascular (1.69 million people die every year), pulmonary chronic obstructions (0.97 million deaths), lung cancer (0.85 million). Smoking, just like all the other diseases caused by an inadequate lifestyle, does not appear immediately, and the body doesn't show any signs of not tolerating this vice. Figure No. 5 shows the graphics for the evolution of the diseases caused by cigarette consumption, which cause death both in men and women. These statistics shows the reason why the statistically approximate period is about 30 years, from the moment someone develops this vice until they become ill. So, the young people who start smoking at 20 years of age are fairly likely to develop a serious, incurable disease by the time they are 50, which causes their death. According to Figure 5, there is a close connection between smokers and deaths caused by smoking, with an average delayed action during the 30 years.

As to the way European citizens feel about smoking, according to a European Commission 2012 report, Romanians were the most reluctant to give up this vice in the entire EU (1 out of 10 Romanians is willing to give up smoking). According to the same study, a lot of cigarettes are used in Romania: after Bulgaria and Lithuania. Romania occupies the third place with a 93%. The most important reason why Romanians start smoking is given in 82% by the answers of the respondents who say they were influenced by their friends who smoked.

Fig. The evolution stages of smoking correlated with mortality caused by smoking (in men and women)
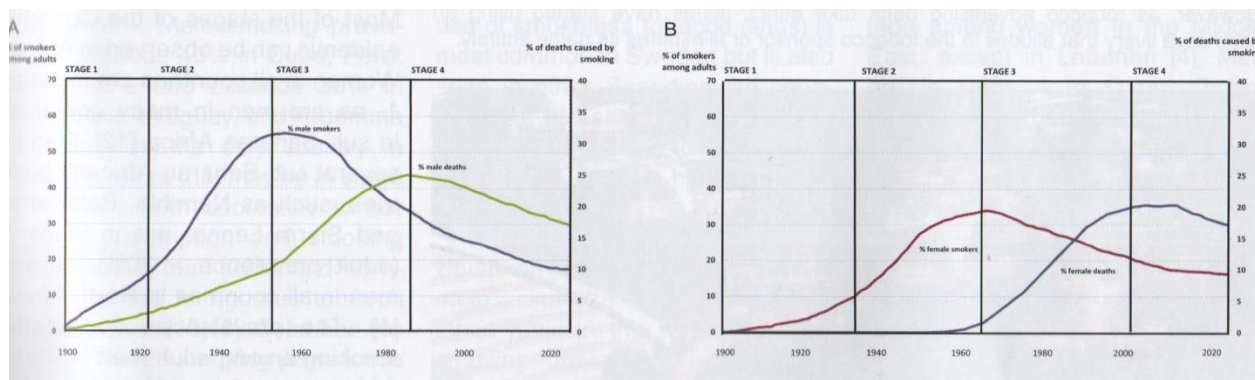
The most spread disease in Romania, caused mainly by smoking, is lung cancer (14.22% of all cancer cases). In the previous report, we made a few referrals to the statistic data concerning the evolution of lung cancer, but also the costs of treatment as compared to the costs for the early detection and prevention of lung cancer.

Few smokers know that cigarettes are dangerous especially to their chemical content including over 7000 components, many of which are considered as carcinogenic (World Cancer Report, 2014). So, these components make the body ill by many ways, including by genetic mutations which can be transmitted to the fetus, inflations, oxidation or epigenetic changes. The specialists (World Cancer Report, quoted source) draw attention to the products people use in order to give up smoking, which contain over 3000 such chemicals, many of which are carcinogenic.

According to the latest epidemiologic studies and the above quoted source, apart from cardiovascular diseases, there are 14 different types of cancer caused by smoking, the most important of which is lung cancer and the products smokers use in order to give up smoking cause oral cavity and pancreas cancer.

Considering all these important details regarding the unquestionable negative impact of smoking on human health, approx. 30% of the Romanian respondents declare they are smokers (UE-EC report, 2012) (the questionnaire was applied on a representative sample in relation to the entire Romanian population), as opposed to the 28% average in EU. Only 12% of these smokers would give up smoking; this is the lowest rate in the EU. This fact regarding the attitude of the population of our country towards this vice which is very likely to cause an incurable disease leads us to the conclusion that, on one hand, a lot of stress should be laid on fighting against this consumption through prevention actions (which , according to report No. 1, are ineffective, both in terms of the assigned budget and especially in terms of communication with the target group) and, on the other hand, smoking must be discouraged by increasing cigarette price continuously, but also by other means which are available to government associations.

Alcohol does not have so many negative effects as smoking, but it's important due to the increased consumption of alcoholic beverages and pure alcohol in the last 20 years in Romania (as we already showed in report No. 2). The negative impact on alcoholic beverages on health is caused mainly by the adverse effects of the substances which are introduced or contained in these beverages, out of which ethanol induces a toxic effect at a genetic level due to acetaldehyde complexes, a predominant agent in the occurrence of cancer , according to Jurgen Rehm and Kevin Shield ((World Cancer Report, 2014). In a study on the connection between the average daily alcohol consumption and the relative risk of cancer, the same authors showed that the alcohol consumers' risk of becoming ill rises with the consumption dose and the patients are exposed to the following types of cancer: mouth and oropharyngeal cancer, esophageal cancer, laryngeal cancer, breast cancer (for women), liver cancer, rectal cancer and colon cancer. For instance, the risk of developing mouth and oropharyngeal cancer is 9.5% for a daily alcohol consumption of 150 grams. Nevertheless, according to several studies, there are statistics according to which the cautious and moderate consumption of alcohol is beneficial to health. According to Dean Edell (Dean E., 1999), the French men who drink two glasses of wine a day are confronted with 35% less cardiac deaths and 25% less deaths from cancer, and according to compared statistics, although French people consume more animal fats than Americans, cardiovascular mortality in France is 2.5% times less. Of all alcoholic beverages, it seems that red wine is the best beverage for people's health (World Cancer Report, 2014), as it contains the most flavonoids which prevent the formation of clots, and phenolic compounds including catechins, antocyanins and tannins which bring down cholesterol; thus, this product acts as a preventive natural drug for health. The most important thing for these products is to limit the preservers which are put in the wine in order to preserve it for a long period of time; the most important ones are sulfites. Therefore, the less chemicals are used, the more valuable the products are to health. Stress is laid on the ecologic products belonging to this product range and solutions have already been found in order for certain sorts of ecologic wines to be made without sulfites.

BIBLIOGRAPHY

1. Anca Marina Marinov, Poluarea apelor subterane, energ.pub.ro
2. Burger Guy Claude, La Guerre du Cru, Roger Faloci, 1985
3. Chirilă P, Alimentația echilibrată a omului sănătos, Ed Național, 2010
4. David Schreiben în lucrarea sa Anticancer, Ed EFP, București, pag. 105, 2008
5. Dean Edell, Eat, Drink & Be Merry, Harper Collins Publisher, 1999
6. Glynn T., Seffrin JR, Brawley OW și colab., The globalization of tobacco use 21 challenges for the 21st century, 2010
7. Gotschall Elaine, Breaking the Vicious Cycle, The Kirkton Press, Baltimore Ontario, Canada, 1994
8. Mark D Gold sau James și Phyllis Bilch, cercetători la Food and Drug Administration (FDA), 2004

9. Molnar Ildiko și Morar Liliana, prezentare susținută sub îndrumarea prof univ dr.ing. Anca Mihaly Cozmuta, CEPA IV, 2011
10. Oncology, third edition, Oxford, 2015
11. S. Fauci, E. Braunwald, K. J. Isselbacher, J. D. Wilson, J. B. Martin, D. L. Kasper, S. L. Hauser, D. L. Longo, Harrison, Principiile medicinii interne, Teora, București, 2000
12. Segal Rodica, Valoarea nutritivă a produselor agroalimentare, Ceres, 1983
13. Studiu privind „Atitutinea europenilor față de fumat", realizat de Comisia Europeană, mai 2012
14. Vasilescu Mihaela și colaboratorii, Poluarea cu insecticide organo-clorurate a Dunării, sursă de apă potabilă, The Iith International Sympozion and Exibition on Environmental Contamination in Central and Eastern Europe, 10-13 September, 1996, Varșovia
15. Vasilescu Mihaela, Poluarea apei cu pesticide (1988-1996), A XXXII Sesiune Științifică aniversară, 8-9 mai 1997, Institutul de Igienă și Sănătate Publică, Servicii de Sănătate și Conducere, București, 1996
16. World Cancer Report 2014 cap. 2.9 Pollution of air, water and soil, WHO Press, 2014
17. World Cancer Research Fund/American Institute for Cancer Research (2007). Food, Nutrition, Physical Activity, and the Prevention of Cancer: A Global Perspective. Washington, DC, American Institute for Cancer Research

GENERAL OVERVIEW OVER THE THIRD SECTOR IN ROMANIA TODAY

VIOLETA STANCIU (CHIRILOAIE)[1]

Abstract: *The present paper aims to present the picture of the Third Sector in Romania, today and the way it relates to Law 219/2015 on the Social Economy. It was analyzed the current legislative text and the specific laws on establishing and functioning of the key organizations concerned. It has been made a documentary on statistical data provided by institutions such as The National Office of the Trade, The National Bank of Romania, the Institute of Social Economy. To analyze the degree of knowledge of the law by the potential beneficiaries and their opinion on the current legislative approach, there were conducted semi-structured interviews and questionnaires were administered by phone and e-mail. Responders were chosen from the representatives of NGOs and cooperative federal bodies. It was found that the Third Sector has experienced a steady development in recent years but not all the organizations listed by law can become or are interested in becoming Social Enterprises. Due to legislative inconsistencies, bureaucracy and the lack of fiscal or financial incentives, the degree of interest in obtaining the status of a social enterprise is currently low. It remains to be seen whether future developments draw attention to Law 219/2015 and to related legislative approaches. But, regardless of this, the return to the basic principles of the social economy in the XIX-th century of which the connection between the economic activity and the social and moral values to be respected and the way to make efficient the own economic activity even without governmental or European financial assistance may have a decisive role for the development of the Social Economy sector in Romania and in Europe in general.*

Key Words: *Social Economy, Social Enterprise, Community Economy, Cooperative, The Third Sector*

JEL Classification: L31, A13, D71

INTRODUCTION

According to The Country Report Romania 2015, 40.4% of the Romanian population was exposed to the risk of poverty and social exclusion in 2013. The same document explains that "paid employment does not safeguard against this threat for a large part of the population...In-work poverty is the highest in the EU...this stems mostly from the high number of low-wage earners, poor self-employed subsistence farmers and unpaid family workers."(European Commission, 2015, pg 59) Children are the most affected at national level, 51% of them being in risk of poverty. (European Parliament, 2015) Children living in rural areas (49.77% of the total infant population) face a poverty risk three times bigger then in urban areas. (Bădescu G., Niculina P & Angi D, 2012, pg 84) During the last decades, Social Economy was intensively promoted by the European Union as a solution to social and financial exclusion of the vulnerable groups. The aim of the present article is to study the Social Enterprises presently active in Romania and to analyze the Law 219/2015 (on the Social Economy). According to the Institute of Social Economy, in 2010 in Romania there were 26.000 associations and foundations with possible Social Economy features, over 2000 cooperatives, 2983 mutual companies (C.A.R.). (Constantantinescu Ș, 2012, pg 9) An updated study (2012) also identified and included 682 organizations hold by Social Economy entities. During the latest years, the number of omanian RSocial Economy entreprises have been increasing. (Barna C., 2014)

MATERIAL AND METHODS

In order to determine the number of these organizations and study their evolution over the past years, we have used databases provided by institutions such as the National Office of Trade Registry, the National Bank of Romania, the National Institute of Statistics and the Institute of Social Economy. From the legal point of view, Romania enacted the Law on Social Economy in August 2015. This establishes two categories of organizations: Social Enterprises and Work

---

[1] PHD Candidate, Faculty of Management, Economic Engineering in Agriculture and Rural Development, University of Agronomic Studies and Veterinary Medicine, B-dul Marasti, Nr. 59, Sect. 1, Bucharest, E-mail:violeta.chiriloaie@yahoo.com, Mob: +40745306991

Integration Social Enterprises. To be a part of these categories, the organizations concerned must prove they comply with certain principles and criteria. On the other hand, they need to want this, the registration as such being optional. The related detailed rules (Norme metodologice) were enacted one year later(august 2016), after the present research was carried. In April, 2016 we tried to find out to what extent the associations and foundations, cooperatives and mutual companies (the most numerous categories among those specified by Law 219/2015) identify themselves with the Social Economy field, the degree of knowledge of Law 219/2015 among these organizations, and their desire to apply for authorization. For this purpose, we used telephone interviews and questionnaires. When the respondent showed willingness for a more detailed questionnaire, it was sent by email. For cooperative companies and mutual companies, we addressed primarily to some federations in the field. In the case of associations and foundations, the sample consisted of NGOs accredited with the Chamber of Deputies to participate to legal public debates. The choice of sample was motivated by the assumption that these organizations are interested in pursuing the legislative steps and are informed on the Law adopted last year. At present, only 699 NGOs of almost 100,000 organizations recorded with the Ministry of Justice are registered in the NGO Directory provided by the Chamber (the registration is voluntary). Only 194 were accredited with the committees (April 2016). We excluded from the list organizations which didn't observe the criteria of Law 219(such as the trade unions, animal protection associations, etc.), in total 23 organizations. Of the remaining 171 organizations, the NGOs considered inactive following the checking of the contact information provided online were excluded (83 organizatins). Consequently, the number of subjects who participated in the survey was 88 organizations.

RESULTS AND DISCUSSIONS

According to the Law on Social Economy, Art. 3, the following organizations may apply for authorization as a Social Enterprise: first degree cooperative enterprises, established under Law 1/2005; credit unions governed by GEO 99/2006; associations and foundations(G.O. 26/2000); mutual companies of employees and pensioners (Law 122/1996 & Law 540/2002), agricultural companies (Law 36/1991); federations and unions of legal entities referred to above and "any other categories of legal entities that comply, according to legal documents of incorporation and organization, cumulatively, with the definition and principles of social economy stipulated in this law." Certification criteria are specified in Art. 8, namely: "they act for social purpose and / or in the general interest of the community; they allocate at least 90% of the profit achieved for the social purpose and statutory reserve; they undertake to submit the assets remaining after winding-up to one or more social enterprises; they apply the social equity principle towards the employees", ensuring payroll ratios of maximum 1-8.

The studies of the Institute of Social Economy (2010-2012) showed that the number of associations and foundations has grown steadily, they accounted for over 90% of the total potential Social Economy organizations in Romania. The constant increase phenomenon of NGO's seems to be due to the easiness by which such an organization is established, the government or private funds available, the tax relief granted over time. On the other hand, these figures show the massive orientation of the current Social Economy towards charity and supporting vulnerable groups by outside persons and organizations, in opposition to the beginnings of the Social Economy when cooperative organizations relied on self-help of the members.

	Year 2010	Year 2011	Year 2012
Associations and foundations	26,322	29,656	33,670
Cooperatives	2,017	2,145	2,228
Crafts	857	836	846
Consumption	958	947	940
Credit	75	87	86
Agricultural	127	275	356
Mutual Companies	2,983	2,735	2,767
Retirees	203	193	198
Employees	2,780	2,542	2,569
Total	31,322	34,536	35,898

Table 1, source www.ies.org

Asked if they consider themselves part of the social economy, many of the NGOs surveyed gave a negative answer.

Do you think that the organization you represent carries out its activity in the field of social economy?
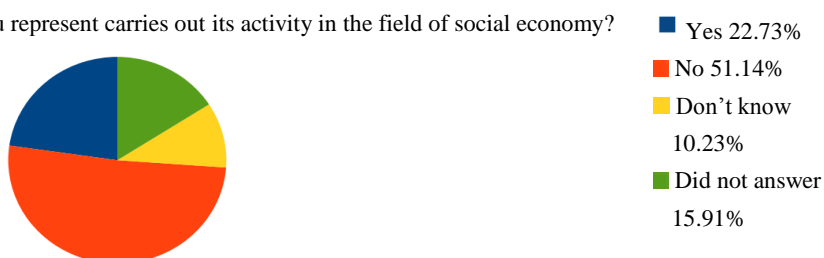
■ Yes 22.73%

■ No 51.14%

■ Don't know 10.23%

■ Did not answer 15.91%

Figure 2, personal contribution

This is partially due to the fact that although all the associations and foundations have social purposes, without which they cannot be established, few of them identify themselves with the notion of "economy". We note that the term "economy" is not limited to asset activities. It originately meant the management of the house (of the Greek terms oikos (house) and nomos (management). The term economy can be reflected upon all organizations generating income and expenditure. In 1932 Lionel Robbins defined the economy as "the science which studies the way in which scarce means are allocated for alternative purposes." (*Robbins. 1923, pg. 15)* Volunatry or paid work can be considerea a scarce mean and alternative purposes may includethe exchange of goods and services on or outside the market. It should also be noted that the G.O. 26/2000 allows associations and foundations to establish commercial companies that produce goods and services with market orientation. According to ISE studies, about 12% of them carry out economic activities. Among these, village communities (obşti) incorporated as associations, professional associations and educational institutions set up as foundations. Among organizations that have responded positively to this question range the associations that have formed or collaborated with protected units or social inclusion organization.

Of all the organizations surveyed, only 20.45% are aware of the legislative measure.

Do you know the Law 219/2015?

■ Yes 20.45%

■ No 63.64%

■ Did not answer 15.91%

Figure 3, personal contribution

At this moment, only three organizations in the sample take into consideration the possibility of registering as Social Enterprise. From past experience, the respondents declare they are disappointed by bureaucracy, the lack of transparency of public authorities and their behaviour.
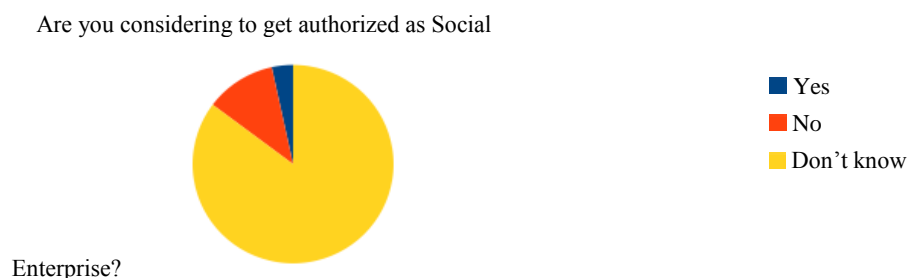
Are you considering to get authorized as Social

Enterprise?

Figure 4, personal contribution

The overall conclusion of the study is that most of these associations and foundations either do not know the term Social Economy, or do not identify themselves with it. For the moment, Law 219/2015 is not known and those who know it do not find the necessary motivations required to pass through a new bureaucratic process to be authorized as Social Enterprises.

As for the co-operative companies, according to Atlases of Social Economy (I.E.S.), increases in the most underrepresented segments before 2010 were recorded, the most significant being the increase of agricultural cooperatives by 180%. But agricultural cooperatives are mainly established under Law 566/2004. Based on the balance sheets for the 2014 financial year(NOTC) there were 332 agricultural cooperatives established under this legal document and only 19 agricultural cooperatives registered under Law 1/2005.

Table 5, source ONRC

Companies that submitted a yearly financial situation in 2014				
	No cooperative	total turnover 2014	total bruto profit 2014	average no of employee
Cooperativa agricolă	332	401,699,452	10,694,442	291
Societate cooperativă agricolă	19	2,319,034	369,789	7

Pursuant to Law 219/2015, only cooperatives established under Law 1/2005 are mentioned as possible Social Enterprises, those established under the previous law may eventually be assigned the section g) of Art. 3 ("any other categories of legal entities complying...with the definition and principles of social economy stipulated in this law"). Agricultural cooperatives are traditional organizations of social economy in the European doctrine. Under Law 566/2004, they carry out commercial activities (Art. 7). Their goal is "the economic and social development of rural areas" (Art. 7, section 7) focusing on the economic advantages for members and obtaining profit. Sometimes cooperatives appropriate more than 10% of the profit to dividends. In case of winding-up, the remaining assets are distributed to its members, "pro rata to the value of paid up social shares". Thus, agricultural cooperatives usually lie outside the conditions specified by Law 219/2015. We got in touch with a representative of an agricultural cooperative of cattle breeders in Romania, reaching today a total of 70 members. The proceeds of the cooperative are intended for the capitalization of the farms. The mark-up of the cooperative is insignificant and is reinvested. The cooperative operates essentially as a center for collecting and valorizing the milk. It also negotiates the price of input for its the members, managing to obtain better prices by purchasing larger quantities. Cooperative members remain legally and accounting independent. The cooperative plans to open a factory for processing milk in the near future with European funds. As for the Law 219/2015, the cooperative representative things is of no concern for them (the registration as Social Enterprise likewise).

Although consumer type cooperatives are the most numerous, the biggest employer in the

field are the craft-type cooperatives. They also achieve the biggest turnover among all types of cooperatives. In case of many of such co-operatives, profit is one of their aims. They sell their goods and services on a competitive market. For this reason, they do not always identify themselves with the legal term of social economy.

Credit unions are supervised by the National Bank. The institution's website indicates a number of 41 active credit cooperatives plus a central body (CREDITCOOP)(25 March 2016). The latest issues the framework Incorporation Act for the entire network, under the supervision of B.N.R. This makes these cooperatives quite inflexible to legislative changes in the non-banking area if these changes are optional. GEO 99/2006 allows credit cooperatives to appropriate more than 10% in dividends and not to necessarily transfer the assets to other similar companies. The representatives of such organisations consider they can not comply with the authorising conditions imposed by Low 219/2015 for Social Entreprises.

Mutual Companies are also registered with the National Bank of Romania in the Register for Non-Bank Financial Institutions. Mutual Companies of the pensioners are represented by the "OMENIA" National Federation. The governing body of the Mutual Companies for employees is UNCASR. According to the latest, during the last financial year closed and submitted, "a number of 1,659 affiliated mutual companies have submitted balance sheets." According to the latest update on BNR website (21 April 2016), currently there are 2,778 such institutions of which 190 have the term "pensioners" in their designation. UNCARS was kind enough to forward its opinion on the Social Economy and Law 219/2015. Asked whether they would meet the criteria for accreditation as a Social Enterprise, the answer was affirmative. Asked if they want this, the answer was negative.

CONCLUSIONS

The study showed that the number of organizations which are deemed, according to the European doctrine, of Social Economy, is growing in Romania. The concept is however not well known in our country, and they do not identify themselves with it. The Law on Social Economy is new and not well enough known by the organizations targeted. In addition, there are conflicts between the specific laws on the establishment and functioning of organizations such as agricultural cooperatives and the credit unions and the criteria set forth by Law 219/2015 which can block their authorization as Social Enterprises in Romania. Thus, two distinct sets shall be created at national level within the same term defined at European level: the Social Enterprises authorized under Law 219, and the social economy organizations that will not get a national authorization either because they do not desire it, or because they do not meet the criteria of the domestic law.

At the same time, the Law on Social Economy in Romania and many of the definitions and European policies in the field seems to have omitted two key principles that defined this sector since its inception (the XIXth century): on the one hand, the criterion of self-help and, on the other hand, the close relationship between the practice of economy and the moral values that should accompany it. Economists such as C. Dunoyer and J.S. Mill, thinkers and professionals such as R. Owen and the Rochdale Pioneers were promoting principles such as the respect for work as a value and for the welfare of others, the practicing of fair trade, the avoidance of waist, the importance of education both as learning practical skills and appropriate a positive social behavior.

Introducing Associations and Foundations in the social economy field, along with cooperatives, has brought a change of the general guidelines on which the field was guiding in the XIXth century, pushing it towards charity and government aids rejected by the initial principles of Social Economy. C.I.R.I.E.C identifies some significant differences between the sector of Non-Profit Organizations and the Social Economy: NGOs cannot obtain and appropriate any dividends at all, foundations and associations do not always have a democratic management, the main purpose of the NGOs is not always the community (they may also serve individuals, companies or unions of capital).(Campos & Ávi, 2012) In the Romanian legislation, this applies only for associations that may also serve personal interests (Art. 4, Law 26/2000). Thus, not all NGOs are part of the Social

Economy. In terms of research, however, it is very difficult to make the difference within the nearly 100,000 organizations registered with the Ministry of Justice. Because these organizations are part of different legal and fiscal categories, obey different registration and reporting rules their number and impact is hard to calculate. (Campos & Ávi, 2012)

The study showed that organizations mentioned by the Law 219 desire a simplification of procedures concerning them and have unpleasant experiences in the relationship with authorities. In the absence of real advantages which they demand or expect, they do not show interest in a new bureaucratic procedure of certification. On the other hand, if granting European funds dedicated to the Social Economy (and any specific government funding) will depend in the future on the authorization as Social Enterprise, it is likely that the motivation of registration will emerge with these measures.

However, turning to the above, the Social Economy was and must remain, in my view, an economy of self helped people. The allocation of funds may create parallel motivations that divert the organization from its original purpose, it endangers its independence and long-term viability. Henri Feugueray, member of the French revolutionary government of 1848 which supported cooperatives, presented in his monograph dedicated to the co-workers organizations of the nineteenth century in France, the example of a piano manufacturer. Believing they needed a considerable capital, several hundred people, who claimed they wanted to set up a cooperative, demanded the Constituent Assembly a substantial subsidy that had not been however allocated. Most of them abandoned the project, except 14 people who pooled their tools and materials, contributed with a subscription of 10 francs each and mostly were willing to work within the organization. For 2 months, the cooperative could not pay any salary. But in time it began to pay weekly dividends to the partners, reaching up to 20 francs. In 1850, orders could no longer be satisfied, the cooperative becoming one of the most prosperous in Paris. The author believes that the success was actually due to the government's refusal to allocate the required amount, which forced the workers to overcome deprivation and sacrifice together, to rely only on themselves and on each other. (Feugueray H, 1851. pg 114)

With or without Law 219/2016, state aids or grants, the Social Economy should be a solution assumed by the people concerned. It is a way of capitalizing its own workforce within enterprises where the same people are solidarity investors, employees, volunteers, entrepreneurs and managers of their own business. It is the only way these organizations can find the path to development, survive in time, educate their members and the community, fighting against poverty, social and financial exclusion, reconstructing small local communities that are capable of self-government and accumulate social capital of trust and values.

Social Economy is not about charity, subsidies or grants from impersonal government institutions. It is primarily about what anyone can do for itself, joining forces with those alike it.

REFERENCES

[1]***(2015). Country Report Romania 2015 Including an In-Depth Review on the prevention and correction of macroeconomic imbalances. Bruxelles. Belgium: European Comission at http://ec.europa.eu/europe2020/pdf/csr2015/cr2015_romania_en.pdf

[2]***(2015). Parliamentul European. *One in four children at risk of poverty in Europe*. Disponibil la http://www.europarl.europa.eu/pdfs/news/public/story/20151116STO02883/20151116STO02883_en.pdf

[3]***(2016). Adresa 168357, raspuns la solicitarea cu privire la comunicare numărului cooperativelor din Romania. București. Romania: ONRC

[4] Barna C. (2014). Atlasul Econmiei Sociale, Romania 2012. București. Romania: Institutul de economie socială la http://www.ies.org.ro/library/files/atlas.pdf

[5] Bădescu G., Niculina P & Angi D. (2014). Bunăstarea copilului din mediul rural. Cluj Napoca. Romania: Risproint from http://www.worldvision.ro/bunastare2014.pdf

[6] Constantinescu Ș. (2012). Atlasul Econmiei Sociale, Romania 2012. București. Romania: Institutul de economie socială

[7] Duch Guillot J. (2015) One in four children at risk of poverty in Europe. Bruxelles. Belgium: European Parliament from http://www.europarl.europa.eu/pdfs/news/public/story/20151116STO02883/20151116STO02883_en.pdf

[8] Feugueray H.(1851) L'Association Ouvrière Industrielle et Agricole. Paris. France: Gustave Havard/ A La

propagande , pg 114 at http://gallica.bnf.fr/ark:/12148/bpt6k83642x/f4.item.r

[9] Munos Campos J.L.&Chavez Avila R.(2012)The Social Economy in the European Union. European Economic and Social Comittee at http://www.eesc.europa.eu/resources/docs/qe-31-12-784-en-c.pdf

[10] Robbins, L. (1923). An Essay on the Nature and Significance of Economic Science , Macmillan&Co, London. Disponibil la file:///C:/Users/7/Downloads/Essay%20on%20the%20Nature%20and%20Significance%20of%20Economic%20Science_2.pdf

[11] www.bnr.ro

[12] http://www.cdep.ro/informatii_publice/ong.chest_aprobate?par=1

[13] www.ies.org.ro/

[14] www.lege5.ro

[15] www.onrc.ro

[16] www.somes-aries.ro

DEMOGRAPHIC, SOCIAL AND ECONOMIC IMPLICATIONS OF RURAL POPULATION AGING

LORENA FLORENTINA CHIŢEA[1]

Abstract: *Romania, like most European countries in recent years, is faced with a worrying demographic phenomenon of population aging with multiple consequences of demographic, social, cultural, economic, political nature etc. The main factors that caused this situation were: declining birth rates, rising life expectancy and external migration; reducing or stopping this population decline must be achieved by improving the combined result of the three mentioned factors. The implications of aging are complex and are felt both at the macroeconomic (influencing economic growth, pension and health care system functionality, investments etc.) and micro economic level (individual level, which must adapt their behavior to the evolution of the economic environment). The present paper aims to surprise the rural population aging phenomena from demographic and social perspective. The working hypothesis is that, as the county shows a more pronounced level of rurality, so its population is aging, less educated, with high employment in agriculture, generating low levels of competitiveness.*

Key words: *rural areas, demographic ageing, dependency, employment*

INTRODUCTION

Romania, like most European countries, is confronted with the complex economic and social phenomena of a population under slow but continuous demographic ageing. The main factors that generated this situation are the following: birth rate decrease, life expectancy increase and external migration; by the combined effect of improving the three factors, the demographic decline could be decreased or stopped.

From the competitive point of view, in the last years, Europe lagged behind compared to other advanced economies, and this gap has been intensified as a result of the low productivity growth. Thus, it is absolutely necessary to improve the human capital, the performance of research, education and training systems by encouraging innovation, which is essential for increasing productivity.

In this context, the problems investigated in the paper with regard to the demographic ageing, the precarious education and high employment in agriculture represent important issues both at national and European level; thus, competitiveness increase by investing in human capital becomes a priority.

MATERIAL AND METHOD

The present paper intends to evaluate the rural areas at county level from the point of view of the aging of the population, depending on the rurality level.

To establish indicators battery I left the set of demographic indicators proposed Balestieri, 2014, when its model for assessing competitiveness. The indicators are selected according to the competitive impact reflected by each of them. The main working hypothesis is that in the case of counties with higher rurality levels, the population is older and less educated, resulting in low competitiveness.

Based on these indicators of social demo will achieve a competitiveness analysis in close to the degree of rurality. The data source was the National Statistics Institute (tempo Online 2014). The data collected were processed using SPSS, using mainly factorial method.

---

[1] CS. Chiţea Lorena Florentina, Romanian Academy, Institute of Agricultural Economics, Bucureşti, chitu_lorena@yahoo.com

RESULTS AND DISCUSSIONS

Given the fact that human resource is one of the key factors of development (Florian, V., 2004), population aging affects the entire system of social, economic, cultural and political. Even if Europe is guided by model development neo-endogenous (in development is achieved as a result of interaction between local forces and global (Lowe et al., 1995)) and in Romania prevailing patterns of endogenous development (the development is based on a balance of local resources - natural, human and cultural - (Picchi, 1994)), the problem of an aging population - as a factor in depreciation of human capital - is very important regardless of the type of development to which we refer. Both for Europe and for Romania, is very important, at present, increasing competitiveness can not be achieved with an aging population (Europe 2020).

Rurality level

The starting point is the definition of the rurality concept, which continues to be the main topic of ample research works and debates, several points of view existing with regard to its definition.

In the year 2010, at the European Union level, a new typology of urban/rural areas was adopted starting from the revised OECD typology, which takes into consideration both the population density and the presence of large urban units and their share in the total population of the region. The purpose of this new methodology is to provide a common basis for all the European Commission reports and publications. The typology agreed by the European Union establishes 3 categories of regions: predominantly rural regions, intermediate regions and predominantly urban regions.

Ageing rural population – demographic and social evaluations

The indicators used in assessing social and demographic phenomenon of aging are:

- ageing rate – reflecting the ageing level of a society, with great implications from the social and economic point of view;

- structural dependency ratio – the ratio of the working-age population to the non-working age population, reflecting the pressure exercised on the working-age population by the inactive population;

- population replacement rate – reflecting the replacement of elderly population by the young population;

- employment rate in agriculture – reflecting the employment of the rural population of working age in agriculture.

Table 1. The indicators used in assessing social and demographic phenomenon of aging by rurality level, in the year 2015

	Predominantly urban	Intermediate	Predominantly rural
Rural population's ageing rate	91,66	106,52	119,61
Rural population's dependency ratio	42,53	49,97	53,08
Rural population replacement rate	103,46	89,57	89,33
Rural population's employment rate in agriculture	22,32	35,59	38,58

Source: tempo online, INS, 2015

These indicators will be analyzed both individually and in close connection to the rurality level.

The indicators will be analyzed at county level, for the rural area, grouping the counties into 5 categories depending on the level reached by the investigated indicator: 1. Very low, 2. Low, 3. Medium, 4. High, 5. Very high.

Table 2: Distribution of counties according to the ageing rate,
in the rural area, in the year 2015

Groups	Average rural population's ageing rate %		Average dependency ratio of rural population %		Average rural population replacement rate %		Average employment rate in agriculture of the rural population %	
Very low level	CT, Sb, Is, Bv, SM, SV, CV, BC, TM, Vs, BN, IIF, MS, BH, GL	82,95	IIF, TM, CT, SM	43,41	Vs, Is, SV, BT, BC, NT, GL	69,95	DJ, TL, HD	53,58
Low level	HR, MM, BT, DB, NT, AR, TL, VN, PH, CL, IL, SJ	110,36	AR,TL, MM, GJ, GL, Sb, DB, PH, BC, Is, HR, CS, Bv	48,45	SM, BN, Sb, VN, GJ, SJ, IL, CL, BR, MS, MH, MM, DB, GR, DJ, BH, Bv, CT, HR, TM	87,36	CS, AB, CJ, OT, BT, BR, MM, MH	45,92
Medium level	GJ, CJ, AB, AG, BR, GR, MH, CS, BZ, DJ	136,68	AB, NT, AG, BN, BH, CV, HD, MS, SV, CJ, VN, OT, GR	52,19	CV, OT, AG, BZ, AB, PH, VL, AR, TL, CJ, IIF	98,11	SV, CL, SM, VN, CT, SJ, Vs, VL, BZ, BH, IL	38,90
High level	VL, OT	173,52	VL, CL, BR, MH, BZ, DJ, Vs	56,46	TL, CS	113,67	AG, BN, CV, GL, AR, HR, NT, TL, TM, MS, GR	32,74
Very high level	HD, TL	198,68	IL, SJ, BT, TL	60,49	HD	136,87	IIF, PH, BC, Sb, Bv, DB, GJ, Is	25,56

Sursa: Tempo online, INS 2015

The ageing rate is the ratio of the population aged over 65 years to the population aged 0-14 years, in 100 persons, and reflects the population's demographic ageing with multiple long-term implications on the population structure as well as at social, economic, cultural and political level.

The average ageing rate is 108.02%, indicating an old-aged population. The values of this indicator reveal high discrepancy between counties, even though the ageing tendency is omnipresent: the lowest values are found in the counties Constanţa 66.64%, Sibiu 69.53%, Iaşi 67.85%, while the highest values are found in Teleorman 208.72%, Hunedoara 188.63%, Olt 177.40%. In this case there is a directly proportional relation between the ageing rate and the rurality level.

In the period 2010-2015, the average ageing rate increased from 103.54% to 108.02%. It is only in the predominantly urban counties that this indicator decreased, from 109.10% in the year 2010 to 91.66% in 2015, mainly due to the population's migration to the rural areas limitrophe to

the large cities. The highest increase of the population's ageing rate was found in the predominantly rural counties, from 112.37% in the year 2010 to 119.61% in the year 2015.

The ageing trend has been maintained in most counties, except for: Ilfov, where the ageing rate was down by 17.44%, Cluj by 5.89%, Ialomiţa by 3.45%, Braşov by 0.84% and Călăraşi by 0.17%.

The highest ageing rate increase values are found in the following counties: Vâlcea – 28.90%, Olt – 26.10%, Hunedoara – 20.04%, Gorj – 17.21%, Caraş-Severin – 16.36%, and Teleorman – 15.02%.

The macro-region with the highest ageing rate increase is macro-region four with 11.76 %, while the other macro-regions have more moderate increases – 2.19% in macro-region three, 2.78% in macro-region one and 3.84% in macro-region two.

Rural population's ageing generates additional costs for elderly people's maintenance and care in the communities, which limits the investment process that could generate new incomes for the community. In order to limit these costs, measures to maintain the elderly people in the productive community as long as possible can be taken. Unfortunately, in the rural area, this implies underemployment in subsistence farming.

The demographic ageing implications are complex and are felt both at macro-economic level (impact upon economic growth, functionality of the pensions and healthcare system, investments, etc.) and at micro-economic level (at individual level, people having to adapt their behaviour to the economic environment evolution).

If in Romania the social problems generated by demographic ageing are not properly managed, the dependency ratio pressure will raise serious problems for the state budget, taking into consideration the fact that the state budget is the main income source for elderly people.

The demographic dependency ratio is the ratio of the number of "dependent" age persons (persons under 15 years old and older than 64 years) to the population of working age (15-64 years), on percentage basis.

The dependency ratio is an indicator of the demographic pressure on the productive population, being one of the most important indicators used to evaluate the financial incidence of the ageing process on the pension system. The indicator does not take into consideration the "dependent" persons who are economically active and the "dependent" persons of working age.

The higher the dependency ratio, the higher the pressure exercised by the inactive population on the active population. In the absence of firm economic development policies, population's ageing may slow down the population's living standard increase.

The average dependency ratio in the Romanian rural area is 51.38%. The highest pressure is found in the counties Teleorman 63.47%, Botoşani 61.13%, Sălaj 59.46%. The lowest pressure is found in the county Ilfov 42.53%, followed by Timiş 42.99% and Constanţa 43.55%.

The rurality level has a direct effect in determining the demographic dependency ratio, so that when the county has a higher rurality level, the pressure of the dependent population on the population of working age is also higher.

In this context, the hypothesis according to which the dependency ratio in the rural area is higher when the rurality level of the county is higher has been confirmed.

The average dependency ratio in the rural area decreased from 54.71% to 51.38% in the period 2010 – 2015. This situation was determined by the decrease in number of the dependent population – population under 15 years old (by 5.24%) and of the population older than 65 years (by 1.82%) – and by the increase of the number of population of working age (by 1.55%)2.

If we have in view only the dependency ratio evolution, the situation would be quite encouraging, but if we consider the evolution by age groups, a series of problems emerge. The elderly population will disappear and would be replaced by a numerous population coming from the present age group 15-64 years, while the group 15-64 years will benefit from low contingents of young population, which would result in a high demographic dependency ratio.

---

[2] The utilized statistical data refer to the period 2010-2014

If the young population decrease rate is maintained and no economic and social policy interventions are made for encouraging the birth rate, the situation will continue to generate disequilibria at the level of the population's age structure.

The **rural population replacement rate** is calculated as ratio of elderly population (55-64 years) to the young population (15-24 years). This indicator reflects the demographic renewal capacity so that the population can continue to carry out the economic and social activities in the respective communities.

In the case when this indicator is higher than 100, the population has a fast growth tendency, if it is equal to 100 it expresses stagnation, and if it is lower than 100, the number of the population is decreasing.

In the Romanian rural area, we can notice that 100 working age persons aged 55-64 years will be replaced by only 86 persons aged 15-24 years, resulting in a population deficit of 14 persons. The values of this indicator range from 63.90% in the county Vaslui to 136.87% in the county Hunedoara.

The concentration of counties in the lower part of the interval (65.85%), i.e. in the category low level and very low level of the rural population replacement rate, reveals a low level of elderly population replacement by the young population in rural Romania.

In the period 2010-2015, the average demographic replacement rate significantly increased from 75.77% to 86.42%. The replacement rate increased in most counties, except for the following counties: Teleorman (from 104.90% to 100.53%), Dolj (from 91.57% to 89.75%), Botoşani (from 70.83% to 69.25%) and Sălaj (from 87.02% to 85.58%). The highest increases are found in the counties Tulcea (from 85.11% to 111.06%), Constanţa (from 66.42% to 91.63%), Ilfov (from 78.90% to 103.46%), Hunedoara (from 113.86% to 136.87%).

In the case of the intermediate and predominantly rural counties there are no significant discrepancies with regard to the rural population replacement rate, while the predominantly urban counties stand out with a replacement rate of 103.46%.

The population replacement rate decreases as far as the rurality level increases, so that the initial hypothesis – according to which the rural population replacement rate increases with the decreasing rurality level – has been confirmed.

The average demographic replacement rate in the rural area, regardless of the rurality level, is on the rise, namely:
- the predominantly urban counties experienced increases from 78.90% in the year 2010 to 103.46% in the year 2015;
- the intermediate counties experienced increases from 76.03% in the year 2010 to 89.57% in the year 2015;
- the predominantly rural counties experienced increases from 79.15% in the year 2010 to 89.33% in the year 2015.

Employment rate in agriculture

The employment in agriculture of total population aged 15-64 years is a relevant indicator for competitiveness assessment, so that the higher the values of this indicator, the lower the competitiveness at county level, as agriculture is an economic activity with lower capital gain, at least at the present moment. Competitiveness in agriculture could be increased in two modalities:
- by introducing innovation both in the agricultural production structure and at the level of farm endowments and production means;
- increasing the diversification of economic activities, by encouraging those activities that best put into value the local advantages.

The average agricultural employment level in the rural area is 35.93% in total population aged 15-64 years. The lowest levels are found in the county Ilfov 22.32%, Prahova 22.33% and Bacău 23.74%, while the highest values are found in the counties Hunedoara 57.42%, Teleorman 52.33% and Dolj 50.99%.

Across macro-regions, the hierarchy of the employment rate in agriculture of the rural population aged 15-64 years is the following: macro-region three (31.99%), macro-region two (34.59%), macroregion one (37.07%) and macro-region four (41.40%).

The rurality level directly influences the employment rate in agriculture, i.e. the higher the rurality level, the higher the employment rate in agriculture of the population of working age, so that the initial hypothesis has been confirmed.

The large number of people who are involved in farming activities represents a first premise of the low labour productivity level and of the agricultural sector competitiveness implicitly.

A major constraint in reaching the convergence between the agriculture competitiveness of our country and the agriculture of other EU member states continues to be the labour force employed in agriculture, oversized compared to the EU standards.

A significant part of the population employed in agriculture is vulnerable from the social point of view, old-aged and with a very low educational level; this resulted in the existence of real poverty bags in the Romanian rural area, under the background of the low capacity of rural communities to attract investments. This situation acts as a vicious circle, so that the absence of investments in agriculture as well as in other non-agricultural sectors leads to the employment of the largest part of the population in the subsistence, non-productive and non-competitive farming sector, resulting in low incomes. This mechanism also limits the access to innovation in agriculture, as well as in the agro-processing sector, innovation being the starting point in increasing productivity and agricultural competitiveness.

In the rural area, the high level of employment in agriculture is also determined by the existence of major problems on the labour market, which constrain the attraction of the population into non-agricultural activities; among these problems, the most important are the following:
- inadequate structure of local labour force: mismatch between the existing jobs and skills;
- lack of agricultural job diversification;
- difficult access from the place of residence to a job adequate to people's education and training.

Demographic potential of rural areas

For an overall picture of the demographic and social situation of the Romanian rural area, the counties were grouped into 3 categories, depending on the demographic potential of the rural areas (rural areas with low, medium and high demographic potential). This classification was made by each rurality level.

Starting from the investigated demographic indicators, i.e. the demographic ageing rate, the replacement rate, the dependency ratio, the counties were assigned scores from 1 to 5 depending on the favourability level of each demographic indicator in part. Finally, each county obtained a cumulated score, according to which 3 groups were established for each rurality level: intermediate rural area with low, medium and high demographic potential; predominantly rural area with low, medium and high demographic potential. The urban area is not subject to any classification, as only one county is included here, which also has rural population.

Taking into consideration that the favourability scores were not assigned for the entire Romanian rural system and not separately by the rurality level, there are no significant differences with regard to the demographic potential between the intermediate areas and the predominantly rural areas; yet a slight gap is maintained in favour of the intermediate areas by each favourability category.

Table3 :
Demographic and social indicators by the 3 favourability classes
in rural area, in the year 2015

Rural subsystems	Ageing rate	Replacement rate	Dependency ratio	Share of population employed in agriculture
Urban area	91,66	103,46	42,53	22,32
Intermediate rural area with low demographic potential	129,21	84,23	54,71	43,58
Intermediate rural area with medium demographic potential	113,82	91,08	50,37	36,49
Intermediate rural area with high demographic potential	82,69	90,67	46,57	29,53
Predominant rural area with low demographic potential	151,76	89,59	57,95	43,68
Predominant rural area with medium demographic potential	115,47	83,41	54,08	38,22
Predominant rural area with high demographic potential	100,42	93,88	48,88	35,3

Source: tempo online, INS, 2015

This classification is useful for an accurate picture of the demographic phenomenon. For instance, if we evaluate the rural subsystem of the county Hunedoara only on the basis of the ageing rate indicator, we could say that the demographic situation is disastrous, as the ageing rate is extremely high, i.e. 188.63% (one of the highest at national level); however, we can also notice that the county Hunedoara has the highest replacement rate, i.e. 136.87%, which indicates demographic regeneration, so that the situation is not so critical even though there is a slow and continuous population ageing process.

CONCLUSIONS

This classification is also useful in orienting the national, regional and local policies for solving up the specific problems, namely:

- in the areas with high demographic potential the interventions should be targeted on business sector stimulation, mainly for those activities that have in view the introduction and adaptation of certain innovative products and processes, being also necessary to encourage the linkages between education, the research institutes and the business representatives in order to supply well-trained labour force, etc.;

- in the areas with low demographic potential, with a high population aging rate, a high demographic dependency ratio and a low replacement rate, social protection measures are needed through the development of elderly care services, as well as measures for natural population increase, etc.

In other words, depending on the intensity of demographic changes, the rural areas need different support strategies.

REFERENCES

1. Balestrieri, Mara (2014). Rurality and Competitiveness. Some Observations on the Local Area: The Case of the Sardinian Region, International Journal of Rural Management
2. Camagni, R. (2002). On the Concept of Territorial Competitiveness: Sound or Misleading?, Urban Studies
3. Chiţea M. (2015). *Competitivitatea regională. De la teorie la practică. Studiu bibliografic, Perspectivele agriculturii şi dezvoltării rurale prin prisma noii politici agricole comune 2014-2020*, Editura Academiei Române, Bucureşti
4. Dwyer, J., N. Ward, P. Lowe and D. Baldoc. (2007). *European Rural Development under the Common Agricultural Policy's "Second Pillar"*: Institutional Conservatism and Innovation, Regional Studies
5. Harvey, D. (1989). *The Urban Experience*, Oxford: Blackwell
6. Mureşan Cornelia (1999), *Evoluţia demografică a României. Tendinţe vechi, schimbări recente, perspectiv*e, Presa Universitară Clujană
7. *** (2006) *Cartea verde a populaţiei*, Comisia Naţională pentru Populaţie şi dezvoltare, UNFPA
8. *** (2011) Propunere de rezoluţie a Parlamentului European referitoare la schimbările demografice şi la consecinţele acestora asupra viitoarei politici de coeyiune a UE, PE 462.525v02-00
9. *** (2014) Taking Stock of Europe 2020 Strategy for Smart, Sustainable and Inclusive Growth, European Commission, Brussels
10. ***(2014) Strategia de Dezvoltare Teritorială a României. Studii de fundamentare.
11. http://ec.europa.eu/eurostat/statistics-explained/index.php/Population_statistics_at_regional_level/ro
12. Tempo online, National Institute of Statistics

THE INFLUENCE OF EDUCATION ON RURAL POPULATION EMPLOYMENT - REGIONAL DISPARITIES

CORINA - GEORGETA DINCULESCU[1]
.

ABSTRACT: *A higher level and continuous education throughout entire life (necessary for adapting to the changes in the labor market) and a better health offer greater chances of sustained economic and social development. Also, a higher education level contributes to decrease the disparities between economic regions of development, due to the influence it has on employment population, in a particular area. The analysis may reveal regional employment disparities, sometimes severe, between development regions, representing a hindrance to economic development of the country, as a whole. The 8 development regions of Romania have certain particularities (features) in terms of employment, which makes some characteristics (demographic, educational etc.) to impart significant influence on employment.This paper aims to highlight the features of the rural area, in terms of population participation in economic activity, and disparities between the development regions, in terms of employment of rural population, respectively the influence that the level of education has on employment, and how it is reflected in the employment rates of rural population (by age groups), but also ranking of the development regions from this point of view.*

Keywords: *labour force, employment, regional disparities, level of education, rural area.*

JEL Classification: J21, J24, I25, O15.

INTRODUCTION

Essential component of rural development policy, the labour resources are an important factor for sustainable rural development. To meet the multiple challenges of rural areas, regarding the social component, appears to be appropriate a qualitative analysis of labour resources to determine as precisely is possible the disparities between EU average and Romania.

The national interest is more obvious than the European one, given the specific situation of Romania, where most specific indicators (employment, education, qualification) are below the European average, and the disparities are large enough to pay more attention to this area. Thus, the analysis of labour resources in rural, and of regional disparities between them could lead to identification of specific problems of social component for each region / county, on which must take actions to improve those levels and to establish priority objectives in the field.

To assess the human resources, this paper proposes an analysis of labour resources in rural areas, aiming to highlight how one of the objectives of rural development policy for the period 2014 - 2020 - balanced territorial development of rural communities - might contribute to the economic development of the area, with a focus on decreasing regional disparities.

USED DATA AND METHODS

The analysis of labour resources and of the rural labour force, was based on aggregated results of statistical research of Romanian Institute of Statistics , LFS (Labour Force Survey in households), *by custom queries of the public available database* (Tempo Online), followed by *various selections, tabulations, charts and extra own processing, mainly in MS Excel*.

With respect to reveal the disparities at geo-level (8 developments' regions) the author used specific methods (statistical and geo-referenced analysis with GIS). Along with *the core statistical methods used by GIS[2] software to produce thematic maps*, *the relative distances method* was used, which requires the national averages for all selected variables for the rural space of Romania's regions ranking.

---

[1] Corina Dinculescu, research assistant, Romanian Academy, Institute of Agricultural Economics, corina.dinculescu@gmail.com
[2] GIS Geographical Information System

For a relevant hierarchy were used specific meaningful indicators of labour resources. In this paper the author used the simple *method of ranking* - the results of which can be used in correlation analysis using nonparametric methods (rank correlation coefficient). The choice is justified by the existence of a small number of observation units (8 regions) and by analysing a reduced number of variables (depending on data availability by region).

When about ranking of each feature and for the combined rank some information is lost. It is therefore necessary to use additional other methods (*The relative distances' method like)* to check and confirm the hierarchy of development regions established by the previous method.

RESULTS AND DISCUSSIONS

The qualitative analysis of labour resources[3] in rural areas will reveal how they are used, the correlation between employment and existing jobs in rural areas, the influence of the training level on employment, the correlation between: age, educational level and getting a job - factors that increase the persons' chances for getting jobs according with their training and personal expectations.

Romania's regions have certain features in terms of employment which makes some characteristics (demographic, educational, etc.) to render paramount influences on employment, which determine their future development on the medium and long term basis.

The most ruralised regions of Romania (with the largest share of rural population) were, in 2014, the "South - Muntenia" (60.5%), closely followed by the "North – East" (58.4%) while less the ruralised is the "West" region (38.3%), unless we consider the "Bucharest – Ilfov" (10.3%), which is atypical due to the large share of urban (Bucharest capital city has almost 10% of Romania's total population).

Ranks of development regions by share of rural population[4] in total population is maintained when ranking the regions by labour resources in rural areas (see Table 1). Combining ranks shows that four development regions of eight have the same position in both ranking (by share of rural population and by share of rural labour resources.

Chart 1- Distribution of labour resources in rural areas of development regions, 2014
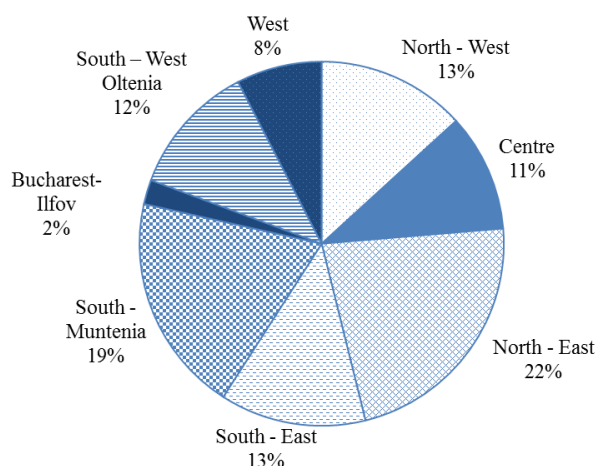
Data source: Romanian Institute for Statistics and own calculations

---

[3] Labour resources represent that category of the population having all the physical and intellectual capacities that enable it to perform a useful work in any field of activities. The labour resources include the population in working age, able to work and people under and over working age currently working.
[4] Resident population at January 1st

The distribution of total rural labour resources (see Chart 1) in rural areas by regions reveals that almost half of them are concentrated in two regions ("North - East" and "South - Muntenia"), other labour resources being distributed as follows:

- "North - West" and "South - East" regions have each around 13% of the labour resources of rural areas and
- "South - West Oltenia" and "Centre" regions having 11.7%, respectively 10.5% of rural labour resources.

Table 1 – Development regions ranks, 2014

	Share of rural population in total region		Share of labour resources in total region		Mixed rank
	%	rank[5]	%	rank	
North - West	47.4	4	50.7	5	4
Centre	42.2	6	44.5	6	3
North - East	58.4	2	70.9	1	5
South - East	46.6	5	52.4	4	4
South - Muntenia	60.5	1	64.8	2	5
Bucharest-Ilfov	10.3	8	8.9	8	1
South – West Oltenia	54.0	3	59.0	3	6
West	38.3	7	40.9	7	2

Data source: Romanian Institute for Statistics and own calculations

Over the period of 2002 - 2014, the number of labour resources has continuously decreased in the years following the beginning of the review period, until 2006, when it reached the minimum period. This decrease was followed by an increasing trend toward the beginning of the period. In 2014, labour resources were slightly above the level of the beginning period[6].

Knowing the number and labour resources in a certain period is not enough. For a good analysis is necessary to compute ***the employment rate of labour resources***, what means the proportion in which those are used. This indicator is the ratio of the occupied population by the volume of labour resources. A high value of this indicator means that a greater part of the population included in labour resources is able to obtain the necessary income for living.

A simple comparison between the employment rate of labour resources at national level (66.9%) and at rural level for 2014 clearly shows a difference of over 10 percentage points in favour of the first one, revealing that the rural labour resources are used just over half. The greatest influence in this evolution have had, obviously, the population of working age whose slightly increasing evolution balanced the 3 percentage points decrease of the employed population outside the labour age (65 and over).

This trend highlights the fact that in the period under review, the population aged 65 and over, either retired, becoming pensioners, thus entering in the category of inactive population or not

---

[5] The ranking by the percentage of rural population, which is mathematically correct, can be confusing because a higher percentage means a less favorable situation, so the hierarchy should be reversed - however, mixing both ranks reveal very clear that a region with large share of population has a large share of labor resources used as well.

[6] Includes population aged 15 years, which would be fair (because the law allows employment from age 15 - with their parent or legal guardian consent), but not perfectly comparable to the figures of LFS.

stating employed[7] status, when they fulfilled the criteria to be classified in such category. However, there are still people in the labour market over the working age (65 and over), which could be explained by the need of additional revenue for covering the living costs.

The hierarchy of the development regions in terms of employment rate of labour resources in rural areas shows a difference between the maximum and minimum rates of employment of rural labour resources of 16.8 percentage points, highlighting with this indicator as well, and the disparities in regional development. An interesting, but understandable and expected (see explanation above) reveals the "Bucharest-Ilfov" region, which, although it has the lowest share of resources for rural labour, the last position in the ranking of regions has the highest employment rate of any region (63.6% versus 46.8%, "Centre" region, with the lowest employment rate of labour resources).

The work resources' analysis does not provide a complete picture out of population employment (that part of used resources). Particularly, important for analysing existing workforce at a specific date is determination of its structure by different characteristics: age, level of education, residence, region of development, etc., and the correlation between these characteristics.

The main indicators characterizing the population by participation in economic activity are reflected in the following synthetic table (Table 2).

Table 2 - Participation in the economic activity of the rural population aged 15 and over, by educational level, 2014

- thou persons -

Education level	TOTAL	Active population	Employed population	Uneployed population	Inactive population
TOTAL	7,630	4,165	3,945	220	3,465
Superior	239	1,956	182	13	43
Secondary	2,988	2,120	1,994	127	868
Lower	4,403	1,849	1,769	80	2,554

Data source: Romanian Institute for Statistics

In 2014, just over half of the rural employed population (aged 15 and over) had secondary education, the other half is characterized mostly by a lower level of education. As regards to unemployed persons in rural areas, it is clear that their educational profiles was dominated also by secondary (57.6%) and lower (36.3%) levels.

Rural inactive population is dominated by a lower educational level (almost three quarters of total).

The preponderant secondary educational level could shape the idea of a possible lack of interest of the rural population to invest in their education, which would allow them to get a job according to their qualifications and to have more chances to obtain higher wages. But this is not the only one explanation – the inability to adapt the education system to the labour market requirements could be certainly another one.

A close look at the *employment rates of rural population* shows significant discrepancies between development's regions, the spread between the maximum and the minimum rates of

---

[7] According to the methodology of the survey on labor in households, employment comprises all persons 15 years and over who carried out an economic activity for at least an hour (at least 15 hours for self-employed and unpaid family workers in agriculture previous year 2011) in the reference period (one week) in order to get income in the form of wages, payment in kind or other benefits.

Since 2011, self-employed and unpaid family workers working in agriculture are considered employed persons unless they are owners of agricultural production (not necessarily of the soil/farm) obtained and meet one of the following conditions:

a) agricultural production is destined, even at least in part, sold or exchanged in kind (barter);

b) agricultural production is exclusively for own consumption, if it represents a substantial part of total household consumption.

employment of the workforce is nearly 25 percentage points - "North - East" with an employment rate of 62.6% and the "Centre" region, with the lowest employment rate of 39.2%.

Only two regions have employment rates of rural population higher than country rural area level - "North - East" (62.6%), and "South - West Oltenia" (56.1%).

By age groups, there is the same ranking of regions where the employment rate of the rural population, the "North - East" having the highest employment rates in almost all age groups (except for the age group 15-19 years, in which the highest employment rate was in the "South - West Oltenia" - 18.2%).

It can be said therefore that of all the regions, the "North - East" is in the most favourable situation, in terms of rural population employment.

At some age groups the employment rate gap is much larger than for total. Thus, for the North-East region the difference is of more than 25 percentage points in terms of employment of rural population aged 60 and over and the case of total rural areas in this age group. Large differences of more than 15 percentage points are remarked to the age groups 20-24 years and 55-59 years.

At the opposite side lies "Centre" region, which, same as for total rural, registered the lowest rates of employment of the rural population in the age groups 15-19 years, 25-29 years and 40-54 years, the difference between them and the total rural level being over 10 percentage points.

On the other age groups, the lowest employment rates are in the "Bucharest-Ilfov" region. The differences are significant: for age groups of 20 - 24 years and 55-59 year the employment rates are less than half of the level for total rural areas, for age group of 60 - 64 the employment rate of the population accounts for only a quarter of the total rural and for 65 years and over the employment rate represents only one seventh of the rate of the total rural employment.

Similar disparities between the development's regions are observed when analysing the employment rates of the rural population by **educational level** (see Map 1).

Map 1 - Employment rate of rural population by regions and level of education, 2014
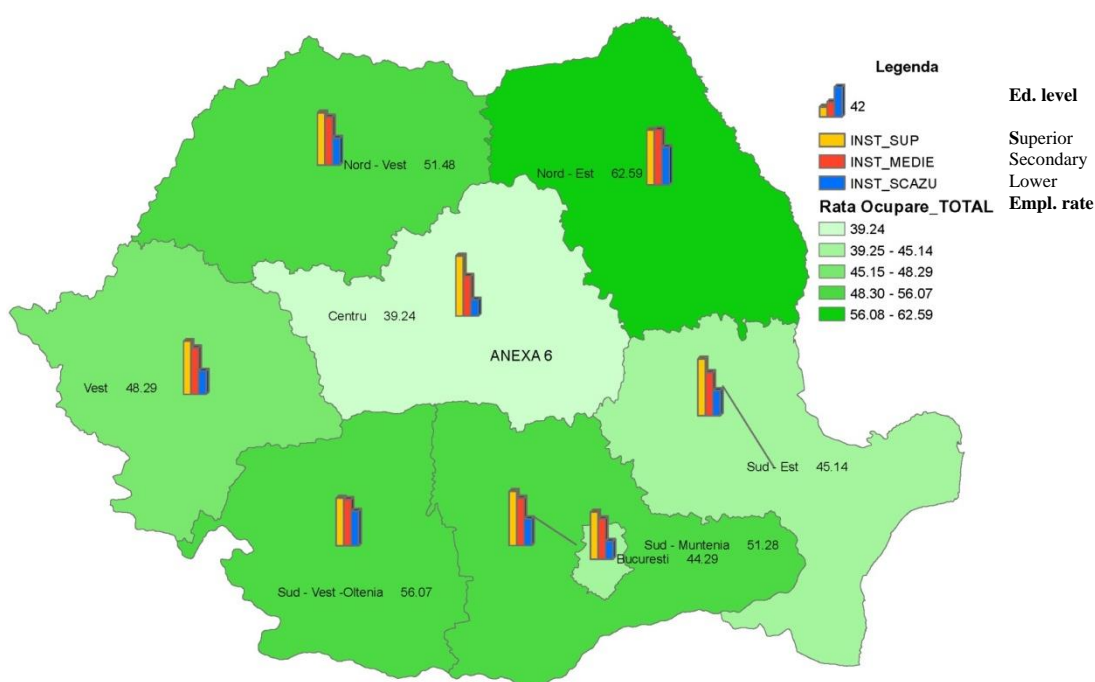
Data source: Romanian Institute for Statistics and own calculations

The "Centre" region shows the highest employment rate of rural population with higher education (84.8%). This is followed by the "South - East" region with an employment rate of rural population with higher education (80.1%), "North - East" (77.2%) and "South - Muntenia" (76.5%), all values above the rate for total rural areas.

For the rural population with secondary education, the employment is reflected differently by region. The highest rates of employment of the rural population with secondary education are in the "North - East", followed by "North - West" and "South – Muntenia", regions where employment rates of this population are located above the rate for total rural areas.

"North - East" and "South - West Oltenia" region rank first in terms of employment of rural population with lower education.

The correlations between the age groups and the education level in terms of rural population employment reveal significant differences between regions.

A segment of the population, and particularly carefully monitored, are **young people NEET[8]**. Along with reduced employment of young people in rural areas, the rate of young people not engaged in any form of employment, education or NEET training[9] recorded a significant increase. These young people seemed to have disappeared from the radar of education and social system and from the labour market as well, as it was explained in one OECD study[10].

An overview of young people, group of 15 - 24 years, shows the increasing discrepancy (over the years) of education level between rural and urban population. This could be explained by the large opportunities young people, living in urban areas, have to obtain a higher education and also by the severe shortage of teachers in rural areas (only a third of the teachers work in rural areas, continuously decreasing during 2002-2014).

Regarding the employment of young people aged 15 - 24 within rural area, the last 15 years are marked by the same continuous decrease trend, as for the national average. However, the employment rate of young people aged 15 - 24 in rural areas (29.8%) are above the national one, which is 22.5%.

Low youth employment rate does not necessarily mean that these people are involved in the education system, neither is NEET category. Possible explanations would be the occupation of these in an informal work (undeclared) or young migrants to various countries in EU or outside EU, without declaring change of residence.

The analysis by level of education reconfirms the fact that a lower level of education determine a low level of employment of young people aged 15 - 24 in rural areas. In Romania, it could be observed that, while reducing employment of young people aged 15 - 24 rural, the NEET rate has decreased in the last 15 years - a situation which should be positive if the values of NEET rate would have been lower. The gap between NEET rates of the EU28 and Romania was reduced from 7.2 percentage points at the beginning of the period, to 4.6 percentage points in 2014. The national situation is far from positive, although the NEET rate for age group 15-24 years in 2014 has been decreased with 2.7 percentage points comparing with 2002.

A similar trend at the national level, but with much higher values, was observed for NEET rate of youth aged 15 - 24 years in rural areas.

The highest rates of young people NEET rate it is noted at youth aged 20-24 years. In the entire analysed period, the NEET rate was higher than those of young people aged 15-19 years. In 2014, the NEET rate for 20-24 years was almost 30%, which leads to the explanation of whether they work in the informal sector or are not motivated by a corresponding salary to individual expectations, which causes them not to enter in the labour market (formal).

It is obvious that the rural space is characterized by an unfavourable situation, the high values of the NEET rate meaning that the investment in training for this segment of population is wasted, because the knowledge gained during the training period does not bring the expected results, neither for the individual level (a well-paid job), nor for society (the contribution of these

---

[8] NEET youth - youth who are neither employed nor enrolled in an education or training.

[9] The rate of young people not engaged in any form of employment, education or training NEET - is the ratio between young people aged 15-24 unemployed, not enrolled in some form of education or training to all young people in that age group. Shortly it will be used as *NEET rate*.

[10] Youth, Skills and Employability, OECD Skills Outlook, 2015

people to economic development). Having long-term NEET rate high values and continuous increase can lead to poverty and marginalization.

Significant disparities in terms of the share of young people NEET aged 15 - 24 in total population 15 - 24 years in rural areas are recorded at regional level. In "Bucharest-Ilfov" region NEET rate (36.2%) is the largest, showing a negative situation (perhaps influenced by higher informal economy). The better situation has the North-East region with a NEET rate of 11.9%.

Chart 2 - NEET rate of youth 15 - 24 years in rural areas, by regions, in 2014
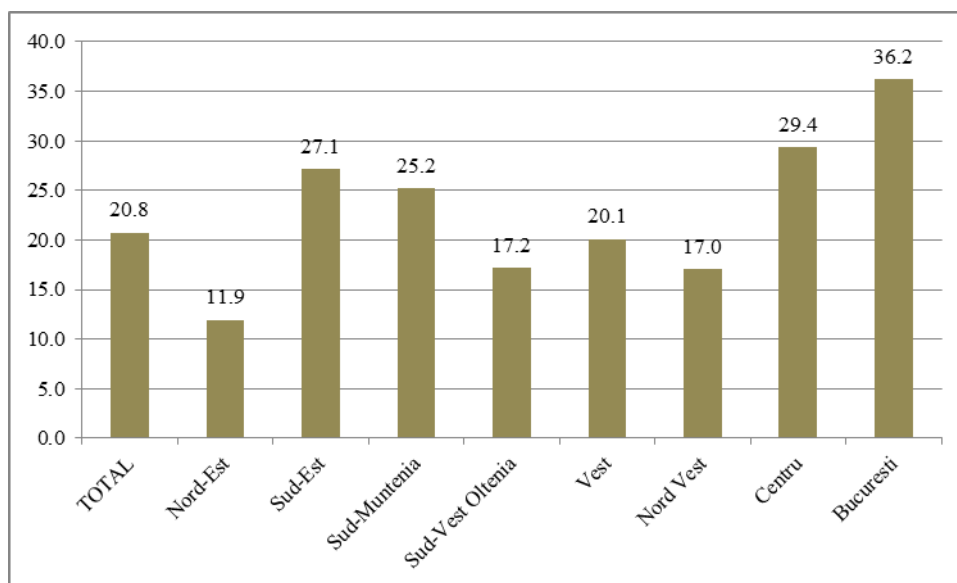
Data source: Romanian Institute for Statistics

The regions where there is a apparently favourable situation (ie, the NEET rate lower than of the total area) are: "North - West" (17.08%) and "South - West Oltenia" (17.2%) and "West" (20.1%). The situation is apparently favourable only. The values of this indicator are still high, showing that young people aged 15 - 24 are not enrolled in any form of education or in the labour market.

CONCLUSIONS

The achievements of a large research done by the author, related to the matter, were presented within this very short paper.

The main conclusions are as follows:

1. there is a direct dependency between the education level and the chances for getting a job or a better wage;
2. the most vulnerable group of persons in rural areas is of 15-24 years;
3. the education system is not adapted to labour market needs;
4. the rural area is captured within a vicious circle: there are extremely reduced investments (including from public sources) able to produce jobs, and if there are some intentions to do such investments, the process are discontinued due to the lack of trained/qualified persons to apply for new jobs; But few powerful investors took over the mater and trained themselves the future workers when other factors were more important for selection of a specific place for investment.
5. the data availability and quality have a major impact on research results:
   a. due to the fact that there are a small units of observations for which the data are representative;

b. LFS has a limited sample and is not updated often, being remarked over large periods very low variations, which cannot be explained comparing with real life observation or other non-conventional sources possible to be scanned within big-data concept;

c. starting with Population Census 2011, the concept of resident population was altered comparing with its definition, including a part of legal population (not interviewed/missed at census time and wrong counted from Population Register as resident at its legal domicile); External migrants have also a very approximate estimation; So the census resident population of 20,121,641 includes 1,236,810 persons captured from register, but not necessarily being all residents of the census place, some of them living in other places, in other localities or districts or abroad. This is making the current population figures uncertain and of course all further information resulting from its use.

6. The research will continue identifying more data sources and enlarging the number of observation units and of variables and then adopting of more sophisticated methods of data analysis and of results' presentation using at maximum extent the new visualisation tools.

BIBLIOGRAPHY

- ANDREI, T., 2003, *Statistics and econometrics*, Bucharest, Economic Publisher;
- ANTONESCU, D., 2003, *Regional development in Romania, Concept, mechanisms, institutions,* Bucharest, Oscar Print Publisher;
- BARON T., BIJI E., 2004, *Theoretical and Economic Statistics,* Bucharest, Didactic and Pedagogic Publisher;
- DOBRIN M., TACHE A., PETRIŞOR A. I., 2010, *Analysis of regional development disparities in Romania using Geographic Information Systems*, Romanian Statistical Review;
- GHIŢĂ, S., 2005, *Statistics of labour resources,* Bucharest, Editura Meteor Press;
- JABA E., 2002, *Statistical methods applied in the study of regional disparities*, Iaşi, Sedcom Libris Publisher;
- *OBADIĆ A.,* 2004, *Comparison of basic macroeconomic indicators on the labour markets of a select group of countries*, Project: The competitiveness of Croatia's human resources*;*
- OECD Skills Outlook, 2015, *Youth, Skills and Employability*;
- POPESCU, C. R., 2002, *Regional disparities in economic and social development of Romania,* Bucharest, Meteor Pres Publisher
- PREDA D., 2002, *Employment and Sustainable Development, Bucharest, Economic Publisher;*
- TRINH LE, JOHN GIBSON, LES OXLEY, *Measure Of The Stock Of Human Capital In New Zeeland*;
- National Institute of Statistics, Romania, Labour force in *Romania: Employment and unemployment, in 2014*
- National Institute of Statistics, Romania, *Romania in figures*
- National Institute of Statistics, Romania, 2002 - 2015, Statistical Yearbooks
- *** EUROSTAT - http://epp.eurostat.ec.europa.eu
- *** National Institute of Statistics, Romania - www.insse.ro/

TERRITORIAL COMPETITIVENESS IN THE DEVELOPMENT REGION SOUTH-EAST. CASE STUDY: BUZĂU COUNTY

CHIȚEA MIHAI ALEXANDRU[1]

Abstract: *The present paper attempts to evaluate the territorial competitiveness at the level of the development region South-East, of Buzău county respectively, starting from the premise of the identification of the strengths and weaknesses influencing the specific competitiveness of the investigated units. The paper draws on an evaluation model developed for measuring the local competitiveness in Croatia, which was adapted to Romania's specificities, with regard to the relevance, sources and availability of indicators. The adapted model was used for the evaluation of territorial competitiveness at regional and county level. The working hypothesis was represented by a lower competitiveness level in the case of the county Buzău, compared to that of the South-East region; this situation is mainly determined by the factors relating to the development level of the non-agricultural business sector, of specialization and innovation.*

Key words: *territorial, regional competitiveness, evaluation models, indicators*

JEL Classification: A13, P47

INTRODUCTION

In the recent decades, the debates on competitiveness at academic and economic level have been omnipresent and often contradictory. The main questions to which answers have been looked for focus on the opportunity and righteousness of using the national competitiveness concept, as well as on the concrete modality in which the regions, towns and localities are competing. Despite these divergences and conceptual problems, competitiveness has represented a core objective in many strategic documents and development programs at international and national level such as the Lisbon Agenda, Europe 2020 Strategy or the National Strategy for Competitiveness 2014-2020. Despite this, we are still far from a broad consensus on competitiveness expressed at national and regional level and at the same time we are the witnesses of the following recurrent hypothesis: nations, regions and towns do not have any other option than to struggle to be competitive so as to be able to face the new global information and knowledge-based economy.

Regardless of the aggregation level to which we refer, the competitiveness conceptual framework is based on specific elements of different economic theories developed throughout time: the classical theory, known through the studies by Adam Smith and David Ricardo, the advocates of absolute comparative advantage, of labour division and production factor endowment; the neo-classical theory – of perfect competitiveness, represented by identical technologies, the returns to scale and the perfect factor divisibility; the Keynesian theory – where the determinant factors are represented by capital intensity, public investments and expenditures; other theories like the development theory, the new growth theory, the new trade theory and Michael Porter's competitive advantage theory [4]. Furthermore, Martin [2] considers that in order to understand regional competitiveness, some other elements of micro-economic and sociological nature should be also analyzed, which are present in the urban growth theory, the new institutional economics, the business strategy economics and the evolutionary economics / Schumpeter's model.

All these elements also influence the territorial competitiveness evaluation process, leading to the existence of numerous models/methods to measure this, at all aggregation levels, developed at institutional, academic and business environment level. For example, referring to the regional competitiveness evaluation, Berger [1] identified not less than 46 evaluation models from public, private and non-profit institutions. In this context, the selection of a certain model to measure competitiveness must have in view, besides the aggregation level, the research particularities, referring to the scope and nature of the investigation.

---

[1] Scientific researcher, Institute of Agricultural Economics, mihai_chitea@yahoo.com

MATERIAL AND METHOD

In order to evaluate the competitiveness of Buzău county compared to that of the development region South-East to which it belongs, we shall use a model developed in Croatia by O. Mikuš, R. Franić and I. Grgić [3] for the evaluation of the competitiveness of rural areas. Having in view a series of differences with regard to the structure and availability of indicators, the model was adapted to the local specificities of Romania, by replacing those indicators for which no adequately structured data exist.

Table 1. Adapted model for competitiveness evaluation at county level

Variable – Original model Croatia	Variable – Adapted model
Group – Human resources	
Employed population in the rural area (persons)	Employed population, thousand persons
Population with higher education (persons)	Population with higher education (persons)
Young population in the rural area (persons)	Young population (persons)
Population density - pers/km²	Population density - pers/km²
Group – Situation of the non-agricultural sector economy	
GVA (Euro)	Turnover – thousand euro
Value of exports (Euro)	Value of exports – thousand euro
Investments in goods on the long term (Euro)	Density of local active units no./1000 inhabitants
Net average wage (Euro)	Net average wage (Euro)
Group – Situation of the agricultural sector economy	
Average farm size - ha/farm	Average farm size - ha/farm
GVA (euro)	Turnover – thousand euro
Value of exports (euro)	Value of exports – thousand euro
Investments in goods on the long term (euro)	Density of local active units
Net average wage (euro)	Net average wage (euro)
Group – other income gaining activities on the agricultural household farms	**Group – Specialization and innovation**
Share of tourism households	Share of the population employed in the non-agricultural sector
Share of craft households	Employees in CDI per 10000 civil employed persons
Share of processing households	% crop production in total value of agricultural production
Share of households that earn from other income gaining activities	-

Source: adaptation based on the model developed by O. Mikuš, R. Franić și I. Grgić, 2012

In the process of identifying the indicators at county level for Romania, one group of indicators was replaced from the four initial groups of indicators in the model: it is the group "Other income gaining activities at agricultural holding level", which was replaced by the group "Specialization and innovation". Having in view the limitations imposed by certain indicators referring to the latest available year, the data were extracted at the level of the year 2012; an exception is represented by the indicators *Population with higher education* and the *Average farm size*, where the latest available year was 2010.

The following formula was used for the calculation:

$$X_i = 100(x_i/X)/(p_i/P),$$

where the small letters are the values for the county level, and the capital letters are the values for the regional level; Xi is the variable selected for the county and X for the region, and pi is the

population at county level, and P the population at regional level. The four groups of indicators were assigned the same specific weight, i.e. 25%.

RESULTS AND DISCUSSIONS

We shall next present a few important benchmarks of the development region South-East and of the county Buzău.

The development region South-East is the second in size among the eight development regions of Romania, and covers an area of 35,762 km^2. It is crossed by the Danube River and borders on the Black Sea coast in its eastern part; it covers a part of the Curvature Sub-Carpathians, Bărăganului plain, the Dobrudgea plateau with the Macin mountains and the Danube Delta. In the year 2012, the population of the region totalled 2,538,949 persons – with a population density of 70.9 persons/km^2 . The network of localities comprises 35 towns (out of which 11 municipalities) and 355 communes. The most important towns in the region are Constanța, Galați, Brăila, Buzău, Focșani and Tulcea.

The region is well-connected to the national and European transport network, being crossed by important road transport corridors (E60, E85, E87, E70); it also benefits from an extended river and sea transport infrastructure represented by the Danube and the Black Sea. The tertiary sector polarizes the largest part of the labour force at regional level, followed by the primary sector (agriculture, forestry and fisheries) and the secondary sector (industry+constructions).

Source: www.adrse.ro
Figure 1. Map of the South-East development region

The development region South-East has 6 component counties, namely: Constanța, Tulcea, Brăila, Galați , Buzău and Vrancea.

The county Buzău is located in the western part of the region South – East, neighbouring upon the counties Brașov and Covasna in the north-west, the county Vrancea in the north-east, Brăila in the east, Ialomița in the south and Prahova in the west. It covers an area of 6102,6 km^2, benefitting from a balanced distribution of the main relief forms: the mountains Buzău in the north, part of the Curvature Carpathians, plain in the south, and a hilly region in the middle, covered by

orchards and vineyards[2]. From the administrative point of view, the county has 2 municipalities – Buzău and Râmnicu Sărat, 3 towns – Nehoiu, Pogoanele and Pătîrlagele and 82 communes with 482 villages.

As regards the transport infrastructure, the county Buzău is crossed by important road corridors – E 85 (DN2), which crosses the county from south to north and connects Romania's capital city to the northern part of the country, DN 1B to Ploieşti, DN10 to Braşov, DN 2B to Brăila, as well as by the major railway route of European importance – railway line 500 – which makes the connection between Bucharest – Buzău – Focşani – Bacău – Suceava.

Source: www.ghidturism.info
Figure 2. Map of Buzău county

In the year 2012, the population of the county Buzău totalled 449,218 persons, with a population density of 73.3 persons/km[2], above the region average, yet significant lower than the national average of 84.1 persons/km[2]. The economy of the county is sustained by local active units in industry and agri-food sectors, as well as in the sector of services, the county Buzău having a significant tourism potential.

We shall next evaluate the competitiveness of the county Buzău on a comparative basis with that of the development region it belongs to, i.e. the region South - East.

Table 1. Competitiveness index of the county Buzău – 2012

Variable / Level	Region South-East	Buzău County	X_i Buzău
Population (persons)	2538949	449218	
HUMAN RESOURCES			
Employed population, thou. persons 2012	1011	176.4	**98.62**
Population with higher education	268348	36595	**77.08**

---

[2] Presentation of Buzău county, County Council Buzău, www.cjbuzau.ro

Variable / Level	Region South-East	Buzău County	X$_i$ Buzău
(persons)			
Young population 0-20 years (persons)	540895	94000	**98.22**
Population density persons/km2	70.8	73.3	**103.53**
		SUB IND 1	**94.36**
NON-AGRICULTURAL SECTOR			
Turnover – thou. euro	21982843.28	3584327.24	**92.16**
Value of exports – thou. euro	4129817	481019	**65.83**
Density of local active units, no./1000 inhabitants	21.34	18.58	**87.03**
Net average wage (euro)	329.67	310.82	**94.28**
		SUB IND 2	**84.82**
AGRICULTURAL SECTOR			
Average farm size - ha/farm	4.94	3	**60.73**
Turnover – thou. euro	1305892.82	321934.47	**139.33**
Value of exports – thou. euro	542293	69985	**72.94**
Density of local active units, no./1000 inhabitants	1.17	1.00	**84.88**
Net average wage (euro)	233.17	221.27	**94.90**
		SUB IND 3	**90.56**
SPECIALIZATON AND INNOVATION			
Share of population employed in non-agricultural sector	66.3	56.7	**85.61**
Employees in CDI in 10000 civil employed persons	16.4	3.3	**20.12**
% crop production in total value of agricultural production	65.67	58.62	**89.26**
		SUB IND 4	**65.00**
COMPETITIVENESS INDEX OF BUZĂU COUNTY – 83.69			

Source: own calculations based on NIS data

CONCLUSIONS

The competitiveness index calculated on the basis of the adapted evaluation model reveals the existence of a significantly lower competitiveness of the county Buzău compared to that of the development region South-East, to which it belongs. There are a series of particularities that have contributed to this result.

All the four groups of indicators contributed to a lower competitiveness level, yet by different intensities:

- The group "Human resources" – is the closest to the average value of the region, mainly due to the indicator population density – higher in the county Buzău compared to the regional average; other two indicators – the employed population and the young population – have very close values to the regional average; the indicator that mainly contributes to the lower competitiveness level is the "Population with higher education" – only 77.08% of the regional average.
- The group "Non-agricultural sector" also contributes to lowering the general competitiveness level, in the first place by the indicator "Value of exports" – which is by almost 35% lower

than the regional average, as well as by the other indicators, among which we mention the "Density of active local units" – about 87% of the regional average.

- The group "Agricultural sector" - the indicator that mainly contributes to the decrease of the competitiveness level is "average farm size" - with almost 40% lower than the regional average; also, "value of exports" doesn't make an exception, the value at county level being significantly lower than the regional average; the only exception is in the case of "turnover" of the agricultural sector, which is significantly higher than the regional average.

- The group "Specialization and innovation" -represents the most influential factor in the direction of decreasing the competitiveness level of the Buzău county, the overall value of the sub index being almost 35% lower than the regional average; among the indicators included in this group, the highest impact on the competitiveness level was that of the "Employees in CDI in 10000 civil employed persons" - counting for only 20.12 % of the regional average; the other indicators also act in the direction of decreasing the competitiveness level at county level, compared to regional level, but with much lower amplitudes.

Having in view the above aspects, the initial hypothesis according to which the Buzău county registeres a lower competitiveness level compared to that of the South -East development region, is confirmed. All four groups of indicators contribute to the decrease of the conty's competitiveness level, however, two of them in an determinative way, namely "situation of the non agricultural sector" (foremost through the "value of exports") and "specialization and innovation" (mainly through "Employees in CDI in 10000 civil employed persons").

REFERENCES

1. Berger T., (2011). *An overview and Analysis on Indices of Regional Competitiveness.* Review of Economic and Finance, Academic Research Centre of Canada
2. Martin R.L. (2004). *A study of the factors of regional competitiveness.* Final draft report the European Commission, Cambridge
3. Mikuš O., Franić R., Grgić I. (2012). *The evaluation of rural competitiveness in creating a policy of rural development in Croatia*, *Journal of Food, Agriculture & Environment, Vol.10 (2): 962-969*
4. Porter M.E. (1990). *The competitive advantage of nations.* Free Press, New York
*** www.adrse.ro
*** www.cjbuzau.ro
*** www.ghidturism.ro

DEFINING THE RURAL AREA IN ROMANIA – LEGISLATIVE APPROACHES

STANCIU (CHIRILOAIE) VIOLETA[1]

SUMMARY: *This article is an analysis of how the rural area was defined in the Romanian legislation starting with the oldest law in force until last legislative initiatives in the field. The texts of Romanian legal acts were studied comparatively and against the provisions of the European Charter of Rural Areas. It was found that the definition of rural area in Romania was done generally by comparison and even in opposition to urban area. The new European paradigm emphasizes the complementarity of the two areas, different as specificity but equally important. Thus, the European Union's aim is no longer to transform rural into urban but to preserve and capitalize the specificity of each area in order to increase the living standards of all citizens, to maintain a healthy natural environment and to comply with the principles of sustainable development. National legislation does not seem to keep up with these trends, the biggest risk identified so far being a low rate of absorption of European funds. To avoid blockages, the documents providing the access to finance found, however, solutions for choosing beneficiaries specific to them. However, redefining the Romanian rural area within the national legislation, rigorously and in compliance with current European trends is a necessity for the elaboration of sustainable development policies in the medium and long term.*

Keywords: *rural environment, urban environment, territorial administration, rural development, urbanization indicators*

JEL Classification: P25, A12, D63

INTRODUCTION

The definition of rural area is subject to certain socio-economic paradigms which are reflected in European development policies but also in national legislations. For this reason, we thought the opportunity of a brief analysis of legal regulations from Romania, starting with the oldest law on territorial organization, still in force, and ending with the last attempts to harmonize the legislation with rural development policies of the EU.

MATERIAL AND METHOD

This paper is a study of national legislative documents that provide definitions of the rural area. There were analyzed comparatively the laws in force, the amendments thereof, a recent legislative initiative and the European Charter of Rural Areas. For confronting the de jure and de facto situation there have been used data published by the National Institute of Statistics on some of the minimal urbanization indicators mentioned by Law 351/2001.

RESULTS AND DISCUSSIONS

The oldest document in force on the theme studied was adopted in 1968, republished in 1981, repealed by Law 2/1989 but brought into force again in 1990 "until drafting a new law of administrative organization of Romanian territory". The new regulations were adopted 11 years later, the Parliament omitting to repeal the Law 2/1968 on the administrative organization of Romania. Article 4 thereof defines the city as "the center of population more developed from economic, social-cultural and urban-household point of view". Article 5 defines the commune as the "administrative-territorial unit which comprises rural population and it mentions that "by its organization, there is provided the economic, social-cultural and household development of rural areas". Therefore, the definition of urban and rural area is made comparatively, the city being superior(more developped), but without having clear explanations about the measurement indicators of this superiority (GDP per capita, regional institutions, infrastructure, etc.). Superiority

---

[1] PhD student Stanciu (Chiriloaie) Violeta, Plant and Animal Resource Management and Engineering, University of Agronomic Sciences and Veterinary Medicine of Bucharest, violeta.chiriloaie@yahoo.com

of city thus becomes the letter of the law and the development differences a "normality" that will last as long as the division of territory into cities and communes will last. Since some communes have become cities based on this law, we could conclude that, in their case, the development gap would have been eliminated through "economic, social-cultural and household" progresses.

After its re-enactment (1990), 5 localities were declared cities: Teius (Alba) and Faget (Timis) in 1994, Baia de Aries (Alba) – 1998, Otopeni (Ilfov) and Geogiu (Hunedoara) – 2000. After 2001, the transformations will continue based on ***Law 351 on the approval of the National landscaping plan*** that establishes the minimum criteria for classification of localities in various categories, presents procedures and ways of transitioning from one category to another and sets up metropolitan areas.

According to NIS data, none of the 5 localities mentioned above had more than 10,000 inhabitants when declared city or today, except city Otopeni. On the other hand, the communes Floresti (Cluj) has evolved from 5616 inhabitants in 1992 to 24,941 inhabitants in 2015, Commune Matca (Galati) had 11,227 inhabitants in 1992 and currently has 12,545, Commune Lumina (Constanta) registered 5572 inhabitants in 1992, today it has 10,348 inhaditants. There are many such examples, showing a stronger development of some communes compared to smaller cities whose population has diminished in the past years (Teius, Faget, Geoagiu, etc). Percentage of modernized roads (paved!) in these cities is less than 50% except Geoagiu and Faget. In the case of Faget, however, the percentage increase is due to the decrease in the total number of kilometers of road from 33 to 15, therefore the percentage of modernized roads does not represent progress. The sewage system remains weak. Less than 50% of roads have this facility, Otopeni included. Concerning green spaces, Otopeni seems to have suffered the most from urbanization, followed by Faget, and Teius never provided the minimum 15 sqm/inhabitant. None of these localities currently report the flow taken by plants in operation for wastewater treatment. Meanwhile, communes like Șintea Mare (Arad), Maracineni (Arges), Sascut (Bacau), etc. benefit from this facility.

The main novelty brought by Law 351/2001 is dividing the localities into five "tiers" as follows: "tier 0 – Romania's capital, municipality of European significance; tier I – municipalities of national significance, with potential influence at European level; tier II – municipalities of inter-county, county significance or with steady role in the network of localities; tier III – cities; tier IV – villages as commune residence; tier V - villages composing the communes and villages belonging to municipalities and cities". (Article 2) According to Annex 1, the tier is the expression "of present and immediate future significance of a locality within the network from administrative, political, social, economic, cultural point of view, etc., in relation to the sizes of the area of influence polarized and to the decision level it involves in the allocation of resources. This matter must also find its counterpart in the level of modernization". [10]. The dividing line between rural and urban is between tier III – cities and those of tier IV – villages as commune residence. Annex II, Law 351/2001 establishes the minimum conditions to be met by a locality to belong to the urban environment. Given that these parameters are defined as "minimum", we understand that they must be met cumulatively and compulsorily. At the time the Law was enacted, Romania had 172 cities, many of which did not met and do not meet either today (15 years since the adoption of the Law and 4 years since its last update) the minimum conditions stipulated. If we consider only the first criterion (minimum 10,000 inhabitants) and consult the list published in the same law, we note that over 40% of the cities had a smaller population. The gap was increased by a reverse migration phenomenon. "If until 1997, more people were leaving from rural environment to urban environment, the trend has started to reverse: every year, approximately 28,000 people left the cities for the villages". (Territorial Development Strategy of Romania, 2014, page 45) The importance of cities as a hub for economic, social and administrative development seems to be decreasing with the decrease of their ability to give people facilities they would search for and afford. The prioritization depending on the importance of regional influence of a locality on those around (of the network) from administrative, political, social, economic, cultural, etc. point of view is often a consequence of its level of development. Thus, the communes with a population greater than 10.000 inhabitants, which have managed to attract several investments, may become more influential in regional and

even national level than the depopulated and impoverished cities. After the adoption of this law, many communes have declared themselves cities. In 2012 Romania counts 217 cities (an increase of 26%) given that some of the old cities became municipalities (22 localities in 11 years). "For most new cities, the transition from rural to urban was done without modernization and development of facility and service infrastructure". (Territorial Development Strategy of Romania, 2014, page 27) We would add <u>in its absence</u>, also. If the letter of the law would have been obeyed, the adequacy of reality to it would have meant either to bring cities to the level of achievement of minimum indicators, or to reclassify them into category of tier IV localities. From 2001 until now, no city has become commune. On the other hand, the law has not been interpreted by the executive as its obligation to bring at least the cities already declared to the facility level mentioned. Subsequent amendments to the Law establish the bodies which may be involved in the development of localities (government, local authorities, civil society) but there are no sanctions for breaches of minimum requirements for fitting in certain categories of localities, nor deadlines for bringing them to this level of compliance. However, the localities that have been declared cities in various contexts of our recent history and so considered ex officio of superior "tier" while simply fitting the localities in the category of communes or villages makes them of inferior "tier", regardless of GDP per capita, the amount of taxes collected, the number of inhabitants, provision of public utilities.

The main minimum quantitative and qualitative indicators to define urban localities	
Number of inhabitants	10,000
The population employed in agricultural activities (% of total employment)	75
Equipping houses with water supply installation (% of total houses)	70
Equipping houses with bathroom and toilet in the household (% of total houses)	55
Equipping houses with central heating installation (% of total houses)	35
Number of beds in hospital per 1,000 inhabitants	7
Number of physicians per 1,000 inhabitants	1.8
Educational units	high school or other form of education
Cultural and sports facilities:	auditoriums, libraries, spaces for sports activities
Places in hotels	50
Modernized roads (% of total length of roads)	50
Roads with water distribution networks (% of total length of roads)	60
Roads with sewage pipes (% of total length of roads)	50
Wastewater treatment:	wastewater treatment plant with mechanical-chemical gear
Roads with exterior fire hydrant networks (% of total length of roads)	60
Green areas (parks, public gardens, squares) sqm/inhabitant	10
Landfills with secured access	present

*Table 1 Annex II, Law **no. 351/2001 revised by law 100/2007***

As noted, the law stipulates a hierarchy of localities, according to their presumed importance in the network. It regulates again the inferiority of rural over urban by fitting the communes and villages in tier IV and V. In 2014, of the total area of Romania, the rural area represents a percentage of 87%. 47.8% of the population living in this area. (Territorial Development Strategy of Romania, 2014, page 21) The question is whether we can afford to consider these localities of inferior "tier" and whether this type of approach is the one that lowered the standard of living of a large social segment.

First of all, in terms of language, the use of the word "tier" can feed in the collective mentality a disregard of rural, perceived as underdeveloped and secondary to the urban and civilized. As we have seen, the mere fact of being declared a city in various pre or post-revolutionary conjuncture does not mean prosperity or urban amenities. The city is not always "more developed" or more influential, therefore, "tier of significance" given by law is often formal.

Secondly, urbanization minimal indices can be interpreted today as indispensable factors of a decent standard of living that should be provided to all citizens regardless of residence environment. We may not say that for localities which are no longer in urban area, the lack of public utilities such as sewage systems, hydrants, green areas, modernized roads, etc. is normal. Regardless of the number of inhabitants in a locality or their occupation (agricultural or non agricultural), each of them is entitled to an unpolluted environment, education and health. To say that 1000 inhabitants in cities need a minimum of 1.8 doctors, in municipalities the same number of

inhabitants must have a minimum 2.3 medical assistance while in rural areas there is only needed a medical clinic, pharmacy or drug store, without mentioning the type of personnel employed and regardless of the size of population in the commune it means to treat the 1,000 people differently, depending on the type of localities where they live, which may constitute discrimination. Same goes for the square meters of green area/capita (15 in cities, 10 in municipalities). In fact, we talk about the same number of people and these people are equal in rights. Art. 16 of the Constitution states that "All citizens are equal before the law and the public authorities, without any privilege or discrimination", and Art. 47 states: "The State is bound to take steps of economic development and social protection, likely to provide the citizens a decent standard of living". It is about all citizens and the Constitution does not allow ranking the importance of citizens based on residence environment.

Thirdly, the law maintains this rule according to which the communes may transition from an inferior tier to a superior tier as significance only by transforming themselves to cities. It is thus omitted the development of rural localities by preserving their identity and developping their inner features that can be seen as advanteges compared to the urban areas. Development of rural tourism, revival of crafts, making the rural agriculture more efficient, can bring more prosperity to rural localities than mere transition to city status. Moreover, they are opposite to urban environment features. Annex 1 comes with a completion expected in this field, defining the rural locality as a locality where: "a) the majority of workforce is focused in agriculture, forestry, fishery, providing a specific and viable way of life to its inhabitants, and through which the modernization policies will also maintain in the future the rural specificity; b) the majority of workforce is in areas other than agricultural, forestry, fishery, but currently providing an insufficient facility necessary to declare it as city and which, by the facility and modernization policies can develop into urban localities". So, the modernization is not incompatible with the rural status but "the development" of these localities remains subject to adopting characteristics specific to the urban environment.

An interesting document in defining urban and rural areas is the **Law no. 2 of April 18, 1989 on improving the administrative organization of the territory of the Socialist Republic of Romania**. It was repealed in 1990 because it abolished "over 300 communes and a large number of villages with deep tradition in the country's history". At the same time, however, there was decided to maintain in force the provisions of the law on the transition of 23 communes to the category of cities". (Article 1) In its preamble there was mentioned the need for territorial reorganization as a consequence of "the profound transformations that have occurred in the lives of all localities of the country in the period since the adoption of Law no. 2/1968". The law of 1968 was considered obsolete by 1989, the legislators after 1990 maintain it in force. The stated purpose of the document was to deepen "the process linking the working conditions, of life and culture in rural areas to those from urban areas, to the material and spiritual standard of living of all people".

Instead of ranking the localities on tiers proposed by the current legislation, Articles 7 and 8 were creating the same type of locality, depending on one criterion, the number of inhabitants. Thus the cities were divided into the following categories: "I – up to 10,000 inhabitants; II – between 10,001 – 20,000 inhabitants; III – over 20,000 inhabitants". (Art. 8) Thus, the communes were no longer considered a "less developed" area compared to cities (as the Law 2/1968 mentioned), they were not "tier IV" as significance and influence. The legislator stipulated that "the commune organization ensures the strong development and modernization of agriculture, expansion of industrial and service activities, of the health network, education and culture, thereby creating to inhabitants work and life conditions as close as possible to those of the population of cities". A simple amendment to the annexes of this law by re-adding dismantled communes and villages would have offered us a more progressive legal document than the Law 2/1968 but also than the Law 351/2001, since 1989. The paradigm which this document is subordinated to, repealed in 1990, seems to better align to the international trends and Rural Charter than many of the legislative attempts after the Revolution.

The Order No. 143/610 of March 4, 2005 on the definition and characterization of the rural area was issued by the Ministry of Agriculture, Forestry and Rural Development. Its goal was

to define and characterize the rural area of Romania "in accordance with the provisions of the Council Regulation (EC) No. 1,296/1996 on the European Charter of rural areas" and to clarify the eligibility status of applicants to SAPARD funds.

In 1996, the Council of Europe noted that "a new action was needed at Pan-European level to strengthen the justice and social and economic stability between urban and rural areas". It aims to improve "the living and working conditions in rural areas" proposing concrete measures for rural development, without considering at any time its urbanization. On the contrary, art. 9 letter b mentions the commitment of signatory states to protect "the rural area against intensive or anarchic urbanization". The document speaks about rural development by preserving and enhancing its own specificity. The perspective of approaching is different from Law 2/1968 but also from Law 351/2001. Unfortunately, despite the aim stated in its preamble, neither the Order 143/2005 transposes it entirely.

Since the beginning, to define the rural area, the Charter uses the terms "villages and small cities" while the Order 143 mentions "areas belonging to communes, as well as peri-urban areas of cities or municipalities", removing the possibility of categorizing the small cities in this area. The document of the Council of Europe defines areas with a particular use of lands for certain economic, social, cultural, environmental protection purposes, while the Order 143/2005 delimits areas only defined by a certain economic specificity. The notion of territory, which by its nature is fixed, constant, helps the delimitation and localization of rural area for its protection and development. Thus, defining an area in terms of its economic activities carried out may be temporary while territoriality is a constant. In addition, the economic aspect does not exhaust the definition of rural area as neither "agriculture, forestry, aquaculture and fishery" in the European vision only includes "plant agricultural and/or livestock, forestry, fishing and aquaculture production" because agricultural production means agriculture but is not identical to it. Council Regulation (EC) No. 73/2009 defines agricultural activity as "production, raising or cultivation of agricultural products [...] **or maintaining the land in good agricultural and environmental conditions**. (art. 2, let. c) If agricultural land is no longer used for some time for economic purposes, it does not mean that it is no longer part of the rural environment. Its non-use does not remove the obligation to protect it from ecological point of view, activity which remains subject to the agricultural field. The Annex of the Recommendation also notes that today agriculture is multi-functional. Besides obtaining agricultural products, which is not only made for economic reasons but also for social reasons (such as ensuring food security of the population in both areas of residence), agriculture should contribute to: "the preservation and maintenance of the landscape heritage [...] keeping and promoting the cultural values of the rural world […] conservation of vital resources (soil, water, air)" and their sustainable exploitation (Annex, Guideline 6. Agriculture and Agricultural Policy). The document mentions the need for "an economic and social policy" aimed at both "rural development and agricultural development". This should "take into account the equality and interdependence of rural area and the urban area". Development of rural area is no longer done by the transition to city but by preserving and capitalization of complementary differences in a world where the importance of the two areas is equal. (Guideline I. Principles, let. b).

In 2013, noting an unsatisfactory absorption of European funds and awareness that many Romanian cities are not on track to meet the criteria of Law 351, a group of Members of the Parliament submitted the **"Legislative proposal on defining national rural area".** Stated objectives were "balanced development of the national territory, efficient use of European funds, encouraging diversification of the rural economy, improving the quality of life in rural environment" (art. 3). The draft was adopted by the Chamber of Deputies (2013) but rejected by the Senate after two years of waiting (2015). Article 4 included in the rural area "all administrative-territorial units up to 25,000 inhabitants" (and therefore a part of small cities), provided cumulative fulfillment of the following criteria: "density of population-150 inhabitants per km^2 maximum; the proportion of households engaged in industry is at least 25% and over half of the minimum quantitative and qualitative indicators of urban development set out in annex 1 are fulfilled". The point of view addressed to the Chamber of Deputies (registered under no. 8114/September 20,

2013) by the Romanian Government opposes to the adoption of the document, citing procedural flaws but also the presumption that the recognition and preservation of rural characteristic of small cities would be anachronistic. So, contrary to the spirit of the European Charter, governmental approach remains true to the paradigm where the villages and communes are inferior to cities and development is only done by urbanization at any price and not by exploiting the specificity and inner advantages of each area, as indicated by the European Council. The question is whether low level of development of these localities, which the Government Dmitts, is the result of forced and artificial preferred urbanization of certain sustainable rural development policies. Could it be that, through such political and administrative approaches, the rural population is condemned to social exclusion and underdevelopment, considering natural that the village is underdeveloped as long as it keeps its appurtenance to the rural environment? In terms of the access to financing, the executive believes that it is not blocked "only by certain ambiguities in the national legislation" but rather by eligibility rules and provisions of documents governing access to finance". From my point of view, the question is whether the access is blocked by these ambiguities not whether they are the sole cause of the blockage. If ambiguities are in this blockage, whether the only causes or part thereof, they should be eliminated. In addition, the eligibility criteria for accessing European funds refer to rural/urban division in the national legislation. It is however true that, solutions were found in this regard by customized definition and even the exact nomination of beneficiaries in the applicant's guides of every funding line. Although it is a rural development program, the RDP also addressed some localities considered urban by the national legislation. The example of LEADER program invoked by the Government is eloquent, also addressing to cities of up to 20,000 inhabitants.

CONCLUSIONS

Customized approaches for defining eligibility for each line of financing seem a good solution but only for the moment, typical to the Romanian society that seems to bypass problems, leaving them unresolved but looking for detours to still go further. One such issue is prioritizing rural and urban areas, the first being inferior by law, approach which, according to the author, is unconstitutional, does not align to the European development policies and it is not always consistent with the reality that surrounds us. Inequalities between urban and rural areas may not be denied, but the development degree of each is often tributary to the paradigma adopted by the national development policies. The beneficiaries of these policies should be citizens with equal rights, respected and represented by state institutions equally, regardless their residence.

Due to the lack of coherent long-term development policies we face with contrary tendencies. On the one hand there is a tendency to (re) ruralization. Government considers it anachronistic but government policies so far are actually those that created it. Territorial Development Strategy of Romania 2014 considers this phenomenon "obvious in case of small and medium cities". It "is manifested by waiving urban amenities (running water, heating) that have become too expensive for some people, increase of population employed in agriculture, plus a significant flow of return migration" to the rural area. (Territorial Developpment of Romania, 2014, pg. 51) On the other hand, we are facing the "uncontrolled urban sprawl outside the area for housing, where they are regularly lacking most basic facilities (both in prosperous areas and in poor areas) and an "intensive or anarchic" urbanization acknowledged both at the European Council recommendation (Title IV; art. 9) and Law 351/2001 (art. 10), tendencies which rural areas must be defended of.

Finally, we remember that the laws have primarily a normative, not descriptive character. Their role is not to find and especially to preserve inequalities unfavorable to its citizens but to establish rules by which all citizens may benefit from rights such as equal opportunities, access to a decent living regardless of the area of residence. The approach of the legislators whereby rural area is defined as an inferior tier in permanent opposition to the city which is, by definition, "more developed" is anachronistic and does not always correspond to reality. Moreover, it can create social disparities, antagonisms, under or over unfounded assessments and ultimately perpetuation of socially unfair inequalities and economically ineffective in the rural-urban relationship.

We need a revision of mentalities and legislation that should accept the complementarity of urban and rural area, preserving and developing the different ontological but equally valuable potential that both have. This approach that resonates with the spirit of the European Charter of rural area is the duty of State institutions to all its citizens, regardless of where they were born, they live, where they carry out their activity or where they choose to retire. It is a duty that we all have for all: previous, present and future generations.

BIBILOGRAPHY

[1] Alecu I., Giambaşu Talida (2014), *Conceptual approaches of the rural area, Agricultural Economy and rural development, realities and prospects for Romania.* Bucharest, International Symposium, Edition 5,

[2] Dona I. (2006) *Rural development – lecture notes, synthesis,* Bucharest, USAMV, ID9 Department Oct 14, 2011

[3]*** Law No. 2/ February 16, 1968 on the administrative organization of the territory of the Socialist Republic of Romania, Official Bulletin No. 17 of February 17, 1968, http://www.cdep.ro/pls/legis/legis_pck.htp_act?ida=15549

[4]***Law no. 2/ April 18, 1989, Of. B. no. 15 of April 25, 1989, http://legislatie.just.ro/Public/DetaliiDocument/21464

[5]***Law decree no.38, January 22, 1990 on the repeal of Law no. 2/1989 relating to the administrative organization of the country territory, Official Gazette no. 14/January 23, 1990, http://www.cdep.ro/pls/legis/legis_pck.htp_act_text?idt=11085

[6]***Law 350, July 6, 2001 on territorial planning and urbanism, the Official Gazette no. 373/July 10, 2001, http://www.cdep.ro/pls/legis/legis_pck.htp_act?ida=30200

[7]***Decree no. 368, November 27, 1985 for the amendment of annex to Law no. 2/1968 on administrative organization of the territory of the Socialist Republic of Romania, Of. B. no. 65/ December 2, 1985 http://www.cdep.ro/pls/legis/legis_pck.htp_act_text?idt=10903

[8]***Law no. 351/July 6, 2001 on approving the National territory arrangement plan – Sect. IV Network of localities , Official Gazette No. 408/July 24, 2001, http://www.cdep.ro/pls/legis/legis_pck.htp_act?ida=30501

[9]***Law no. 100/2007 for amending and completing Law NO. 351/2001 on approving the National territory arrangement plan – Section IV Network of localities, the Official Gazette No. 408/July 24, 2001

[10]***Order no. 143/610, March 4, 2005 on defining and characterizing rural area issued by the Ministry of Agriculture, Forestry and Rural Development, the Official Gazette No. 382 of May 6, 2005, http://lege5.ro/Gratuit/g4zdmmrw/ordinul-nr-143-2005-privind-definirea-si-caracterizarea-spatiului-rural

[11]***Law no. 66, July 15, 1994 on declaring as city of commune Teius, Official Gazette No. 188/ July 22, 1994, http://www.cdep.ro/pls/legis/legis_pck.htp_act?ida=5045

[12]***Law no. 67, July 15, 1994 on declaring as city of commune Faget, the Official Gazette No. 188/July 22,. 1994, http://www.cdep.ro/pls/legis/legis_pck.htp_act?ida=5046

[13]***Law no. 18, January 8, 1998 on declaring as city of commune Baia de Aries, county Alba, the Official Gazette No. 13/January 16, 1998, http://www.cdep.ro/pls/legis/legis_pck.htp_act_text?idt=388

[14]*** Law no. 220, November 28, 2000 on declaring as city of commune Otopeni, county Ilfov, the Official Gazette no. 617/November 30, 2000, http://www.cdep.ro/pls/legis/legis_pck.htp_act?ida=26723

[15]***Law no. 221, November 28, 2000 on declaring as city of commune Geoagiu, county Hunedoara, the Official Gazette no. 617/November 30, 2000, http://www.cdep.ro/pls/legis/legis_pck.htp_act?ida=26725

[16] Council of Europe, European Charter of Rural Areas, 1996, http://assembly.coe.int/nw/xml/XRef/Xref-XML2HTML-EN.asp?fileid=15330&lang=en

[17] Government of Romania, September 20, 2013. Perspective on the legislative proposal entitled Law on defining national rural area, 8114/DRP, http://www.cdep.ro/proiecte/2013/200/00/8/pvg208.pdf

[18] Territorial Development Strategy of Romania, Polycentric Romania 2035 Territorial cohesion and competitiveness, development and equal opportunities for the people, Version 2, July 2014, http://mmediu.ro/new/wp-content/uploads/2014/08/2014-08-14_SDTR_6.1.pdf

[19]. http://statistici.insse.ro/shop/index.jsp?page=tempo3&lang=ro&ind=POP108D

[20] http://statistici.insse.ro/shop/index.jsp?page=tempo3&lang=ro&ind=GOS105A

[21] http://statistici.insse.ro/shop/index.jsp?page=tempo3&lang=ro&ind=GOS104A

[22] http://statistici.insse.ro/shop/index.jsp?page=tempo3&lang=ro&ind=GOS110A

[23] http://statistici.insse.ro/shop/index.jsp?page=tempo3&lang=ro&ind=GOS103A

[24] http://legislatie.just.ro/Public/DetaliiDocument/190

[25] http://www.legex.ro/Ordin-143-2005-50003.aspx

[26] http://www.cdep.ro/proiecte/2013/200/00/8/pl404.pdf

[27] http://www.cdep.ro/pls/legis/legis_pck.htp_act?ida=15549

[28] http://www.mae.ro/taxonomy/term/356/1

RURAL AREA OF THE REGION SOUTH-MUNTENIA – EVOLUTIONS AND GAPS OF THE SOCIO-ECONOMIC INDICATORS. CASE STUDY: ARGES, DAMBOVITA AND PRAHOVA COUNTIES

BUCUR SORINEL IONEL[1], BUCUR ELENA CARMEN[2]

Abstract: *The addressing to rural areas, coupled with the identification of indicators characterizing the degree of resource endowment, derives both from the size of the rural area and also from the share of employment in productive activities of social and cultural services, habitat, etc. Although the problem can be considered just as far as perennial agricultural activity, subject of much discussion and debate, rural development acquires new meanings in the context of the apparent trend of economic globalization. In this regard, it has become urgent the structural adjustment both economically and socially, on the background of higher migration flows from rural to urban areas and the increasing impoverishment of the rural population. From the methodological point of view, the current approach is based on public statistical information, using established statistical methods for processing, such comparisons, structures; mainly the results are presented in tabular form. The support information to the development of this approach was based on data provided mainly by the National Institute of Statistics, the Tempo-Online database. Given that public information at the regional level are limited in terms of accessibility and the release time during this process were also used data from the European statistics by Eurostat database.*

Key words: *rural area, sustainable development, indicators.*

INTRODUCTION

The issue of rural development was discussused both in academic and scientific research, especially in business and decision makers, in an effort to developing strategies and plans. Studies undertaken by academics and research provided relevant information in many cases the decision makers whose specialized expertise is often quite low as spectrum information and establish connections with the real evolution of the economy. Strengthening economic viability of rural areas is based provide the means to defend its social and economic functions. The social implications resulting from using the opportunities on rural employment, diversification of economic activities and promote local activities in the field of products, services, handicrafts and rural tourism. Conservation of the environment is also a prerequisite for lasting development of the economic potential in rural areas.

MATERIAL AND METHODS

Making a projection on sustainable and equitable development is based on the existence of an information database truthful and multilateral, which constitutes support in building a system of indicators expressing both quantitatively and qualitatively many aspects status, structure and dynamic behavior these. The studies conducted so far on actual knowledge of specific indicators rural development have contributed to some guidance on the course of development in order to maintain efficiency and steady state.

Connection the theoretical information to the evolution of the real economy had resulted in development of strategies for regional development, including in terms of attracting funds. In fact, bending to the side of the regional economy was manifested with higher intensity when they raised the issue of EU accession. Disparities between regions and especially so within regions have been and continue to be topics of debate in terms of establishing priorities for development.

Based on the above considerations it should be noted that in designing a system of indicators, studies reveal that they reflect the specific business processes, trends, factors with positively and negatively impact on the economy, as support knowledge of the economic potential

---

[1]   Scientific researcher, Institute of Agricultural Economics, Romanian Academy, bucursorinelionel@yahoo.com.
[2]   Scientific researcher IIIrd degree, Institute of Agricultural Economics, Romanian Academy, elenacarmenbucur@yahoo.com.

of a country. The literature on the economy and local development, regional stresses practical, and the role of factors that may explain imbalances increasingly larger existing intra and inter-regional level. For example, an important factor approach is to determine the ability of the region to promote entrepreneurship and innovation potential, including human resource development in the process.

On the other hand, other experts consider that in fixing the demo-economic and social indicators are a number of criteria, namely: their real value, truthfully sides expressing general and specific economic and social activity of the country; the causal relationship between socio-economic phenomena and processes, by correlating indicators factorial outcome indicators in order to measure economic and social efficiency; unity of form and content of the indicators and their calculation methodology at all levels of the national economy; comparability of information worldwide and the economic content between the prospective and retrospective indicators.

RESULTS AND DISCUSSIONS

1. Characteristics of the rural area of the analysed counties

Addressing rural communities in three of the seven counties of the South-Muntenia starts, first, from the similarities between them, in terms of the characteristics of geographic location or combination of three forms of relief or mountain, hills and plains. On the other hand, the existence of multiple forms of relief gives to the three counties the ability to develop a variety of activities without being focused essentially on mono-activities such as, for example, agriculture.

In terms of area, Arges County holds first place from the three counties, covering 6816.3 kmp. In 2014, Arges County was composed of seven towns (3 municipalities), 95 communes and 576 villages, the average area of a municipality being 68 kmp. As a share of total area of the county, rural owns 94.2 percent, while urban holds only 5.8% of the total area. Of the 95 municipalities, 28 are situated in terms of surface held over the countryside, representing almost 29.5% of the total.

In 2014, out of the 650 332 inhabitants of the county, 51% lived in rural areas and 49% in urban areas. Compared to 1992, the rural population was reduced by aprox.8% while the urban population registered a reduction of 0.7 percent, resulting in decrease by 4.5% on total County.

Of the 95 municipalities in 2014 compared to 1992, 72 municipalities recorded a significant reduction of population, with percentages ranging from -0.1% (Berevoieşti) and -64% (Albeştii Muscel), representing 75.8 % of the total. At the opposite pole, 8 communes that have experienced population growth by percentages ranging between 11.1% and 59%, explainable phenomenon, among others, polarization or ancillary activities developed around the Dacia-Renault plant.

As an indicator that expresses the popularity of a locality, the average population density in rural areas was in 2014 arround 71 people / kmp, 40 joint hovering over this average. Compared to 1992, the population density was decreased in 2014 aprox.8% in just 22 communes recorded increases it.

Comparative analysis of population density of Arges communes allowed their classification into five categories, namely:
- Communities with a population density of up to 50 inhabitants/kmp (45 communes);
- Communities with a population density of between 50-100 per/kmp (28 communes);
- Communities with a population density between 100-150 inhabitants/kmp (11 villages);
- Communities with a population density between 150-200 inhabitants/kmp (6 communes);
- Communities with a population density of 200 inhabitants/kmp (three common);

Basically, in the 93 communes, only 21.5% of them recorded a population density of 100 inhabitants/kmp. It is noteworthy that in the communes located around the poles of local development (such as, for example, Dacia plant and some local units from the production of auto spare parts), the population has increased significantly resulting in increases in population density. It is the situation of Bascov, Bradu, Maracineni Schitu Golesti and Titeşti whose population density falls on a visible uptrend.

Unlike the County of Arges, **Dambovita County** in 2014 had an area of 4054.3 kmp, out of which 93% are rural. County comprises seven towns (2 municipalities), 82 communes and 353 villages, the average area of communes being 46 kmp. Out of the 82 municipalities, 40.2% have an area above the average, most common being Moroieni (287.4 sq km).

As with the Arges county, the population recorded in Dambovita County, the county total in the period 1992-2014 dropped by 4.3%, generated by the decrease in both urban (-6.2%) and rural (-3.4%). Of the 82 municipalities, 67% showed a significant reduction in the population with percentages ranging from -0.3% (Bucşani) and -69.7% (Bărbuleţu). Related to the area detained in 2014, the population density in the 82 municipalities varies between 18 inhabitants/ kmp (Moroieni) and 434 people / kmp (Doiceşti) over the period 1992 to 2014 is visible on a downward trend in the total rural county (-3.4%), but with significant oscillations from one joint to another (from -27% to + 27.7% in Lucieni in Cojasca). Basically, from the 82 communes in 53 there is a tendency of reduction in population density, which is aprox.65% of the total.

Compared with the above two counties, **Prahova County** record in 2014 a total area of 4715.9 kmp, out of which 85.2% is related to the countryside. County comprises a total of 14 towns (2 municipalities), 90 communes and 405 villages, the average area of communes being 44.6 kmp. Of the 90 municipalities, 36.7% have an area above the average, the highest common - Valea Doftanei (286 kmp) Măneciu (236.4 kmp) and Cerașu (120,6 kmp) - pooling 16% of rural county area. Across the county, the total population decreased by 6.5%, while in rural areas has declined by 4.8% in 2014 compared to 1992. The average population of a municipality was in 2014 to 4395 inhabitants, 46.7% of the common hovering above average. The top five communes regroup 13.5% of the total rural prahovean, with a total of 53 542 inhabitants. Compared to 1992, the number of residents declined in 67 common values - 0.8% (Dumbrava) and -53.9% (Gheorghe), because the other communes number of residents to enroll on a slightly rising trend with percentages ranging from + 0.7% (Gura Vitioarei) and + 24.9% (Târgşoru Vechi).

In 2014, the average population density in rural areas is 117 inhabitants/kmp, hovering over this average to 34 communes. Basically, in 2014, the population density varied between 21 inhabitants / km² (Jugureni) and 435 inhabitants/kmp (Blejoi). Compared to 1992, the population density was low with the total rural aprox.5%, with percentages that vary greatly from one community to another. Near the poles of local development, mainly industrial, generated amplitude positive population density in two communes of Prahova (Blejoi and Lipanesti), just 10 communes of the 90 localities recorded a population density of 200 inhabitants/ kmp increase compared with 1992. Approx. 24% of registered common population density between 100-200 people/kmp, with visible oscillating trends in time, the difference is shared between the first two categories, namely the joint density between 0-50 people/kmp (11 communes) and common population density between 50-100 people/kmp (28 communes).

2. Diagnosis of the economy of rural communities from Arges, Dambovita and Prahova counties – evolutions and gaps of the socio-economic indicators

In the evaluation of any rural communities should consider, in a first stage, the existence of adequate information support. From this perspective it should be noted that at local level, territorial statistics do not provide enough relevant information to estimate existing disparities inter and intra county. Even in the presence of such information, relatively incomplete, it should be mentioned that the time is relatively limited, which does not lead, most often, to estimate with a high degree of accuracy, the changes in structure indicators.

Based on these considerations, the present approach envisages capturing the amendments made to the following indicators:

a) The degree of endowment land resources;
b) Demographic indicators;
c) Indicators of the educational system;
d) Indicators of social system in terms of endowment municipal level;

e) The value of the local economy at county level in terms of GDP and GVA realized value.

a) From the point of view of *endowment land resources*, analysis of counties allowed highlighting the following conclusions:

- In Arges County, in 2014, the average agricultural area owned by a municipality stood at 3395 hectares, 34 communes hovering over this average; of the 95 communes components, Buzoieşti has the largest agricultural area, ie 14 600 ha;
- In the county of Arges period 1990-2014 is characterized by an oscillating trend of agricultural area, with percentages ranging between -55.3% (Hartiesti) and + 43% (Albeştii Muscel);
- Compared to the average 1708 hectares of arable land, from the 95 communes, 28 communes numbers are above that level; basically commune with the largest arable area is Buzoieşti, with no less than 13 500 ha in 2014;
- It should be noted that given the geographical location of Arges county, it benefits from large areas occupied by pastures and forests; thus, for example, Arefu holds the largest area occupied by pastures (9092 ha in 2014), because the most important area occupied by forests to return commune Nucşoara (32113 ha in 2014);
- Unlike the county of Arges, in Dambovita the largest agricultural area owned by commune Corbii Mari (8767 ha), accounting for almost half of the village related Buzoieşti of Arges;
- Arable land in Dambovita county in 2014 ranged from 648 ha (Doiceşti) to 8767 ha (Corbii Mari); practical, in Corbii Mati the arable land represents 94% of agricultural land;
- Compared to the previous counties, average agricultural area in Prahova was in 2014 to 2662 ha, hovering over it a number of 35 communes; unlike agricultural land, the period 1990-2014 is characterized by a trend of reducing arable percentages range between -0.3% (Sirna) and -84.6% (Bertea);

b) From the *demographic perspective*, the commitment to the development detained birth rate, mortality and natural growth; so, in terms of birth rate, the period 1990-2014 is characterized by a visible trend of decline in rural percentages exceeding in most cases 30% (**Table no. 1**).

Table no. 1. Evolution of the birth rate in three counties of Souh-Muntenia Region (live births per 1000 inhabitants)

	South-Muntenia	Argeş	Dâmboviţa	Prahova
1990	12,7	12,8	13,9	12,5
1991	11,4	12,1	12,6	11,4
1992	11,7	13	12,6	12
1993	11,7	12,3	12,7	12,1
1994	11,5	11,8	12,3	11,8
1995	11,2	11,5	11,8	11,2
1996	10,7	11,3	11,2	10,8
1997	10,9	11,5	11,2	11,1
1998	10,9	11,6	11,7	10,8
1999	10,8	11,5	11,5	10,5
2000	10,7	11,1	11	11,2
2001	10,3	10,5	10,9	10,3
2002	9,8	10,1	10,4	9,9
2003	9,9	10,2	10,5	10,1
2004	9,6	9,7	10,7	10,1
2005	9,6	9,5	10,1	10,6
2006	9,4	9,2	9,6	9,9
2007	9,1	8,6	9,4	9,7

	South-Muntenia	Argeş	Dâmboviţa	Prahova
2008	9,4	9	10,1	9,2
2009	9,8	9,3	10,3	9,9
2010	9,2	8,9	10	8,8
2011	8,6	8,4	9,3	8,1
2012	8,7	8,3	9,3	8,3
2013	8,5	8,1	9	8,2
2014	8,4	8,2	8,8	8,1
2014/1990	**-33,9**	**-35,9**	**-36,7**	**-35,2**

Source: Calculations on the Tempo-Online database, 2016.

A frightening situation can be found at the level of mortality rate but that falls on a downward trend in two of the three counties analyzed, the highest increase being recorded in Arges (+ 47.6% in 2014 compared to 1990). Compared to the average regional population growth in rural areas during the period 1990-2014 has seen a downward trend in two three counties, the most significant increase being in the Prahova County (**Table no. 2**).

Table no. 2. Changing of the natural increase in 2014 compared to 1990 (%)

	Total	Urban	Rural
South-Muntenia	**-469,2**	**-132,7**	**536,4**
Argeş	-228,0	-100,0	1475,0
Dâmboviţa	-241,7	-124,6	-816,7
Prahova	-350,0	-207,1	-1140,0

Source: Calculations on the Tempo-Online database, 2016.

Upward occurs in the infant mortality rate. Specialty literature [3] defines four waterfalls of infant mortality, namely:
- First rate level waterfall with a rate of dead children 4-6 / 1000 births;
- Second waterfall with a high rate of dead children 6-9 / 1000 births;
- Third waterfall with a high rate of dead children 9-15 / 1000 births;
- Waterfall fourth with a rate level of over 15 children dead / births.

By analyzing statistical information available except Arges County falling within category III, in the other two counties, Prahova and Dambovita, the infant mortality rate is related to the second category. Over the period 1990-2014, however, it is worth a noticeable trend improvement in this indicator.

c) Regarding the *education system indicators* it should be noted that during 1996-2014, the available statistical information public, is characterized by a visible trend of deterioration both in total and in each region counties.

- In rural areas, the total number of schools decreased in 2014 compared with 1996, not less than 83% across the region, the same trend is visible in Arges (-88.3%), Dambovita (-85 3%) and Prahova (-82.1%); the same downward trend was scored and the number of units in primary and secondary education, with percentages that reach up to -78.5% in Arges, being -70.5% regional average;

- Regarding the number of units of high school, period 1996-2014 is characterized by a tendency to increase them, except Arges (-14.3%) and Dambovita (-16.7%); demographics and the deteriorating living conditions, rural school population of South-Muntenia registered in 2014 a decrease of 24.2%, generated by local regress in case of all seven counties components; thus, in Prahova County, the rural school population was reduced by 18.9%, while in Arges reduction was 31.4 percent; the same negative trend is visible for the

---

[3] Bădescu, I.(2008): „ *Viaţa şi moartea în satul românesc. Sociodemografie rurală*", Ed. Mica Valahie.

Dambovita county where the school population was reduced by 27.4% over the same reference period;

- It should be mentioned that the reduction in the school population is noted for all levels of education, with different intensities from one county to another and from one form to another type of training; therefore, reducing the number of teaching staff with a much lower than the school population, the number of staff / 100 students in the rural areas scored on an upward trend;

- In terms of the quality of education, it should be noted that an essential element of academic success of a student is the school-family relationship. Over time there have been different forms of manifestation of this type of relationship, while in the democratization of education, cooperation between school representatives and students' families has become fundamental. There are a number of features printed this relationship by representatives of each party. On one hand, school type and characteristics of the teachers involved are important for the efficiency of such a relationship, and on the other hand, family involvement students differs depending on its structure, number of children, parents' education, occupation and their income, residence. Beyond this objective way of conditioning the relationship between school and family, there are a number of subjective aspects of this relationship, ie perceptions, aspirations, attitudes and behaviors of parents towards school.

d) From the perspective of the *degree of endowment with utilities* in the urban, it should be mentioned that since 1990 we are witnessing a process of expanding networks of drinking water, gas and sewage, both in urban and in rural areas. In rural areas, in 2014 compared with 1990 drinking water network in rural areas reached 9035.5 kilometers, 29.6% of the total length being found in Arges county, followed by Prahova (1939 km) and Dambovita (1402 km); extension of drinking water generated implicitly increase the number of localities connected, both in urban and rural areas; for example, in rural areas in 2014, in Arges county, of the 95 municipalities, 87.4% were connected to the drinking water, while in Dambovita percentage is 74.4% and in Prahova 83%. Unlike the drinking water network, the number of localities connected to the natural gas, sewerage and thermal energy is still extremely low percentages range between 47.6% (Prahova natural gas) and only 6.7% heat (Dambovita) (**Table no. 3**).

Table no.3. The number of localities connected to utilities in rural areas in 2014 (no)

	Water		Natural gas		Sewerage		Thermal energy	
	No. localities	% of total	No. localities	% of total	No. localities	% of total	No. localities	% of total
Argeș	83	87.4	28	29.5	21	22.1	28	29.5
Dâmbovița	61	67.8	40	44.4	11	12.2	6	6.7
Prahova	75	91.5	39	47.6	26	31.7	6	7.3

Source: Calculations on the Tempo-Online database, 2016.

e) From the perspective of *economic performance*, national statistics do not provide enough information about the value of GDP or GVA at county level or the media. From this point of view, during this process was used information from Community statistics, for the period 2000-2013, at the NUTS-3. Based on these methodological considerations, it should be noted that half of the GDP and GVA South-Muntenia were conducted in two counties, namely Arges and Prahova, followed in 2013 by the Dambovita with a GVA of 2349.65 mil. euro (**Table no. 4**).

Table no.4. Evolutions of GDP and GVA in 2013 compared with 2000

	GDP (mil. euro)			GVA (mil. euro)		
	2000	2013	2013/2000 (%)	2000	2013	2013/2000 (%)
Sud-Muntenia	5,082	17,612	246.6	4,566.46	15,511.07	239.7

Argeş	1,211	3,832	216.4	1,088.14	3,374.97	210.2
Dâmboviţa	732	2,668	264.5	657.56	2,349.65	257.3
Prahova	1,541	5,926	284.6	1,384.65	5,218.81	276.9

Source: Calculations on the Tempo-Online database, 2016.

CONCLUSIONS

The analysis of demographic, economic and social phenomena of three of the seven counties of the South-Muntenia highlighted the wide gap both inter and intra-county. The specific characteristics of each county in terms of geographical location, size or population gives to each attributes that distinguish them clearly from each other in terms of potential but held and how to exploit available resources. In this sense, it can be raised at least the following trends:

- Municipalities with the largest area do not, in general, and a high population density; although there are common resources valuable not only in industry and services (tourism), they have a low population density;
- The proximity to cities or municipalities, generating activities in different economic sectors, training in villages adjacent higher population density compared to those outside the poles of development;
- Oscillating the villages around the towns prints them another level of development, with implications not only on labor productivity and the quality of life in these rural communities;
- Extending the network of utilities is an asset to each community as a starting point in attracting investments in the development of productive activities;
- Limiting urban endowment only, without direct connection to local resources but does not lead to a high efficiency level, the impact on the sustainable development of those communities.

Starting from the premise that regional development in general and rural development, in particular, take place almost exclusively through local initiatives, we believe that the priorities of the complex development of rural areas of the three counties of South-Muntenia, derived from the priorities of rural nationally, it can be mentioned at least three direct impact on the level of performance and sustainability, namely:

- Speed up the restructuring of small and medium farms and turn them into economically viable holdings and improve the economic performance of farms and the processing sector to increase market integration of quality products and import substitution;
- Maintaining and improving the quality of the environment through sustainable management of natural resources and combating climate change;
- Diversification of economic activities, creating jobs, improving infrastructure and services to improve the quality of life in rural areas.

BIBLIOGRAPHY

1. Antonescu, D. (2011). *Dezvoltarea regională. Tendinţe. Mecanisme. Instituţii, Geoeconomie*;
2. Bădescu, I. (2008). *Viaţa şi moartea în satul românesc. Sociodemografie rurală*, Ed. Mica Valahie;
3. Bulgaru, M. (2003). *Mileniul III. Disperare şi speranţă. O nouă paradigmă a dezvoltării*, Ed. Revista Română de Statistică, Bucureşti.
4. Cace, S. (coord), Nicolăescu, V, Scoican, A.N. (2010). *Cele mai bune practici în sectorul economiei sociale în Grecia şi în alte state ale Uniunii Europene*, Ed. Expert, Bucureşti;
5. Dona, I. (2015). *Economie rurală*, Ed. Economică, Bucureşti;
6. Ghizdeanu, I. (2010). *Prognoză regională*, Ed.Mustang, Bucureşti;
7. Hoffman, O., Popescu, Ghe. (2009). *Probleme de metodologie în analiza realităţilor sociale*, Ed.Universitară, Bucureşti;
8. Ianoş, I., 2000 (a). *Sisteme teritoriale, o abordare geografică*, Tehnică, Bucureşti;
9. Nicolăescu, V. şi alţii (2013). *Îmbunătăţirea incluziunii sociale prin economia socială. Identificarea celor mai bune practici şi inovaţii sociale*", în Revista de economie socială, nr.2/2013, vol. III, ed. Hamangiu, Bucureşti;

10. Neagu, G.(2012). *Şanse de acces la educaţie în societatea românească actuală*, în revista „*Calitatea vieţii*", nr.4, anul XXIII, Ed.Academiei Române";
11. Neguţ, A. (2003). *Economie socială, capital social şi dezvoltare locală*, în revista „*Calitatea vieţii*", nr.2, anul XXIV, Ed.Academiei Române";
12. Otiman, I.P. (1997). *Dezvoltarea rurală în România*, Ed. Agroprint, Timişoara;
13. Baza de date Tempo-Online a INS, 2016.

DEVELOPMENT AND PROMOTION OF RURAL TOURISM THROUGH EUROPEAN FUNDS IN ROMANIA

ELENA SIMA[1]

Abstract: *Romania has a great tourism potential, but unfortunately this potential has not been explored enough. The objective of this paper is to analyze how the European funds were accessed for developing and promoting tourism activities in rural areas at national level. The work is based on the data processed according to the European Commission Statistics (Eurostat) and the national statistics. The databases published by the Ministry of Agriculture and Rural Development and different organizations in the field were also investigated. The research methods were represented by data collection, mainly online data, data processing, centralization and synthetic presentation (under tabular form). The investments in rural tourism have a great advantage, i.e. job creation and maintaining the local (rural) labour, revitalization of rural localities, mainly those from the less-favoured and remote rural areas.*

Key words: *European funds; rural tourism; investments; tourism infrastructure; Romania.*

JEL Classification: *Q14, L83, R58.*

INTRODUCTION

In the last half of the century, in numerous countries, very many specialists consider that tourism is one of the sectors with the highest potential to contribute to economic growth and development, even though its participation to the economic-social progress differs from country to country, depending on the development level and the tourism policy. (1,3,5)

In this context, rural tourism, as form of tourism providing a direct contact of tourists with the physical and anthropic environment in the rural area, has acquired a strong cultural and educational vocation, as well as a special importance for preserving the values and cultural identity of the rural communities, contributing to the promotion of the socio-economic development in the less-favoured areas.

After 1960, in the European Union (EU), the population manifested a growing interest in spending their leisure time and the number of spontaneous getaways in the rural areas increased. With the enforcement of the Lisbon Treaty – signed by the EU Member States on December 13, 2007 and enforced on December 1, 2009, tourism importance has been recognized as essential sector in the economy of the Member States, and "rural tourism turned into a fast growing prosperous activity, with an important role in the economic development of rural communities" (2).

At present, a new philosophy of the tourism phenomenon is taking shape, which intensifies the European Commission's efforts in the application and coordination of the community policies with impact upon the competitiveness and sustainable development of tourism, by allocating funds, at the level of the EU financial instruments, for the support, coordination and completion of the national and regional actions implicitly of each Member State as regards the tourism sector development.

Among the tourism activities funded by the EU, we can mention those promoting the natural values as potential for rural tourism development, if we take into consideration that "many regions, from France and Germany in particular, without special resources, have developed and successfully practiced this kind of tourism" (4).

As a EU member state, Romania has participated to the Community mechanisms and has the possibility, through the European funds, to complete its own national effort in the adjustment of certain priority domains in industry, agriculture and services to the dynamic environment of the European economy. Thus, it can contribute to reaching the basic goal of the European Travel Commission, that of maintaining Europe on the first place in the world as a tourist destination.

---

[1] Ph.D Elena Sima, scientific researcher, Institute of Agricultural Economics, Romanian Academy, Bucharest, elena.sima2008@yahoo.com

MATERIAL AND METHOD

The Romanian effort to develop and promote tourism in the rural area has been completed by the support provided by the EU funds since the year 2000, in conformity with the priorities and rural development directions of the National Rural Development Plan (NRDP), established in close connection to the community priorities and in relation to the analysis of the socio-economic and environment situation, obtained on the basis of available statistical data. The European Pre-Accession Program 2000-2006 granted community financial support through the SAPARD fund (Special pre-Accession Programme for Agriculture and Rural Development), specially created for the pre-accession program for agriculture and rural development). The European post-accession programs 2007-2013 and 2014-2020 have granted and still grant community financial support through the EAFRD funds (European Agricultural Fund for Rural Development).

The development of Romanian tourism and agro-tourism have largely benefited from the EU funds implemented through the Agency for Rural Investment Financing (ARIF), which took over the patrimony of the Agency for Payments and Intervention in Agriculture (APIA) and the attributions resulting from the monitoring function of SAPARD Program, as well as the attributions for the technical implementation, payments and monitoring for NPRD 2007-2013. In addition, ARIF complies with the accrediting criteria throughout the period for which it was conferred the assistance management through the European Commission's Decisions (9).

The goal of the present paper is to analyze the main measures and sub-measures whose eligible investments provide support to tourism development and promotion in the Romanian rural area, under the three National Rural Development Programs – NRDP 2000-2006, NRDP 2007-2013 and NRDP 2014-2020 (Table 1).

Table 1. Main measures providing financial support to tourism development and promotion in the Romanian rural area

Period	Program	Measure	Eligible investments
2000-2006	NRDP - SAPARD	3.4 "Development and diversification of economic activities generating multiple activities and alternative incomes"	- Rural tourism - Other types of tourism activities in the rural area
2007-2013	NRDP	313. "Encouragement of tourism activities"	- Tourism accommodation infrastructure and recreational activities - Small-scale infrastructure (tourist information centres, installation of tourism signs etc, - Development and/or marketing of tourism services related to rural tourism
2014-2020	NRDP	06 – Development of farms and enterprises - sub-measure 6.4 "Investments in the creation and development of non-agricultural activities" - sub-measure 7.2 "Investments in the creation and modernization of small-scale basic infrastructure"	- Infrastructure on the tourist reception units of agro-tourism type, leisure activities (agro-tourism accommodation services, leisure services and catering) - Development/promotion of rural tourism services (to be continued from NRDP 2007-2013, through the transition procedure, by which 119 projects were transferred to be completed, out of which 161 under sM 6.4 and 38 projects under sM7.2)

Source: Author's format based on existing documents

The entire volume of information was obtained on the basis of methods specific to selective research, while respecting all the research stages from the methodological point of view: identification of issues to be investigated, delimiting the research framework, information collection, processing, centralization of data and their synthetic presentation (under table form), data analysis and interpretation and drawing up the conclusions.

RESULTS AND DISCUSSIONS

In the European strategies, the tourism thematic is interconnected with themes such as the impact of the economic activities on the environment, the non-agricultural economic activities, the economic competitiveness increase and knowledge-based economic development, competitiveness increase by the improvement of the access of enterprises (mainly small and medium-sized enterprises) on the market, the increase of living standards in the rural areas by the diversification of the rural activities, narrowing the development disparities between the country's regions, etc. (11).

The development of entrepreneurial initiatives in rural tourism has taken place under the background of the significant increase in recent years, both in number and in quality, of the accommodation units in the rural area, due to individual investors and financing under the pre-accession and post-accession governmental programs (SAPARD, NRDP 2007-2013 and NRDP 2014-2020), as well as to the activity of certain organizations, such as ANTREC, which provide support to the rural suppliers of tourism services to enter the market and help the rural communities to appreciate the significance of tourism and understand the advantages that they can get from this activity.

The European Pre-accession Program SAPARD 2000-2006 was adopted by the European Commission by Decision no.372/2000, and implemented on the basis of the National Agriculture and Rural Development Program (NARDP, as basic document that contributed to the implementation of the *acquis communautaire* in the pre-accession period in Romania and stated the funding of integrated rural development projects, to be applied at commune level; thus, premises were ensured for a new entrepreneurial behaviour and for the development of certain activities in agreement with the environmental requirements. The Program became operational together with the accrediting of the first measures (Measure 1.1, 2.1 and 4.2) by the European Commission, on July 31, 2002 respectively.

The funds granted in conformity with the European Union's regulations had as main goal to ensure the gradual training of the Romanian farmers and processors so as to be able to operate on the EU market with competitive products and to avoid the negative effects that could have appeared if Romania had not been prepared for the accession from the economic, institutional and legislative point of view.

The development of tourism and of other tourism activities in the rural area were supported by sub-measures of Measure 3.4 "Development and diversification of economic activities generating multiple activities and alternative incomes". This measure was accredited in December 2003, and the payments to the beneficiaries of the measure started in October 2004. (9)

By December 31, 2009, 4,374 projects were finalized, out of which 1018 projects under Measure 3.4. out of which only 3 projects were resiliated. The total value of the projects paid under the measures was 1348.016 million euro, respectively 69.272 million euro in the year 2009, out of which 68.196 mill. Euro were paid for Measure 3.4, respectively 3.364 million euro in the year 2009. (6)

The main activity is rural tourism, amounting to 83.9% of the activities approved under Measure 3.4. Before starting the measure, only 25% of the budget of Measure 3.4 was allocated to rural tourism. As things progressed, the preference for rural tourism became clear and this action reached 53.6% of the total allocated budget, reflecting the fact that the global potential is much higher in this sub-sector than in other sub-sectors under this Measure. The results mainly refer to the modernization and the construction of new buldings used for tourists' accommodation, restaurants and recreational areas.

The European Post-Accession Program 2007-2013. After Romania's accession to the EU (in the year 2007), the National Development Plan (NDP) has had a major role in getting the national development policy in line with the community development priorities by the promotion of measures considered to foster the sustainable socio-economic development at European level. This

represents the strategic planning and multiannual financial programming document, approved by the Government and elaborated under an extended partnership, which is orienting the socio-economic development of our country in conformity with the Cohesion Policy of the European Union. In the cohesion policy terms, for the period 2007-2013, NDP represents a prioritization tool of public development investments, mainly oriented on the priorities and objectives compatible with the intervention domains of the Structural and Cohesion Funds. Practically, NDP establishes the fundamental directions for the public development investments in the period 2007-2013, in order to reach certain quantified targets. There are multiple financial sources: budgetary resources, community funds, private co-financing, external and internal loans. The community funds to which Romania has had access since 2007, as a EU Member State, is a consistent support for reaching NDP goals and priorities, as it results from the financial programming chapter. (12)

In the EU, the measures relating to the sustainable rural development, complementary to the market and incomes support policy applied under the Common Agricultural Policy, the Cohesion Policy and the Common Fisheries Policy are implemented through the European Agricultural Fund for Rural Development Fund (EAFRD). As regards the EAFRD programming at national level, this is achieved under the coordination of the Ministry of Agriculture, Forests and Rural Development, through the National Strategic Plan and the National Rural Development Plan (NRDP), in conformity with the new Strategic Orientations of the European Commission for Rural Development.

At NRDP 2007-2013 level, *rural tourism* was approached through Axis 3: "The improvement of life quality in the rural areas and rural economy diversification", Measure 313 "Encouragement of tourism activities". The general objective of this measure was to develop the tourism activities in the rural areas, which can contribute to the increase of the number of jobs and alternative incomes, as well as to increase rural space attractiveness. The financial support provided under this measure targeted investments in:

- the tourist reception infrastructure and leisure activities (both actions related to the construction, modernization, enlargement and endowment of the tourist reception structures, and private investments in the tourism leisure infrastructure, independent or dependent on the tourist reception structure),

- the small-scale infrastructure (such as the tourism information centers, installation of tourism signs/tourist routes, etc.),

- the development of the marketing of tourism services related to rural tourism (design of promotional materials, information materials, etc.).

By 31.12.2015, 7 project submission sessions took place under Measure 313, in which 3703 projects were submitted with a public value of 569890.75 thousand euro. From the total submitted projects, 2586 projects were selected, out of which 1289 projects were contracted *(this number reflects the contracts that remained in the system as a result of operating the resiliated contracts)*. These represent 46.75% of the NRDP target of 2757 projects. The total investments volume was 358976.99 thousand Euro, representing 76.87% of the NRDP target of 467000.86 thousand euro, and the contracted public value was 179867.78 thousand euro. (7)

On a cumulated basis, by the end of the year 2015, 135,867.83 thousand euro were paid for the financed projects, the EAFRD contribution representing 121,539.96 thousand euro (the financial execution rate being 44. 76%, from the allocated amount of 303,550.56 thousand euro).

According to the "NRDP – 2015 Annual Progress Report", the category "Leisure infrastructure" has the highest share of investments, with 74.63% of total approved projects, followed by the category "Small-sized infrastructure" with 24.67% of total approved projects and the category "Development /promotion of rural tourism services" with 0.70% of total approved projects under this measure (Table 2).

Table 2. Situation of projects under Measure 313 by types of actions

No.	Type of action	No. of approved projects	Total investments volume	Public value	
				Contracted	Paid
1	Leisure infrastructure	962	287.36	132.16	98,14
2	Small size infrastructure	318	69.81	46.50	37,06
3	Development/promotion of rural tourism services	9	1.80	1.21	0,66
Total Measure		1289	358,97	179.87	135.86

Source: Data from the "NRDP -2015Annual Progress Report"

Depending on the *type of action*, the proposed target has been reached as follows:
- for the leisure infrastructure and tourist reception with 45.88%,
- for the small scale infrastructure with 59.66% and
- for the development of the rural tourism services marketing by 7.14%.

From the point of view of the *regional distribution* (Table 3), more than 20% of projects are found in the Region 6 North-West Satu Mare and Region 7 Center Alba Iulia. Region 8 Bucharest lies at the opposite pole, with the lowest share.

Table 3. Situation of projects under Measure 313 by development regions

No.	Development Region	No. of approved projects	Public value – million euro	
			Contracted	Paid
1	North -East Iaşi	204	24.92	18.04
2	South - East Constanţa	87	13.76	10.27
3	South Muntenia Târgovişte	74	10.83	8.92
4	South West Oltenia Craiova	121	18.25	13.00
5	West Timişoara	209	30.06	22.57
6	North -West Satu Mare	333	45.46	33.59
7	Center Alba Iulia	260	36.40	29.35
8	Bucharest Ilfov	1	0.19	0.12
General total		1289	179,87	135.86

Source: Data from the "NRDP -2015Annual Progress Report"

For the projects related to *agro-tourism actions*, 667 projects received funding under the Program, accounting for 99.70% compared to the target of 669 projects foreseen by NRDP. 477 projects have in view *rural tourism actions*, representing 49.12% of the NRDP target of 971 actions, while the *recreational activities* are foreseen in 270 projects representing 59.08% of the NRDP target of 457.

By the end of the year 2015, 307 contracts were finalized, out of which 201 are in the category "Leisure infrastructure", 103 in "Small size infrastructure" (information centres, signalling out the tourism sites, etc.) and 3 in "Development /promotion of rural tourism services"; 1007 financing contracts were resiliated, out of which 729 at beneficiaries' request, 261 due to non-compliance of contract clauses and 17 contracts were resiliated out of other reasons.

Under the projects finalized before 2015, as result of the support received, 42 tourism reception structures (boarding houses) diversified their range of tourism services. Diversification mainly consisted in the fitting up of multifunctional sports grounds - multifunctional/spaces for practicing winter, summer sports, swimming pools, beach areas/catering-restaurants/organization of events, conferences, access to internet /diversified leisure services – transport of tourists by sledge and carts, etc.

The European post-accession program 2014-2020 provides financial support to private investments in the non-agricultural sector, for micro- and small-sized enterprises under P6 priority, targeting the agro-tourism accommodation infrastructure, the recreational and catering services in

the rural area. The financial support is oriented to the "Development /promotion of rural tourism services", which continued in NRDP 2014-2020, through the transition procedure by which 199 projects were transferred for finalization, with a public value that remained to be paid of 8,805.90 thousands Euro under the sub-measure 6.4 "Investments in the creation and development of non-agricultural activities", respectively 38 projects with a public value to be paid of 1,653.07 thousands Euro under sub-measure 7.2 "Investments in the creation and modernization of the small-scale basic infrastructure" (7).

These were added to:

- investments for infrastructure in agro-tourism reception units, projects for recreational activities (agro-tourism accommodation services, tourism leisure services and catering) under sub-measure 6.4 "Investments in the creation and development of non-agricultural activities";

- rural tourism promotion under sub-measure 7.6 "Investments associated with the protection of cultural heritage";

- turism supply diversification in the rural area under Measure 19 – Support for local development -LEADER.

The beneficiaries of the financial support are the following:

- existing and newly established micro- and small-sized enterprises in the rural area;

- farmers or members of certain agricultural enterprises who wish to diversify their basic farm activity by developing a non-agricultural activity in the rural area within the already existing enterprise that falls into the category of micro-enterprises and small-sized enterprises, except for the non-authorized physical entities;

- communes as defined in conformity with the current legislation;

- NGOs as defined in conformity with the current legislation;

- religious establishment in conformity with the current legislation;

- authorized physical entities / commercial companies, having have public utility cultural heritage objectives, B class into their administration.

The specific eligible costs are the following:

- construction, enlargement and/or modernization and endowment of buildings;

- procurement and installation costs, under leasing inclusively, of new equipment and installations;

- non-tangible investments: procurement or development of software and procurement of licenses, permits, copyright, trademarks;

- rehabilitation, preservation and endowment of buildings/monuments from the immovable cultural patrimony of local interest, class B;

- construction, enlargement and/or modernization of the access roads of monastic establishments, class B;

- rehabilitation, preservation and/or endowment of monastic establishments, class B;

- modernization, renovation and/or endowment of cultural community centers.

The selection criterion for infrastructure investments on the agro-tourism reception units, leisure activity projects is based on the principle of stimulating the tourism activities in the sense of prioritizing the agro-tourism activities developed in the areas with high tourism potential/ eco-tourism destinations, natural protected areas, which were established in conformity with the Emergency Ordinance no. 142/2008 approving the National Land Management Plan.

The selection criteria for the investments in the rehabilitation and preservation of the cultural heritage of local interest is based on the tourism potential principle, in the sense of prioritizing the projects in the rural localities with tourism development potential; for the investments in the modernization and endowment of the cultural community centers, the population servicing principle is applied, the tourism potential principle of the rural locality respectively.

The non-refundable public support will respect the provisions of Regulation 1407/2013 as regards the *de minimis* support and it will not exceed 200,000 euro/beneficiary per 3 fiscal years. The intensity of the non-refundable public support can reach 90% for the applicants who carry out production activities, healthcare services, sanitary-veterinary services and agro-tourism activities.

The support for the income-generating projects will be received in conformity with (EU) R no. 1407/2013 on the application of Articles 107 and 108 of the Treaty on the functioning of the European UNion for the *de minimis* aids, and the total value of the *de minimis* aids received for the 3-fiscal year period by one beneficiary will not exceed the maximum ceiling of the public support of 200,000 euro/beneficiary. For the public utility projects, non-generating incomes, the non-refundable public support granted under this sub-measure will be 100% of total eligible expenses and it will not exceed 500,000 euro. For the incomes-generating projects, the non-refundable public support received under this sub-measure will represent 80% of total eligible expenses and will not exceed 200,000 euro. The financial allocation of sub-measure 7.6: Investments associated with the protection of cultural heritage represents 15% of the total allocation of the measure (8).

CONCLUSIONS

The funding programs from non-refundable European sources represent, for the development and promotion of tourism in the Romanian rural area, a support to the national economic interests and an extremely favourable incentive for the economic progress.

In the context in which the physical-geographical potential and the available human resources are the strengths of the conditions in promoting and development of rural tourism, to which the financial and information support from the European Union is added, the small-scale business development in this sector is acknowledged as the most important source of income-gaining jobs in the rural area.

Tourism development on boarding houses located in the rural area depends on the specific characteristics of each region – folklore, ethnography and agricultural products. At regional level, rural tourism development largely depends on the existence and quality of tourist accommodation structures and on the presence of various types of activities, i.e. folklore, ethnographic/cultural heritage and farming and vine growing practice (agro-tourism).

The clear and unequivocally inflow of EU funds contributed to the development of services related to rural tourism and to the increase of the living standard of the rural people, through the development of the rural economy and of the entire rural space. Thus, in the period 2001-2015 (Fig. 1) the tourist reception structures with accommodation functions in the rural area (tourism and agro-tourism boarding houses) continuously developed. (10)

Figure 1. Dynamics of the number of tourism and agro-tourism boarding houses in the period 2001-2015
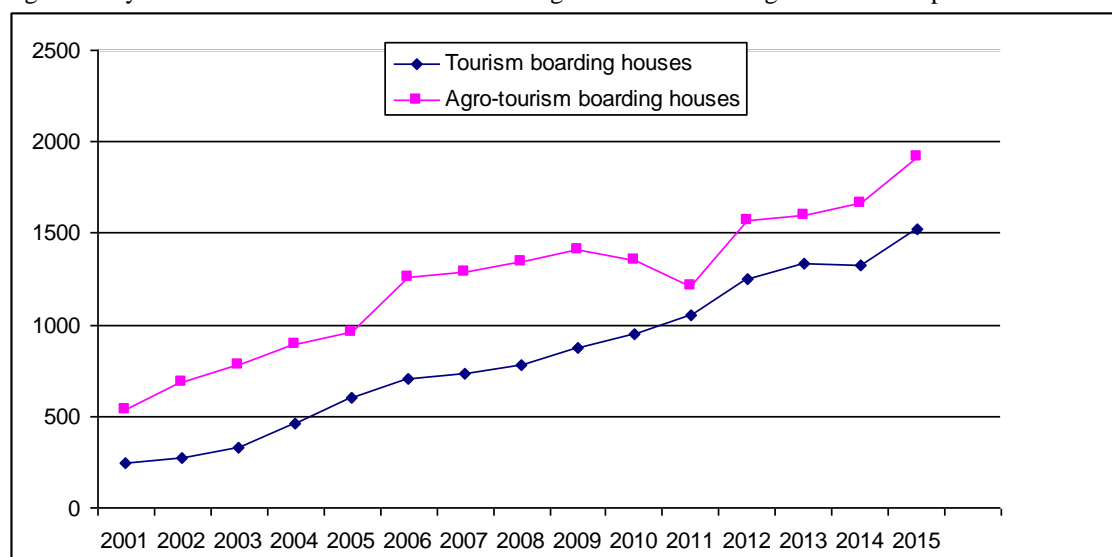
Source: Tempo-online database, 2016

However, the Romanian tourism sector is adversely affected by the lack of organization, promotion and dissemination of information on the tourism centers and by the limited number of

these centers activating at local level. Rural tourism is not fully developed so as to meet the market needs at national and international level, while the tourism infrastructures in particular do not comply with the requirements and needs with regard to the accommodation and recreational structures, from the qualitative and quantitative point of view.

As a consequence, the strategic direction of action for the next years must ensure the legislative foundation from which the whole system of institutional-legislative instruments should start, meant to foster tourism development and diversification in Romania, as a strong and efficient platform for guaranteeing the sustainable economic and social development.

REFERENCES

1. Andrei Daniela, Ruxandra, Chiriţescu Vergina, Kruzslicika Mihaela, Gogonea Manuela Rodica, Sandu Mariana, (2013), *Development of tourism and agrotourism infrastructure in Romanian rural areas during 2000-2012*, Facultatea de Management agricol, Lucrări ştiinţifice, vol.XV, Timişoara, pp. 88-93, http://lsma.ro/index.php/lsma/article/view/56

2. Dorobanţu Maria Roxana, *Forme de dezvoltare şi promovare a turismului rural în spaţiul Uniunii Europene*, http://www.strategiimanageriale.ro/images/images_site/articole/article_39f926fd85ea77b158712bef99361282.pdf

3. Cosma M., R., Buzoianu O., (2015), *Rural tourism – a chance for rural development in Romania*, pp. 276-283, http://conferinta.academiacomerciala.ro/CD2015/ARTICOLE/3/RURAL%20TOURISM%20%20IN%20ROMAN IACosmaBuzoianu.pdf

4. Nistoreanu Puiu, (2007), *Appreciations on the rural tourism phenomenon*, Journal of tourism, no 3, pag. 16-23, http://www.revistadeturism.ro/rdt/article/view/229/137

5. Popescu Agatha, (2016), *The position of tourist and agrotourist guesthouses in Romania's accommodation structures,* Scientific Papers. Series Management, Economic Engineering in Agriculture and Rural Development, Vol. 16(1): 417-424

6. Evaluarea ex-post privind implementarea programului SAPARD în România în perioada 2000-2008, Raport final de evaluare ex-post SAPARD-Romania, (2011), http://old.madr.ro/pages/dezvoltare_rurala/sapard/Raport-Final-Evaluare-ex-post-SAPARD.pdf

7. http://www.madr.ro/docs/dezvoltare-rurala/raport-anual/Raport-anual-de-progrese-PNDR-2015.pdf

8. http://www.madr.ro/docs/dezvoltare-rurala/programare-2014-2020/PNDR-2014-2020-versiunea-aprobata-20-aprilie-2016.pdf

9. http://www.afir.info/

10. http://www.insse.ro/

11. http://ec.europa.eu/

12. http://www.madr.ro/

SHORT FOOD SUPPLY CHAINS AS A MEACHANISM FOR SUSTAINABLE DEVELOPMENT.
CASE STUDY - TÂRGU-NEAMȚ TOURISTIC AREA

LUCIAN TANASĂ[1], CODRIN DINU VASILIU[2], IOAN SEBASTIAN BRUMĂ[3], SEBASTIAN DOBOȘ[4]

Abstract: *At present, gastronomy is becoming an increasingly stronger motivation and focus of interest in economics, especially in fields related to tourism. At the same time, gastronomic tourism represents one of the most important business opportunities, allowing direct contact between food sector producers and tourists. Moreover, food related tourism is a key factor of success for local food fests and food markets based in touristic destinations. Thus, food related tourism represents an important incentive for the development of short food supply chains, resulting in the cooperation between local producers and tourism operators. In satisfying the demand of tourists interested especially in gastronomical aspects, local economic operators, whether small food sector producers or accommodation unit owners, are compelled to cooperate and complement each other. The present study aims to discuss this particular economic mechanism specific to the Târgu Neamț touristic area, by taking into consideration both its strengths (especially regional cultural, historical heritage and natural habitat) as well as its weaknesses, represented by the local producers` lack of access to an adequate market, which is a key factor in ensuring long term regional proper development opportunities. Our conclusion is that, at least one potential solution to achieving sustainable development in the Târgu Neamț region, is to encourage the establishment of long lasting mutually beneficial partnerships between local food sector producers and tourism sector operators.*

Key words: *short food supply chains, gastronomic tourism, rural tourism, Târgu Neamț touristic area, local producers, local sustainable development*
JEL: *Q13, Q11, O13, O16, O18, M31, L83*

INTRODUCTION

Strategic instruments and local solutions to the problems of sustainability and durability

By both reviewing the currently available literature and on-field practices one can note that there is a tendency to make use of short term and long-term government level strategies, which require a great deal of effort from local or regional authorities and other socially involved bodies, such as economic units, NGOs . In this respect, one can take into account two eloquent examples such as the constant renewal of governing laws and the frequent adjustment of educational and regional development targets and objectives.

It can further be noted that solutions to many arising problems, particularly durability and sustainability, are generally characterized by a global perspective and approach, usually resulting in a low level of impact on the economy`s real issues.

This state of affairs is to some extent the result of the neglecting of specific methods and instruments, which can accurately help to achieve a real sustainable development in rural areas. Such instruments often have immediate cost-effective results, implying the use of only a few available resources, and thus they can be described as economically and ecologically non-invasive. It can be noted moreover that they are better suited to specific local geographic characteristics and can, if implemented, lead to the enhancement of humans` relation to the natural environment, an interaction that is altered excessively by their anthropic environment.One such useful instrument in this respect is the short food supply chain (SFSC), which can address specific issues such as sustainability and durability, offering very much needed locally adapted solutions in an economy ever increasingly marked by globalization.The SFSC can prove to be very effective in tourist areas and regions especially as a result of the fact that tourism generates a large influx of visitors, a key aspect which ensures the possibility of expansion and development for both local agri-food sector

---

[1] Tanasă Lucian, CS III, Academia Română, Filiala Iași, ICES „Gh. Zane", luciantanasa@ices.acadiasi.ro
[2] Codrin Dinu Vasiliu, CS III, Academia Română, Filiala Iași, ICES „Gh. Zane", codrindinuvasiliu@gmail.com
[3] Brumă Ioan Sebastian, CS III, Academia Română, Filiala Iași, ICES „Gh. Zane", sebastianbruma@ices.acadiasi.ro
[4] Doboș Sebastian, CS, Academia Română, Filiala Iași, ICES „Gh. Zane", sebastiandobos@ices.acadiasi.ro

producers as well as food products processors. Thus, SFSCs can contribute directly to the improvement of the local as well as the regional brand.

METHOD AND MATERIAL

The present study aims to approach the problem of sustainable development in rural areas by means of SFSCs, with an emphasis on the setting up of 'links' or 'connections' between small sized farmers/producers and or tourism operators, especially guesthouse owners.

With regard to the research approach, it can be noted that the main methods used are that of observation and the field literature review. The research endeavor has as a starting point the partial and selective analysis of the most relevant studies in the field on the aspects of brand and local culture, as well as their characteristics, types and impact level on the development of local communities. The research article furthermore presents a case study – the Târgu-Neamț tourist area – that stresses out the social, economic and environmental impact of SFSCs on local communities. It is noteworthy of mentioning that in the introductory part of the article the method of indirect research has been used- the consulting of various valuable articles and studies published in the field.

1. The Brand, tourist experience and the local culture

Over the course of time, tourism has been a human-driven activity confronting the humans` need for a personalized exploratory experience with a particular geographic area, which could be a loose description of the tourism phenomena. Tourists are itinerant individuals that aquire new knowledge and experiences from their physical and spiritual interaction whith different cultures, in relatively short spans of time. From a cognitive perspective, tourists are nothing more than hedonistic beings in search of new experiences, intent on gaining gratification, relaxation, knowledge, etc., or simply the opportunity to improve one`s health. Variously, tourists observe, integrate and are sometimes encouraged or compelled to emulate, to a certain degree, a different way of living, one that is determined by the temporary place of residence and its environs. They get to this stage by experiencing and implicitly memorizing different geographic and cultural information, as well as by getting to understand other types of attitudes, ways of thinking, customs etc., more or less different from those practiced in their places of origin. In this respect, local cuisine too plays an important role, in the sense that tourists are often keen on tasting local dishes based as much as possible on local produce and recipes. In this way, tourists are able to experience to the full the local environment and thus add to their exploratory experience.

The quality of individual tourist experiences is influenced to a great extent by a series of factors such as geographic coordinates, culture, history, economy, social environment and ecology. What this study aims to emphasize is that, as a result of the influence of these specific, and sometimes unique factors, one can note the emergence of "regional brands" on the market. In this respect, *cuisine* plays a major part in the development of such "brands", due to several reasons:
- it is a basic characteristic of the anthropic environment;
- from an economic perspective, cuisine has the integrated feature of being able to influence both horizontally and vertically different areas of the cultural and social environment;
- cuisine varies sharply across the different geographic areas;
- it implies identifiable patterns of development, which involve effective communication between host and guest.

Thus cuisine emerges as one of the most important elements of tourist experiences. This may well be the reason why at a global level, a growing number of tourists are interested in personalized holiday packages where the quality of the cuisine is growing in importance.

Gastronomy is closely related to local customs and habits through the locally sourced produce and traditional recipes. The locally sourced ingredients are of particular importance for authentic local cuisine, as are the traditional methods and means of cooking. This is the only approach to gastronomy which combines traditional values with the emerging developments in tourism: appreciation of local culture and traditions, healthy lifestyles, authenticity, sustainability

and experience. Sustainability is traceable to the growing degree of awareness of environmental issues, and the need to adopt more eco-friendly ways and habits of living. SFSCs are absolutely essential to putting local gastronomy to good use.

2. Characteristics of Short Food Supply Chains

There is no unanimously accepted definition of short food supply chains, as a result of the fact that most of them come in various forms, depending on the local geographic and economic context and the particular types of producers and consumers. One of the most widely accepted definitions is that of the U.K. Soil Association (2001): "a system of producing, processing and trading, primarily of sustainable and organic forms of food production, where the physical and economic activity is largely contained and controlled within the locality or region where it was produced, which delivers health, economic, environmental and social benefits to the communities in those areas" (Tanasă, 2014). Generally speaking, a Short Food Supply Chain is an economic chain involving, ideally, no more than one, or as few as possible intermediaries between the producer and the end consumers.

There are nevertheless several distinct characteristics of SFSCs:
1. First, short supply chains operate solely with local produce, where the term "local" means "the smallest unit to describe the origin of food", according to *Defining local food systems and short supply chains in EU Rural Review"* (Publication from the European Network for Rural Development, Issue no. 12).
2. Second, "Short Supply Chains" are those with as few as possible intermediaries, the ideal being a *direct contact* between the producer and the consumer. Taking into consideration several definitions of the concept (Marsden et al., 2000, p. 425-426; Renting et al., 2003, p. 399-400, Kneafsy et al., 2013, p. 13), as well as others still proposed by French state authorities and the European Commission (*"Short Food Supply Chains and Local Food Systems in the EU. A State of Play of their Socio-Economic Characteristics"*) according to which *"the foods involved are identified by, and traceable to a farmer. The number of intermediaries between farmer and consumer should be 'minimal' or ideally nil."* In ideal cases where there are no intermediaries, the contact between the agri-food sector producers and the end consumers involves additional relationships, besides the financial ones, namely direct communication and mutual trust. Even though the number of intermediaries can be reduced and further eliminated, their economic role can be fully suppressed. The activities previously performed by them must be taken over by the food sector producers: sorting, packaging and delivery, etc, while end consumers must be willing to lower their standards, given the fact that size sorting and washing, for example, cannot be in most cases be tackled by local small-scale producers.
3. Third, distance is another major factor with an impact on quality regulations and assurance schemes. Although regulations tend to differ across countries, they generally stipulate a 50, 80 or even 120 km radius within which the production, processing, sale and consumption of produce or food should e place. According to the National Rural Development Programme 2014-2020 (Ministry of Agriculture and Rural Development, p. 539), in Romania the local market is defined as a marketing radius of no more than 75 km from the original place of production.
4. Last but not least, from an economic perspective, SFSCs are not synonymous with direct sales, for instance, agri-food sector cooperatives can sell their entire harvest or low processed produce to supermarkets through their specialised employees (Marechal 2008; Aubry & Chiffoleau 2009).

3. Types of Short Food Supply Chains (SFSCs)

Marsden et al. and later Renting et al., based on the principle of "connection" or "link" between the end-consumer and the agri-food sector producer, have identified three main types of SFSCs (Marsden et. al., 2000; Renting et. al. 2003):
1. Direct interaction (*face to face*): the consumer purchases a product directly from the producer/processor on a face-to-face basis. Thus, authenticity and trust are obtained through personal interaction. Authenticity ("designated origin and geographically protected origin") as well

as mutual trust and respect are attained by means of personal interaction (e.g. farm shops, farm-gate sales, farmers` markets, as well as roadside sale along major transit ways).

2. Spatial proximity: agri-food sector products are obtained and later sold in their specific region of production; meanwhile consumers are regularly informed of the local nature of the product at the point of sale. Even though this category overlaps with the previously mentioned "face-to-face" category and includes the same retail spaces as noted above, in addition, this category may include specialist retailers (e.g. bakeries, mills, butchers`, grocers`, vegetable growers) which sell local produce. This category can also include public sector food provision – producers that either sell or provide locally sourced foods (e.g. hospitals, schools/universities, penitentiaries, orphanages, care homes).

3. Spatially extended: information about the place and processes of production is provided to consumers who are outside the region of production itself, and who may have no personal experience of that region. All types of retail space are potentially appropriate for this type of SFSC. In this way, customers are informed about product features through product packaging and marketing techniques (branding), and the use of certifications and regulations to protect trademarked products with distinct geographical origin. The main examples are P.D.O. (Protection of Designated Origin) or P.G.I. (Protected Geographical Indication).

4. The Impact of Short Food Supply Chains on the Socio-Economic Environment in Rural Areas. Case study: The Târgu Neamț Tourist Area

Taking into account the preceeding short description of the characteristics of SFSCs, one can note that SFSCs play an important part at all socio-economic levels in those areas where they function. The following graph represents the influence of SFSCs on communities residing in rural areas:

Figure 1: The effects of Short Food Supply Chains on the rural environment

4.1. Tourist Features of the Târgu-Neamț Area

In order to get a better understanding of the impact that SFSCs have in general, one must take into account the specific attributes of the area. The Târgu-Neamț area comprises 16 administrative units (Târgu-Neamț, Agapia, Bălțătești, Brusturi, Crăcăoani, Ghindăoani, Grumăzești, Drăgănești, Păstrăveni, Petricani, Pipirig, Răucești, Timișești, Țibucani, Urecheni and Vânători-Neamț). This microregion, including approximately 52,900 hectares of agricultural land, mainly arable (32,000 hectares) and pastures (20,000 hectares), can be said to have a dual structure – crop cultivation and animal husbandry (NIS Tempo online, 2016).

Most importantly, the Târgu-Neamț microregion is also a self-sustaining tourist destination, due to its natural and cultural potential, its overall development owing a great deal to its extented existing tourist infrastructure.

The uniquely preserved natural environment is widely known and appreciated, due mainly to the Vânători Natural Park - a site of E.U. importance (S.C.I.), part of the ecological network (Nature 2000), and BirdLife International, which includes the 'Dragoș-Vodă' Wildlife Reservation, which focuses on preserving specific Carpathian fauna, in particular the European bison.

The cultural heritage of the region has a major religious component, as a result of several of the most famous monasteries in Moldavia (Agapia, Neamț, Văratec, Secu, Sihla and Sihăstria) which attract every year a significant number of tourists. At the same time, the cultural heritage is complemented mainly by the medieval Neamț Fortress, the 'Ion Creangă' Memorial House in Humulești, the 'Nicolae Popa' Ethographic Museum in the village of Târpești, the Mihail Sadoveanu Memorial House and the Veronica Micle Memorial House.

The concentration of these natural and cultural tourist sites on a relatively small area has stimulated the expansion of distinct tourism forms such as (Tanasă, 2013):

- *religious* or *faith tourism* is widely practiced in the Neamț County area, as a result of the presence of a large number of churches, monasteries and small convents, most of which are included in the important national religious tourist trails (for example 'Agapia', 'Văratec', 'Neamț', 'Secu', 'Sihăstria', 'Sihla', 'Horaița' and others), attracting a significant number of both foreign and Romanian tourists every year;

- *cultural tourism* is probably one of the most important forms tourism practised in Neamț County; Târgu-Neamț`s cultural heritage (customs and habits included) is of particular importance and can be described as generous to locals as well as potential visitors. well represented in the rural environment as well in urban areas its heritage includes numerous historical monuments which are granted recognition and protection from the Ministry of Culture, Religious Affairs and National Heritage, as well as memorial houses ('Ion Creangă' in Humulești village, 'Veronica Micle' in Văratec village, 'Mihail Sadoveanu' in Vânători village, 'Alexandru Vlahuță' located in Agapia commune), several museums (History, Ethnograpy and Archaeology – in Târgu Neamț town; ethnographic – in Târpești commune; small-scale privately owned historical exhibitions run by the Orthodox Church are located in several monasteries such as 'Neamț', 'Agapia', 'Văratec', 'Secu' and 'Sihăstria'); of similar significant importance to tourists and visitors by chance are the numerous cultural and artistic events taking place regularly in the area ('Neamț Fortress` Days', the 'Artisans and Crafts` Fair', 'Silver Forest's' traditional fest, national literature author 'Ion Creangă' fest days and last but not least 'New Year`s customs and traditions` parade';

- *gastronomic tourism* - is extensively practised thanks to the large number of operating restaurants and accommodation units in the region. Tourists can savour local traditional dishes of the Moldavian cusine ('Humulești' broth, 'Secu Monastery' - abbey meat hodgepodge, traditional hodgepodge – 'Hanu Ancuței' Inn, wild mushroom soup/borsch, pickled orange agaric, 'shepherd`s pie", Moldavian "Gugelhupf' - marble cake, stuffed zuchini, cottage cheese boiled dumplings, 'poale`n brâu' pies and so on. Traditional local delights can be served individually or in groups at rhe sheepfolds in the area.

- *forest tourism* (wild medicinal herbs harvesting, wild fruit and mushroom picking, etc.); the 'Vânători Natural Park' is again an important destination for tourists interested in such activities, given its sheer size and varieties of plants thriving in this protected wildlife area;

- *trekking* is pracised on marked and unmarked trails in the 'Neamț Fortress`' environs or nearby monasteries;

- *recreational tourism* (weekend trips included) is extensively practised especially during the summer and winter seasons;

- *cycling* is another well appreciated form of tourism, which is expanding as it benefits from a large number of unmarked off-road and charted tracks for bike enthusiasts in forested areas; riders can also benefit from the scenery by choosing to take advantage of the network of tarmac cycling paths linking the numerous religious sites in the region;

- *hunting tourism* – the Târgu Neamț County is a potential destination due to its natural habitats and wild fauna areas encompassing approx. 47,600 hectares included in the BirdLife International network;

- *photography travel/tourism* – due to its highly appreciated landscapes that are home to several fauna and flora habitats of E.U. importance. Besides wildlife, scenic rural and urban architecture are also potential attractions for people enjoying or making a living out of photography;

- *bird-watching* (research eco-tourists) - due to the large numbers of bird species present in the 'Vânători Natural Park' (a habitat protected under the *Natura 2000* network), including several endangered species such as the C. crex, lesser spotted eagle, the European honey buzzard (pern or common pern), the hazel grouse, spotted flycatcher and the black woodpecker.

Most accomodation units in the Târgu Neamț tourist area are mainly rural and urban guesthouses, located primarily in the town of Târgu-Neamț and in nearby villages of 'Vânători-Neamț' and 'Humulești' and around the 'Agapia', 'Văratec' and 'Neamț' monasteries.

4.2. Economic Effects

SFSCs produce significant economic effects as a result of the fact that agriculture, husbandry and agritourism are the main occupations in rural areas. As long as rural guesthouses get their food supplies from traditional rural households, the businesses of farming, husbandry and agritourism can complement each other, ensuring economic growth. Tourism operators can take advantage of the growing consumer interest in locally sourced food products by establishing formal or informal partnerships with local farmers, thus ensuring a constant offer of food products in the tourism industry.

Equitable and economically viable producer-consumer partneships can be set up, benefitting both sides. Agrifood sector suppliers of quality fresh vegetables, meat and dairy products are able to sell most of their products at fair prices. On the other hand, by including many diverse locally sourced food products in their offer of services, tourism business owners can improve their cost-effective branding strategies, thus attracting more and more tourists interested in healthy lifestyles, organic dishes and beverages. Even though the relative importance of SFSCs will vary depending on farm size and tourism business scale as well as geographical location, there is considerable evidence that SFSCs subsequently lead to increased local sales, employment growth (especially for women) and larger incomes for tourism businesses. Small-scale farmers may benefit from short or intermediate term credits, so that they will be able to provide steady buyers with a constant supply of produce. In such cases both sides involved in the business deal can agree on the terms of delivery, given the seasonal nature of the agrifood sector and tourism activities. Finally, SFSCs will ensure a sizeable constant flow of investments and revenues for local or regional economies. Even though the local culinary heritage is often associated with the context of healthy, sustainable diets, the importance of locally sourced based gastronomy resides in its ability to stimulate overall rural development.

4.3. Social Effects

SFSCs functioning in the tourism industry favour the interaction and 'connection' between local farmers and end-consumers, which promote the development of mutual trust. Social capital gained this way can also lead to the development of a local sense of community, providing tourists with a feeling of belonging, with positive social and economic effects in the long term, including

future visits, overall improvement in attitudes to the environment, new knowledge acquisition and sharing, as well as stronger consumer awareness.

In the last decades, likee other regions of Romania, the Târgu-Neamț area has been severely impacted by a shortage of jobs and low incomes, which have resulted in an exodus of the local workforce – particularly the youth- to Western European countries. The current unstable global socio-economic and political context, characterized by a growing resentment of economic migrants, as well as widespread unemployment and lowered incomes may witness a potential reverse of migration of the Romanian nationals employed abroad. In this respect Neamț County`s rural environment can to some extent provide the potential returnees with the opportunity to resettle and open new small-scale family businesses. One important argument supporting this plausible scenario is that many of the Romanian migrants currently living and working in Western Europe have largely preserved their properties - households and/or agricultural lands in Neamț County. If such a phenomenon will take place at significant level, SFSCs could prove to be a potential solution for individuals willing to make a fresh start or get involved in an established business operating in the agrifood sector or tourism and hospitality industry, taking advantage of the growing demand for locally sourced produce at a regional level. By resorting to SFSCs, younger individuals returning from abroad as well as youngsters moving in from urban areas can also help counter the severe phenomena of population ageing and economic decline of the rural space that emerged after 1989, creating instead a new stable social climate marked by a positive sense of community.

4.4. Environmental impacts and benefits

In the general context of numerous and lively debates aiming at assessing the environmental effects of SFSCs as economic mechanisms, some authors have argued that these can be seen as an overall driver of GHG emissions reduction. Even though studies emphasize that proper logistical arrangements are required and that there is an important potential for improvement in SFSCs, two main categories of benefits can arise from the use of short distribution networks. Firstly, using ecological methods of production and processing, which are mandatory to attaining a less negative global impact on the environment, fuel consumption levels can be greatly reduced, carbon footprints can be lowered accordingly and food product waste can be countered. Many researchers have pointed out yet another series of potential positive effects on the local environment arising from the use SFSCs. Using eco-friendly methods of production and processing, one can note a significant drop in the overuse or misuse of natural resources (land fund, forests, water resources etc.), thus attaining a much needed level of sustainability. Moreover, individuals too are beginning to reconsider their current relation to the natural environment, as part of the general tendency of growing awareness regarding climate change, natural resources scarcity, restraining geographical natural habitats, as well as ethical values on the whole.

The environmental benefits of rural tourism are clear due to the fact that viable SFSCs contribute to the improvement of the general image of landscapes, allowing tourists to better experience the authenticity of rural communities living in numerous picturesque villages and communes, by getting to know or better understand traditional agricultural practices employed in small scale farms, as well as by tasting local dishes, participating in culinary themed trades and fairs or by simply visiting temporary local traditional farmers` markets.

4.5. Impact on health, well-being and the environment

Local food systems provide the possibility of improving the overall diet and state of health of many individuals, through increased access to nutritious food, given the fact that produce sold by means of SFSCs undergo an extremely low degree, if any, of processing and are obtained by using traditional methods that involve a minimum of inputs, or no inputs at all of non-organic fertilizers and pesticides. Among Western tourists and especially the Scandinavians it can be noted that there is a strong tendency favorable to consuming an increasing amount of chemical-free and preferably seasonal produce, trend that is largely motivated by health consciousness. Consequently, big tour operators are starting to adapt their products and services by including in their portofolio stays and

holiday trips to various Meditteranean basin countries that are highly valued for their healthier diets, nutritious food products and sun exposure benefits.

4.6. Cultural impact assessment

In Târgu-Neamț touristic area one of the most relevant roles short food supply chains play is aiding to the conservation and branding of the local gastronomy and cultural heritage on the whole.

Small-sized farmers sell their locally sourced products, specific to the Neamț County region in markets open in the surrounding areas of monasteries and churches. Vendors supply the markets mainly with products such as syroups, jams, sorbets, dairy products and meat based products. Worth mentioning is also the range of 'homemade' products crafted by artisans - proprietors and managers of several workshops spread throughout the Neamț region.

Guesthouses serve visitors with traditional dishes based on their harvested crops from their own agricultural holdings, either on the procurement of locally sourced vegetables, dairy and meat products. In spite of the fact that a significant number of guesthouse owners still buy a wide range of supermarket sold food products, one can currently observe the tendency of the owners` reconsidering of their commercial relation, especially given their strong local sense of pride. The main reason for this state of facts are the strict regulations and norms that severly limit the use of homegrown produce in the tourism industry.

5. Recommendations on potential tools supporting the expansion of SFSCs

The expansion of SFSCs viewed as an efficient tool of distribution capable of generating a positive impact on the development of the level of sustainability reachable in the Târgu-Neamț area can be supported by:

- aiding the increase in cooperation and association between small size agricultural holdings, and tourism operators;
- stimulating the growth of farmers` markets (permanent and temporary) and fairs;
- enhancing the branding of agri-food sector products and local cuisine, criteria necessary in aiding also to the expansion of touristic services and offers;
- holding as many as possible gastronomic events (tasting events, cooking contests, fairs and exhibitions) with aim of increasing the attractiveness of touristical destinations;
- stimulating the growth of E.U. funding accessed by individuals and enterprises based on the legal basis provided by the 2014-2020 National Rural Development Programe framework, especially the sub-measures dedicated to encouraging the establishment and aiding of existing SFSCs, by providing incentives to stimulating association and cooperation between groups of farmers and also for the development of rural tourism; the issues are adressed by the N.R.D.P. thanks to Sub-measure *16.4 - "Support for horizontal and vertical cooperation among actors in the supply chain for the establishment and development of short supply chains and local markets, and for related promotion activities in a local context"* and *Sub-measure 9.1a – "Establishment of producer groups in the fruit-growing sector"*;
- improving the credibility attributable to agri-food sector products provided by rural vendors by encouraging and even financially backing them to adopt labelling and quality-warranty schemes such as P.D.O. (Protection of Designated Origin), P.G.I. (Protected Geographical Indications) as well as T.S.G. (Traditional Specialities Guaranteed);
- implementing innovative forms of marketing and selling, as means of stimulating the expansion of SFSCs and rural tourism;
- resorting to strategic actions and perspectives when addressing rural communities with increased potential for development in tourism related activites.

CONCLUSIONS

Whilst other Western European countries have only relatively recently discovered and taken advantage of the innovative benefits of SFSCs, historically speaking, Romania is quite familiar with this concept. During the long communist rule (1945-1989) the Romanian population residing in urban and rural areas were constrained to resort to the use of SFSCs as a solution to ensure its very survival in many cases, due to the severe shortages of produce supplies in the state owned shops and farmers` markets (especially in the `50s and `80s). That was mainly the result of the communist regime`s nationalization of most of the existing agricultural land, between 1945 and 1962, policy which consequently deprived most rural inhabitants of their landed properties, leaving them with no more than a miniscule privately owned plot of cultivable land around their housheoulds to make a living out of.

Taking a leap forward to present times it can be noted that the Târgu-Neamț touristic area currently presents mainly all of the necessary elements for ensuring a proper socio-economic environment suitable for the development of local small-scale farming and tourism operators by means of economically viable partnerships. By harnessing and turning into good account the many geographical features of the Neamț region overall, SFSCs can prove to be an efficient economic mechanism if properly adjusted and implemented locally. Among many criteria needed to be met in order to implement such functional SFSCs, especially given the current fierce competition and pressure exerted by large supermarket chains and government regulations, small farmers are compelled to seek cooperative forms of association in order to stand a real chance in opposing many national, as well as other global interests and trends. To this respect, of crucial importance is the growing demand of fresh, chemical-free and seasonal produce strongly shown by tourists and end-consumers in general, which can be a considerable competitive advantage in favour of the expansion of local food systems and of SFSCs in particular. In Târgu-Neamț area many small scale farmers have already succesfully managed to sell their produce to numerous guesthouses based on traditional gastronomy. Thus SFSCs have proved to be an efficient method of marketing and branding used by both producers and as well as tourism operators - a win-win situation.

BIBLIOGRAPHY

Aubry, C. & Chiffoleau Y. (2009). *Le developpement des circuits courts et l'agriculture periurbaine: histoire, evolution en cours et questions actuelles. Innovations Agronomiques*, 5, 53-67.

European Network for Rural Development. (2013). *Defining local food systems and short supply chains.* In *EU Rural Review*, 12, 5, https://enrd.ec.europa.eu/sites/enrd/files/fms/pdf/89E54472-A7ED-41AD-84A6-C392AD7ECE14.pdf

Institutul Naţional de Statistică TEMPO Online. (2016). *Suprafaţa fondului funciar după modul de folosinţă, pe judeţe şi localităţi*, http://statistici.insse.ro/shop/index.jsp?page =tempo3&lang= ro&ind=AGR101B

Kneafsey, M. et al. (2013). *Short Food Supply Chains and Local Food Systems in the EU. A State of Play of their Socio-Economic Characteristics*. Luxembourg: Joint Research Center.

Marechal, G. (Ed.). 2008. *Les circuits courts alimentaires: bien manger dans les territoires*. Dijon: Educagri.

Marsden, T. et al. (2000). *Food Supply Chain Approaches: Exploring their Role in Rural Development*. În *Sociologia Ruralis*. 40 (4), 424-438.

Ministerul Agriculturii şi Dezvoltării Rurale. (2015). *Programul Naţional de Dezvoltare Rurală pentru perioada 2014-2020* (versiunea aprobată), Bucureşti

Renting, H. et al. (2003). Understanding Alternative Food Networks: Exploring the Role of Short Food Supply Chains in *Rural Development. Environment and Planning* A 35, 393-411.

Tanasă, L. (2015). *Lanţuri logistice agroalimentare scurte sustenabile pentru dezvoltarea inovativă a turismului şi a comunităţilor rurale din ţările emergente*. In *Crizele şi pieţele emergente*, Haller, A.P. & Dămăceanu, R.C. (Ed.), Bucureşti: Pro Universitaria, 191-218.

Tanasă, L. (2014). *Benefits of Short Food Supply Chains for the Development of Rural Tourism in Romania as Emergent Country During Crisis. Agricultural Economics and Rural Development*, Year XI (2/2014), Bucureşti: Editura Academiei Române, 181-193.

Tanasă, L. (2013). *„Realităţi actuale şi oportunităţi de dezvoltare a turismului rural din judeţul Neamţ. Studii de caz"*, Editura „Terra Nostra", ISBN 978-606-623-033-9, Iaşi.

***. (2016). Slow Food Italy, http://www.slowfood.it/tag/carlo-petrini/

TOURISTIC ACTIVITY IN SUCEAVA COUNTY

ELISABETA ROSU[1]

Abstract: *The natural and anthropic tourism potential of the Suceava county characterized by numerous natural reserves, many of them unique in the world, by the variety, density and value of historic, religious and architecture monuments are creating conditions for the county Suceava to be a tourism destination chosen, both for the Romanian and foreign tourists. This approach is intended to be an analysis of the main indicators of tourism activity in Suceava county during 2001-2014.*

Keywords: *tourism potential, tourism activity indicators, Suceava county*

JEL: L8, L83, Q2

INTRODUCTION

The tourism potential of an area represents an essential condition for tourism development, while the essential requirement is that this potential is best put into value by the suppliers of tourism products and services.

In recent years, the tourism, both as economic and social activity, has significantly developed compared to other sectors of the economy. Tourists, either Romanian or foreigners prefer to travel as much as possible, to explore new places and to get closer to nature.

The county Suceava is one of the most complex tourism areas in the country. The natural tourism potential characterized by special landscape areas, with diverse therapeutical factors together with the valuable anthropic potential, resulting from the history and culture of the people from this area provide great opportunities for the practice of a wide range of tourism forms.

MATERIAL AND METHOD

The analyzed information was collected through the documentary study of the works on the approached theme. The methodology comprised the statistical analysis of the primary data using the Excel software for quantitative data analysis. The statistical data on which the analysis was based were at county Suceava level, they covered the period 2001-2015 and had the following sources: i) NIS statistical data available online – www.tempo-online; ii) other online sources – www.prefecturasuceava.ro.

The first part of the paper contains a brief characterization of the county, focusing on the natural and anthropic potential; in the second part of the paper the main tourism activity indicators are analyzed: the tourism accommodation structure, the tourist accommodation capacity, the tourist accommodation capacity in operation, arrivals and overnight stays of tourists.

Based on these synthetic indicators of tourism activity were calculated two indices: the average length of stay by formula:

$$D_m = N_{în} / N_s, \text{ where:}$$

D_m is the average lenght of stay; $N_{în}$ represents the number of overnight stays and N_s represents the number of arrivals and the net utilization index of the tourist accommodation capacity in operation, by formula:

$$I_n = (N / C_f) \text{ x } 100$$

where: I_n is the net utilization index of the tourist accommodation capacity in operation; N is the number of overnight stays in a certain period; C_f is the tourist accommodation capacity in operation.

The tourism potential of Suceava county

---

[1] Institute of Agricultural Economics, Romanian Academy, e-mail: betty_rosu@yahoo.com

General data

The county Suceava is located in the north-eastern part of Romania, is the second in size in the country, which explains the geological, landscape and natural resources diversity.

From the administrative point of view, the county Suceava comprises 5 municipalities (Suceava – county residence, Fălticeni, Rădăuţi, Câmpulung Moldovenesc and Vatra Dornei), 11 towns, 98 communes and 379 villages.

By relief units, the area of the county Suceava is divided into: mountains (53%), plateau (30%) and river meadow (17%). The mountain area is the prevailing relief unit consisting of massive and complex groups of mountain ridges separated by deep valleys or depression areas.

Graph 1. The total population, by residence areas, in Suceava county
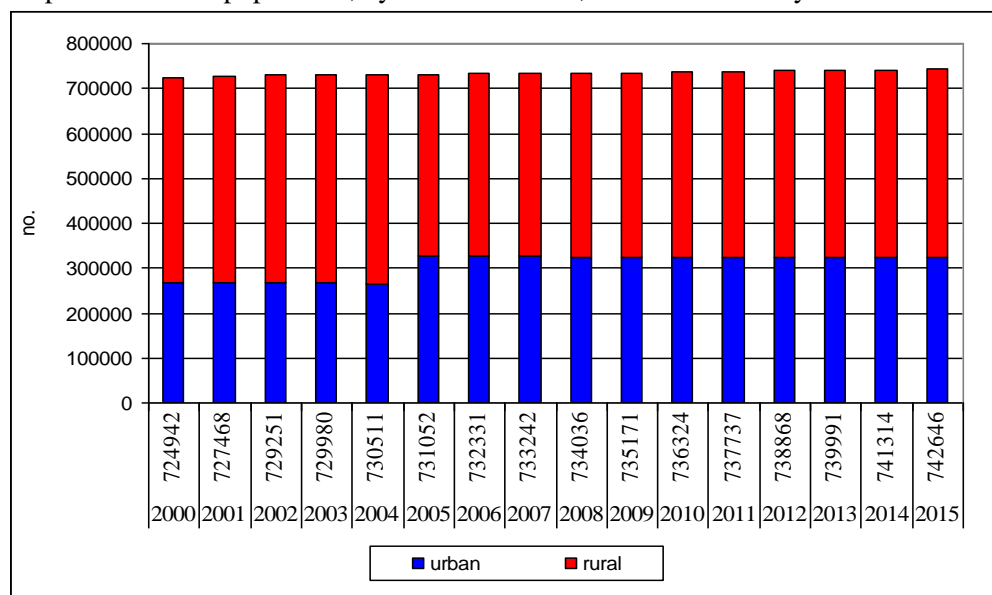
Suceava county's population in 2015 was larger than in 2000.

Suceava county's population in 2000 was 724942, of which 37% lived in urban areas, while in 2015 the population was 742642, of which 43.6% lived in urban areas.

Source: www.tempo-online

The natural tourism potential

The territory of the county Suceava is partially overlapping the Eastern Carpathians and the Suceava Plateau. The mountains are represented by: Suhard Mountains – partially the Călimani mountains, Bucovinei ridges (Mestecăniş, Feredău and Obcina Mare), Bistrita Mountains (Rarău, Giumalău, Bârnaru and Budacu) and Stânişoarei Mountains (only Sutra).

The depression system is characterized either by a smooth relief or by hilly relief units (Dornelor Depression), or by fields of meadows and terraces along the valleys (the depression corridors Câmpulung Moldovenesc – Gura Humorului, Moldoviţa and Găineşti depression).

The plateau area and the Sub-Carpathian hills are represented by Suceava Plateau and the Neamtului Sub-Carpathians.

There are 29 **natural protected areas of national interest**[2] in the county, with a total area of 16199.2 ha, out of which:
-   6 botanical reserves, with a total area of 396.5 ha;
-   11 forestry reserves, with an area of 3351.8 ha;
-   6 geological reserves, with a total area of 257. ha;
-   2 paleontological reserves, with a total area of 1.1 ha;
-   2 mixed reserves, with a total area of 1,287 ha;
-   1 scientific reserve, with an area of 6 ha;

---

[2] The natural protected areas of national interest were declared by Law no. 5 from 2000 on the approval of the National Landscaping Plan – Section III - protected areas, by Government's Decision no. 2151 of 2004 on the establishment of natural area regime for new zones and Government's Decision no. 1143/2007 on the establishment of new protected areas.

- 1 National Park - Călimani National Park with a total area of 24041 ha, out of which 10700 ha on the territory of Suceava county).

In the year 2014, from the category of natural protected areas[3] of community interest, there were 6 special birds and fauna protection areas (SBFA) with a total area of 96415.4 ha and 23 sites of community importance (SCI) with a total area of 221916 ha.

There is also **a natural protected area of international interest** on the territory of the county – Tinovul Mare Poiana Stampei. This is the largest turf nature reserve in Romania, with an area of 681 ha, localized on the territory of the commune Poiana Stampei, in the county Suceava, which was declared natural monument in the year 1955.

In the year 2007, Tinovul Mare Poiana Stampei Reserve was declared site of community importance, gaining European recognition as part of Natura 2000 Network. The international recognition was obtained together with the accession to the *Ramsar Convention on Wetlands* (Ramsar, 1971) in the year 2011, by declaring the reserve as *Wetland of International Importance*.

The anthropic tourism potential

The cultural-historical and ethnic-folklore patrimony of the county has a great tourism value and attractiveness: historical objectives (Fortress Şcheia, Royal Fortress of Suceava and Fortress Zamca), civil constructions (the Royal Court and the Royal Inn in Suceava), monasteries (Voroneţ, Humor) as well as many museums and memorial houses.

Box 1. Main tourism attractions in Suceava county

The History Museum – Suceava Municipalty
The Natural Science Museum – Suceava Municipality
Stephan the Great's Fortress – Suceava Municipality
Monastery Zamca – Suceava Municipality
Monastery Saint John – Suceava Municipality
Royal Inn – Suceava Municipality
Wood Art Museum – Câmpulung Moldovenesc Municipality
Bucovina Ethnographic and Folk Techniques – Rădăuţi Municipality
Monastery Voroneţ – Town Gura Humorului
Monastery Humor – Town Gura Humorului
Monastery Suceviţa – Commune Suceviţa
Monastery Putna – Commune Putna
Monastery Moldoviţa – Commune Moldoviţa
Monastery Dragomirna – Commune Mitocul Dragomirnei
Monastery Slătioara – Commune Râşca
The Black Ceramics Center from Marginea – Commune Marginea
Daniil Sihastru's Hermitage – Commune Putna
Ciprian Porumbescu Memorial House – CommuneCirprian Porumbescu
Cacica Salina – Commune Cacica

Source: Prefect's Institution*,* Strategy for tourism development and promotion in Suceava county, 2005

---

[3] The natural protected areas of community interest are part of the European Ecological Network Natura 2000, created for the conservation of the natural heritage of the European Union, based on two directives: *"Habitats" Directive* (no. 92/43 of1992 on the *conservation of natural habitats and wild fauna and flora*) and *"Birds" Directive* (no. 79/409 of 1979 on *the conservation of wild birds).*

The "B*irds*" Directive was implemented by Government's Decision no. 971 of October 5, 2011 for the modification and completion of G.D. no. 1.284/2007 on declaring the special avifaunistic protection areas as integrating part of the European Ecological Network Natura 2000 in Romania.

The "*Habitats*" Directive was implemented by Order of the Minister of Environment and Forests no. 2387/2011 for the modifying and completing M.M.D.D Order no. 1.964/2007 on the establishment of natural protected area regime of the sites of community importance, as part of the European Ecological Network Natura 2000 in Romania.

The monasteries in the rural areas, the numerous churches and Daniil Sihastru's Hermitage represent important attraction points for tourists. The rural areas are preservers of customs, traditions, crafts and old customs and habits – ceramics, hand woven carpets, fur dressing, cloths, folk instruments, folk masks, etc. The county Suceava is well-known for its ethnographic museums (Suceava, Rădăuţi, Gura Humorului, Câmpulung Moldovenesc, Solca, Vatra Dornei, Vama, Marginea), as well as for the important creation centers or individual workshops of the folk artists who are well-known for their crafts (Vatra Moldoviţei, Ciocăneşti, Brodina, Poiana Stampei – egg painting; Marginea, Rădăuţi – ceramics; Humorului, Rădăuţi, Arbore monasteries – cloths; Suceava, Rădăuţi, Vatra Dornei, Molid, Fundu Moldovei – icon painting; Marginea, Gura Humorului – knittings; Bilca, Vama, Fundu Moldovei – leather works, fur dressing; Solca – carpentry-sculpture workshops).

The artistic events and the traditional folk festivals organized throughout the entire year are attracting the Romanian and foreign artists.

Main tourism activity indicators in Suceava county

The main tourism activity indicators are: the tourist accommodation structures, the tourist accommodation capacity existing and in operation, arrivals and overnight stays of tourists.

In the period 2001-2015, the tourist accommodation structures, the tourist accommodation capacity existing and that in operation had a positive trend.

The indicator tourist accommodation structures had the highest increase in 2015 towards the reference year 2001, from 24% up to 222.9%.

The increase of the number of tourist accommodation structures lead implicitly to the increase of the number of beds. So, at the level of the Suceava county the tourist accommodation capacity existing doubled in the period.

Table 1. The tourist accommodation structures, the tourist accommodation capacity existing and in operation, in Suceava County, in the period 2001-2015

Year	The tourist accommodation structures		The tourist accommodation capacity existing		The tourist accommodation capacity in operation	
	No.	% [*]	Places	% [*]	Thou. places days	% [*]
2001	96	100	5034	100	1421	100
2002	119	124.0	5192	103.1	1400	98.5
2003	122	127.1	5577	110.8	1641	115.5
2004	143	149.0	5755	114.3	1761	123.9
2005	179	186.5	6526	129.6	1932	136.0
2006	220	229.2	7012	139.3	2057	144.8
2007	236	245.8	6831	135.7	2087	146.9
2008	233	242.7	7029	139.6	2102	147.9
2009	235	244.8	7554	150.1	2176	153.1
2010	245	255.2	8033	159.6	2264	159.3
2011	271	282.3	8835	175.5	2440	171.7
2012	296	308.3	9447	187.7	2594	182.5
2013	295	307.3	9585	190.4	2643	186.0
2014	296	308.3	9650	191.7	2686	189.0
2015	310	322.9	10143	201.5	2780	195.6

[*] these percentage data represent reductions (-) or increases (+) towards the basic year (2001=100.0)
Source: own calculation by www.tempo-online

The tourist accommodation capacity in operation, which represents the number of housing places put at the tourists' disposal by the units of tourist housing, registered an ascending trend, except the year 2002. In the year 2002 the tourist accommodation capacity in operation at the level of Suceava County situated at only 98.5% from the level existent in the year 2001, but starting with the year 2003 this enlarged from 15.5% up to 95.6% in the year 2015.

Except the years 2009 and 2010, the number of tourist arrivals in Suceava county registered an ascending trend, being double in the period under analysis.

The number of overnight stays in the tourist accommodation structures in Suceava county registered oscillating evolutions. With all this, towards the reference year 2001, the number of overnight stays in Suceava county increased by 1.5 times.

Graph 2. The arrivals and the overnight stays of tourists in Suceava County
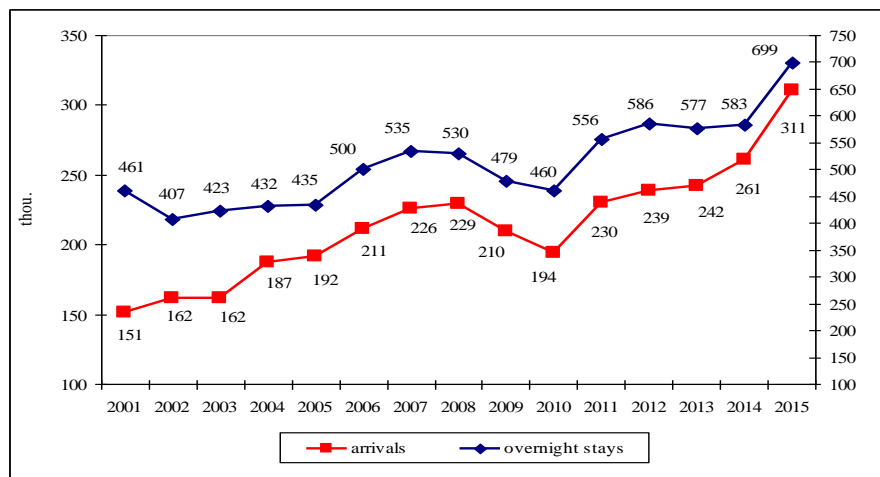
The number of overnight stays at the level of the Suceava county was, in the period 2002-2005, and also in the year 2010 under the level registered in the year 2001, while in the rest of the period under analysis was over the reference year level, reaching a maximum of de 699 thousands in the year 2015.

Source: www.tempo-online

The average length of stay reflects the capacity of the tourist offer to keep the tourist in the respective zone. In the year 2001 tourists had an average length of stay in the Suceava county of 3.1days, while in the year 2015 their average length of stay shortened, reaching to an average of 2.2 days.

Table 2. The average length of stay in the Suceava county in the period 2001-2015

- no of days . -

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
D_m	3.1	2.5	2.6	2.3	2.3	2.4	2.4	2.3	2.3	2.4	2.4	2.5	2.4	2.2	2.2

Source own calculations after www.tempo-online

A stay of 2.3 or 2.4 days shows the fact that the tourists who reached the Suceava County had a high degree of mobility.

Graph 3. The correlation between the tourist accommodation capacity in operation
and the number of overnight stays in Suceava county, in the period 2001-2015
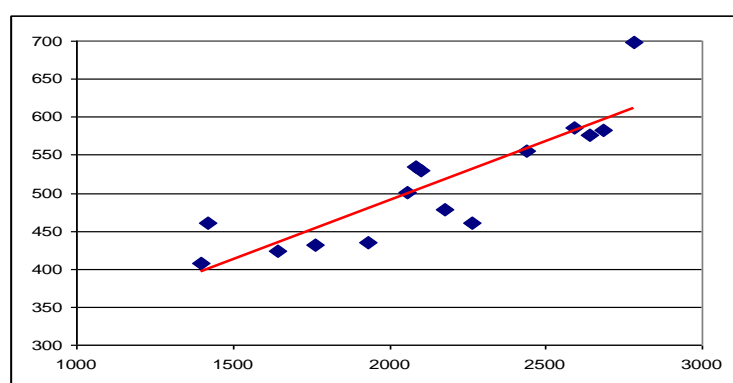
Correlating the two indicators, the tourist accommodation capacity in operation with the number of overnight stays we can affirm that there is a direct positive correlation, which means that the increase of the number of places-days of housing lead implicitly to the increase of the number of overnight stays of the tourists in the Suceava county in the period 2001-2015.

Source: own calculation by www.tempo-online

Graph 4. The types of tourists visiting the Suceava county
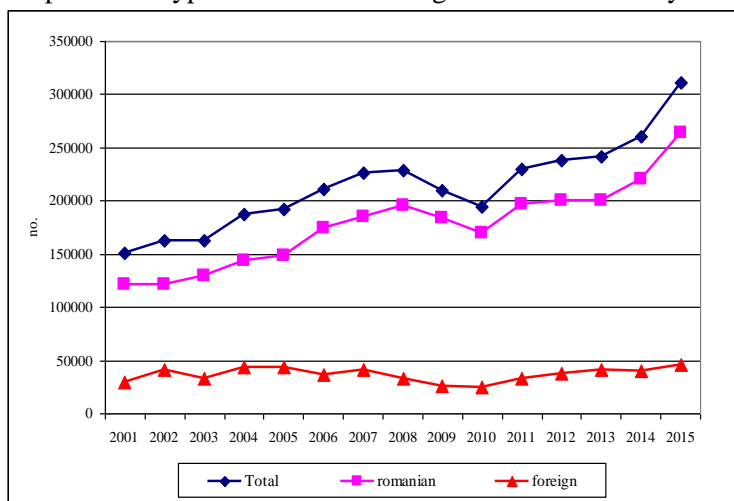
In the period analyzed the total number of tourists who visited the Suceava county was continuously increasing, except the years 2009 and 2010, years when it was felt the economic crisis started in 2008. The total number of tourists increased from 150000 in the year 2001, to over 300000 in year 2015. In total number of tourists, the Romanians predominated, while the tourists from abroad represented over 20% in the period 2002-2005, in the rest of the years their share situating under this threshold.

Source: www.tempo-online

On basis of the two synthetic indicators: the tourist accommodation capacity in operation and the overnight stays we can calculate the net utilization index of the tourist accommodation capacity in operation, which shows the degree of tourist capacity utilization.

The net utilization index of the tourist accommodation capacity in operation in period 2001-2015 had oscillating evolutions, registering the highest value of 32.4% in the year 2001, reaching to 25.1% in the year 2015.

Graph 5. The net utilization index of the tourist accommodation capacity in operation
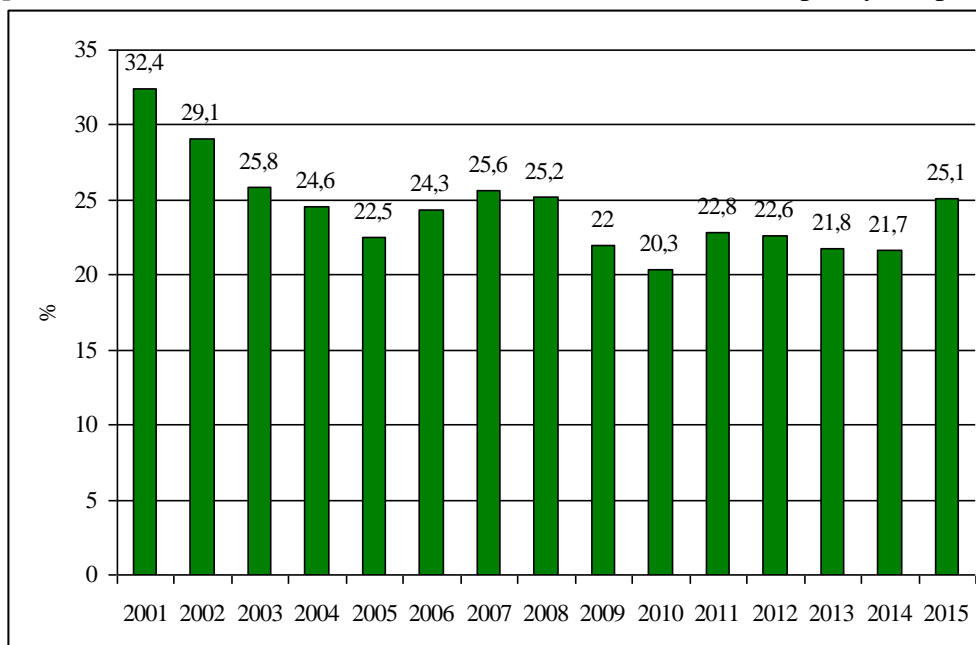
Source: own calculation by www.tempo-online

In the year 2010 it was registered the smallest value of the degree of tourist capacity utilization (20.3%). This fact is due to the small number of tourist overnight stays in the tourist units in ratio with the relatively big number of their accommodation capacity in operation.

The net utilization index of the tourist accommodation capacity in operation in Romania, in the year 2001, was of 34.9%[4], higher by 2.5 percentage points than that of Suceava county. This gap

---

[4] http://www.insse.ro/cms/files/pdf/ro/cap20.pdf/turism

enlarged in the year 2015 when the net utilization index of the tourist accommodation capacity in operation in Romania was of 29.7%[5] higher by 4.6 percentage points than that in Suceava County.

CONCLUSIONS

Following the analysis of the main tourism activity indicators in the period 2001-2015 in Suceava county we can draw the following conclusions:
- three of the main indicators of the tourism activity: the tourist accommodation structures, the tourist accommodation capacity existing and the tourist accommodation capacity in operation registered positive trends;
- the number of tourists visiting Suceava county doubled in the analyzed period;
- the number of overnight stays by these ones in the tourist accommodation structures was of 1.5 times bigger in the year 2015 opposed to the year 2001;
- the time spent by the tourists in the Suceava county had a duration between 2.3 and 2.4 days, which means that they preferred to visit Suceava county in a limited time;
- the net utilization index of the tourist accommodation capacity in function registered fluctuations in the period under analysis, situating under the value registered by this per total Romania.

Evolution results of the tourism activity show the fact that there existed a positive tendency under the aspect of putting into value of the tourism potential of the Suceava county. Different actions are necessary which should have as result the increase of the tourists flow, either they choose only to stop, but especially to spend more time in Suceava County. For this thing we need as many tourism programs as possible, with the practicing of some promotional prices and of tourist offers to lead to the increase of the number of tourists and to their keeping as many nights as possible in the zone.

So, a better promotion of this destination could lead on the future to a better putting into value of the natural and anthropic touristic potential so rich and diverse of this zone.

BIBLIOGRAPHY

Niţă, I., Niţă, C., (2008), *Piaţa turistică a României. Realităţi. Mecanisme. Tendinţe,* Ed. Economică, Bucureşti

Stanciu, P., (2007), *Studiul pensiunilor turistice din judeţul Suceava*, Revista de turism, nr.4.

Stănciulescu, G., Micu, C. (2009). *Economie şi gestiune în turism. Probleme, proiecte şi studii de caz*, Editura C.H. Beck, Bucureşti

*** Instituţia prefectului – judeţul Suceava, *Strategia de dezvoltare şi promovare a turismului în judeţul Suceava*, 2005

*** www.tempoonline

http://www.insse.ro/cms/files/publicatii/publicatii%20statistice%20operative/Seria%20turism%20tr%20III%202015.pdf

---

[5] http://www.insse.ro/cms/files/publicatii/publicatii%20statistice%20operative/Seria%20turism%20tr%20III%202015.pdf

THE TOURISTIC AND AGROTOURISTIC POTENTIAL OF TULCEA COUNTY – ROMANIA

Eugenia-Dorina CIOBANU(RĂDOI)[1], Manea DRĂGHICI[2]

Summary: The article sets to identify and analize the tourism development potential of Tulcea County, it's place regarding this matter within the South-East Region and the capitalization degree of the existing potential. After the analysis, it appears that the South-East Region has an extremely high touristic development potential, as it has been capitalized very little at the moment. Through investments, quality touristic products could be made that could compete with touristic products from other strong tourism companies.

Key words: *tourism, agrotourism, agrotouristic bed and breakfast.*

JEL Clasification :Q01

INTRODUCTION

The touristic potential is defined as the unit of natural and anthropical elements that exist in a certain area, that triggers the tourists interest and as a consequence, the achievment of touristic activities.[1]

The touristic potential represents the way of internal formation of the touristic heritage, respectively the structural and functional capacity of a territory to sustain the development of activities with a touristic profile, to determine the existence of touristic destinations through the presence within (the terrirory) of elements of attraction with peculiar physico-geographical, cultural and socio-economic valence (including the touristic infrastructure etc.).[2]

The touristic heritage represents on one side the unit – defined as touristic potential – of the natural, social, economic, cultural elements, and on the other side, the entirety of accommodations intended for existing touristic activities in a territory (city, county, region, country etc) – reflected by the ethnical-material base – in which there are included: the communication means, accommodation, reposal, treatment, food, facilities for amusement and practice.[3]

The South-East Region is part of the 8 development regions in Romania and it's made up of 6 counties: Brăila, Buzău, Constanța, Galați, Tulcea and Vrancea.

Regarding the surface, the region comes second in dimension of the 8 regions in the country and has almost all the known forms of relief: the Danube Meadow, the Bărăgan Plain, the Dobrogea Plateau, the Măcin Mountains and a part of the Carpathians and Sub Carpathians of Curvature on the norh-west side, the Danube river that crosses the region, the Danube Delta made by the Danube at it's influx in the sea and the whole romanian seaside of the Black Sea on the east side.[4]

Even though the smallest population density in the entire region is in Tulcea county, the largest being found in Galați County, however, the highest possibilities of touristic development are in Tulcea given the existence of the touristic aim, unique in our country, that has an out of the ordinary natural beauty, the Danube Delta, the Biosphere Rezervation, one of the less altered places by human pollution, protected by law and preserved by locals.

---

[1] Ph.D. Eng. Eugenia-Dorina Ciobanu (Rădoi) – University of Agronomic Sciences and Veterinary Medicine - Bucharest, radoi_eugenia_dorina@yahoo.com

[2] Prof. Univ. Dr. Manea Drăghici - University of Agronomic Sciences and Veterinary Medicine - Bucharest, dmprofesor@hotmail.com

MATERIALS AND METHODS

The analysis of the region from a touristic and agrotouristic point of view has been made with help from the following markers: the tally of the touristic development potential sorted by localities and groups of localities, the structure of the touristic units in the region and their scatter within the South-East Region.

The data has been taken from the National Tourism Authority website – Public information section[5].

RESULTS AND DISCUSSIONS

Through analysing the statistical data, respectively the total tally on touristic development taken from the List of areas with high touristic potential – Annex 10 from Submeasure 6.2 – Support for founding non-agrarian activities in the rural areas – from Ministry of Agriculture and Rural Development/Rural Investments Financig Agency website, we can conclude regarding the tourism development degree of the localities in the South-East Development Region that most of the localities that are developed from a touristic point of view and have development possiblities in that sense, are in Constanța and Tulcea County, the existence of the danube Delta and the Black Sea seaside being the advantage of this area.

With a number of 25 localities in Constanța County and 24 localities in Tulcea County we have here an added up percentage of 43% of the total of administrative-territorial units with a high touristic potential.

Brăila, Galați and Buzău counties, with a number 14, 15, respectively 16 localities with a high touristic potential, represent the areas that are more frail from a touristic point of view, within the analysed development region, adding up together only 39% from the total of administrative-territorial units with a high touristic potential in the South-East Development Region.

Vrancea County is on the third place in touristic importance, containing 19 localities with high touristic potential, the calculated percentage being 17% from the total of administrative-territorial units with with a high touristic potential in the South-East Development Region.

We can see in Table 1 that the majority of localities in the analysed developing region, are tallyed with 20-29 points, respectively 63 localities out of the 113 in the region, adding up a percent of 56% from total, tallyed in the 20-29 tallies category.

One locality is being tallyed with 1-9 points because it's located in Brăila County and only 5 units are tallyed with 40-50 points, in Constanța and Tulcea County.

A number of 44 localities are in the 10-19 tally categories and 30-39 points, the first tally category with 13 localities and the second one with 31 localities.

In the above 50 points category of tourism development potential, there isn't any locality in the South-East Region that fits.

We can say that the South-East Development Region has a high touristic potential, ephasizeing on Constanța and Tulcea counties, where are the highest possibilities of development in this field.

Table 1. The localities structure in the South-East Region
by touristic development total talling

Nr. crt.	Judetul	UM	Total		Punctaj total potenţial de dezvoltare					
			localitati	%	1-9	10-19	20-29	30-39	40-50	>50
1	Brăila	Nr. loc	14	12,4	1	4	9	x	x	x
		%	100,0	x	7,1	28,6	64,3	x	x	x
2	Buzău	Nr. loc	16	14,2	x	3	8	5	x	x
		%	100,0	x	x	18,8	50,0	31,3	x	x
3	Constanța	Nr. loc	25	22,1	x	2	8	11	4	x
		%	100,0	x	x	8,0	32,0	44,0	16,0	x
4	Galați	Nr. loc	15	13,3	x	1	11	3	x	x
		%	100	x	x	6,7	73,3	20,0	x	x
5	Tulcea	Nr. loc	24	21,2	x	2	14	7	1	x
		%	100	x	x	8,3	58,3	29,2	4,2	x
6	Vrancea	Nr. loc	19	16,8	x	1	13	5	x	x
		%	100,0	x	x	5,3	68,4	26,3	x	x
Total localitati în Regiunea Sud-Est		Nr. loc	113	100,0	1	13	63	32	5	x
		%	100	x	0,9	11,5	55,8	28,3	4,4	x

Source: AFIR

In order to analyse the capatalisation degree of the touristic and agrotouristic potential in the South-East Region we used the marker, the structure of the number of authorised touristic units, by types of categories and degree of comfort, for each and every county in the region.

The analysed and presented data have as reference year 2015.

From table nr. 2, it appears that within the South-East Development Region there are a total number of 1943 authorised accommodation units, the bigger weight belonging to Constanța County, with a number of 1309 units and a percentage of 67% of all the authorised accommodation units in the analysed region. We can conclude that this county capitalizes very well it's touristic potential.

Tulcea county comes right after Constanța, with a number of 346 accommodation units and a percentage of 18% of total, that's where we believe that there are possibilities and space for development and capitalization of the touristic potential that Tulcea County has. Buzău, Vrancea, Brăila and Galați counties, have percentages under 10%, of the total of accommodation units in the South-East Region, which means that they still have reservations in capitalizing the touristic potential they have.

The most often found units in the region are the hotels with 430 accommodation units and touristic mansions with a number of 425 accommodation units.

The touristic bed and breakfasts are on the third place, with a total number of accommodation units of 391 from which only 10 accommodation units are agrotouristic bed and breakfasts, representing just 1 % of the accommodation units.

Most of the touristic bed and breakfasts are located in Tulcea County, respectively 151 accommodation units, from which 4 bed and breakfasts are agrotouristic.

By not having any authorized rural touristic or agrotouristic bed and breakfast, Brăila and Vrancea County prove that they did not initiate this form of tourism yet, a form that is soughted more and more today by tourists in the country or from abroad.

Tabelul 2. The structure of the number of authorized touristic
units from the South-East Region in 2015

| Nr. crt. | Judet | UM | Total unitati | | Hotel | Pensiuni | | Vila | Altele * |
			Numar	%		Total	din care agroturistica:		
1	Brăila	nr. unitati	44	2,3	16	12	x	3	13
2	Buzău	nr. unitati	116	6,0	16	61	3	6	33
3	Constanța	nr. unitati	1309	67,4	349	108	1	337	515
4	Galați	nr. unitati	48	2,5	18	11	2	5	14
5	Tulcea	nr. unitati	346	17,8	23	151	4	69	103
6	Vrancea	nr. unitati	80	4,1	8	48	x	5	19
Total localitati în Regiunea Sud-Est		**nr. unitati**	**1943**	*100,0*	**430**	**391**	**10**	**425**	**697**
		%	**100**	**X**	**22,1**	**20,1**	**0,5**	**21,9**	**35,9**

Source: ANT

From the data analysed and presented in Table 2 it appears that even though the South-East Reagion generally and Tulcea County especially have a rich and diverse touristic potential, rural tourism and agrotourism are types of tourism that are developed very little .

The quality of the accommodation structures from the South-East Development Region has been analysed by the degree of comfort that it provides and it's ranked with a number of stars/flowers for the accommodation function units that are presented in Table nr 3.

Table 3. The structure of the number of authorized touristic units from the South-East Region,
sorted by quality categories in 2015*

| Nr. crt. | Judet | UM | Total unitati | | din care unități după nr de stele/flori * | | | | |
			numar	%	”1”	”2”	”3”	”4”	”5”
1	Brăila	nr	44	2,28	5	15	20	4	x
		%	100,0	X	11,4	34,1	45,5	9,1	x
2	Buzău	nr	113	5,9	7	52	48	6	x
		%	100,0	X	6,2	46,0	42,5	5,3	x
3	Constanța	nr	1306	67,7	216	442	529	80	39
		%	100,0	X	16,5	33,8	40,5	6,1	3,0
4	Galați	nr	46	2,4	4	10	28	3	1
		%	100,0	X	8,7	21,7	60,9	6,5	2,2
5	Tulcea	nr	341	17,7	5	48	160	89	39
		%	100,0	X	1,5	1,5	1,5	1,5	1,5
6	Vrancea	nr	80	4,1	6	23	41	9	1
		%	7,50	X	7,50	28,75	51,25	11,25	1,25
Total localitati în Regiunea Sud-Est		nr	1930	100,0	243	590	826	191	80
		%	100,0	X	12,6	30,6	42,8	9,9	4,1

Source : ANT

From a total of 1930 accommodation units in the development region categorized by the number of stars/flowers as resulting from Table nr 3, almost a half, respectively 43% of the units total are categorized with 3 stars/flowers.

The overweight of the units categorized with 3 stars/flowers stays the same in each county from the analysed region.

With 2 stars/flowers are categorized 31% of accommodation units total, 13% of accommodation units total are categorized with 1 star/flower and 10% of accommodation units total are categorized with 4 stars/flowers.

The units that are categorized with 5 stars/flowers add up at region level a total of 4, from which 2 are located in Constanța County and 2 in Tulcea County.

It appears that at the South-East Development Region level, the accommodation units have a medium quality level as they are categorized with 2 and 3 stars/flowers and have the highest degree of occupancy.

The luxury units, respectively the accommodation units that are categorized with 4 and 5 stars/flowers, are few but they still exceed in percentage the number of accommodation units with poor quality that are categorized with 1 star/flower.

Table nr. 4 contains data about a particular category within accommodation units, respectively the rural touristic bed and breakfasts and the agrotouristic bed and breakfasts located in the South-East Development Region, sorted by quality (number of flowers).

The number of these accommodation structures in the analized area is very small, as there are only 13 rural touristic bed and breakfasts and agrotouristic bed and breakfasts functional in the whole region, Tulcea County having 5 registered units from total and 4 functional units are found in Buzău County.

There isn't any rural touristic bed and breakfast and agrotouristic bed and breakfast in Brăila and Vrancea counties which is a waste for these areas that have a high degree of authenticity, respectively an abundant agrotoursitic potential.

We believe that rural tourism and agrotourism are not developed sufficiently given the level of agrotouristic potential that the South-East Development Region has.

Table 4. The structure of the number of authorized rural and agrotouristic bed and breakfasts in the South-East Development Region based on quality catergories in 2015

Nr. crt.	Judet	UM	Total unitati		din care unități după nr de flori				
			numar	%	"1"	"2"	"3"	"4"	"5"
1	Brăila	nr. unitati	x	x	x	x	x	x	x
		%	x	x	x	x	x	x	x
2	Buzău	nr. unitati	**4**	30,8	x	1	3	x	x
		%	100,0	x	x	25,0	75,0	x	x
3	Constanța	nr. unitati	**2**	15,4	x	1	1	x	x
		%	100,0	x	x	50,0	50,0	x	x
4	Galați	nr. unitati	**2**	15,4	x	x	x	x	2
		%	100,0	x	x	x	x	x	100,0
5	Tulcea	nr. unitati	**5**	38,5	x	4	1	x	x
		%	100,0	X	x	80,0	20,0	x	x
6	Vrancea	nr. unitati	x	x	x	x	x	x	x
		%	x	x	x	x	x	x	x
Total localitati în Regiunea Sud-Est		nr. unitati	**13**	100,0	x	6	5	x	2
		%	100,0	x	x	46,2	38,5	x	15,4

Source: ANT

CONCLUSIONS

We believe that the touristic potential of the South-East Development Region is capitalized insufficienlty as opposed to the demand for touristic and agrotouristic products existing on a national and internaional level.

The main mean for economic development in Tulcea County, that would not need large investments consists of rural tourism that is an increasing source of interest for tourists.

Under these conditions a good quality rural tourism requires a minimum modern sanitary endowment, comfort conditions for both accommodation and catering, access routes and civilised communication means and especially the reception staff's special professional training [7].

BIBLIOGRAPHY

[1] Ielenicz M., Comănescu Laura, 2006, Romania. Potenţial turistic, Edit. Universitară, Bucureşti, p. 9

[2] GHERASIM Virginia, 2006, Potenţialul turistic al depresiunilor Sibiului şi Făgăraşului- Rezumatul tezei de doctorat, Universitatea din Bucureşti- Adobe Reader, accesat 04.06.2013.

[3] Ielenicz M., Comănescu Laura, 2006, Romania. Potenţial turistic, Edit. Universitară, Bucureşti, p. 9.

[4]   Regiunea de dezvoltare Sud-Est, accesibil on-line la https://ro.wikipedia.org/wiki/Regiunea_de_dezvoltare_Sud-Est, accesat 03.07.2016

[5] Anexa 9 - Lista zonelor cu potenţial turistic ridicat, accesibil on-line la
http://portal.afir.info/informatii_generale_pndr_investitii_prin_pndr_sm_6_2_infiintare_activitati_neagricole?amp;lang=RO, accesat 03.07.2016

[6] Lista structurilor de primire turistice cu funcţiuni de cazare clasificate, accesibila on-line la http://turism.gov.ro/informatii-publice/, accesat 03.07.2016

 [7] Puiu, Nistoreanu, Turismul rural, o afacere mica cu perspective mari, Editura Didactica si Pedagogica, Bucuresti, 1999

ANALYSIS OF AGROTURISTIC SECTOR AFTER FIRST NATIONAL RURAL DEVELOPMENT PROGRAMME (2007 - 2013)

DUMITRU EDUARD ALEXANDRU[1], PETRE LAURENȚIU IONUȚ[2]

Summary: *We can say that one of the main problems of the Romanian rural area is the high levels of poverty recorded among people in rural areas, where the main activity is agriculture of subsistence and semi-subsistence. Another problem is the state of infrastructure in the area, lack of utilities (water/sewer), is a problem that affects their quality of life and where the main problem raised by local authorities is the lack of funds.*

A solution that can help mitigate these problems of Romanian rural area can be the diversification of agricultural activities into non-agricultural activities. Considering the growing demand of the population for leisure in remote areas that are protected from pollution sources, and the increasing number of the Romanian population who prefer to migrate to rural areas, abandoned "parental" houses and willing to return periodically in such an environment, agro hostels would be an important factor for the economic recovery of rural space, generating new jobs, sources of revenue for municipalities in the area, but also to stop the phenomenon of migration young especially in the rural area to urban centers.

However foreign tourists, with a promotion indirect (Prince Charles) are tempted by these areas in Romania, where accommodation prices are much lower compared to other regions in Europe with a tradition in the sphere of agro recognized for years but also landscapes and areas which were not affected by the development era in which we live.

Keywords: *agrotourism rural tourism units, rural area*

INTRODUCTION

According to the official definition given by the World Tourism Organization, but also by other European rural tourism, it is considered that rural tourism is a form of tourism that includes any tourist activity organized and managed in rural areas by the local population, exploiting resources local tourist posed by natural, historical or cultural-human and amenities, tourist structures, including hostels and agritourism farms.

Rural tourism at the European level, began to take shape in 1990 with the establishment EUROGITES - European Federation of Rural (Tomar - Portugal), who was busy running the network of rural tourism in Europe.

Nationally, rural tourism has begun to operate especially after 1993, when Romania joined as a member EUROGITES and the first steps to encourage this form of tourism culminated in the creation of a legal framework for the mountainous area, the Danube Delta, the Black Sea coast, when they tried to create the first condition relating to electricity, sewage, drinking water and eliminating taxes on this deal for households that have 3-20 rooms and by setting up a body to advise the network of farms included in rural tourism.

Romania, which enjoys a temperate continental climate with four seasons and in addition to the possibility of cultivating a broad spectrum of plant species (such that agriculture is an important sector in the share of GDP of the country), in conjunction with landforms existing form Romania to have countless opportunities to develop tourism sector, but also of the agritourism.

There are documents attesting to the emergence of tourism in Romania since ancient times by famous Herculane resort, Ocna Sibiu, Sovata and more.

National Rural Development Programme (RDP) was a significant impetus for development rather Romanian countryside, by appearance and agro tourist accommodation units. By far 313 - Encouragement of tourism activities were contracted over 1.200 projects totaling 174 million euro, where the amount actually paid in the amount of these projects was 138 million euro, giving priority area agro related leisure services.

Under Measure 313 - Encouragement of tourism activities can be carried out construction, modernization, expansion and equipping of tourist reception namely agri-tourism that should not have

---

more than 8 rooms, and the travel with functions of tourists who had to provide for a maximum of 15 cameras.

Also investments in agro-tourism (the tourist accommodation) required to achieve a minimum standard of quality of a daisy. Agrotourism establishments also had to provide the methodology and other agricultural activities which involved contact with housework and providing tourist partial food from local produce.

MATERIALS AND METHODS

The research is based on information obtained from the processing of data distributed by the National Institute of Statistics, considering the number of accommodation units, especially agro number of arrivals and overnight stays in 2002, the emergence of SAPARD funds and 2015 being the last year for which information is available statistics on the issue under examination.

As defined tourist arrivals, it represents the number of tourists accommodated in tourist accommodation establishments comprising all persons (Romanian and foreign) traveling outside the communities in which they reside for a period longer than 12 months and staying at least one night a tourist accommodation in areas visited in the country; main reason for the trip is other than to carry out a paid activity in the visited places.

Also the definition of overnight travel is within 24 hours, starting at the hotel, for which a person is recorded in the space tourist accommodation and enjoys hosting account price paid, even during the actual stay lower range mentioned. They are considered overnight stays related to additional beds (paid by customers).

RESULTS AND DISCUSSION

The main problem of the Romanian rural area is the high level of poverty among the population, characterized by the fact that their predominant occupation is agriculture. High unemployment due to lack of jobs in these areas are a large part of the population live on welfare or "work day in the village". In rural areas, finding a job for males is more affordable than in the case of females, putting their work into account the fact that the jobs available require more than brute force, mostly from agriculture. According to the Law tourism, rural tourism is a form of rural tourism, organized and conducted in close relationship with the occupation of the inhabitants of rural areas - agriculture, livestock, crafts and other activities specific tourism activity is secondary to farming.

Also according to the law of tourism, central public administration authority responsible tourism (Ministry of Regional Development and Tourism) supports the development of rural tourism and rural tourism through a series of specific measures to promote rural tourism potential, provides information on tourism opportunities in rural areas and authorization of rural tourism and rural boarding houses, newly constructed through the certificate of classification.

According to art. 21 of the same law, tourist rural agro hostels and traditional homes must meet a minimum set of specific regulations in the field of veterinary and food safety. These regulations are drawn up by the central authority in the field of veterinary and food safety, in cooperation with the central government responsible tourism and adopted by order of the leaders of the two institutions.

Table no. 1.
Evolution of tourist accommodation units, depending on its type in the period 2002 - 2015

Types of tourist accommodation	Years													
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
	UM: Number													
Total	3338	3569	3900	4226	4710	4694	4840	5095	5222	5003	5821	6009	6130	6821
Tourism pensions	271	328	461	597	702	736	783	878	949	1050	1247	1335	1323	1527
Agrotouristic pensions	682	781	892	956	1259	1292	1348	1412	1354	1210	1569	1598	1665	1918

Source: Statistical data processing INSSE;

Analysing the number of establishments of tourist reception, depending on the type, between 2002 (the period in which they were introduced SAPARD) - 2015 (end of the first programming period of the RDP 2007-2013 and the start of the second period Software 2014 - 2020) we observed an increase in the total number of establishments of tourist reception, so if in 2002 the total number of structures was 3.338 at the end of 2015, their number has doubled reaching 6.821.

According to Table 1, number of rural tourism in 2002 was nearly three times higher than the boarding houses with a total number of 682, reaching the end of 2015 the difference between the two types of tourist accommodation is no longer so significant. Thus tourist pensions totaled 2015 a total of 1.527 units, representing only 79.6% of the total number of rural tourism.

Table no. 2.

Evolution of tourist accommodation units, depending on the category of comfort during 2002 - 2015

Types of tourist accommodation structures	Classification	Years													
		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
		U.M: Number													
Total	Total	3338	3569	3900	4226	4710	4694	4840	5095	5222	5003	5821	6009	6130	6821
	5 star	8	10	10	14	53	20	55	57	65	78	100	105	105	85
	4 star	100	125	168	219	251	231	244	301	337	395	438	472	494	558
	3 star	362	427	584	830	990	870	913	1098	1295	1611	1890	2031	2117	2448
	2 star	1323	1479	1661	1780	2084	1209	1222	1237	1200	1150	1252	1256	1218	1293
	1 star	1052	1080	1057	1030	955	781	778	740	742	407	444	424	411	403
	5 flowers	:	:	:	:	:	10	10	12	10	13	15	15	20	19
	4 flowers	:	:	:	:	:	41	47	66	91	107	134	159	177	214
	3 flowers	:	:	:	:	:	238	252	389	434	490	713	769	837	1021
	2 flowers	:	:	:	:	:	865	929	835	727	539	647	597	579	607
	1 flower	:	:	:	:	:	138	110	110	92	61	60	58	52	57
Tourism pensions	Total	271	328	461	597	702	736	783	878	949	1050	1247	1335	1323	1527
	5 star	:	:	:	3	4	5	5	6	7	9	10	14	11	15
	4 star	12	19	28	44	54	56	64	81	90	100	110	131	136	161
	3 star	65	71	114	186	221	250	277	343	423	504	654	737	748	893
	2 star	160	194	254	295	326	364	377	387	373	372	414	394	368	404
	1 star	33	43	64	69	70	61	58	59	53	64	58	58	57	52
Agrotouristic pensions	Total	682	781	892	956	1259	1292	1348	1412	1354	1210	1569	1598	1665	1918
	5 flowers	:	:	:	:	7	10	10	12	10	13	15	15	20	19
	4 flowers	2	5	18	22	33	41	47	66	91	107	134	159	177	214
	3 flowers	52	64	89	142	192	238	252	389	434	490	713	769	837	1021
	2 flowers	449	519	597	652	906	865	929	835	727	539	647	597	579	607
	1 flower	179	193	188	140	121	138	110	110	92	61	60	58	52	57

Source: Statistical data processing INSSE;

If at the end of 2002, the total number of accommodation facilities are classified in category 5 star almost zero (only 8 such units) due to demand these types of services at the highest level, reached the 2015 number them to be 85, representing an increase of 9.4 times compared to 2002.

Regarding agro hostels, the emergence of structures classified to 5 flowers/daisies data from 2006, when only 7 units existed, reaching a number of 19 at the end of 2015. Out of 1918 agrotourism establishments, most are classified 3 flowers / daisies, accounting for 53.23% of the total.

Table no. 3.

Analysis of tourist accommodation capacity, depending on the category of comfort during 2002 - 2015

Types of tourist accommodation structures	Classif.	Years													
		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
		UM: Locuri													
Tourism pensions	Total	4378	5670	8100	10910	12546	13429	14538	16653	18422	20499	25019	27325	27295	32051
	5 star	:	:	:	64	83	104	103	115	143	182	197	283	246	356
	4 star	224	406	587	940	1181	1305	1425	1797	2013	2296	2705	3134	3115	3744
	3 star	1267	1530	2479	4163	4492	4993	5776	7010	8645	10486	13892	15823	16184	19263
	2 star	2256	2908	3920	4594	5180	5941	6105	6536	6486	6682	7472	7322	6968	7930
	1 star	595	790	1078	1149	1229	1086	1099	1163	1079	840	740	741	720	721
Agrotouristic pensions	Total	6219	7510	9405	11151	14551	15448	16906	19783	20208	20683	27453	28775	30480	35188
	5 flowers	:	:	:	:	115	162	200	258	263	317	348	356	466	491
	4 flowers	20	58	303	418	612	747	878	1320	1752	2395	2886	3537	3912	4817
	3 flowers	596	812	1143	1962	2746	3519	4014	6500	7651	8906	13138	14286	15854	19371
	2 flowers	4397	5277	6485	7212	9625	9383	10424	10047	9246	8110	10270	9782	9504	9648
	1 flower	1206	1363	1474	1559	1453	1637	1390	1658	1296	955	811	814	744	861

Source: Statistical data processing INSSE;

Accommodation capacity at tourist guesthouses suffered from 2002 to 2015, a significant increase from 4.378 seats to 32.000 seats, where the largest share have places to stay in accommodation that are classified 3 stars, representing approximately 60% of their total number.

Regarding the accommodation capacity of rural tourism is distinguished also an upward trend so that in 2002 their number was 6.219, so that at the end of 2015 the total number of seats was 35.188, of which approximately 55% are classified 3 flowers/daisies.

Table no. 4.

Evolution of the number of arrivals of tourists in tourist accommodation structures in the period 2002 - 2015

Tipuri de structuri de primire turistica	Ani													
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
	UM: Număr persoane (mii)													
Total	4847	5056	5638	5805	6216	6971	7125	6141	6072	7031	7686	7943	8465	9930
Pensiuni turistice	126	163	235	310	363	451	478	412	406	479	586	653	704	899
Pensiuni agroturistice	64	89	149	170	217	288	357	325	289	360	447	501	549	672

Source: Statistical data processing INSSE;

The number of arrivals of tourists increased from year to year, so if among boarding houses in 2002 they were 126 thousand at the end of the year reached 899.000, and among the rural tourism units they have evolved from 64.000 in 2002 to over 670.000 in 2015.

It is noted that in 2015, the number of tourist arrivals to the pensions is around 33% more than in the case of rural tourism arrivals.

Tabel nr. 5.

Evoluția numărului de înnoptări în structurile de primire turistică în perioada 2002 - 2015

Tipuri de structuri de primire turistica	Ani													
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
	UM: număr mii													
Total	17276	17844	18500	18372	18991	20593	20725	17325	16051	**17979**	19166	19362	20280	23519
Pensiuni turistice	232	307	460	599	734	927	959	813	802	928	1083	1197	1273	1664
Pensiuni agroturistice	144	225	321	365	459	592	743	673	604	741	906	996	1081	1368

Sursă: Prelucrare date statistice INSE;

In the case of the number of overnight stays in the establishments of tourists' reception period 2002 - 2015, the situation is similar, so both among boarding houses, and among the rural tourism units, evolution is an upward, from 232.000 overnight stays by the 1.6 million overnight stays in tourist guesthouses, ie from 144 thousand to 1.3 million overnight stays overnight stays in the case of rural tourism.

CONCLUSIONS AND RECOMMENDATIONS

Rural tourism and agro-tourism are economic activities which have developed significantly in recent years due to various factors, from the increase in demand for such services, represented the desire of tourists to escape from crowded cities and polluted, plus factors represented the premises for facilitating proper construction of these units, especially referring to the national rural development programs.

There must also be a balance between the development of this sector and between the environment, which may suffer adverse effects.

Most likely a development of this segment, represented by units agro would have a more significant impact on how the other establishments, as it engages multiple services outside the usual accommodation, improving the one eating through acquisition necessary food from its own farm and in this way meets the requirements of many customers.

The rural population would benefit from opening these businesses, creating jobs, both family members and the people of the village, town halls may have higher receipts from the local budget, which could contribute a more harmonious development of the village and helping to stop the migration of youth to urban centers, start looking for a job.

Contributing to the development of Romanian rural areas can be clearly and by building these agritourism accommodation, which is well suited for families in rural areas, where each family member can handle one specific activity.

The new National Rural Development Programme for the programming period 2014- 2020 provides people in rural areas, two sub-measure 6.2 - Support for the establishment of non-agricultural activities in rural areas, which are supported investments in creation of new non - agricultural, eligible farmers or members of households in rural areas and where support is granted in the form of two tranches worth EUR 70,000.

What was the second measure is 6.4. - Investment in the creation and development of non-agricultural activities, having mostly the same role as far as 6.2., but the amount of support may be up to 200,000 euros.

BIBLIOGRAPHY

1. M. Cândea, (2003), Potenţialul turistic al României şi amenajarea turistică a spaţiului, Editura Universitară, Bucureşti;
2. P. Nistoreanu,(2006), Ecoturism şi turism rural, Editura ASE, Bucureşti;
3. E. Matei, (2006), Turism rural şi ecoturism, Editura Credis, Bucureşti;
4. E. Matei, (2011), Ecoturism, Editura Universitară, Bucureşti;
5. ORDONANTA nr. 58 din 21 august 1998 (*actualizata*) privind organizarea şi desfăşurarea activităţii de turism în România;
6. Ministry of Agriculture and Rural Development, the National Programme for Rural Development 2013-2020, Bucharest, Romania;
7. National Institute of Statistics, Database Query-Online, Romania;

RESEARCH ON THE ROLE OF ECONOMIC AND SOCIAL DEVELOPMENT AGROTURISM IN ROMANIA

GODJA (DĂNILĂ) DANIELA ILEANA[1]

Abstract: *The main purpose of this paper is to present agrotourism, as a "specific phenomenon of the modern world". Agrotourism is circumscribed Romanian society and is influenced by the difficulties facing the Romanian economy, the pace in which the process of economic reform and the emphasis on the tertiary sector and tourism as its constituent part. Romania has an exceptional tourism potential that the attractiveness of the complexity and variety may urge to travel an extremely wide range of tourists, but more importance should be given to transforming this fund tourism in heritage tourism. For the purpose of World Tourism Organization and European organizations of rural tourism, it is a "form of tourism which includes any tourist activity organized and managed in rural areas by the local population, exploiting tourism resources local (natural, cultural - historical, human) and facilities, including hostels and tourist structures agrotourism farms. "the general objectives of the tourism industry in our country areas should contribute to increasing the number of jobs and income alternatives. Tourism development, even at a smaller scale, holds particular importance as regards the country's economic development and employment.*

Keywords: *tourism, economic development, heritage tourism.*

INTRODUCTION

Agrotourism participate in the development of the rural area and the fundamental action of the modern economy through the development and diversification of their economic potential turning sense by hosting activities and capitalizing on their products and local. It must undergo economic activity due to additional income for rural households.

Agrotourism must be considered and expressed as an economic element that produces jobs and stimulating rural settlements factor determining economic growth. Structural transformation of the economy of rural areas but produce rigorous constraints leaders and local authorities are looking for innovative actions to solve the problems of these areas and thus support good rural population.

The problems solving support facing rural areas and change the trend of depopulation, especially due to the weakening of agriculture, the European Union has developed a support framework and integrated rural development. Also promoted policies that have strengthened the emergence of new economic activities in rural areas and rural tourism occupies an important position.

MATERIAL AND METHOD

Unit tourism evolves in some circumstances that make up the overall socio-economic environment. Strategy that relies on tourism development and development unit, must take into account the characteristics of the environment in which it operates, but also directions and how they evolve their composition.

The totality of tourism activities taking place in terms of tourism demand go through different stages progressive and necessitated highlighting and rural development through tourism benefit. Studying this development presents itself through periodic progress constituted by a peak period of activity in a particular area of economic activity.

The research method used is qualitative analysis by studying documents and data retrieved and processed by the National Institute of Statistics and literature, bibliographic documentation, studying the results of research conducted on the subject at national level and to study the legislative framework to practice rural tourism in Romania and the European Union. As for the statistics Romania EU countries is lower GDP earnings from tourism. The highest proportion for example in

[1]*Drd. Ing. GODJA (DĂNILĂ) DANIELA ILEANA[1],UNIVERSITATEA "VALAHIA" DIN TÂRGOVIŞTE - IOSUD,* *godja_daniela_ileana@yahoo.com*

2014 they had Croatia (17.2%), Malta (14.4%) and Cyprus (12.3%), Romania (0.9%). In Romania tourism is one of the economic sectors with real opportunities for development and is also a means of creating and improving the country's image in the other country is a source of increasing foreign exchange earnings, a secure labor market.

RESULTS AND DISCUSSIONS

The role of tourism in economic and social development and rural tourism development occurs as a result of the action of the natural environment in terms of modern existence. Thus, rural tourism is considered as a therapy for easing necessary modern man, in an appropriate and pleasant space at a reasonable price. The decrease in revenues due to citizens economic crisis, unemployment and inflation affected by mass tourism, and the middle class was determined to turn to tourism. This reduction led her people to assert their homes and landscaped spaces suitable agro prepared for receiving guests. Here they are providing dining areas and other complementary activities, directly dependent on economic specifics of the farm as well as leisure activities, teaching various skills in traditional horse riding, fishing, therapeutic cures, etc. Thus, specific tourism and existing accommodation capacity in agro hostels are in a continuous growth. Balancing tourist development through a strategy to stimulate rural economy and rural economies through additional demand for agricultural products and financial capital contribution can be achieved by:

- encourage the improvement and use of agricultural land less productive (enabling preserved surfaces covered with natural vegetation);
- guiding and encouraging investors;
- implementation of a specific management;
- identifying the values that can form the basis of sustainable tourism;
- ensuring long-term security of investments in tourism;
- encompassing idea of nature conservation and cultural heritage of the region specific strategy for tourism development;
- encouraging new entrants in tourism ecological education of tourists, inventory of natural and cultural peculiarities all that can form the basis of tourism potential and analysis of all information received, assessing the carrying capacity of the different areas, which are components of approved tourist areas.

This increase recorded nationally, it is explained by the fact that the development of rural tourism depends very much on specific regional and the presence of various types of activities, folklore, the existence of ethnographic regions and practicing various agricultural activities. Thus, specific tourism:

- Bucovina (North - East) is religious,
- in Maramures (North-West) - architectural tour and ethnographic
- in Transilvania (Centre) - and cultural recreational tourism, food and wine,
- in the Carpathian foothills is fishing.

Countryside with various features and all its parts and better preserved life in the country with significant traditional components, agricultural and forestry potential of the highlands, the specific architecture of rural areas are natural factors that favor its development. The essential condition of success work in rural tourism organization requires several steps (Fig. 1):
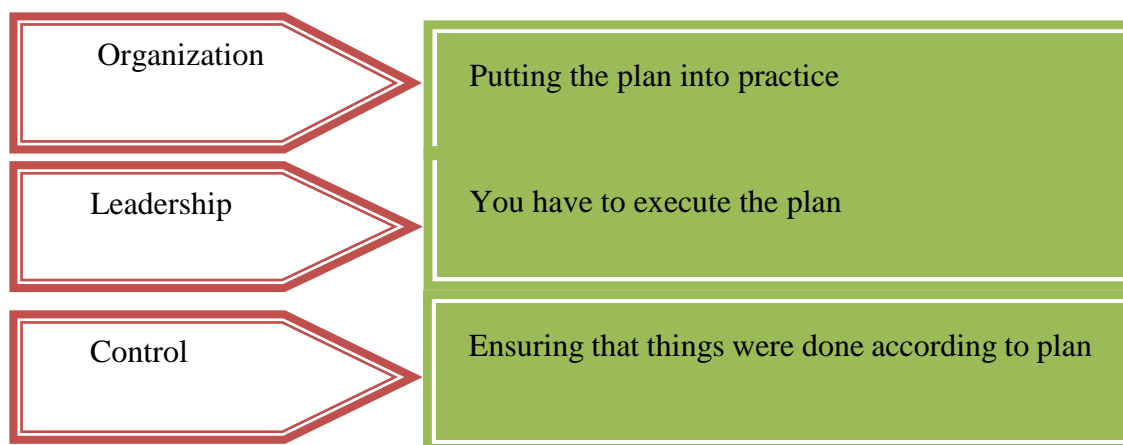
Fig. 1 - Organizational steps in tourism

Planning is paramount to all other activities and finally can argue only unnecessary effort because often entrepreneurs will enter directly into the action and begin concrete visible results in the short term.

To better understand the implications of economic and social development in the tourism industry, it is necessary to know the number of accommodation units in a calendar year or oscillations while the volume and intensity of visitor flows in different areas and tourist resorts inters.

After analyzing government data, national tabulation its comparison reveals increase in the number of rural locations. In the period under review, the ability of existing tourist accommodation in 2014 increased by 2% compared to 2013. And tourism capacity in 2015 increased by 5.5% compared to 2014 (Table 1).

Chart no.1
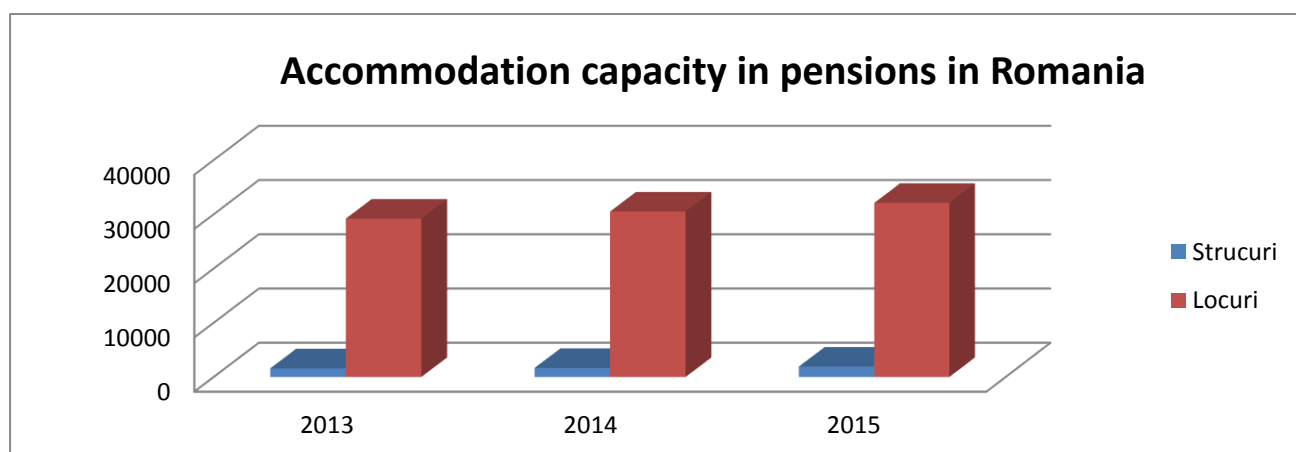
To reflect the agritourism accommodation capacities in Romania, we took into account the number of reception The structure of the National Statistical Institute statistics on years between 2013-2014.

Table nr. 1

TOURISM CAPACITY (NUMBER OF STRUCTURES)			
YEARS	2013	2014	2015
Hotels	1.445	1.473	1.545
Hostels	185	204	248
Motels	215	212	221
Villas	621	624	643
Tourist Chalets	152	162	196
Boarding Houses	1.335	1.323	1.527
Agro Pensions	1.598	1.665	1.918
Bungalows	249	242	280
Other types	209	225	243

Chart no. 2
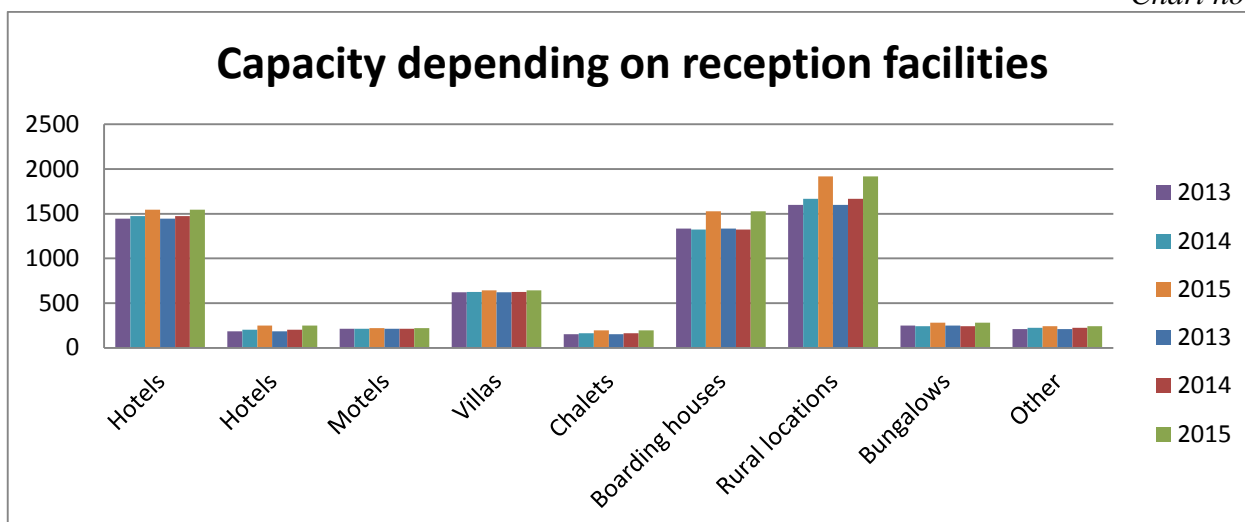
The economic function that rural practice follows:

o ensuring production system tourism that meets the needs and demands of the inhabitants and provide them and their families an adequate level of income compared to that of other liberal professions, with a level of responsibility comparable, thus providing a source of income basic rural population;

o protect the environment and ensure the regeneration of the means of production for future generations in the spirit of sustainable development;

o appearance of activities in most rural areas to stimulate and support initiatives for mountain tourism, especially rural tourism, respect for the natural environment, economic and social diversification small industries of clean production craft, acting on infrastructures and administrative and fiscal procedures.

In terms of accommodation in rural areas currently laying down certain developments and innovations that put the following issues:

o programs of reconstruction and renovation of village houses, for receiving guests, proposing, for optimum productivity, musters housing and a collective tender for local services (known as "shelters" without being provided necessarily work reception tourists, customized for each villager in parts);

o In many European countries there is a diminishing and aging population, which could reduce local development and reduce the economic impacts of tourist accommodation in rural areas;

o implementation and use of these designations of "safe" housing furnished, which are not subject to any control or standardization (labeling), carries a risk of diminishing the importance of name and guarantees its quality, arising out of unjust (inadequate) thereof;

o initiatives are adopted by organizations territorial tourism to regroup tourism offers under a single label, to implement a single strategy to promote tourism product globally, which could lead to a trivialization of tourism at the expense of means receiving specific rural areas, but also to a standardization of villages in terms of tourism;

o a variety of strategies and there tags for rural tourism offer in various western European countries, each region and singled wanting to own products compared to other similar regional products. These activities are justified in seeking a "tourism identity" regional, but are also a source of confusion for consumers.

CONCLUSIONS AND RECOMMENDATIONS

Agritourism is an area that can contribute significantly to the national economy, given that take into account the place, role and importance in the economy. Besides the changes to be made at the organization level, most important effects, evidenced by higher revenues. On motivations that determine consumer to choose one or more travel services, and factors that determine the development of tourist areas, are important factors investors should consider in this industry.

Rural areas must produce renewable raw materials to meet the needs of small and medium agricultural, industrial, craft or commercial service. Activities in most rural small industries pursue diversification of clean production craft, acting on infrastructures and administrative and fiscal procedures, and supporting initiatives in the field of mountain tourism, especially rural tourism, respect for the natural environment, economic and social.

BIBLIOGRAPHY

1. Bîrsan, M., Șușu, Ș,(2013). *Analiza economico-financiară în comerț și turism*, Editura Didactică și Pedagogică, București,
2. Duguleană L., (2012). *Bazele statisticii economice*, Editura C. H. Beck, București
3. Minciu R., coordonator. (2007). *Economia turismului. Aplicații,* Editura Uranus, București,
4. Zaman, Gh., Geamănu, M., (2006). *Eficiența economică*, Editura Fundației România de mâine, București
5. www.insse.ro
6. http://www.mediafax.ro
7. http://ec.europa.eu/eurostat/statistics-explained/index.php/Tourism_statistics/ro

THE IMPORTANCE AND EVOLUTION OF AGROTOURISM IN ROMANIA

Eugenia Dorina CIOBANU (RĂDOI)[1], Petruta Antoneta TUREK-RAHOVEANU[2]

Summary: *According to recent studies and statistical data in the field, agro tourism, a relatively new form of tourism in our country has grown in the last years, becoming at present time the type of tourism with the highest possibility of development and a real chance of getting a large profit for those who are doing it.*

Due to our country's rich natural and anthropical touristic potential, that is diversified and so harmoniously distributed around the territory, the existence of many areas that are still untainted by people's presence and the pollution that accompanies them , of the localities, especially the rural ones that have kept their authenticity, their traditions, customs and their charm from the past, the existence of a vast and interesting history and culture, all of those things make Romania the ideal leisure venue, respectively a strong touristic destination.

Tourists are heading more and more towards peaceful natural destinations from the areas where agriculture is still done in the old ways, the land and the animals being the main sources of nutrition and it being natural obviously. Here, they have the possibility to spend their leisure in a picturesque unpolluted environment, get involved in the main housework and take a break from the bustle and everyday stress from the cram in which they live in the big and crowded cities.

***Key words*:** *agrotourism, tourism, Romania*

JEL Clasification*:Q01*

INTRODUCTION

The excessive urbanization, the cram in which we are forced to live and develop everyday activities and the everyday stress that we all have to go through in order to survive, all of the above, amid the growing trend of sedentary life, make it so that each and everyone's modern XXI century man's life, needs a compensation, a balance of the relaxation state and psychological comfort, respectively those touristic excursions in order to leisure in a relaxing environment.

Starting from these premises, this article submits a short investigation on a theoretical and practical level in which all the Romanian tourism and agrotourism problems have to be approached.

The article's theme is part of the present day frame of changes that happen on a national nevel, changes that have affected and will continue to affect the rural environment, respectively the rural tourism and agrotourism, the forms of tourism that could improve the standard of living of the inhabitants from the rural areas that have touristic potential.

Agrotourism, is defined by romanian authors as " the specific form of rural tourism that has a higher degree of complexity, containing both touristic activity (accommodation, services, recreation) and the economical activity, usually agrarian, made by the hosts for the tourists (production activities, manufacturing agrarian products inside the household and trading them)".[1]

Foreign authors have defined it as: "the entirety of the activities of greeting, accommodating, food and relaxation that take place in an agrarian household (farm); the agrarian tourism (at the farm) proposed by agrarians and interrelated with their traditional activities; greeting activities, accommodating and providing services using an agrarain household (farm) resources that contributes to the increase of economic viability, of the productive function and of it's multifunctionality ".[2]

Thus, rural tourism and agrotourism are real posibilities of economical, social and human development for the rural population and our country has a huge potential in this field.

---

[1] Drd. Eng. Ciobanu (Rădoi) Eugenia-Dorina – University of Agronomic Sciences and Veterinary Medicine - Bucharest, radoi_eugenia_dorina@yahoo.com

[2] Drd. Eng. Petruţa Turek-Rahoveanu – Scientific Researcher III at The Research Institute for Agricultural Economics and Rural Development, turek.petruta@iceadr.ro

Right now, rural tourism and agrotourism consists of rural households that provide a touristic product that doesn't have a very good quality, with a material base and basic services that are not adjusted to the requirements of the clients that have tourism experience and a certain level of demand.

People from the rural areas that have not been altered by modernization, that kept their originality are truly hospitable, they proudly present the romanian ethnography and folklore, giving the tourists the possibility of going back in time and spending leisure in a pictoresque area, but they need more than that in order for this type of tourism, the agrotourism, to be strong enough to improve their living standards, they need a quality product.

Without claiming to exhaust in the following lines a theme that is so extensive and in a continuous change and perfecting state, the article's end goal is highlighting the most important aspects of the country's agrotouristic potential as well as the impact of the agrotourism development upon the inhabitants, especially those from the rural areas with agrotouristic potential.

MATERIALS AND METHODS

As a method of analysis of the agrotourism evolution in Romania, we used the statistical data taken from The National Institute of Statistics website, respectively the statistics conducted on a 10 year period, statistics containing the number of agrotouristic bed and breakfasts and the number of tourists that used them as accommodations for leisure during the studied years.

In order to also set the quality level of agrotourism in our country at present time, respectively 2015, we have used the statistics containing the number of agrotouristic bed and breakfasts ranked by the level of comfort – the owned number of flowers.

RESULTS AND DISCUTIONS

According to The National Institute of Statistics provided data, it shows that the agrotourism evolution in Romania in the last 10 years is significant and constantly growing, as the number of bed and breakfasts has grown from 956 – registered in 2005 upon conducting annual statistics, to 1918 – that were identified later in 2015, after conducting the statistics at the end of the year.

Table 1. The increasing number of agrotouristic bed and breakfasts between 2005-2015 in Romania

Types of tourist accommodation structures with tourist accommodation facilities by types of structures and types of property		
Types of tourist accommodation structures	Types of property	Years
		Year 2005
		UM: Number
		Number
Agrotouristic bed and breakfast	*Total*	*956*
Types of tourist accommodation structures	Types of property	**Year 2015**
		UM: Number
		Number
Agrotouristic bed and breakfast	*Total*	*1918*

Also, in order to confirm the agrotourism evolution as a new type of tourism preffered by tourists, the statistics show that the number of tourists that chose the areas with agrotouristic potential as holiday destination and accommodated in agrotouristic bed and breakfasts increased significantly, from 149.104 tourists accommodated in 2004 in these structures, to 549.302 tourists accommodated in 2014 in the same agrotouristic structures. [3]

Table 2. The number of tourists accommodated in agrotouristic bed and breakfasts in 2004 and 2014

Tourist arrivals in tourist accommodation structures with tourist accommodation facilities by types of structures and types of property		
Types of tourist accommodation structures	Types of property	Years
		Year 2004
		UM: Number of people
		Number of people
Agrotouristic bed and breakfast	**Total**	**149104**
Types of tourist accommodation structures	Types of property	UM: Number of people
		Number of people
		Year 2014
Agrotouristic bed and breakfast	**Total**	**549302**

However, from the statistics made by the same empowered institution, we can see that the level of comfort provided by these accommodation units is lacking and prevents a faster evolution and the capitalizing of the areas with agrotouristic potential.

We can see, according to Table 3, that the number of bed and breakfasts ranked 5 flowers is of only 19 units, meanwhile the units with 1 flower are 57, the rest of bed and breakfasts being ranked 2, 3 and 4 flowers.

Table 3. Romanian 2015 agrotouristic bed and breakfasts ranked with flowers

Tourist accommodation structures with tourist accommodation facilities by types of structures, comfort category and tourist destinations			
Types of tourist accommodation structures	Comfort category	Tourism destinations	Years
			Year 2015
			UM: Number
			Number
Agrotouristic bed and breakfast	**5 flowers**	**Total**	**19**
	4 flower		**214**
	3 flower		**1021**
	2 flower		**607**
	1 flower		**57**

Source :INSS

This shows the fact that că they don't put a lot of emphasis on quality, the units function with basic endowments or a little higher that the minimum accepted level and as we can see in the table below the accommodation capacity is also insufficient.

Table 4. Romanian 2015 agrotouristic bed and breakfasts accomodation capacity

The existing touristic accommodation capacity by types of accommodation structures, counties and localities			
Types of tourist accommodation structures	Counties	Localities	Years
			Year 2015
			UM: Locuri
			Locuri
Agrotouristic bed and breakfast	TOTAL	TOTAL	**35188**

Sourse : INSS

The owners of these units must take example from the highly developed countries in this field, respectively agrotourism: France, Germany, Austria, which through PHARE programs have developed this concept and become leaders in agrotourism. [4]

By organising the whole agrotouristic activity with high attention to details, diversity, recreation, on a material base that has quality and a well thought offer promotion, all of that made it possible for these countries mentioned above to become an example for all the countries with agrotouristic potential, who want to develop this tourism niche.

In Romania, this form of tourism is insufficiently developed and harnessed, despite the touristic and agrotouristic potential that is extremely rich and diverse.

The development of this form of tourism would bring a significant economical growth and an increase of the living standard of the inhabitants from rural areas that have touristic and agrotoursitic potential.

CONCLUSIONS

The conclusions that we can take after the analysis above based on the data aquired from The National Institute of Statistics according to whom, in Romania, there has been a significant increase of the number of agrotouristic bed and breakfasts, and also an increase of the number of tourists accommodated in these units, are the following:

- firstly, in our country there is an important tourism and agrotourism potential and, according to the figures, there is an appeal that is growing year by year, shown by the touristic products consumers toward this type of tourism – the agrotourism;

- secondly, the country's touristic and agrotouristic potential is not exploited and harnessed to the fullest in order to significantly increase the level of living of the inhabitants from the rural areas who exercise rural tourism and agrotourism;

- thirdly, the touristic product is not, also according to figures, a very good quality one and that is shown in the level of classification using flowers of the existing agrotouristic units.

A wider promotion both internal and international, investments in the moderization of the material base, diversifying recreational possibilities, getting local government institutions involved in the touristic activity of the areas that exercise tourism, but also an active involvment of the locals from the areas with high tourism potential, are just a few of the strategies that must be followed in order to have a visible evolution of the romanian tourism and agrotourism and an increase of the level of living of the country's inhabitants taking example from the developed countries in this field.

BIBLIOGRAPHY

[1] Brezuleanu S., Management agroturistic, Editura USAMV Iasi, Iasi 2006

[2] Tire de Mamdy, Jean-Francois, Nathalie Disez et Monique Begon, Agrotourisme et territoires, le cas du Massif central, 2001

[3] www.insse.ro

[4] www.scritub.com

ANALYSIS OF THE FINANCIAL AND ECONOMIC ACTIVITY AGROTURISM

GODJA (DĂNILĂ) DANIELA ILEANA[1]

Abstract: *This study presents the efficiency of tourism enterprises in the market economy, which is the essential condition of its existence. For this reason, economic and financial situation of the company is the basis of tourism taking all decisions and actions that commits additional expenses. Businesses in rural areas need to face some unique conditions that are not in urban areas. For this reason a need expanding business in rural tourism which is the result of creating favorable conditions for harmonization of elements rendered by: offer various types of accommodation; supply food products, traditional folklore, crafts and folklore; offer natural surroundings and environmental requirements; offer paid jobs in rural areas; infrastructural equipment in the public and private services. The impact of tourism on economic sectors is divided into a zone multiplier effects, and incentive plan output, income and employment.*

Keywords: *tourism, economy, economic resources.*

INTRODUCTION

This study presents the efficiency of tourism enterprises in the market economy is the essential condition of its existence. Economic and financial situation of the company is taking all decisions and actions based hiring additional expenses. Premeditation economic efficiency and social agrotourism activity is linked to the need to expand business in rural tourism.

Stage of this efficiency can expose the technical indicators (structure of production, the average annual total production physical) and economic indicators (material expenses, employment costs, production costs, total revenues, rates of recovery, production costs, profits, profit rate).Besides economic efficiency, which seeks in any activity and implicitly in the agro and social efficiency. Highlights and the role it plays in building agrotourism an evolutionary process on mainly:

- improved quality of life, social life revival of villages,
- creating new jobs
- maintain and develop heritage
- beautifying areas with agro potentialities.

The need to expand business in rural tourism is a phenomenon at national level by expanding some categories of factors dominate. This emphasis requires deepening the relationship in time and space-saving environment, which involves achieving a balance between negative and positive effects resulting from the conduct of tourism activities.

MATERIAL AND METHOD

Business enterprise in tourism and rural tourism businesses need action worldwide is a phenomenon extending certain categories of factors dominate.

Action growth and effects and default and increase incomes, consumption of goods and services leads to ensure demand at high levels, increasing the culture and civilization, developing protective measures and security, so the quality of life. Also the demand we prepare for the natural surroundings and the environment; traditional folklore offers paid jobs in rural areas, infrastructural equipment in the public and private services.

---

[1] *Drd. Ing. GODJA (DĂNILĂ) DANIELA ILEANA, UNIVERSITATEA "VALAHIA" DIN TÂRGOVIŞTE - IOSU, godja_daniela_ileana@yahoo.com*

The research method used is qualitative analysis by studying documents and data retrieved and processed by the National Institute of Statistics and literature, bibliographic documentation, studying the results of research conducted on the subject at national level and to study the legislative framework to practice rural tourism in Romania.

RESULTS AND DISCUSSIONS

The influence of tourism on the economy sectors is divided into an area and stimulate multiplier effects in terms of output, income and employment. Agritourism business plan consists initiating analysis which can be for example:
- knowledge of the objectives that we set,
- designation location, the village,
- employment in rural tourist supply,
- leading and participating in business etc. (fig.1)

For the strategy set out to run any additional costs for environmental protection, resources to increase national investment value, as a result of ongoing collaboration between tourism and other sectors, local authorities and government. To define the nature of the proceeds of all activities (agricultural, tourism, services, etc.) Must establish a budget of income and expenses showing sources of revenue and cost of resources used. Estimation of economic efficiency and social activity are related to the need to extend agrotourism business in rural tourism.
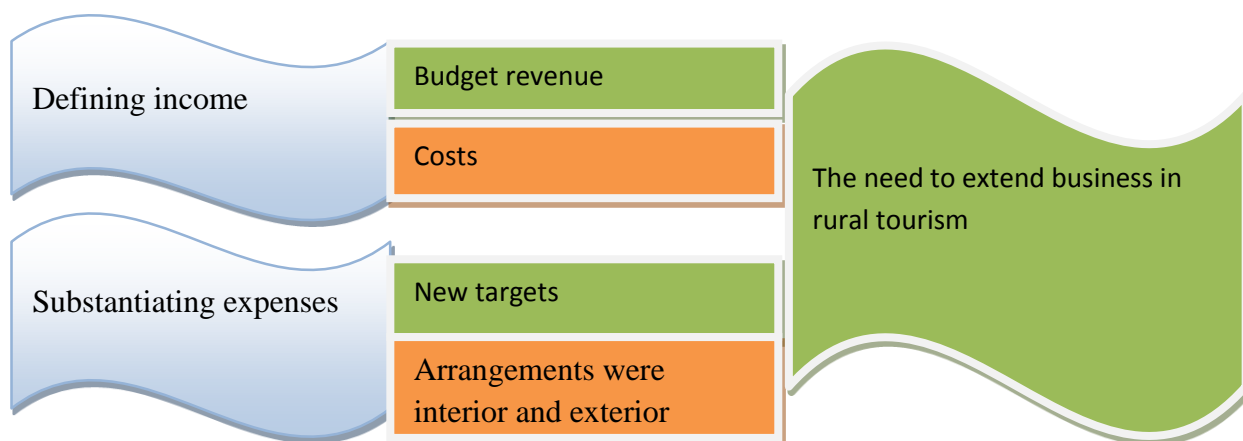
Fig.1 - Leading and participating in business

These issues represent an important award event knowledge and economic efficiency of agricultural production on a farm agrotourism. Expression levels of this efficiency is narrated through technical indicators such as: the production structure, total average annual production and physical production.

Economic indicators are also part of efficiency, they manifested by: material costs, employment costs, costs of production, total income, prices of recovery, costs of production, profit, the rate of profit.

While economic efficiency is followed by a social efficiently. The behavior of a draft funding elaborations important to underscore the following: the satisfaction of tourists existence productivity, management of tourism activities, use of resources, actions and activities, civic and social responsibility, the net result. No action by any business should be reflected in the content of the rural development policies.

Following consultation with the official data in the North West of the country, it is found that revenues from the sale of accommodation and food and possibly other ancillary services were reinvested in accommodation either for maintenance or modernization of spaces necessary and

essential tourists, either through external spatial unit (swings, Best offer furniture, small lakes with fish, creating new traditional wear) or upgrading the accommodation (new building or expansion of the existing vertical / horizontal).

North-West region covers 14% of Romania's territory was established under Law no. 151/1998 (amended by Law No. 315/2004) by meeting Bihor, Bistrita-Nasaud, Cluj, Maramures, Salaj and Satu-Mare. Northwestern is characterized by:
- existence of affordable and varied landscape composed of mountain ranges, plains and depressions
- favorable climate for tourism throughout the year.

In 2013, the North West there were 329 travel agencies licensed by the National Tourism Authority, of which most in Cluj County (167), followed by Bihar (75) and Maramures (38). 55 of travel agencies belong to the National Association of Travel Agencies in Romania, which has a branch for the North West. A well-organized rural tourism can be achieved through a strategy of conservation and can accomplish the occupation as a new alternative to current free time doing various recreational facilities. Rural tourism is characterized as an activity which may adversely affect the development of rural areas, loss of identity by industrialization, changing the mentality, the attitude towards architecture and port, adopting modern patterns in everyday life and activities; therefore it is necessary for the conduct of tourism in rural areas should be planned and managed carefully.

The number of tourist arrivals in Northwestern had an accelerated growth during 2013 - 2014. According to data provided by the NIS in Maramures County next arrivals were recorded for foreign tourists / Romanian in agrotouristic hostels (Table 1):

Table 1

ARRIVALS OF TOURISTS IN THE REGION NV AGROTURISTIC PENSION			
County	*2013*	*2014*	*2015*
BIHIOR	24.375	31.394	36.866
BISTRIȚA NĂSĂUD	2.790	3.444	3.274
CLUJ	27.500	27.531	34.488
MARAMUREȘ	12.519	13.458	17.961
SATU MARE	6.431	6.946	7.693
SĂLAJ	3.712	4.582	6.088
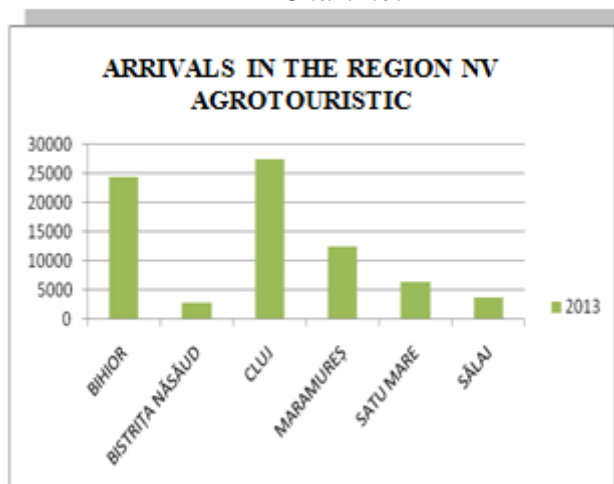
Chart no. 1   *Chart no. 2*
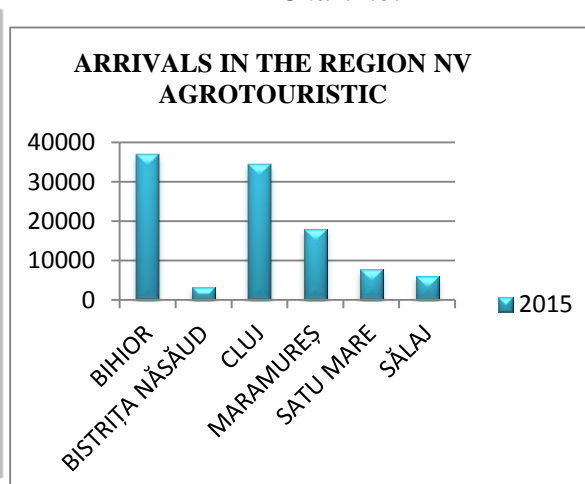
Chart no. 3
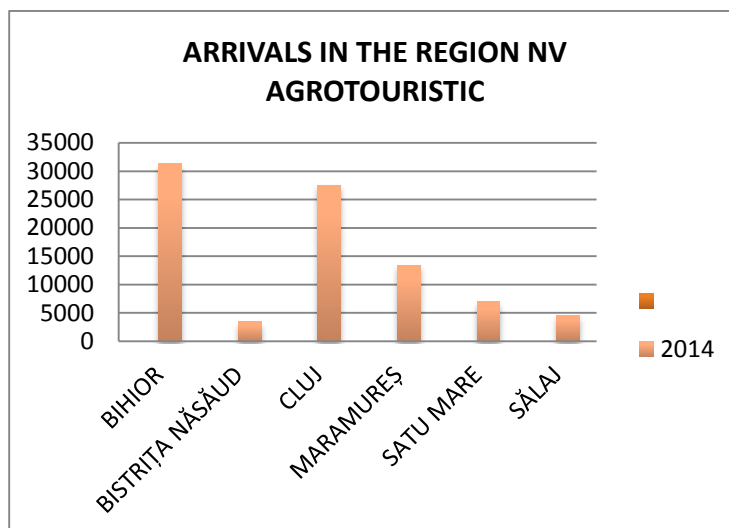
In the period to take part in growth of tourism demand variations, and this leads to economic and financial development.

In tourist literature was given much attention to economic issues and frequent demand for tourism services, and currently is seeking solutions to reduce as much as possible the negative impact of seasonality phenomenon.

To mitigate seasonal fluctuations in tourism need to examine the causes which they determine what will allow you to better recognize the specific nature of these variations. Factors affecting primarily the attractiveness of tourist resorts and seasonality of activity in the studied areas can cause major changes in seasonal tourism activity.

We can analyze the following factors that could cause economic development:
- existence and richness of natural resources and values;
- the widening of individuals need to relax,
- the level and structure of income population;
- duration and structure of free time for recreation
- secondary tourist offer;
- subjective factors with implications tourist behavior.

Analysis of the factors enumerated helps us to appreciate that tourism demand is flexible while tourism offer must keep step with the requirements, constantly changing and evolving of possible customers.

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, we can say that the North West has a high potential and diversified tourism - spa (thermal water or salted, salt mines), cultural (thanks in large cities and thanks to the wealth of historical monuments), mountain, rural, religious (region is imbued with religious traditions), sports and leisure, business tourism, a large number of localities in the region accredited with tourism potential.

The region's largest tourist accommodation capacity in operation meets in Cluj, Bihor and Maramures. Foreigners mostly prefer these three counties, but the number is small and travel packages are not integrated and diversified.

Despite the need for promotion of tourism is realized, there is insufficient information tools and promoting regional tourism and lack of information aimed at the connection between tourist flows and forms of tourism, does not support the harmonious development of specific regional tourism.

Situation analysis indicated that the accommodation traditionally related to ecotourism or adventure tourism (tourist lodges, cabins, rest stops, campsites, etc.) were recorded figures of tourist

arrivals absolutely negligible, only the tens of thousands per year. Analysis average length of stay at the regional show steady declines, the index of capacity utilization also decreased dramatically as a tourist quarter, especially in recent years in the region. There are still some mountain resorts or resorts where length of stay is significantly higher than average where investments should be focused on promoting and recreational services.

BIBLIOGRAPHY

1. Bîrsan, M., Şuşu, Ş,(2013) *Analiza economico-financiară în comerţ şi turism*, Editura Didactică şi Pedagogică, Bucureşti,
2. Minciu R.,(2004) *Economia turismului,* Ediţia a II-a, Editura Uranus, Bucureşti
3. Tălângă Cristian -(2010), *Turism rural-* Universitatea din Bucureşti Editura CREDIS
4. Zaman, Gh., Geamănu, M., (2006) *Eficienţa economică*, Editura Fundaţiei România de mâine, Bucureşti,
5. web www.insse.ro
6. www.muntiimaramuresului.ro

IMPLEMENTATION OF THE LEADER AXIS OF THE RURAL DEVELOPMENT PROGRAMMES 2007-2013 IN MOLDOVA

ALINA-MIRELA MARCU[1]

Abstract: *At European level, LEADER programme appeared in 1990, when the public programs for rural developmental from several countries, were limited about their investment objectives, they were managed in a traditional mode top-down (from the central level to local). Since 2007, LEADER has not represented a Community initiative, but it was been introduced as a axis in the National Rural Development Programme 2007-2013. LEADER was addressed in special to implementation the local development strategies as well as to achievement the cooperation projects, by the operation of Local Action Groups and the establishment of public-private partnerships. In Moldova, the eligible beneficiaries of this axis have applied in particular to financial support of the Local Action Groups, the most projects being implemented in Suceava County (LAG "Sucevita-Putna", LAG "Basin of Dorna", LAG "Bucovina of Mountain") and Bacau County (LAG Valley of the Mountain, LAG Valley of Trotus). A possible explanation of this situation it represents the low capacity to involvement of economic and social partners, of the local community to establish formulas for cooperation, or associations, to ensure a higher level of economic and political affirmation, according to available resources.*

Keywords: Axis, development, Local Action Groups, strategy, programme.

INTRODUCTION

European Commission has designed the LEADER program (from the acronym "Liaison Entre Actions de Développement de l'Économie Rurale" - Links between actions for the development of the rural economy) as a tool of implementing the reforms of the Common Agricultural Policy, in the direction of the sustainable rural communities' development. It was a "Community initiative" financed from the European Union Structural Funds [6] and for to encourage rural territories to become more competitive and be able to overcome the challenges they face, such as population aging, low level of performance or lack of employment opportunities [8].

In Romania, the concept of the LEADER was promoted in the documents approving the Rural Development National Programme 2007-2013, which represents the strategic planning and multiannual financial programming document, developed by a broad partnership that guides and stimulates the socio-economic development of Romania in accordance with European Union Cohesion Policy [5]. Through this programme have been established four priority Axes for funding by European Agricultural Fund for Rural Development, as follows:
• Axis I - Improving the competitiveness of agricultural and forestry sector;
• Axis II - Improving the environment and the countryside;
• Axis III - Improving the quality of life in rural areas and diversification of the rural economy;
• Axis IV – LEADER.

The overall objective of LEADER Axis had in mind the starting and operation of local interest initiatives, using the approach "bottom up" and the involvement of local stakeholders for the implementation of rural development policy [7]. The aim of this axis was to improve the local governance through the establishment and operation of Local Action Groups (LAGs) [4]. These groups were an important element in rural development because they contributed to create a local development strategy, respectively a detailed development plan for a particular rural territory, and were responsible for the project submission and coordination process [3].

The most frequent types of cooperation between LAGs were communications (the exchange of information), educational activities, research, marketing strategies, the strategies of products' development and promotion. That is why the LEADER is considered to be the "laboratory of new ideas".[2] Regarding the LEADER target areas, they are by point of view geographically, socially and physically, homogeneous small territories, often characterized by common traditions, local identity, common needs and expectations [1].

---
[1] Ph.D. Alina-Mirela Marcu, "Alexandru Ioan Cuza" University of Iasi, Romania, E-mail: alina_marcu87@yahoo.com

MATERIAL AND METHOD

For the programming period 2007-2013, LEADER represented the fourth generation of implementing initiatives Leader I, Leader II and Leader +. In the EU-10, a similar measure has been implemented in six of the new Member States, in the EU-15 about 52 million people lived in territories belonging to the Local Action Groups, and in the EU27, LEADER constituted about 6% from the contribution of the European Fund for Agriculture and Rural Development.

In Romania, the authorities responsible for implementing LEADER Axis were: Ministry of Agriculture and Rural Development - the Managing Authority for for RDP, Directorates for Agriculture and Rural Development (Managing Authority representatives at the county level), the Payment Agency for Rural Development and Fishing (authority for implementation financial and technical of measures), and Local Action Groups responsible for developing and implementing local development strategies and project selection.

After consulting the information published by these institutions about the eligible beneficiaries of Measure 431 financed by the European Fund for Agriculture and Rural Development, it was taken into account the realization an detailed analysis of selection and functioning of Local Action Groups in Moldova, by using statistical and mapping methods.

RESULTS AND DISCUSSIONS

Development of rural space from Moldova through Axis IV LEADER was influenced by local actors in quality of decision makers and responsible for evolution over time of delimited territorial areas in which they acted. Thus, at the Local Action Groups level, public private partnerships were formed up of representatives of sectors: public (public administration and public services), private (commercial sector, financial sector, agricultural sector, organizations of entrepreneurs, companies providing community services), and civil society (non-profit organizations, associations, foundations, individuals, groups of individuals not formally registered).

Regarding activities undertaken under Axis IV, they have been summarized in the following measures:
• Measure 41 - "Implementation of local development strategies" in order to increase competitiveness of agriculture and forestry sectors, improving the environment and the countryside, increasing the quality of life and diversifying the economic activities of rural space through the implementation of integrated strategies of local development.
• Measure 421 - "Implementing cooperation projects" to optimize local strategies supporting actors at local level to implement expansion projects of experiences, to stimulate and support innovation, obtaining skills and improve them both inter-territorial but also transnational.
• Measure 431 - "Functioning Local Action Groups, skills acquisition and animation of territory", by forming partnerships, preparing and ensuring the implementation of local development strategies. This measure, in turn, was divided in two sub-measures:
- Sub-measure 431.1 which has supported the development of public-private partnerships, achieving local development strategies and local development plan to participate in the selection of the Local Action Groups (LAGs);
- Sub-measure 431.2 which provided to LAGs the financial support for performing functioning expenditures, animation and skills training.

The accentuated preoccupation of rural localities from Moldova to form Local Action Groups, was due to eligibility criteria of the National Rural Development Programme (RDP) which has limited the presence of urban localities with a population of over 20,000 inhabitants in the composition of the LAG. Through the inclusion of small towns in these structures it was taken into account the insurance of territorial cohesion, of human resources, financial and economic to supporting the local development strategies of the territory.

But to benefit from European funds allocated by Axis LEADER of National Rural Development Programme 2007-2013, public-private partnerships in Romania participated in 2011 in a selection process organized by the Managing Authority for RDP of the Ministry of Agriculture and Rural development. After the selection process these partnerships have become official Local Action Groups.

According to information provided by the Ministry of Agriculture and Rural Development in Moldova currently operates 40 local action groups (Table 1), of which 16 were selected in 2011 and 24 in 2012, each comprising localities from one or more counties. From the administrative point of view, on the teritory of Vrancea County meet, most associations type GAL (7), followed by the counties of Iasi (6); Bacau, Neamt, Suceava, Vaslui (5) at the opposite end being Galaţi County with 3 GAL type associations.

Table no. 1: List of Local Action Groups selected by AM-RDP in Moldova

COUNTY	YEAR	LOCAL ACTION GROUPS
BACAU	2011	The Local Action Group "Valley of the Mountain" The Association of Local Action Group "Valley of Trotus"
	2012	The Association of Local Development Group "Green Bacau" The Association of Local Development Group "Valley of Tazlau" The Association of Local Action Group "Tutova Hills"
BOTOSANI	2011	The Association of Rural Development Group "HertaWoods" The Association of Local Action Group "Siret Upper Valley"
	2012	The Association of Local Action Group "Baseu Upper Valley" The Local Action Group "Moldova Hills"
GALATI	2011	The Local Action Group "Zonal Development Association Tecuci"
	2012	The Association of Local Action Group "Floodplain of Siret" The Association of Local Action Group "Covurlui"
IASI	2011	The Association of Local Action Group "Valley of Prut"
	2012	The Association of Local Action Group "Rediu- Prajeni Region" The Association of Local Action Group "Southwest Iasi" The Association of Local Action Group "Iasi Hills" The Association of Local Action Group "Stefan cel Mare" The Association of Local Action Group "Belcesti-Focuri Microregion"
NEAMT	2011	The Association of Local Action Group "Ceahlau" The Association of Local Action Group "Nicolae Roznovanu"
	2012	The Local Action Group "North Plateau of Barlad" The Local Action Group "Stefan cel Mare" The Local Action Group "Valley of Siret"
SUCEAVA	2011	The Association of Local Action Group "Basin of Dorna" The Association of Local Action Group "Bucovina of Mountain"
	2012	The Local Action Group "Northern Confluente" The Local Action Group "Sucevita-Putna" The Association of Local Action Group "Land of Bucovina-Old Fratauti"
VASLUI	2011	The Association of Local Action Group "Moldo-Prut" The Association of Local Action Group "Burcel's mound-North Vaslui" The Association of Local Action Group "High Bridge-Vaslui"
	2012	The Association "Valley of Tutova and Zeletin" The Association "Valley of Racova"
VRANCEA	2011	The Association of Local Action Group "Country of Vrancea" The Association of Local Action Group "Green Siret" The Local Action Group "Vrancea South East"
	2012	The Association of Local Action Group "Land of Vine and Wine" The Association of Local Action Group "Panciu Vineyard" The Association of Local Action Group "Valley of Ramnic" The Association of Local Action Group "Dacian Forests"

Source: Ministry of Agriculture and Rural Development

Also, statistical data published on the website of the Agency of Payments for Rural Development and Fisheries provided information on financial support granted by Measure 431.1 for preparing applications for the selection of the Local Action Groups and construction of public-private partnerships, sub-measure carried out in three phases.

Therefore, Phases 1 and 2 of Sub-measure 431.1 consisted of organizing training on the LEADER approach and had as direct beneficiaries of public or private entities in the field of training, information and diffusion of knowledge, selected according to the procurement procedure public. Among the final beneficiaries were in the first phase: economic and social partners, civil society representatives and public partners in the territories potential LEADER, and in the second phase: the representatives or members of a group composed of at least two private organizations and a public institution from potential territory which followed Phase 1 or who could demonstrate that have knowledge and experience of the LEADER approach. By Phase 3 was granted financial support for the preparation of local development plans to selection of LAGs.

Regarding the status of implementation Sub-measure 431.1 in Moldova, the statistics published indicate that regionally have been supported 18 public-private partnerships, with a total financial value of 843.430 Euro. The most initiatives for preparing dossiers for selection of LAGs were funded in Suceava County (5 projects) and in Counties Bacau (4 projects) and Iasi (3 projects), in contrast to the Galaţi County where was not selected any partnership . (Fig. No.1)

Thus, at the initiative Intercommunal Development Association Obcinile Bucovina, to implement the project "Establishment and strategic planning of the Local Action Group Bucovina of Mountain", was founded Local Group of Action "Bucovina of Mountain", a public-private partnership made up of 10 communes in the county of Suceava (Breaza, Frumosu, Fundu Moldovei, Izvoarele Sucevei, Moldova Sulita, Moldovita, Pojorata, Sadova, Vama, Vatra Moldovitei), of Suceava County Council, Forest District Pojorata, 34 commercial companies and 16 associations. All on the territory of Suceava County has received financial support and the project conducted by the Professional Association for Regional Management Suceava for creating the Local Action Group "Sucevita-Putna". This group was formed by the association of local governments and private entrepreneurs of the 16 administrative units, respectively 15 localities (Arbore, Brodina, Burla, Cacica, Horodnic de Jos, Horodnic de Sus, Iaslovat, Manastirea Humorului, Marginea, Poieni Solca, Putna, Straja, Sucevita, Ulma, Volovat) and Solca city.

Among the beneficiaries of the sub-measure 431.1 was counted and the Association of Local Action Group "Moldo-Prut", made up of 17 communes (Arsura, Berezeni, Blagesti, Bunesti-Averesti, Cretesti, Dimitrie-Cantemir, Dranceni, Duda-Epureni, Falciu, Hoceni, Lunca Banului, Malusteni, Oltenesti, Padureni, Stanilesti, Tatarani and Vetrisoaia) and Murgeni city, with an area of 1.479 km², representing 27.8% of the county of Vaslui. The initiative to set up of this association was manifested among the 43 public and private partners (municipalities, farmers, agents from private economic environment, associations of animal breeders and non-governmental organizations) who have filed joint efforts to obtain the financing of project "Construction, public-private partnership and dossier preparation for LAG selection, Moldo-Prut territory, Vaslui county", amounting to 49,000 Euro.

Also, the Association "Obstilor Vrancene" benefited from European support to establish Local Action Group "Country of Vrancea" in the composition of which exist 15 localities (Barsesti, Campuri, Naruja, Negrilesti, Nereju, Nistoresti, Paltin, Paulesti, Racoasa, Spulber, Tulnici, Valea Sarii, Vidra, Vizantea-Livezi, Vrancioaia) all from Vrancea County. The LAG initiators decided to call him "Country of Vrancea" because localities coincide with ancient historical province "Republic of Vrancea" mentioned by great encyclopedic scholar and prince of Moldavia, Dimitrie Cantemir in one of the most important of his works "Descriptio Moldaviae". However, the territory of LAG "Country of Vrancea" is a distinct ethnographic area due preserving traditional cultural heritage reflected in objectives heritage and popular culture, habits and ancient crafts, but especially in gastronomic products with traditional specific: sheep cheese at Bârseşti, mutton sausages smoked at Racoasa, plum brandy at Tulnici, and so on.

Fig. No 1. Implementation of the LEADER Axis in Moldova - The total number of projects

IMPLEMENTATION OF THE LEADER AXIS IN MOLDOVA
RDP 2007-2013 / Total number of projects

UKRAINE

REPUBLIC OF MOLDOVA

LEGEND

Local Action Groups

Selected in 2011

Selected in 2012

Sub-measures

Sub-measure 431.1.

Sub-measure 431.2.

Total Projects

5 Suceava
3 Iasi
1 Neamt

Sources: The Payment Agency for Rural Development and Fishing
Ministry of Agriculture and Rural Development
Author: Alina-Mirela Marcu, 2016

0   10   20   40 km

Made with Philcarto, http://philcarto.free.fr

Looking at the Figure 1, we see that the state of implementation of the second Sub-measures (431.2) in Moldova differs from the previous in that the spatial distribution of the completed projects presents a new hierarchy in the territorial level. Thus, it can be noted a higher percentage of investments in counties Vaslui and Vrancea (3 projects), succeeded by counties

Bacau, Botosani, Neamt and Suceava (2 projects), on the last place being counties of Galati and Iasi (1 project) .

In this context, a possible justification can be given that the amount allocated to finance the Sub-measures has been divided between the two components as follows: Component A - The functioning of Local Action Group had a percentage at most 80%, and Component B - Training and animation of territory after the selection of LAG had a minimum percentage of 20% of the total amount allocated under Sub-measure 431.2.

CONCLUSION

In conclusion, LEADER Axis has provided new opportunities for rural development in Moldova through strengthening capacity to implement regional strategies. Thus, by addressing the "bottom up", were mobilized local actors in order to create of methods and working practices common by meeting all public, private organisation and of civil society, to the Local Action Groups level for finding new solutions to persistent rural problems. Therefore, the socio-economic factors from Moldova have managed to achieve an effective collaboration to produce goods and services quality with the purpose of capitalization the natural potential and of cultural activities, of improvement the relations between producers and consumers, due to the development of public-private partnerships.

BIBLIOGRAPHY

1. Ailenei D., Morosa L.C. (2011). *Local Action Groups – the European integration catalyst for the Romanianrural area. Annals of University of Oradea, Tom XX, Iulie 2011, 40-46.*
2. *Lošták M. Hudečková H. (2008). Agriculture and farming related activities: their actors and position in the LEADER approach. AGRIC. ECON. – CZECH, 54, 2008 (6): 245-262.*
3. Mietule I., Zvaigzne A. (2015). *Assessment of the strategy of the Local Action Group "Partnership of Rezekne District communities". Proceedings of the 7th International Scientific Conference Rural Development – Towards the Transfer of Knowledge, Innovations and Social Progress, 19-20 November 2015, Aleksandras Stulginskis University, Lithuania, 1-7.*
4. Mosora L.-C., Mosora M.-H., (2012). *The importance of Local Action Groups in the Romanian European Integration Process: an Empirical Study. Published in Informatica Economica Vol. 16, No. 4/2012, 44-28.*
5. Parjoleanu R. (2015). *The implementation of the LEADER approach in Romania. Romanian Economic and Business Review, Vol 10, No.4, 102-116.*
6. Polgár (Deszke) K-D, Duguleană L.(2015). *Characteristics of LEADER program for rural development in Romania. Bulletin of the Transilvania University of Brasov. Series V: Economic Sciences, Vol.8 (57) No.1, 249-256.*
7. Turek Rahoveanu A., Turek Rahoveanu M. M. (2013). *Socio-economic development prospects of rural areas in the context of application of LEADER Program in Romania. Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol. 13, Issue 4, 295-302.*
8. *** European Communities. (2006). *The LEADER approach – a basic guide*. Office for Official Publications of the European Communities, Printed in Belgium, 1-23.

THE TOURISM AND AGRO-TOURISM POTENTIAL ANALYSIS IN TULCEA COUNTY

EUGENIA-DORINA CIOBANU(RĂDOI)[1], RALUCA NECULA[2]

Abstract. Tulcea County is a special tourist area, with a natural and anthropic touristic potential extremely rich and with real development opportunities in this area. An analysis of the touristic activity in the county can be particularly useful, so this work intends to analyze and present the touristic potential and the agrotourism potential of Tulcea County and the degree of use of it at this point. All these analyses will be made having in sight the elaboration and implementation of some potential effective strategies of development and recovery, at maximum range, in the touristic activity, also present and in the future.

Through the development of touristic and agrotouristic pensions' activity carried out in this area, will be able to record the visible developments, economic and social developments in the County, leading to an increase in the standard of living of the inhabitants, especially those from rural areas, who are currently living at the edge of existence.

Keywords : *agro-tourism, rural tourism, Tulcea Region, Romania*

Classification JEL: Q01, Z3, O13

INTRODUCTION

In the last decade, in Tulcea County were allotted important amounts of money for carrying out a major study on the tourism opportunities evaluation, tourism being regarded as a fundamental factor in the economic and social development of the area.

Of the total population of County, 50.7% live in the rural areas, the agrotourism and rural tourism having the opportunity to play an important role in the touristic activity of the County, to increase the standard of living of the inhabitants.

Table 1. The habitable surface evolution on residence areas, in Tulcea County, 1990-2015

Specification	MU	1990	2000	2010	2015	Mean	Standard deviation	Variation coeff.	Annual rhythm
						Th. m²	Th. m²	%	%
County Total	Th. m²	2,953	3,280	3,897	4,341	3,653	447.7	12.3	1.55
	%	100.0	111.1	132.0	147.0	x	x	x	x
TULCEA	Th. m²	917	999	1,240	1,307	1,134	146.1	12.9	1.43
	%	100.0	108.9	135.2	142.5	x	x	x	x
BABADAG	Th. m²	91	114	140	172	132	24.5	18.6	2.58
	%	100.0	125.3	153.8	189.0	x	x	x	x
ISACCEA	Th. m²	56	63	85	96	76	13.7	18.0	2.18
	%	100.0	112.5	151.8	171.4	x	x	x	x
MACIN	Th. m²	107	131	154	175	145	18.9	13.1	1.99
	%	100.0	122.4	143.9	163.6	x	x	x	x
SULINA	Th. m²	62	70	75	83	73	5.1	7.0	1.17
	%	100.0	112.9	121.0	133.9	x	x	x	x
Urban Total	Th. m²	1,233	1,377	1,694	1,833	1,559	205.9	13.2	1.60
	%	100.0	111.7	137.4	148.7	x	x	x	x
Rural Total	Th. m²	1,720	1,903	2,203	2,508	2,094	245.3	11.7	1.52
	%	100.0	110.6	128.1	145.8	x	x	x	x

Processed by: Data from NIS, available at www.insse.ro [4]

From the data given by the National Institute of Statistics, it shows that the number of County residents registered in the year 2015, was of 205,965 inhabitants, of whom 96, 032 live in the urban area and 109, 933 in rural area. From the table 1 data, it can be seen that in the countryside, the habitable space was of 2,094 thousand m² in rural areas and of 1,559 m² thousands in urban areas, as an average of the years 1990-2015. The habitable space growth rhythm is approximately the same: 1.60% in urban areas and in rural 1.52%.

[1] PhD. Student, University of Agronomical Sciences and Veterinary Medicine, Bucharest, Mărăşti Blvd. No. 59, sector 1, Bucharest, Romania, 011464, E-mail: radoi_eugenia_dorina@yahoo .com
[2] Lecturer, PhD., University of Agronomical Sciences and Veterinary Medicine, Bucharest, Mărăşti Blvd. No. 59, sector 1, Bucharest, Romania, 011464, E-mail: raluca_nec@yahoo.com

To be noted that half of the County's surface is occupied with the wetlands of the Danube Delta, and belonging to the Biosphere Reserve which is declared starting with year 1990 by UNESCO as natural heritage of world importance, unique in Romania and in Europe. This natural objective can be an important touristic objective for Tulcea County and for Romania [7]

The Danube Delta is also included in the Network Natura 2000, the European network of protected natural areas. The Danube Delta comprises a large number of wild species and natural habitats of Community interest. The area presents interest both for the nature protection, and to maintain these unique natural spaces in the long run. The Danube Delta ensures at the same time the necessary resources for a socio-economic development in this geographic zone. [6]

The main activities in the area are fishing and agriculture, cumulating together approximately 65% of the economic activities carried out in the County.

The tourism activity is not very developed in the area, and even registered a decline over the past 20 years, the number of tourists decreasing from one year to another, despite the rich touristic potential at the disposal of Tulcea County.

Fig 1. Tulcea County (http://www.turistinfo.ro/judet-tulcea)

MATERIALS AND METHODS

Within the method of the touristic and agrotourism potential analysis of Tulcea County , were used the following indicators: the indicators characterizing the natural conditions, the scores on the assessment of the touristic potential in the administrative-territorial units in relation to anthropogenic and natural touristic resources, infrastructure and specific activity of tourism and the SWOT analysis of the County in terms of tourism.

RESULTS AND DISCUSSIONS

Tulcea County has been analyzed from the following points of view: (1) by natural conditions, (2) through the level scores of the existing touristic potential, (3) through the existing touristic structures and (4) through the SWOT analysis.

(1) **Natural conditions**.

According to the data presented by the Ministry of Environment, Water and Forests-National Agency for Environmental Protection-Tulcea, we can observe the following:

Air -it is of good quality, which favors the practice of tourism, there are no effects of ambient air pollution on health, ecosystems, soil or vegetation, conclusions drawn as a result of the analyses of the atmospheric pollutants, pollutant SO_2, the only pollutant that registered valid date over 75%, according to the Law 104/2011. (Table 2) "

Table 2. The average annual concentrations for SO₂ pollutant, for the period 2008-2014

Pollutant	Station type	Annual average concentration			
		2008	2010	2013	2015
		Limit value: 20(µg/mc)			
SO₂(µg/mc)	TL1-traffic	5.88	3.37	4.99	16.94
	TL2-industrial	2.12	3.30	3.57	-
	TL3-traffic/ suburban		3.75	5.30	-

Annual Report 2015 , Ministry of Environment, Water and Forests National Environmental Protection Agency [2]

Water –the water resources of the County are marked, 207,874,382 thousand m³. The largest amount is due to the existence of the Danube River, with the largest intake of water, and which constitute the main attraction of the area. (Table 3)

Table 3. Water resources in thousands cub meters

Water resources Th. M3	
Surface water(Inland rivers + Danube)	207,704,230
Underground waters	170,152.05
Total	207,874,382.05

Annual Report 2015 , Ministry of Environment, Water and Forests
National Environmental Protection Agency [2]

Soil -grey dark soils of category levigable chernoziums, which are characteristic for this County. Soils thickness varies between 2.0 and 3.5 m, pH is neutral, and for agricultural uses, falls of grade III quality, which favors agriculture. In conclusion the soils condition in the County is relatively good, however these are affected by flooding, drought regularly extended, fires, excessive grazing and practicing a nonorganic tourism.

Landscape and biodiversity -the geographical location of the County makes on its territory to be almost all forms of relief: from the Măcinului Mountains -the oldest mountains in Romania and among the oldest in Europe and up to the Danube Delta-land still in formation, the newest ground in the country.

The existence of the Danube Delta Biosphere Reserve, favors the highest biodiversity in the Country, and of course the biggest attraction for tourists from all over the world.

The Danube Delta is known for its diversity of habitats and the forms of life which it hosts, constitutes a true Museum of biodiversity, a natural gene bank of inestimable value for the universal natural heritage recognized by the three-time protection status which it holds: A biosphere reserve, wetland of international importance especially as a habitat of water birds-Site Ramsar and part of the World Natural Heritage [2]

(2) The level scores of the existing potential

Another important aspect of the analysis is to establish the scores of the touristic potential for each village and every town.

For the calculation of these scores, it have been taken into account the existence of the natural attractions, the anthropogenic objectives and the specific infrastructure from the analyzed areas.

Further will be presented and analyzed in detail, 3 tables, in which are presented the cities and villages of the district, with scores being awarded on the basis of the touristic potential, from two analysis perspectives, and a third table, where the County is analyzed using the SWOT analysis, to draw some conclusions more realistic regarding the touristic potential of the area and possibilities for development and recovery.

According to the data of table 4, the data arising from the score application in tourism according to the criteria established for a project financing submitted under the measure 3.1.3,

conducted by PNDR, annex 10, maximum score achieved by the villages in Tulcea County was 8 points out of 10. [5]

The eight points were obtained by only 2 villages, in 8 villages were booked by 6 points, 4 villages have received five points, the majority of the villages, i.e., 13 of those 46 obtained, 4 points, 3 points got 8 villages, 2 points won 7 villages and 1 point have received 4 villages.

Table 4. The list of villages in Tulcea County with the score awarded in relation to the touristic potential

No. crt.	Villages	Score	Total	
			No.	%
1	Niculițel, Sfântu Gheorghe	8	2	4.3
2	Beidaud, Jurilovca, Luncavița, Mahmudia, Murighiol, Nufăru, Sarichioi, Valea Nucarilor	6	8	10.8
3	Baia, Beștepe, Jijila, Slava Cercheza	5	4	5.4
4	Ceatalchioi, Cerna, Chilia Veche, Crișan, Hamcearca, Maliuc, Ostrov, Pardina, Peceneaga, Smârdan, Somova, Topolog, Turcoaia	4	13	17.5
5	Casimcea, Ceamurlia de Jos, Ciucurova, Frecatei, Izvoarele, Mihai Bravu, Văcăreni, Valea Teilor	3	8	10.8
6	Carcaliu, Dăeni, Greci, Grindu, I.C. Brătianu, Nalbant, Stejaru	2	7	9.5
7	C.A. Rosetti, Dorobanțu, Horia, Mihail Kogălniceanu	1	4	5.4
	Total villages with score in tourism		46	100

Source: Processed by: * PNDR, Measure 313, Annex 10, file:///C:/Users/user/Downloads/pndr_masura_313___anexa_10_lista_comunelor_cu_potential_turistic_ridicat_m313__ actualizat_14112008.pdf [3]

After the presentation and analysis of the list of villages in Tulcea County with the score awarded in relation to the touristic potential, resulting from the application of the criterion established in PNDR, 313, annex 10, villages with touristic potential, we present and analyze the structure of cities/villages with touristic score determined according to MDRT, 2008, Methodology regarding the evaluation of the touristic potential in the administrative-territorial units , according to the data presented in table 5. [3]

In determining the touristic scores were used as basis indicators, the natural touristic resources, the anthropogenic touristic resources and the specific touristic infrastructure.

Were analyzed all the County's villages and each of it has obtained a score that represents the area's touristic potential.

The total scores were assigned into groups, as follows: 1 to 9 points, from 10 to 19, 20 to 29 points, from 30 to 39 points.

In the first group, with scores ranging from 1 to 9 points, we have 10 villages, who scored only at natural touristic resources, in the second group, with scores determined from 10 to 19 points, we have 25 villages and 2 towns- Isaccea and Măcin, who punctuated at the anthropogenic and natural touristic resources, but were very weak at specific touristic infrastructure almost nonexistent, in the group of 20 to 29 points, the 11 villages and 2 towns -Sulina and Babadag, have scored in all three indicators, here observing the highest scores on all aspects of analysis, and the group of scores from 30 to 39 points, we have one town namely Tulcea, the County seat, who scored both at the anthropogenic and natural touristic resources and the existence of specific touristic infrastructure, cumulating a total score of 38 points.

Overall, no town or village, has not exceeded 40 points for touristic potential anthropogenic and natural and specific touristic infrastructure, biggest deficit being the tourist infrastructure, specific branch suitable underdeveloped for an efficient use of this area with a rich touristic potential and a strong source of recovery to create revenue and raising the standard of living of the inhabitants of the County.

Table 5. Structure of towns/villages in Tulcea County according to touristic score

No.	Towns/villages	Total towns/villages		Total score	Touristic resources		Specific touristic infrastructure	Total
		No.	%		Natural	Anthropogenic		
1	Dorobantu, Frecatei, Greci, I.C. Bratianu, Stejaru, Valea Teilor, Daeni, Grindu, Smardan, Vacareni	10	19.6	1 to 9	3.6	0	0	3.6
2	Beidaud, Hamcearca, Horia, Nalbant, Mihail Kogalniceanu, Baia, Ciucurova, Niculitel, Slava Cercheza, Topolog, Carcaliu, Ceamurlia de Jos, Jijila, Mihai Bravu, Ostrov, Sarichioi, Macin, Ceatalchioi, Pardina, C.A. Rosetti, Casimcea, Izvoarele, Jurilovca, Bestepe, Peceneaga, Isaccea, Cerna	27	52.9	10 to 19	5.6	7.5	0.2	13.3
3	Sfantu Gherghe, Sornova, Crisan, Luncavita, Chilia Veche, Turcoaia, Sulina, Nufaru, Mahmudia, Maliuc, Murighiol, Valea Nucarilor, Babadag							
4	Tulcea	1	1.9	30 to 39	14	17	7	38
5	Total	51	100	x	36	32.3	11.5	79.8

Source: Processed by: MDRT, 2008, Methodology to measure the tourism potential in the administrative-territorial base units

(3) Touristic structures

One aspect, equally important as the above, is the identification and presentation of the evolution of the number of touristic establishments with the accommodation functions existent in the County.

Analyzing the data in table 6, we see a slight increase in the number of structures with functions of accommodation between 2001-2015.

The number of establishments has increased, from 85 units in 2001, to 140 units in 2015, the annual growth being of 3.63 units.

We analyzed in depth, the representative units of accommodation, respectively touristic hotels and pensions and we see a significant increase in the past 15 years, the increasing number of hotels, from 13 units in 2001, to 20 units in 2015, while the agrotourist pensions number increased from 11 units to 16 units, having been recorded in 2005 a number of 20 units.

The highest annual growth rate, had the touristic pensions, 4.29 units per year, their numbers almost doubled in the past 15 years, from 5 units in 2001 to 9 units in 2015.

Table 6. Establishments of tourist reception with functions of tourist accommodation

Structures type	MU	2001	2005	2010	2015	Mean	Standard deviation	Variation coefficient	Annual rhythm
						Th. m^2	Th. m^2	%	%
Total	No.	85	128	127	140	122	20.9	17.1	3.63
	%	100	150.6	149.4	164.7	143.7	x	x	x
Hotels	No.	13	16	14	20	17	2.6	15.2	3.12
	%	100	123.1	107.7	153.8	129.7	x	x	x
Touristic pensions	No.	5	10	4	9	7	2.4	32.4	4.29
	%	100	200	80	180	149.3	x	x	x
Agrotouristic pensions	No.	11	20	12	16	17	5.7	32.9	2.71
	%	100	181.8	109.1	145.5	158.2	x	x	x

Source: Processed after : NIS Statistics-tourism,
 http://statistici.insse.ro/shop/index.jsp?page=tempo3&lang=ro&ind=TUR101C [4]

(4) SWOT Analysis.

Next, we will make a SWOT of Tulcea County as a touristic destination, by analyzing the strengths and weaknesses of the County, from a tourist point of view, the opportunities, but also threats, acting on the area.

As a result of this analysis, we notice, that the County has various strengths and opportunities in relation to the weaknesses and threats identified by us in the framework of this comprehensive analysis.

The presence of the Danube Delta Biosphere Reserve-a landmark, unique in Europe, the third most important in the world and an important scientific point, make from Tulcea County a strong touristic area, with multiple possibilities of development.

To be done, in the future, is to take account of the most efficient possible capitalization, resulting from the implementation of programmes and strategies for the development and recovery of the area through tourism, which should clearly show these strengths and to take account of the opportunities offered by the County, which are quite a few, and with real possibilities for development and implementation (table 7).

Table 7. The SWOT analysis of Tulcea County-touristic destination

Strengths	Weak points
The Danube Delta, the most important landmark of Romania-biosphere reserve; Authenticity, tradition and gastronomy, based on area-specific natural products; Possibility of practicing the agrotourism and the development opportunities of this branch; On Tulcea County territory there are many cultural vestiges and historical monuments; Touristic potential is diversified, represented by protected areas, unpolluted rural areas, natural parks, cultural attractions and fishing.	Insufficient promotion of the area; Underdeveloped touristic infrastructure and insufficient; To the touristic objectives the traffic routes infrastructure is weak, sometimes impossible; Low standard of living of the inhabitants and the existence of many communities in rural areas without utility such as water, sewage, gas, etc. Cultural and tourist events are rare and unpromoted properly in the County.
Opportunities	**Threats**
Real possibilities for development of tourism and rural tourism; The possibility of accessing the structural funds through the POSDRU projects; The development of the various types of tourism, allowing the area practicing many forms of tourism; The development of organic agriculture.	The touristic objectives degradation; The increase in the rate of unemployment and the migration of rural residents; Poor absorption of grants, may lead to a fall in the value of funds allocated to the County.

Source: authors ' own Analysis.

CONCLUSIONS

In conclusion, Tulcea County is a county of our country with a diverse natural and anthropic touristic potential and with a high degree of interest for different segments of tourists, with the possibility of multiple forms of tourism, from the travel tourism to sports tourism (sport fishing), up to a scientific tourism.

Agrotourism can be a real opportunity for the development of the standard of living of the inhabitants in the rural area of the County, who are now living on the edge of the existence and that's because agrotourism is able to capitalize on their existing surplus of accommodation in the peasant household by engaging tourists in and supply management services and activities (meals, accommodation, interact with the social and natural environment) in the peasant household without having to disturb its specifics.

Rural tourism embraces all touristic activities in the rural area, with the aim of harnessing the natural and human potential of the villages. [8]

The area's problems in this field become visible, however, when we begin to analyze the specific touristic infrastructure, which refers to the touristic accommodation, with functions of food, conference halls, exhibition centers, treatment facilities, amenities, etc., where there is a deficit of accommodation establishments, insufficient in number and diversity of the types of units.

By referring to the data base of the National Institute of Statistics, is noted that the County has 140 units of accommodation, insufficient number for a County with a such a touristic potential, of which only 20 units are hotels, 80 units are touristic villas, 16 units are agro-touristic pensions, and

9 are touristic, 7 accommodation on waterway vessels and maritime, and 8 are other structures with touristic accommodation functions (chalets 1, holiday villages 1, campsites1, tourists halting places 2,tourist cottages 1, camps for children 1 and 1 inn). [4]

Also, there aren't entertainment facilities specific to the areas 'potential, are not enough exhibition centers, conference halls, etc., in which can be presented the area's beauty and the things that makes it unique in Europe and extremely important in the world.

All of those things listed above, in addition to a weak promotion on the domestic and international tourist market, have made that the number of tourists, who chose this area as a touristic destination, to be reduced from one year to another, with a worrying decline in the last period.

By referring to the data again from the database of the National Institute of statistics, it can be noted that in 2004, arrived in the County 73,241 tourists, and in 2014, just 66,242 tourist have chosen as their destination to spend the holidays, Tulcea County. [4]

The declining number of visitors supports the findings set out above, and should draw a warning, to give institutions a greater interest on the touristic activity in this area, activity with a strong chance of developing and exploiting what the County has best i.e. our country's touristic potential, diversified and so harmoniously distributed in the territory.

Additional funds allocated to this segment of activity, for the tourist development of the area, a more aggressive promotion on market and an increased interest of the inhabitants of the area, are just some of the objectives that should be taken into account in the future development strategies, to increase the living standard of the County's inhabitants .

It is noted that the Government has recently approved the HG. 120/2010 on approval of the list containing the programmes and investment projects in tourism.

Through this document it is facilitated the financing of investment projects in tourism and the finalization of the ongoing investment objectives and whose funding was discontinued after 2013, which we hope to "resuscitate" the Romanian tourism. [1]

BIBLIOGRAPHY

[1] Ioana Andreea Pavel (2016) , retrieved September 2016 from http://www.fiscalitatea.ro/noua-ruling-approved-additional funds-investment-for--in-desk-15385/

[2] Ministry of Environment, Water and Forests, National Environmental Protection Agency, Annual Report, retrieved in September 2016 from http://apmtl.anpm.ro/-/raport-anual-privind-starea-mediului-in-jud-tulcea.

[3] Ministry of regional development and tourism, retrieved in January 2016 from http://www.mie.ro

[4] National Institute of statistics, retrieved January 2016, from http://statistici.insse.ro/

[5] PNDR, Solicitant guide for measure 313, retrieved January 2016 from file:///C:/Users/user/Downloads/pndr_masura_313___anexa_10_lista_comunelor_cu_potential_turistic_ridicat_m313__actualizat_14112008.pdf

[6] Website, The Coalition Nature 2000 Romania, retrieved January 2016 from http://natura2000.ro/

[7] Website, The Danube Delta Biosphere Reserve, retrieved January 2016 from http://www.ddbra.ro/

[8]Wikipedia , Agro-tourism definition, retrieved September 2016 from https://ro.wikipedia.org/wiki/Agroturism

COMPARATIVE STUDY BEETWEN NETHERLANDS AND ROMANIA

BRĂTULESCU ALEXANDRA-MARINA[1]

Summary: *Agricultural consulting is represent a professional counseling and to request involvement. The farmers and people interested in agriculture can consult specialists or authorized organizations to obtain support in actions undertaken , solving problems or achieving goals . Communication is key in terms of agricultural advisory used as a tool for introducing changes in behavior and attitude of farmers. To the extent that farmers are convinced that to realize and advisory services serves their interests, the effect will be directly proportional to it.*

Keywords: agricultural consulting, communication, LVD, rural development, counseling.

INTRODUCTION

For agriculture, farm advice is a professional advisory and request made free of charge or on a fee, by specialists or authorized organizations, aimed at supporting all managers farms or other stakeholders in achieving goals or solving problems in agriculture.

Extension services in Romania is vital to the transfer of knowledge and technology in agriculture, provides information feeds that can help improve the livelihood of the rural population and farmers. For this reason, most international development agencies recognize the need to support and develop agricultural extension. After a period of indifference, agricultural advisory services rebounded strongly in the global development agenda.

Besides the conventional function of providing knowledge to improve agricultural productivity, expect the agricultural advisory services to meet various new features, such as:
- Associating small farmers to export markets,
- Promoting sustainable production techniques for the environment,
- Health challenges affecting agriculture.

Farm advisory services provided are important attributes on the public good. Therefore, it is not surprising that there are more than half a billion consulting agents of various types and with different skills worldwide. About 90% of staff consultancy worldwide are in developing countries, even if the ratio farmers, extension agents is more favorable in industrialized countries.

In 1990 FAS activity was conducted in actions organized from an administrative:
- Publication of numerous books, brochures, leaflets;
- Filmmaking and TV shows or radio.

In the years after 1990, a period of profound economic and social transformations, farm advice has become a necessity to stringent in Romania.

In the Netherlands, farm advice is achieved through an organization providing services to farmers, private organizations and national and international public institutions. These services cover the entire spectrum of agricultural activities, from technical and economic aspects of agricultural production at farm level up to national agricultural policy formulation.

DLV based services (Duch Agricultural Advisory Service) is however the direct provision of technical and economic advice to farmers. DLV is the basis business advice to farmers in all sectors of agricultural production optimization, both technically and economically.

Although technical advice on cultivation practices and management remain a key component of consultancy DLV importance of economic consultancy, in the widest sense of the term, it is growing. Advice on investment in equipment and infrastructure (sheds, greenhouses, storage facilities).

---

[1] ASC Brătulescu Alexandra, ICEADR București, bratulescu.alexandra@iceadr.ro

MATERIAL AND METHOD

Provision and funding, effective and sustainable agricultural advisory services are facing major difficulties that are associated with:
- The level and complexity of the operations expansion;
- Dependence on the success of the extension of the broader context of policy;
- Issues arising from the interaction between extension and knowledge generation system;
- The deeper issues of employee incentive possibilities of extension;
- Political commitment often reduced public support for the extension;
- Burdening common with obligations.

Terms and agricultural advisory services and agricultural extension covers the entire set of organizations that support and facilitate problem solving people involved in agricultural production and obtaining information, skills and technology that would improve their lives. From the perspective of development policy, investment in extension services and facilitating governmental extension is potentially important tools for improving agricultural productivity and increasing farmers' income.

Table 1

THE SITUATION AREA OCCUPIED BY VEGETABLES ROMANIA AND NETHERLANDS - thousand hectares					
	Year 2009	**Year 2010**	**Year 2011**	**Year 2012**	**Year 2013**
NETHERLANDS	15,15	81,83	76,74	72,32	67,48
ROMANIA	270,78	266,94	268,01	263,44	263,75
TOTAL EU	**2515,40**	**2409,1**	**2415,00**	**2313,20**	**2305,10**
% ROMANIA / EU	10,76	11,08	11,10	11,39	11,44
% NETHERLANDS / EU	11,31	11,12	10,1	10,2	10,6

Source: FAOSTAT

Romania's total area of 14.8 million ha, 9.5 billion hectares of arable land is cultivated land and 27%, other 32% are used as grasslands, and 9% are forests. Very modern agriculture, intensive and highly productive occupies 4% of the workforce and accounts for 4% of GDP. The most developed branch is cattle grazing, but in many places and Palm cultivation occupies an important place. In large quantities of potatoes, sugar beet and cereals.

	Anul 2009	Anul 2010	Anul 2011	Anul 2012	Anul 2013
% ROMÂNIA/UE	10.76	11.08	11.1	11.39	11.44
%OLANDA/UE	16.6	29.4	31.5	32	34.2
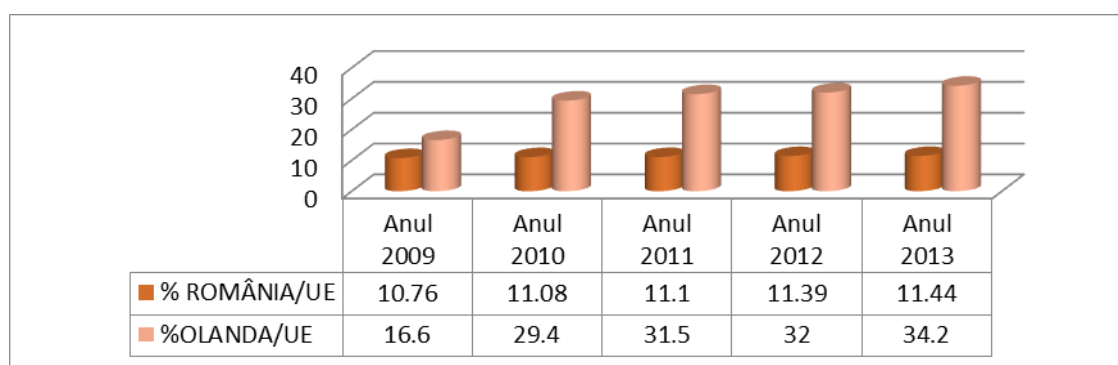
Chart 1 - Situation with vegetables cultivated areas in Romania and the Netherlands
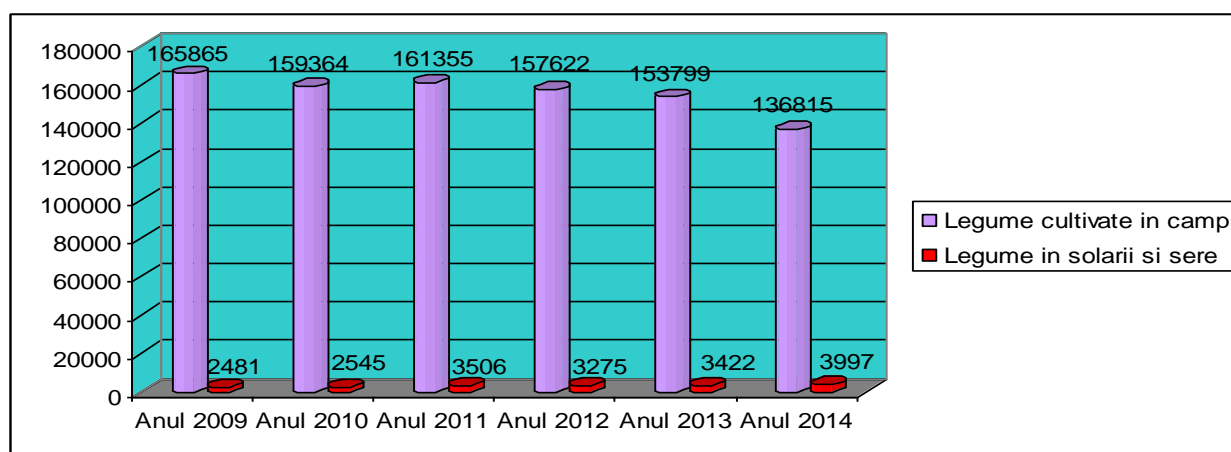
Chart 2 - Areas under vegetables in fields and greenhouses and conservatories in Romania (ha)

Holland area is 2.3 million hectares, agriculture's contribution to GDP in the Netherlands is 36 642 (euros). This is ranked fifth in Europe in the production of butter, ranked fourth in the production of cheese and number one in production flower bulbs. Cultivated tulips, hyacinths and lilies, especially in areas Leiden and Haarlem, where annually is exported million flower bulbs. An important export product is salad vegetables grown in greenhouses in general.

Each member Dutch farmer cooperatives in three to four narrow specialization, such as:
- Cooperative supply
- Credit unions;
- Cooperative processing of each type of product.

The Dutch government's economic policy tends to keep supporting family farms and farmers cooperatives, which are taxed less. In addition, subsidized interest rates for loans, granted financial guarantees to obtain loans, farmers who invest in environmental receive financial support from the state. Dutch State are not neglected either agricultural education and research, which are also funded.

Can be seen in Table 2 comparisons in terms of cultivated areas and the employment rate of labor:

Table 2

SPECIFICATIONS	ROMANIA	NETHERLANDS
Area (km2)	238.391	41.543
Cultivated area	14,8 mln. HA	2,3 mln. HA
The employment rate of labor	59.5%	75.1%

First, consultation carried out through the private sector is generally limited to commercial activities, or serving commercial farmers. One can also mention the fact that small farmers could gain more power if they organize associative (producer groups, cooperatives), for marketing more efficient production. Also, fiscal constraints, even if it is a global problem, have a limiting effect much stronger in countries with less developed agriculture, the type Romanian (Table 3).

Table 3

FAS	
ROMANIA	NETHERLANDS
• Opportunities: you can deploy a new system of consulting in Romania which consists of Agricultural Chambers and take a new name.	• In the Netherlands FAS is achieved through an organization providing services to farmers, private organizations and national and international public institutions.

<table>
<tr><td>• Under the Rural Development Programme 2014-2020 RDP there are consulting firms that can benefit from new firms to sprijin.Serviciile FAS in Romania is vital to the transfer of knowledge and technology in agriculture, provides information feeds that can help improve the living population of the rural population and farmers.
• For this reason, most international development agencies recognize the need to support and develop agricultural extension. After a period of indifference, agricultural advisory services rebounded strongly in the global development agenda.
• The services provided are important attributes of farm advice on public good. Therefore, it is not surprising that there are more than half a billion consultant agents of various types and with different skills worldwide.
• About 90% of staff consultants worldwide are in developing countries, even if the ratio farmers, extension agents is more favorable in industrialized countries.</td><td>• Those services cover the entire spectrum of agricultural activities, from technical and economic aspects of agricultural production at farm level up to national agricultural policy formulation.
• Throughout its 100-year history this organization has played an important role in winning the Netherlands a leading international position as a manufacturer and exporter.
• Most important, however, are of direct personal contacts between consultants and farmers through telephone connections and, in particular, visits to farms.
• Communication via the media and extension activities in the group is around 5% and 10-20% of activity extension of LVD, while individual counseling 75% as a share of total activities.
• Two-thirds of the company's net income is obtained directly from payments for on-farm advice customer-Dutch farmers and increasingly more in the border regions of Belgium and Germany.</td></tr>
</table>

Table 4 found average yields tons / hectare in the Netherlands and Romania, observing that Dutch farmers produce more wheat, potatoes, oilseed rape, maize and fodder than the farmers in our country. Sunflower exception, which is not produced in the Netherlands.

Table 4

AVERAGE YIELD T/HA IN ROMANIA AND NETHERLANDS 2010-2012		
	DUTCH FARMERS	FOREIGN JEANS IN ROMANIA	ROMANIAN JEANS
Wheat	8.6	4.8	1.9 -3.3
Rape	3.5	2.5	1.2 -2.2
Potatoes	45.2	-	9 -15.7
Sunflower	-	2.2	1.1 -1.7
Corn	12.3	6.5	1.4 -3.2
Forage maize	46	-	8.0 -42

RESULTS AND DISCUSSIONS

Consultancy work can be defined as the process of training and dissemination of specific information in response to requirements of time and long-term customer, represented by farmers, agricultural producers.

In our country there is a strong difference not only to the countries with strong tradition in Western Europe, and even to former socialist countries, where the old system was more lenient, allowing import of inputs performance since the period of communist governments, working which did not happen to us.

In order to reduce the gap, a basic component is, or should be, promoting agricultural consultancy to raise the level of professionalism of farmers, informing them on new technologies, agricultural policies promoted by the EU, ways to access different financial opportunities available to them through the Common Agricultural Policy.

Unfortunately, farmers training is currently only resources from the public system, and they are relatively limited. Funds allocated by MARD for consultancy activities and training, still

insufficient should be supplemented, and the only way to achieve this goal would be working with the private system, with NGOs or organizations of farmers, things hovering but at least at the moment at the stage of trials, the rates charged by private companies schooling farmers now being restrictive.

Table 5

IMPORTANCE, THE NEED FOR AGRICULTURAL AND BENEFICIARIES OF CONSULTANCY ROMANIA / NETHERLANDS		
IMPORTANCE OF CONSULTANCY	**NEED FOR CONSULTANCY**	**THE BENEFICIARIS**
Provision of data and Information to farmers;	The low level of training of farmers.	Regarding beneficiaries of extension services, they are primarily agricultural producers, particularly from small and medium sized family farms as well as specialists and other operators in rural areas.
Providing advice and solutions to the problems facing farmers; Popularizing innovations in agriculture.	Need refresh professional knowledge of specialists in agriculture	
Transferring production of new technologies by farmers	Getting an unbiased perspective.	
Conducting training and continuing education for farmers and other agriculture professionals;	The necessity of popularizing scientific research results.	Working methods are consulting communication techniques that intervene between the consultant and beneficiaries.
Creating practical skills to farmers.	The need to learn from consultancy;	
Editing, copying and distributing magazines, newspapers, books, brochures, leaflets, films and other audiovisual material, with topics of interest for farmers	The necessity of popularizing the new regulations and rules.	Individual advice is intensive form of communication within the advisory service.
Motivating farmers to initiate an action or activity;	The need to address emerging issues;	

CONCLUSIONS

First, consultation carried out through the private sector is generally limited to commercial activities, or serving commercial farmers. One can also mention the fact that small farmers could gain more power if they organize associative (producer groups, cooperatives), for marketing more efficient production. Also, fiscal constraints, even if it is a global problem, have a limiting effect much stronger in countries with less developed agriculture, the type Romanian.

To combat this last point, it is necessary to adopt strategies that include measures to boost production and cost recovery of extension or promoting private sector development extension.

Because participation selective private sector extension and consultancy, public sector and non-profit research sector will have a role increasingly higher in disseminating information to farmers, and must work together to meet priority requests consultancy and extension coming particularly from small farmers.

Thus, the Agricultural Chamber (formerly Network ANCA) remains the only institution able to promote agricultural extension and advisory quotas similar to those required by EU professionalism in training lecturers and reasonable rates is a guarantee in this regard. It should also be borne in mind that many farms still have the status of semi-subsistence farms with poor technical equipment, which tend not to conduct a commercial activity.

Transforming these subsistence farms into commercial farms type can only be achieved through cooperation between all stakeholders. Thus, it becomes increasingly important role in agricultural consultancy dissemination of general information and specific idea in order to access this

information to all farmers. The government also aims to provide the necessary infrastructure to regulate access to credit and markets to develop competitive type.

I think it would be appropriate to strengthen the role of Agricultural Chambers, supporting them materially and logistically, and not looking for solutions hybrid gathered elsewhere, solutions that currently do not match any of the agricultural system Romanian, represented primarily by small farms, subsistence nor with the current mentality of Romanian peasant.

And this mentality can only change with the emergence of new generations of progressive farmers, who will be able to fully utilize the information they receive. Regardless of how it is viewed and perceived FAS is generally accepted worldwide that without this kind of service is difficult to obtain performance and efficiency in agriculture.

BIBLIOGRAPHY

1. Sectoral Project ADER 16.1.2. - "Models of development of short chains of capitalizing on service-chain primary production-processing-storage-outlet"
2. Carmen Angelescu, project FAS USAMV Bucharest, 2016
3. Carmen −Angelescu Support course Consultant, 2016
4. http://www.proiecte.ro/agronomie/analiza-comparativa-romania-olanda
5.http://www.ziarulfermierului.ro/extensia-si-consultanta-agricola-rolul-ei-in-dezvoltarea-agriculturii-romanesti/
6. www.insse.ro
7. http://faostat3.fao.org/browse/FB/CC/F

INNOVATION PROCESS IN AGRO FOOD DISTRIBUTION

DIANA CREȚU[1]

Summary: *Distribution of food products includes all activities which ensure the passage of these categories of goods, from traders producers, to end consumers or users. On this regard, it will be presented the following: distribution channel and its dimensions, innovation strategy of industrial distribution channel. Also, it can be shaped a number of recommendations for improving innovation process in agrofood distribution.*

Keywords: distribution channel, agrofooddistribution, innovation process.

INTRODUCTION

Distribution of food products includes all activities which ensure the passage of these categories of goods, from traders producers, to end consumers or users. Distribution channel manges the changes through which a product goes on its way from the producer to the final consumer. He has the responsibility to ensure the availability of goods at the consumer level. It reflects both the itinerary and modalities.

Distribution channel should be seen as a system whose components: producer, consumer and intermediate, are interdependent. It also covers not only distribution channel circuit driving route which it follows, but the sequence of transfers of title of property between the links of the supply chain components, extended to the end consumer.

MATERIAL AND METHOD

By distribution, the desired product is procured at the right place, the right time, in quantity, quality and price for the buying power. Distribution is interposed between production and consumption by:
- The act of sale;
- Transport, storage and delivery.

Distribution channels include all companies participating in acts of sale-buy transferring a product from producer to destination. The distribution channel is always chosen by the manufacturer. Examples of distribution channels:
- Short channel (producer-consumer);
- Channel environment (intermediate producer-consumer);
- Long channel (producer - wholesaler - retailer - consumer).

Intermediaries are wholesalers and retailers that interpose between consumers and producers. Types of intermediaries:
- those working on behalf and for the account of others: brokers, representatives, agents.
- those working on their behalf and on behalf of others-commissioners.
- those working on their behalf and on their own: wholesale companies, retail companies, specialized companies, cooperative organizations.

---
[1]ASC Cretu Diana, ICEADR Bucuresti, cretu.diana@iceadr.ro

FORMS OF COOPERATIVE	
ROMANIA	FRANCE
• The principle of voluntary and open association, according to which cooperatives are voluntary organizations that is based on free will and are open to all persons able to use their services and agree to assume the responsibilities of membership cooperator • The principle of democratic control of cooperative members, according to which cooperatives are democratic organizations controlled by cooperative members who participate in setting policies and making decisions. Persons acting as elected representatives are accountable to the cooperative members • principle of economic participation of cooperative members, according to which members contribute fairly to the establishment of cooperative ownership of the company, exercising democratic control over it. Cooperative members allocate the net profit of the cooperative amounts needed for the following purposes: developing the cooperative, rewarding cooperative members in relation to participation in the cooperative society or supporting other activities • • principle of autonomy and independence of cooperatives, according to which cooperatives are autonomous organizations based on self-help and are controlled by the members. Principle of education, training and information cooperative members, according to which cooperatives ensure that the education and training of their members, elect their representatives, executives or employees so they can contribute effectively to the development of cooperative societies	Ø principle of freedom of choice of the form of cooperation; Ø obligation on members to bring equity and participate in the economic activity of the cooperative through cooperative supply of products delivered Ø principle,, a man -a vote "the decisions taken at the cooperative regardless of capital contribution;. Ø The principle of territoriality,, "or limiting the scope of action of a community cooperative to date. **a. Marketing Cooperatives.** These conducts collection, processing and marketing of raw or finished wholesale or retail. **b. Cooperatives supply** ensure farmers inputs needed. **c. The cooperatives providing services** are organized in order to facilitate members' access to services for agricultural production; **d. Credit cooperatives** are cooperatives and agricultural banks, which are extended in some countries, and in others less. **e. Common exploitation cooperatives of land**

RESULTS AND DISCUSSIONS

Following the analysis of public data, centralizing results at regional level in 2014 compared to 2009, there is a drastic decrease in the number of agricultural cooperatives and agricultural companies operating in Romania.

Fig.1- number of agricultural cooperatives in Romania by region

Table 1

NUMBER OF ROMANIAN AGRICULTURAL COOPERATIVES BY DEVELOPMENT REGION		
REGION	NR. COOPERATIVES	
	Year 2009	Year 2014
North-East Moldova	186	165
South-East Dobrogea	339	89
SouthMuntenia	229	128
South-West Oltenia	245	59
West	271	51
North-West	363	101
Center	612	79
Bucharest-Ilfov	33	25
TOTAL	2278	691

Graphical representation plays suggestively downward trend in the number of agricultural cooperatives (Chart 1)

Chart 1 - Number of agricultural cooperatives in Romania by region
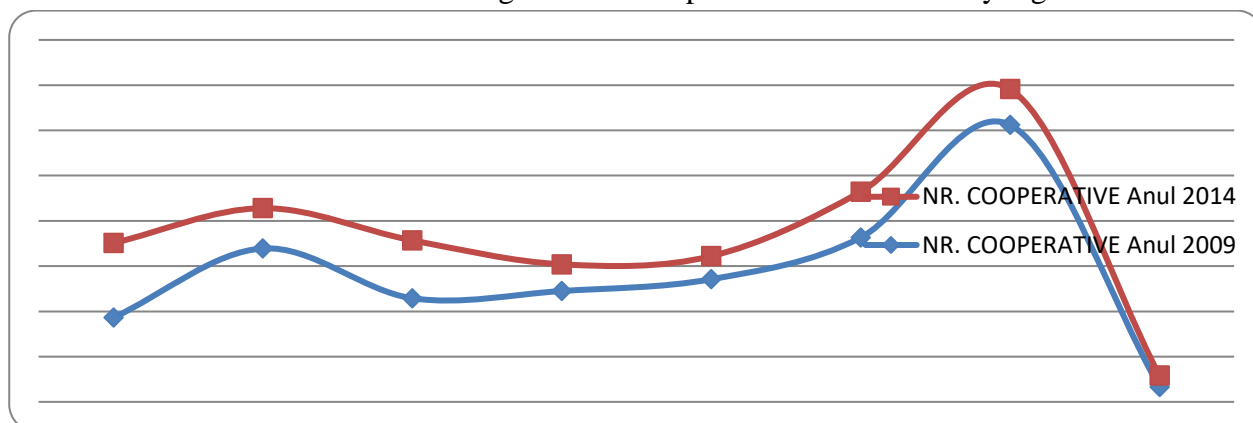
Possible explanations for the sharp drop in the number of agricultural cooperatives and associations come from the following areas:

Cooperative organizations consist of manufacturers and as we saw above intermediaries. To see how organized we give below are examples of cooperative organizations in France:

• Cooperatives storage and marketing of cereals are part of the National Interprofessional Organization Cereals (ONIC), and are currently very strong. 550 cooperatives are in this sector, with 8,000 collection centers and 32 cooperative units.

• The cooperative collecting milk collects 47% of total milk production. They also produce cheese, butter and yogurt. Most cooperatives knownare: SODIMA, I.U., GAMMA.

• Marketing cooperatives (processed raw materials) production is spread edible oils in the vintages, the sale of meat, vegetables and fruit.

• Cooperatives providing services created later in charge of procurement of animals for breeding, artificial insemination, and collection and selling products.

• Cooperatives Usingof Agricultural Machinery (CUAM) were created in 1908. CUAM is made up of members of at least four farmers. Its members subscribe shares and use cars in common. The funding will be loans with interest rates paid on the basis of multilateral investment program. The number of such cooperatives exceeds 12 000.

Here are some statistics on agricultural cooperatives in the EU:

• Most cooperatives are: Italy 8850; Greece 6919; Spain 4350; Germany 3950; France 3618.

• Most members are: Finland 7.12 million; Germany 3.28 million; Austria 2.18 million members.

• Turnover largest cooperatives: France 52 billion euros; Germany 39 billion euros; Netherlands 22 billion euros.

• Market shares of the cooperative sector: cereals (Sweden 75%); beet (Austria 100%); fruits (Denmark 80%); vegetables (Belgium 85%); pork meat(Denmark 91%); bovine meat (Sweden 76%); milk (Ireland with 99.5%).

CONCLUSIONS

Process innovation in the food must be supported because:
- It is necessary to allow all representatives of the food chain in Romania to contribute to competitive products with representatives from other countries;
- It is vital for food industry companies who want to access or maintain market quality products.

In Romania must be institutionalized innovation activities with dedicated budget. Specialists consider that the institutionalization process innovation can help companies to start the innovation process or to optimize it, which helps to increase operational efficiency. Such an approach enables prioritization and acceleration into practice new ideas. To this end, the Ministry of Agriculture and Rural Development should create special programs to support innovation in the food industry. Also in this direction, financial support innovation competitions, especially for young people, can be an effective way of reviving the innovation process in Romania. For example, financing a period of practice to master in production and realization of dissertation thesis on topics of innovative, interest for the company, it would be useful innovation activity, or launching short-term programs, knowledge transfer and technology from research to industry can be a quick and effective.

Romania's food industry must embrace the opportunities offered by open innovation system if it wants to succeed in a market economy where competitiveness is extremely important. Open innovation is linked with the telecommunications and IT industry, but is believed that it can bring major benefits to the food industry. To do this, the industry must facilitate meetings with representatives of universities and research institutes.

BIBLIOGRAPHY

1. Sectoral Project ADER 16.1.2. - "Models of development of short chains of capitalizing on service-chain primary production-processing-storage-outlet"
2. A. Marin, Turek-Rahoveanu P. ANALYSIS FORMS OF ASSOCIATION / COOPERATION IN ROMANIA, Agrarian Economy and Rural Development, Sixth Edition, November 2015
3. http://www.capinfood.eu/_downloads/Rumanien_Strategia%20Nationala%20de%20Cercetare-Inovare%20in%20domeniul%20alimentar%20%203.pdf
4. http://www.e-scoala.ro/referate/economie_distributie.html
5. http://www.scritub.com/management/marketing/Structura-canalelor-de-distrib1441715157.php
6. http://www.aut.upt.ro/~loredanau/teaching/LIC/Distributia-Si-Logistica-Marfurilor.pdf

THE ROLE OF THE RESEARCH AND DEVELOPMENT AND THE NUMBER OF PATENTS, IN THE INCREASE OF GDP PERFORMANCE IN THE EUROPEAN UNION FOR THE PERIOD 2005-2014

RALUCA NECULA[1], MIRELA STOIAN[2], MANEA DRĂGHICI[3] , DIANA NECULA[4]

Summary. *Over time, the research has played a key role in the economic development reflected by the GDP growth, the increase of the patents' number, the volume of exports, the economic competitiveness of countries which have invested in research and development.*

The aim of this paper is to make a study at the level of the European Union's countries of the way that the size of the expenditures with the Research and Development and the number of patents reported at 1 million inhabitants, influences the Gross Domestic Product.

In that respect, the research wants to verify the possibility of Romania to achieve the objective written in the Research, Development and Innovation Strategy 2014 to "reaching until year 2020 the critical mass of researchers needed to turn R&D a factor of economic growth through the provision of rapid and sustainable development, numerical and qualitative human resources in research, development and innovation" (R&D Strategy, 2014).

Keywords: *Research& Development, GDP, Patents, European Union, Romania*

JEL classification – O11, O39, Q16

INTRODUCTION

The paper is important because it tries to study the factors that contributes to the economic growth, at the macroeconomic level, by the expenditures with research and development, in terms of "among the European objectives for year 2020, is that research, development and innovation- a level of the public and private investments in research and development of 3% from the EU GDP" (Lisbon Strategy 2020).

In the recent economic literature many studies were developed regarding the factors that influence the GDP's growth, at the level of each country, on groups of countries, and at the level of the European Union.

The New Economy's dimension, expressed through the R&D expenditures variable (% from GDP), was used in the Goel & Ram studies (1994) and Pop Silaghi and others (2014).

The investments variable is found in the researches of Barro(2000) and Afonso & Furceri (2008), as share of investment in GDP and in the researches of Croix & Doepke (2003), Voitchovsky (2005) and Kneller (1999) as a rate of investments.

The impact of the expenditures for R&D on the GDP's growth, seem to be positive and high from the numerical point of view and stronger in the least developed countries group (Goel& Ram 1994).

After the study of Pop Silaghi , are the same: a growth of the R&D private expenditures intensity stimulates the economical growth on the short term (Pop Silaghi et al 2014).

According to Eftimoski (2006), " the economic growth depends on the scientific and technological knowledge and on the investments in the human capital "(Eftimoski 2006)

The GDP's evolution analysis, in time, per capita at the European Union's level in time shows that there are variations and very high differences between the countries, but that it exists o convergence tendency according to the rhythm of each country (Necula R. and others, 2016).

---

[1] Lecturer, PhD., University of Agronomical Sciences and Veterinary Medicine, Bucharest, Mărăşti Blvd. No. 59, district 1, Bucharest, Romania, 011464, E-mail: raluca_nec@yahoo.com

[2] Proffesor, PhD., Bucharest University of Economic Studies, Romania, Piata Romana no. 6, district 1, Bucharest, Romania, 010374, E-mail: mirela.stoian@eam.ase.ro

[3] Proffesor, PhD., University of Agronomical Sciences and Veterinary Medicine, Bucharest, Mărăşti Blvd. No. 59, district 1, Bucharest, Romania, 011464

[4] Researcher, Research Institute for Agricultural Economics and Rural Development, 61 Mărăşti, District 1, Bucharest, 011464 , email: necula.diana@iceadr.ro

The econometric results show that an increase of 1% of the R&D expenditures increases the GDP/capita with 0.08% (Pescu,2016), which complies with the paper of Pop Silaghi (2014).

MATERIAL AND METHODS

The paper is structured: in the first part are analyzed the expenditures with the R&D (% from GDP), for the 28 European Union countries , for which are calculated: the average for the period 2005-2014, that is statistically compared with the EU 28 's average; the annual growth rhythm of the expenditures and the ranking of countries by the R&D (% from GDP). In the second part the GDP is analyzed (Billion €) through: the average for the period 2005-2014, the annual growth rhythm and the countries ranking by the GDP's value (Billion €). It was analyzed the elasticity between the R&D increase (Billion €) and the GDP increase (Billion €). It was calculated the correlation between the GDP's increase and the R&D increase by: the correlation coefficient ® and the elasticity, that were calculated through an exponential equation: Y $_{GDP\ (mild\ €)}$ = X $_{C\&D\ (mild\ €)}$ $^{\alpha}$ (α= coefficient). In was made a countries ranking by the size of the elasticity (δY/δX).The las part presents the conclusions and some ideas for continuing these researches.

The state authority for the scientific research, technological development and innovation is represented by the National Education Ministry (NEM).

Through the National Strategy for Research, Development and Innovation, 2014-2020, Romania proposes itself that the R&D expenditures, that were in the year 2014 of 0.14% from GDP, to increase at 0.63% from GDP in the year 2017 and at 0.97 in the year 2020 (R&D Strategy,2014).

In the paper the fallowing indicators have been used: arithmetic mean, coefficient of variation, annual growth rate.

The formulas used for to calculate these indicators, are:

For the arithmetic mean $= \bar{x} = \frac{\sum xi}{n}$, where $\bar{x}$ = the arithmetical mean, xi= the average production values for a number of years (i); n= number of years taken into account

The annual average growth rhythm $= r$1990-1999 (and respectively r2005 − 2014)$= \sqrt{\prod \left(\frac{p1}{p0}\right) - 1;}$.

The means comparison with the research expenditures, was statistically made, in which the average of EU 28 was considered a witness (Cv*=Control Value) for the different probability levels (P $_{0.001}$; P $_{0.01}$; P $_{0.05}$).

The calculated equations were exponential (Y = A X$^{\alpha}$) and the significance was made with the correlation coefficient.

RESULTS AND DISCUSSION

Due to the problems that mankind is confronting: poverty, environment degradation, the job's occupancy uncertainty , the sustainable economic development represents that form of economic development that pursues that the current consumption request satisfaction not to compromise the ones of the future generations (Pânzaru S., 2008).

It were calculated the R&D expenditures means also for some countries like Turkey, Russia, US, China, Japan and South Korea, and were compared with the EU's mean.

From the EU 28's countries, a number of 8 countries have allotted for the R&D less than 1% from GDP (Bulgaria, Greece, Croatia, Cyprus, Malta, Poland, Romania, Slovakia), between 1% and 2% from GDP, a number of 10 countries (Belgium, Czech Republic, Estonia, Ireland, Spain, Italy, Luxemburg, Netherlands, Portugal, England), with a mean different from the EU mean(2*), very significant negative. Over 2% from GDP are the rest of the countries, where Finland stands out with 3.5% of GDP and Sweden with 3.3% of GDP, of whose mean is very significant positive towards the mean of EU28. At this very high level are also Japan and South Korea.

Table 1. The Research and development expenditure (% of GDP), significance towards the EU 28 mean and the ranking of the expenditures and of the growth rhythm for the period 2005-2014.

Geo\time	Period 2005-2014							Ranking: expenditure RD(%GDP)	Annual growth rhythm (%)	RANKING: RHYTHM
	2005	2010	2013	2014	Mean	T calc.	Significance			
EU (28)	1.8	1.9	2.0	2.0	1.9	**Cv***	x	x	x	x
Euro area (19)	1.8	2.0	2.1	2.1	2.0	1.0	N	x	1.60	x
Belgium	1.8	2.1	2.4	2.5	2.1	1.9	N	7	1.96	11
Bulgaria	0.4	0.6	0.6	0.8	0.5	-27.1	OOO	26	3.66	1
Czech Republic	1.2	1.3	1.9	2.0	1.5	-4.1	OOO	13	6.87	3
Denmark	2.4	2.9	3.1	3.1	2.8	9.7	***	3	6.14	16
Germany	2.4	2.7	2.8	2.9	2.7	11.9	***	4	2.70	19
Estonia	0.9	1.6	1.7	1.4	1.5	-2.8	OO	12	1.91	8
Ireland	1.2	1.6	1.5	1.5	1.4	-7.4	OOO	14	5.10	15
Greece	0.6	0.6	0.8	0.8	0.7	-27.3	OOO	22	2.76	10
Spain	1.1	1.4	1.3	1.2	1.3	-15.1	OOO	16	4.20	20
France	2.0	2.2	2.2	2.3	2.1	5.3	***	6	1.25	21
Croatia	0.9	0.7	0.8	0.8	0.8	-29.5	OOO	20	1.14	27
Italy	1.1	1.2	1.3	1.3	1.2	-16.4	OOO	17	-0.94	18
Cyprus	0.4	0.5	0.5	0.5	0.4	-41.3	OOO	28	2.31	14
Latvia	0.5	0.6	0.6	0.7	0.6	-31.0	OOO	25	2.93	13
Lithuania	0.8	0.8	1.0	1.0	0.9	-24.4	OOO	19	2.97	12
Luxembourg	1.6	1.5	1.3	1.3	1.5	-6.2	OOO	11	3.36	28
Hungary	0.9	1.2	1.4	1.4	1.1	-12.0	OOO	18	-2.55	9
Malta	0.5	0.6	0.8	0.8	0.7	-22.5	OOO	23	4.40	7
Netherlands	1.8	1.7	2.0	2.0	1.8	-2.0	N	9	5.11	22
Austria	2.4	2.7	3.0	3.0	2.7	9.4	***	5	1.07	17
Poland	0.6	0.7	0.9	0.9	0.7	-20.9	OOO	21	2.57	6
Portugal	0.8	1.5	1.3	1.3	1.3	-6.9	OOO	15	5.72	4
Romania	0.4	0.5	0.4	0.4	0.5	-37.4	OOO	27	6.05	26
Slovenia	1.4	2.1	2.6	2.4	2.0	0.5	N	8	-0.84	5
Slovakia	0.5	0.6	0.8	0.9	0.6	-20.1	OOO	24	6.04	2
Finland	3.3	3.7	3.3	3.2	3.5	21.7	***	1	6.62	24
Sweden	3.4	3.2	3.3	3.2	3.3	27.9	***	2	-0.55	25
United Kingdom	1.6	1.7	1.7	1.7	1.7	-6.5	OOO	10	-0.78	23
Turkey	0.6	0.8	1.0	1.0	0.8	-20.0	OOO	X	0.47	X
Russia	1.1	1.1	1.1	1.2	1.1	-20.1	OOO	X	5.56	X
United States	2.5	2.7	:	:	2.7	14.6	***	X	1.19	X
China (exp. Hong Kong)	1.3	1.8	2.1	:	1.7	-2.5	O	X	1.63	X
Japan	3.3	3.3	3.5	:	3.4	34.7	***	X	5.85	X
South Korea	2.63	3.47	4.15	:	3.4	8.1	***	X	0.59	X

WORLDBANK, 25.05.2016, http://databank.worldbank.org/data/home.aspx
Cv*=Control Value;GL=18; P0.001:3.92;P0.01:2.78;P0.05: 2.10;< 2.10:N

Analyzing the growth rhythm of the R&D expenditures from the GDP, it is observed that the countries with very small percentages have a very high rhythm , and the ones with a very high percentage a very small rhythm.

Thus, Bulgaria, that has the smallest percent occupies the first place at the rhythm, meantime Finland, the first place at the rhythm size, occupies place 24.

The exception is Romania, that occupies the place 27 at the size of the percentage of R&D expenditures that justifies the affirmation" the investment in research and development not being considered a priority in Romania"(Delia, Teselios, 2015)

O solution to increase the expenditures with the R&D is " the private-public partnership that can be considered o innovation for the innovation (Stoian M., 2016)

Table 2 .The EU countries classification by the size and annual growth rhythm of GDP, 2005-2014

Geo/Time	MU	2005	2007	2010	2014	Mean	St. dev	Coeff. of variation	Ranking: GDP	Annual growth rhythm	
						mild €	mild €	%		%	Ranking
UE(28)	mild €	11,517.7	12,915.4	12,794.7	13,959.7	12,878.6	727.71	5.65	x	2.16	x
Belgium	mild €	311.5	344.7	365.1	400.6	361.1	29.27	8.11	7	2.84	13
Bulgaria	mild €	24.0	32.7	37.7	42.8	36.4	6.43	17.68	22	6.62	3
Czech Republic	mild €	109.4	138.0	156.4	154.7	147.3	18.08	12.27	16	3.93	10
Denmark	mild €	212.9	233.4	241.5	260.6	240.0	14.69	6.12	11	2.27	17
Germany	mild €	2,300.9	2,513.2	2,580.1	2,915.7	2,600.4	195.55	7.52	1	2.67	15
Estonia	mild €	11.3	16.2	14.7	20.0	16.0	2.65	16.56	27	6.57	4
Ireland	mild €	170.0	197.1	166.2	189.0	179.2	10.09	5.63	14	1.19	25
Greece	mild €	199.2	232.7	226.0	177.6	211.2	23.59	11.17	12	-1.27	28
Spain	mild €	930.6	1,080.8	1,080.9	1,041.2	1,048.1	51.66	4.93	5	1.26	24
France	mild €	1,772.0	1,945.7	1,998.5	2,132.4	1,989.9	116.14	5.84	2	2.08	19
Croatia	mild €	36.5	43.9	45.0	43.0	43.4	3.13	7.20	20	1.84	20
Italy	mild €	1,490.4	1,610.3	1,605.7	1,613.9	1,593.6	44.81	2.81	4	0.89	27
Cyprus	mild €	14.9	17.5	19.1	17.4	17.9	1.50	8.33	26	1.70	21
Latvia	mild €	13.7	22.6	17.8	23.6	20.3	3.39	16.69	25	6.21	6
Lithuania	mild €	21.0	29.0	28.0	36.4	29.8	4.90	16.45	24	6.32	5
Luxembourg	mild €	29.7	36.8	39.5	48.9	39.5	5.92	15.01	21	5.68	8
Hungary	mild €	90.5	101.6	98.2	104.2	98.8	5.51	5.58	18	1.58	23
Malta	mild €	5.1	5.4	5.8	6.1	6.6	6.9		28	5.19	9
Netherlands	mild €	545.6	579.2	613.3	639.2	617.5	631.5	642.9	6	2.18	18
Austria	mild €	253.0	266.5	282.3	291.9	286.2	294.6	308.6	10	2.97	12
Poland	mild €	244.8	273.4	313.7	363.7	314.7	361.7	380.2	8	5.92	7
Portugal	mild €	158.7	166.2	175.5	178.9	175.4	179.9	176.2	15	1.00	26
Romania	**mild €**	**80.2**	**98.4**	**125.4**	**142.4**	**120.4**	**126.7**	**133.3**	**17**	**7.22**	**2**
Slovenia	mild €	29.2	31.6	35.2	38.0	36.2	36.3	36.9	23	2.74	14
Slovakia	mild €	39.2	45.4	56.1	65.8	63.8	67.4	70.4	19	7.56	1
Finland	mild €	164.4	172.6	186.6	193.7	181.0	187.1	196.9	13	2.50	16
Sweden	mild €	313.2	334.9	356.4	352.3	309.7	369.1	404.9	9	3.60	11
United Kingdom	mild €	1,945.6	2,063.3	2,168.9	1,908.4	1,667.6	1,813.3	1,866.0	3	1.65	22

WORLDBANK, 25.05.2016, http://databank.worldbank.org/data/home.aspx

The current cycle of Lisbon Strategy (March 2008- March 2011) started amid a slowdown process of global economic growth and the risks caused by the financial markets instability and the food and oil prices (Lisbon Strategy 2020).

Tabel 3. The correlation between the R&D expenditures and the GDP, for the period 2005-2014

Countries	MU	Period 2005-2014			YGDP* = A XCDᵅ				signify	Elasticity(δY / δX)	
		2005	2010	2014	A	α	R2	r		%GDP/1% XCD	TOP
EU (28)	mild € CD	202.7	246.9	283.4	808.4	0.50	0.89	0.94	***	x	x
Belgium	mild € CD	5.5	7.5	9.9	162.0	0.40	0.96	0.98	***	0.40	20
Bulgaria	mild € CD	0.1	0.2	0.3	80.5	0.49	0.86	0.93	***	0.54	10
Czech Republic	mild € CD	1.3	2.1	3.1	109.9	0.38	0.71	0.84	**	0.41	18
Denmark	mild € CD	5.1	7.1	7.9	120.0	0.36	0.84	0.92	***	0.35	21
Germany	mild € CD	55.7	69.9	83.7	275.3	0.53	0.94	0.97	***	0.52	12
Estonia	mild € CD	0.1	0.2	0.3	26.2	0.34	0.70	0.84	**	0.29	22
Ireland	mild € CD	2.0	2.7	2.9	176.6	0.00	0.00	0.01	N	0.00	28
Greece	mild € CD	1.2	1.4	1.5	199.9	0.15	0.02	0.13	N	0.18	26
Spain	mild € CD	10.2	14.6	12.8	347.4	0.43	0.92	0.96	***	0.42	17
France	mild € CD	36.1	43.6	48.2	223.2	0.58	0.92	0.96	***	0.58	6
Croatia	mild € CD	0.3	0.3	0.3	79.9	0.57	0.57	0.75	*	0.57	8
Italy	mild € CD	15.6	19.6	20.8	767.1	0.25	0.68	0.82	**	0.25	23
Cyprus	mild € CD	0.1	0.1	0.1	64.4	0.50	0.79	0.89	***	0.53	11
Latvia	mild € CD	0.1	0.1	0.2	71.5	0.60	0.75	0.86	**	0.61	5
Lithuania	mild € CD	0.2	0.2	0.4	72.9	0.65	0.95	0.97	***	0.68	4
Luxembourg	mild € CD	0.5	0.6	0.6	72.5	1.16	0.42	0.65	*	0.98	3
Hungary	mild € CD	0.8	1.1	1.4	96.5	0.20	0.39	0.63	*	0.20	25
Malta	mild € CD	0.0	0.0	0.1	24.2	0.42	0.92	0.96	***	0.40	19
Netherlands	mild € CD	9.8	10.9	13.1	211.4	0.45	0.65	0.81	**	0.45	16
Austria	mild € CD	6.0	8.1	9.8	106.8	0.49	0.97	0.99	***	0.49	13
Poland	mild € CD	1.4	2.6	3.9	229.5	0.46	0.90	0.95	***	0.47	14
Portugal	mild € CD	1.2	2.8	2.2	156.1	0.13	0.78	0.88	***	0.13	27
Romania	mild € CD	0.3	0.6	0.6	181.8	0.68	0.74	0.86	**	0.56	9
Slovenia	mild € CD	0.4	0.7	0.9	38.0	0.20	0.56	0.75	*	0.20	24
Slovakia	mild € CD	0.2	0.4	0.7	95.6	0.44	0.80	0.89	***	0.47	15
Finland	mild € CD	5.5	7.0	6.5	57.8	0.63	0.58	0.76	*	0.58	7
Sweden	mild € CD	10.6	11.9	13.6	19.7	1.17	0.94	0.97	***	1.13	1
United Kingdom	mild € CD	31.7	30.6	38.3	48.6	1.06	0.95	0.97	***	1.08	2

WORLDBANK, 25.05.2016, http://databank.worldbank.org/data/home.aspx; *Y = A Xα ; GL=8; (0.001, 0.87,***; 0.01, 0.76,**;0,05,0.63*; <0.63, N)

The highest elasticity of R&D expenditures is in Sweden, country in which an increase with 1% of GDP trains an increase of GDP with 1.13%. The UK follows with 1.08%, Luxembourg with 0.98%, Latvia with 0.61%, France with 0.57%. The smallest values are registered in Ireland cu 0.0%, Portugal with 0.13%, Greece with 0.18%, Hungary with 0.20%. Romania has a high value of 0.59% and occupies the 9th place, among EU.

Table 4. The EU countries classification, after the number and the annual growth rhythm of the patents number at 1 million inhabitants, for the period 2003-2014

Geo\time	MU	2003	2007	2010	2014	Mean	St. dev.	Coefficient of variation	Ranking : Patent applications	Annual growth rhythm	
						No. / 1 mil pers.	No. / 1 mil pers.	%		%	Ranking
EU (28 countries)	No. /1 mil pers.	107.95	117.39	112.49	111.57	112.4	3.89	3.46	x	0.60	x
Belgium	No. /1 mil pers.	131.7	147.74	139.21	137.30	139.0	6.65	4.78	8	1.10	22
Bulgaria	No. /1 mil pers.	2.73	1.61	2.29	6.55	3.3	2.22	67.30	27	7.56	6
Czech Republic	No. /1 mil pers.	10.88	18.39	18.41	25.30	18.2	5.89	32.29	16	8.28	5
Denmark	No. /1 mil pers.	207.14	239.45	231.38	244.45	230.6	16.54	7.17	4	1.93	19
Germany	No. /1 mil pers.	269.12	296.1	285.88	255.95	276.8	17.78	6.42	2	-0.65	26
Estonia	No. /1 mil pers.	8.29	21.01	29.2	10.31	17.2	9.75	56.71	17	1.59	20
Ireland	No. /1 mil pers.	57.41	75.66	69.49	64.61	66.8	7.72	11.55	12	2.47	17
Greece	No. /1 mil pers.	7.79	9.4	5.89	10.62	8.4	2.05	24.31	21	2.87	15
Spain	No. /1 mil pers.	23.02	30.95	32.44	32.51	29.7	4.53	15.24	14	4.19	11
France	No. /1 mil pers.	128.64	135.79	131.03	138.37	133.5	4.42	3.31	9	1.24	21
Croatia	No. /1 mil pers.	9.41	7.12	7.05	3.43	6.8	2.47	36.61	25	-8.89	28
Italy	No. /1 mil pers.	76.95	84.54	75.92	69.54	76.7	6.15	8.01	11	-0.36	24
Cyprus	No. /1 mil pers.	7.05	13.63	9.36	7.81	9.5	2.94	31.07	20	2.64	16
Latvia	No. /1 mil pers.	3.09	7.09	7.44		5.9	2.42	41.15	26	24.61	1
Lithuania	No. /1 mil pers.	4.91	3.02	5.06	16.61	7.4	6.21	83.91	23	10.17	4
Luxembourg	No. /1 mil pers.	194.45	154.94	151.97	109.32	152.7	34.79	22.79	7	-3.33	27
Hungary	No. /1 mil pers.	13.14	18.99	19.49	22.52	18.5	3.92	21.15	15	4.77	9
Malta	No. /1 mil pers.	8.18	16.84	8.45		11.2	4.92	44.13	18	2.28	18
Netherlands	No. /1 mil pers.	216.22	204.13	183.95	205.23	202.4	13.45	6.64	6	-0.12	23
Austria	No. /1 mil pers.	171.77	207.34	211.25	230.18	205.1	24.38	11.88	5	3.16	14
Poland	No. /1 mil pers.	2.87	5.3	9.48	15.99	8.4	5.74	68.28	22	16.85	3
Portugal	No. /1 mil pers.	6.39	11.66	8.99	12.16	9.8	2.66	27.19	19	6.01	7
Romania	No. /1 mil pers.	0.75	1.54	1.69	5.11	2.3	1.94	85.24	28	18.16	2
Slovenia	No. /1 mil pers.	36.81	59.75	51.75	65.85	53.5	12.56	23.46	13	5.74	8
Slovakia	No. /1 mil pers.	5.84	7.17	8.63		7.2	1.40	19.35	24	4.14	12
Finland	No. /1 mil pers.	248.77	241.51	259.86	339.91	272.5	45.56	16.72	3	3.31	13
Sweden	No. /1 mil pers.	230.01	311.54	300.59	349.36	297.9	49.83	16.73	1	4.59	10
United Kingdom	No. /1 mil pers.	95.33	91.96	85.16	83.12	88.9	5.72	6.43	10	-0.53	25
United States	No. /1 mil pers.	118.03	107.77	97.73	83.12	101.7	14.88	14.64	x	0.65	x
South Korea	No. /1 mil pers.	70.07	96.65	108.21	83.12	89.5	16.53	18.46	x	17.18	x
Australia	No. /1 mil pers.	54.86	45.04	37.09	83.12	55.0	20.09	36.50	x	5.25	x
New Zealand	No. /1 mil pers.	54.51	40.44	36.56	83.12	53.7	21.10	39.32	x	-1.12	x

WORLDBANK, 25.05.2016, http://databank.worldbank.org/data/home.aspx

In the conditions when the current development forms, the workforce and nature, cannot create new development possibilities, without a reduction of cumulation, some assumptions include the ability of the capitalist economy to initiate a new golden age, based on technological innovations. In this respect the number of patents per 1 million / inhabitants is a primary indicator.

Ray Kurzweil, states that current technological achievements are part of a larger phenomenon, which occurs at an accelerated pace: integrate human intelligence with artificial (Ray Kurzweil, 2016).

In our country Alexandru Trifu believes that classical production factors can be replaced by ideas and knowledge, resulting in increased productivity ((Trifu, 2005).

Romania aims that revenues from licenses and patents from abroad that were 0,135 of GDP in 2011, to increase at 0.15% of GDP in 2017 and at 0.17% in 2020 (Strategy R&D, 2014).

Table 5. The correlation between the R&D expenditures and the number of patents, for the period 2005-2014

Countries	MU	Period 2005-2014			$Y\ pat^* = A\ X(CD)^\alpha$					Elasticity(δY/δX)	
		2005	2010	2014	A	α	R2	r	significance	%Pat/1% DC	Ranking
EU (28)	Billion € RD	216.85	246.94	283.38	106,246	*-0.112*	0.554	0.74	*	-0.112	x
Belgium	Billion € RD	5.91	7.48	9.86	1,483.10	0.009	0.003	0.06	N	0.009	18
Bulgaria	Billion € RD	0.12	0.22	0.34	112.05	0.963	0.476	0.69	*	0.954	3
Czech Republic	Billion € RD	1.52	2.10	3.09	0.28	1.985	0.657	0.81	**	1.955	17
Denmark	Billion € RD	5.41	7.10	7.95	641.51	0.365	0.423	0.65	*	0.362	7
Germany	Billion € RD	58.87	69.92	83.68	140,913	-0.428	0.876	0.94	***	-0.427	24
Estonia	Billion € RD	0.15	0.23	0.29	16.67	-0.333	0.093	0.30	N	-0.332	25
Ireland	Billion € RD	2.22	2.68	2.87	278.20	0.146	0.023	0.15	N	0.145	13
Greece	Billion € RD	1.22	1.36	1.49	4.92	89.320	0.001	0.04	N	0.092	19
Spain	Billion € RD	11.79	14.59	12.81	698.60	0.285	0.233	0.48	N	0.283	11
France	Billion € RD	37.99	43.57	48.19	3,581.30	0.237	0.640	0.80	**	0.236	12
Croatia	Billion € RD	0.30	0.33	0.34	19.09	-0.179	0.003	0.06	N	-0.178	23
Italy	Billion € RD	16.89	19.59	20.82	59,940	-0.870	0.906	0.95	***	-0.869	26
Cyprus	Billion € RD	0.06	0.09	0.08	0.65	-0.952	0.044	0.21	N	-0.952	27
Latvia	Billion € RD	0.11	0.11	…	211.62	1.081	0.188	0.43	N	1.070	6
Lithuania	Billion € RD	0.19	0.22	0.37	768.50	2.783	0.849	0.92	***	2.731	1
Luxembourg	Billion € RD	0.56	0.60	0.62	37.63	-1.359	0.095	0.31	N	-1.361	28
Hungary	Billion € RD	0.90	1.13	1.43	181.80	0.586	0.798	0.89	***	0.581	5
Malta	Billion € RD	0.03	0.04	0.07	0.01	-1.928	0.215	0.46	N	-1.937	20
Netherlands	Billion € RD	10.19	10.86	13.06	3,975.0	-0.064	0.016	0.12	N	-0.064	21
Austria	Billion € RD	6.32	8.07	9.85	939.30	0.308	0.622	0.79	**	0.306	8
Poland	Billion € RD	1.50	2.60	3.86	82.59	1.488	0.970	0.99	***	1.470	2
Portugal	Billion € RD	1.58	2.75	2.24	133.02	-0.212	0.118	0.34	N	-0.211	22
Romania	Billion € RD	0.44	0.57	0.57	64.43	0.666	0.040	0.20	N	0.660	9
Slovenia	Billion € RD	0.48	0.75	0.89	126.90	0.159	0.136	0.37	N	0.158	14
Slovakia	Billion € RD	0.22	0.42	0.67	54.72	0.284	0.330	0.57	N	0.282	10
Finland	Billion € RD	5.77	6.98	6.51	1,255.30	0.076	0.001	0.03	N	0.075	16
Sweden	Billion € RD	11.72	11.88	13.61	428.80	0.756	0.724	0.85	**	0.749	4
United Kingdom	Billion € RD	34.04	30.65	38.32	4141.00	0.078	0.054	0.23	N	0.078	15

$Y = A\ X\alpha$; GL=8; (0.001, 0.87,***; 0.01, 0.76,**;0.05, 0.63*; <0.63, N)

CONCLUSIONS

In this paper it is highlighted the importance of the factors that contribute to the economic growth, among them being the results of the research and development, in special the increase of the expenditures allotted for research, development and innovation.

It is demonstrated that the higher the share of expenditures is from the GDP, the country is more developed.

It is also demonstrated that small countries are making big efforts, the correlation between the growth rhythm of expenditures and the growth rhythm of GDP standing up for this theory. The developed countries have instead at a small rhythm of the expenditures increase, maintaining the share from the GDP.

Romania is unfortunately an exception, occupying a 27 place and confirming that there are small investments in the research and development, also signaling an alarm, to increase the interest for investments in this field if a higher GDP is desired and a real economy development.

Regarding the revenues from licenses and patents in Romania, are at a small percentage, only of 0,135% of GDP in year 2011, with a target to increase at 0.15% of GDP in 2017 and at 0.17% in 2020 if we consult the National Strategy for Research, Development and Innovation.

As a final conclusion, it can be observed in the whole paper that the investments in Research and Development have a high importance in the economy growth, its share in GDP being high in the countries that are part from the developed countries.

BIBLIOGRAPHY

Afonso, A. & Furceri, D., (2008). *Government Size Composition , Volatility and Economic Growth*. Working Paper Series ECB, 849.

Barro, R.J., (2008). *Inequality and Growth Revisited*. Working Papers on Regional Economic Integration, (11), pp.1–13, Retrieved September 2016 from http://ideas.repec.org/p/ris/adbrei/0011.html.

Croix, D. de la & Doepke, M., (2003). Inequality and Growth: Why Differential Fertility Matters, Retrived March 2016 from http://www.econ.ucla.edu/workingpapers/wp803.pdf

Eftimoski, D., (2006). *Factors Limiting Investment in Human Capital in Macedonia*. Amfiteatru Economic, 8, pp.50–59, Retrieved August 2016 from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=econ&AN=0932016.

Lisbon Strategy (2020), Retrieved March 2016 from http://www.anpcdefp.ro/userfiles/Anexa_3_TiM_Strategia_Europa_2020.pdf

Teselios, Delia (2015), *Impactul cheltuielilor cu cercetarea dezvoltarea, în economia românească*, Archive, Vol.2(28), Retrived May 2016 from http://www.strategiimanageriale.ro/

Goel, R.K. & Ram, R., (1994). *Research and Development Expenditures and Economic Growth: A Cross-Country Study*. Economic Development and Cultural Change, 42(2), pp.403–411.

Kneller, R., Bleaney, M.F. & Gemmell, N., (1999). *Fiscal policy and growth: evidence from OECD countries*. Journal of Public Economics, 74, pp.171–190.

Kurzweil R., (2016) , What future prepare us ? Retrieved August 2016 from http://www.descopera.ro/lumea-digitala/12234095-ce-ne-pregateste-viitorul-8-previziuni-ale-vizionarului-ray-kurzweil-de-la-google

Necula, R., Stoian, M., Drăghici, M., 2016. The Convergent Evolution of Romania's Gross Domestic Product in Relation to the Average Macro-Economic Result of the European Union Countries. Amfiteatru Economic, 18(43), pp. 575-591

Pânzaru S., (2008), *Cresterea si dezvoltarea economica în context european si mondial*, - Management general nr. 2 . , Retrieved August 2016 from http://www.managementgeneral.ro/pdf/2_2008_7.pdf

Pescu (Beca), M. and Ştefan (Barabas), C., (2016). *The Effects of Gaps and Disparities on Economic Growth. A Study of 10 Former Socialist Countries from the CEE, Members of the EU*. Amfiteatru Economic, 18(43), pp. 592-610

Silaghi Pop, M.I, (2014), *Do business and public sector research and development expenditures contribute to economic growth in Central and Eastern European Countries? A dynamic panel estimation*. Economic Modelling, 36, pp.108–119. Retrieved from http://dx.doi.org/10.1016/j.econmod.2013.08.035.

National Strategy for Research, Development and Innovation, 2014 – 2020, Retrieved April 2015 from https://www.edu.ro/sites/default/files/_fi%C8%99iere/Minister/2016/strategii/strategia-cdi-2020_-proiect-hg.pdf

Stoian Mirela-Mădălina şi colab, (2015), *Finanţarea activităţii de inovare prin parteneriat public privat*, Retrieved August 2016 from http://www.utilajutcb.ro/uploads/docs/SINUC2015/sectia_III/III.13.pdf

Trifu A. (2005) – *Sinergia legilor economice. Viziune diacronică, Editura Performantica*, Iaşi

Voitchovsky, S., (2005). Does the Profile of Income Inequality Matter for Economic Growth? Journal of Economic Growth, 10(3), pp.273–296.

KEY POLICIES AND SOCIO-ECONOMIC GROWTH FACTORS OF RURAL AREAS IN THE EUROPEAN UNION

RUSALI MIRELA-ADRIANA[1]

Abstract: *Economic growth driven by a broad spectrum of factors is essential to long-term, sustainable development. From this perspective the paper approaches the economic growth of rural areas in Romania in light of the Europe 2020 Strategy, in order to identify specific indicators and national targets. The work falls within the management of rural development policy, in the current context of CAP's funding period 2014-2020. In line with the strategic objectives of improving the competitiveness of agriculture, the sustainable management of natural resources and balanced territorial development of rural areas, the results based on a comparative analysis of main socio-economic indicators related to the EU member states, stresses certain variables that present pressure or security risk upon Romania's rural economy.*

Keywords: rural development, socio-economic indicators, growth, European Union.

JEL Classification: O1, F6, Q0, O5.

INTRODUCTION

Rural areas of the European Union face multiple common challenges when comparing to urban regions, i.e. lower incomes caused by fewer employment opportunities and smaller gains from the rural specific economic activities like agriculture and very often undervaluation of agrifood products. Therefore the economic gaps between regions resulted in several cases in phenomena of outward migration flows of rural populations and land abandonment, with a major risk to future rural growth and sustainability. In this context, the article aims at investigate rural economic challenges that require political response, based on the present policy framework designed in the economic growth vision of rural regions of the EU-28 and on an empirical research that highlights the socio-economic structure of rural regions by urban-rural typology, trends within rural employment and an analysis of economic activity in rural areas, with focus on agriculture.

Socio-economic development aims to harmonize the three main pillars of sustainable development: economic development, protection of the environment and social justice (Eurostat, 2015). While gross domestic product is the best-known measure of macro-economic activity and has been regarded by specialists as a proxy indicator for societal progress, the economic dimension of socioeconomic development is analyzed in view of economic growth based on diversity of activities and bringing added value, on employment of trained labour force and investment.

MATERIALS AND METHODS

The overview of recent relevant documents related to the policy framework comprised mainly EU legal communications, regulations and reports generated by the general directions of the European Commission in rural development area and CAP and support studies (*e.g.*: EC, 2010a,b; Eurostat, 2016, 2015).

The policy framework is based on measurable indicators, for which purpose was formulated a set of common context indicators established by Commission Implementing Regulation (EU) No 834/2014, laying down rules for the application of the common monitoring and evaluation framework of the common agricultural policy and Commission Implementing Regulation (EU) No 808/2014, laying down rules for the application of Regulation (EU) No 1305/2013 of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural Development (EAFRD). The selection of the indicators used as a guide the "Study on Employment, Growth and Innovation in Rural Areas" (ECORYS, 2015)

---

[1] PhD, CSII, Institute of Agricultural Economics - Romanian Academy, E-mail: m.rusali@yahoo.com

and has been completed with information provided by the European Commission publications (EC, 2015a,b).

The empiric research has been used the methods of statistical analysis of socio-economic indicators in rural regions of the EU-28 classified by the urban-rural typology (predominantly rural, intermediate and predominantly urban), and synthesis of the outcome resulted from the evaluations of relevant indicators, by comparing most recent available data from Member States supplied by Eurostat *i.e.* National and Regional Economic Accounts, Economic Accounts for Agriculture, Labour Force Survey (LFS).

Economic development is commonly expressed in terms of GDP, which in the regional context may be used to measure macroeconomic activity and growth, as well as for providing the basis for comparisons between regions. Taking into account several aspects of growth, a wider approach have shaped the analytical study: socio-economic structure of regions by the typology urban-rural, in terms of population, territory, distribution of GVA and employment; growth patterns of socio-economic indicators (employment, productivity); sectoral economic structure of the regions and development. Potentials for growth expressed by indicators as gross fixed capital formation (GFCF) (C28) (selected), can be reflected as well by other relevant indicators, for example: total factor productivity in agriculture (C27), agricultural entrepreneurial income (C26), employment of non-agricultural sector, or economic development of non-agricultural sector, self-employment, farmers with other gainful activities, are consistent drivers to economic growth.

RESULTS AND DISCUSSIONS

The rural development policy of European Union (EU) has been constantly evolving to respond to the emerging challenges in rural areas. Agriculture was one of the first economy sectors that received the attention of policymakers, as according to Article 39 of the Treaty of Rome on the EEC of 1957 established the objectives for the first common agricultural policy (CAP), *i.e.* this was focused on increasing agricultural productivity as a way to ensure a fair standard of living for the agricultural community, stabilizing markets and ensuring supply security at affordable prices for consumers. The impact of primary objective of producing more food within Europe determined food surpluses, distorted trade and raising environmental concerns, which asked for changes in the CAP, a process that started in the early 1990s by a change from production support to a market-oriented and a more environment-friendly and sustainable agriculture.

Agricultural policy have embarked on further on reforms taken place in recent years, with main benchmark steps in 2003, 2008 and the most recent reform process concerning the wider one of the EU's Common Agriculture Policy (CAP), has been completed by 2013 with the approval of the basic legislative acts for 2014-2020 (EC, 2010). These reforms are made in relation to the goals of developing an *intelligent, sustainable* and *inclusive growth*, in line with the Europe 2020 strategy, while taking account of the wealth and diversity of the agricultural sector across European regions. Three long-term strategic objectives have been identified by the European Commission in relation to EU rural development policy during the period 2014–2020.

For Romania, the RDP targets are the country's objectives concerning rural zones included in the National Programme for Rural Development (RDP) 2014-2020 (MADR, 2015), which encompass the *6 rural development priorities* i.e. promoting competitiveness and restructuring the agricultural sector, environmental protection and climate change, stimulating economic development, job creation and a better quality of life of people, focusing on the following 3 main areas and targets:

❖ **Farm viability, competitiveness and sustainable forestry management** (19.7%)→ *will help modernize nearly 3400 farms and cooperatives, support the development of more than 30000 small farms, and help more than 9400 young farmers to start up; promoting association between small farmers i.e. 15000 small farmers will also be supported to permanently transfer their holdings, promoting consolidation of holdings. In forestry sector, there will be investments to expand the limited network of forest roads by over 900 km.*

❖ **Restoring, preserving and enhancing ecosystems related to agriculture and forestry** (29.7%) → *more than 1.3 million ha (over 10%) of agricultural land and more than 800000 ha (12%) of forests will benefit from payments to support biodiversity and promote environmentally-friendly land management practices. Compensatory payments will be made to farmers on more than 70% of all the areas designated, representing 4.7 million hectares (> 1/3 of agricultural land) will receive support in order to prevent land abandonment and soil erosion (in areas affected by climatic and physical constraints i.e. mountainous areas, areas with soil erosion, dryness etc.).*

Skills in the agricultural sector will be reinforced by 184000 training places, under the above two priorities.

❖ **Social inclusion and local development in rural areas** (27%) → *almost 27000 jobs will be created in rural areas, of which more than 2000 will be created under LEADER (120 Local Action Groups will implement local development strategies, covering 100% of the eligible rural territory) and the setting up and development of 3000 non-agricultural businesses will be supported. Almost 800 projects will be supported to improve small-scale rural infrastructure, improving living conditions for some 27% of the rural population (will include investments in local roads, waste water/water supply facilities, crèches, kindergartens, after-schools, and agricultural high schools). Almost 400 local cultural patrimony buildings will be restored and preserved.*

Main research findings from agriculture and rural development statistics

More than half (52% in 2014) of the EU-28's territory is within regions classified as being predominantly rural, while these areas were inhabited by 112.1 million people, more than one fifth (22.3 %) of the EU-28's population (table 1).

Table 1. Socio-economic structure of rural regions* in EU-28, by urban-rural typology indicators (2014)

Country / Specification	% Territory			% Population			% GVA			% Employment		
	Rural	Intermediate	Urban	Rural	Intermediate	Urban	Rural	Intermediate	Urban	Rural	Intermediate	Urban
Belgium	33.6	31.8	34.6	8.6	23.6	67.8	5.5	19.8	74.6	6.7	20.7	72.5
Bulgaria	53.6	45.1	1.2	37.1	44.8	18.1	25.3	35.7	39.0	32.5	42.0	25.5
Czech Rep.	48.4	37.0	14.6	32.9	42.9	24.2	27.5	36.8	35.7	31.1	40.2	28.7
Denmark	48.3	50.5	1.2	28.9	48.8	22.4	23.6	41.4	31.6	27.1	45.5	27.3
Germany	38.5	50.4	11.1	16.3	42.0	41.7	13.9	37.2	48.9	15.2	40.3	44.5
Estonia	81.6	8.8	9.6	45.2	11.4	43.5	31.2	7.6	61.2	43.2	10.5	46.3
Ireland	98.7	-	1.3	72.4	0.0	27.6	58.1		41.9	66.3	-	33.7
Greece	82.2	12.1	5.7	43.8	10.6	45.7	34.0	8.4	57.5	41.4	10.2	48.4
Spain	29.4	50.7	19.9	7.3	33.5	59.2	6.5	30.5	62.9	7.0	31.9	61.1
France	53.6	38.5	7.9	29.7	35.2	35.1	22.6	30.1	47.2	27.7	32.3	40.0
Croatia	79.1	19.8	1.1	56.1	25.1	18.8	44.0	22.6	33.4			
Italy	45.2	41.9	13.0	20.1	43.0	36.9	17.4	40.9	41.6	19.1	42.8	38.1
Cyprus	-	100	-	0.0	100	0.0		100		-	100	-
Latvia	62.8	21.1	16.2	36.6	12.9	50.5	22.7	10.3	66.8	36.2	13.3	50.5
Lithuania	64.7	20.4	14.9	41.5	31.1	27.4	29.8	31.7	38.5	39.9	31.5	28.6
Luxembourg	-	100	-	0.0	100	0.0		100		-	100	-
Hungary	66.3	33.1	0.6	46.7	35.6	17.7	34.7	27.2	38.1	39.3	28.9	31.8
Malta	-	-	100	0.0	0.0	100			99.8	-	-	100
Netherlands	2.1	53.8	44.1	0.6	26.9	72.5	0.6	23.2	75.2	0.6	25.0	74.3
Austria	79.2	11.9	8.9	44.1	20.8	35.1	35.5	24.6	39.9	39.6	24.2	36.2
Poland	51.2	39.5	9.3	33.2	38.5	28.3	26.5	32.5	40.9	33.5	33.4	33.1
Portugal	81.1	11.6	7.3	33.8	17.1	49.1	28.4	13.7	57.8	33.0	16.5	50.4
Romania	59.8	39.4	0.8	44.9	43.6	11.4	31.7	41.1	27.2	41.8	46.2	12.0
Slovenia	58.6	41.4	-	43.4	56.6	0.0	36.2	63.8		39.6	60.4	-
Slovakia	59.0	36.8	4.2	50.2	38.4	11.4	40.6	32.2	27.3	43.9	36.7	19.4
Finland	82.4	14.8	2.8	40.4	30.5	29.1	34.6	27.8	37.5	38.3	29.0	32.6
Sweden	44.0	54.4	1.5	15.9	61.6	22.4	13.7	55.2	31.1	15.5	59.1	25.4
United Kingdom	27.6	44.5	27.9	2.9	23.2	73.9	1.9	19.8	76.7	2.8	23.8	73.4
EU-28	52.0	38.2	9.8	22.3	35.1	42.7	15.5	31.2	52.7	21	34	45

Source: author's processing of data from Eurostat - National and regional economic accounts.

In average, 38.2% of the area and more than one third (35.1%) of the EU-28's population were inhabiting intermediate regions, in contrast with predominantly urban regions covering only close to 10 % of the land area, although accounted for a majority of the population, sharing 42.4 %.

Table 1 shows that countries with the major part of GVA obtained in predominantly rural regions were Ireland, which has no intermediate regions (58%), followed by Croatia (44%) and Slovakia and Slovenia which has no regions classified as urban (40.6%). Romania falls also much above the EU-28 average gained in 2014, of 15%, among the group of states with shares between 35.5%-31.7% of GVA produced in rural regions, after Austria, Hungary, Finland and Greece. Moreover, Romania shared 41.8% of the GVA of intermediate regions and 27.2% in urban regions.

The distribution of employment differs between countries and types of region, except for Poland with the most balanced employment shares (33% in each type). Employment structure by type of region evidenced the highest shares in predominantly rural areas from Ireland (66.8%) followed by Slovakia, Estonia, Romania and Greece (43.9%-41.4%), while the highest employment shares in intermediate regions were in Cyprus and Luxembourg (100% each), Slovenia (60.4%), Sweden (59,1%) and Romania (46.2%).

Agriculture in the EU-28 generated in the period 2012-2014 an average gross value added of over EUR 167 billion, accounting for a share of 1.3 % of the total added value of economy. As shown in fig. 1, the contribution of agriculture to total GVA, in 2014, by top 5 countries ranked Romania 5.3% (7.1 billion EUR), followed by Bulgaria, 4.7% (1,7 bil. EUR), Hungary, 3.7% (3.2 EUR), Greece 3.3% (5.2 EUR) and Lithuania 3.1% (1 bil. EUR).

Figure 1. Distribution of GVA in EU-28, by type of regions* (2014)
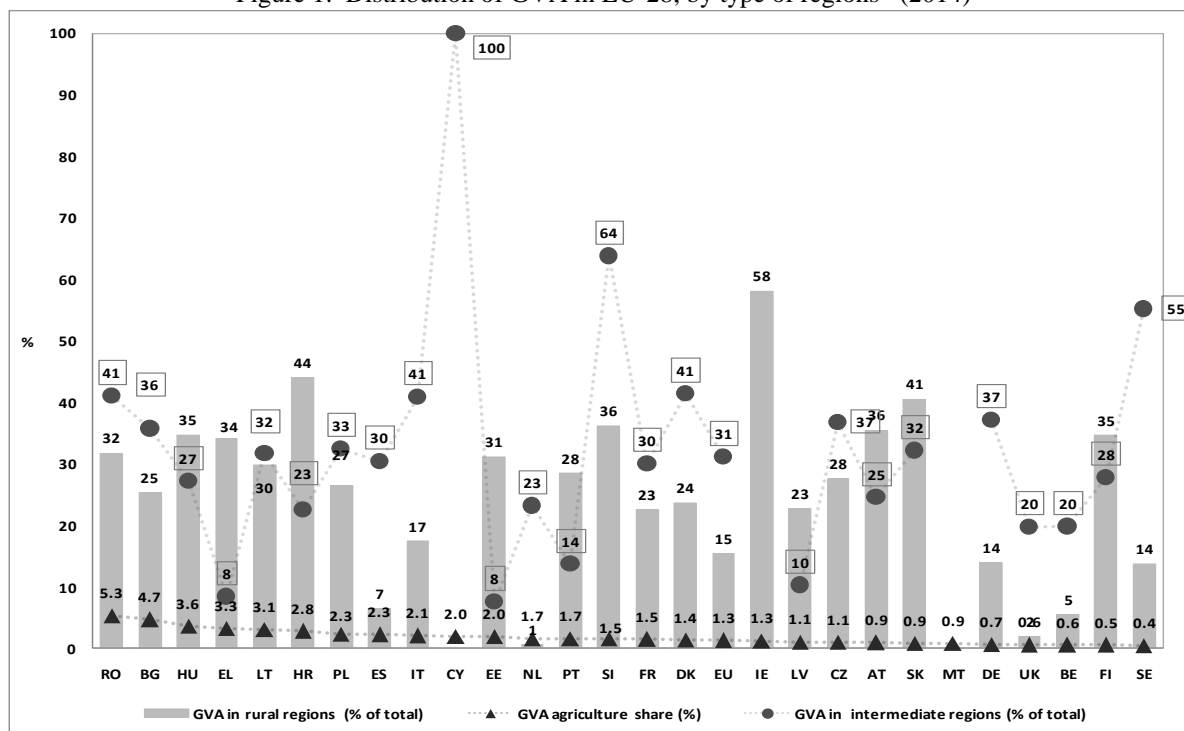
Source: author's processing of data from Eurostat - National and regional economic accounts.
* By urban-rural typology there are classified no intermediate regions in Ireland, 100% urban regions in Malta, 100% intermediate regions in Cyprus, Luxembourg and Slovenia.

By type of regions, the weight GVA in predominantly rural regions differs visibly across countries, ranging, in 2014, from 58% (92.5 million EUR) in Ireland, to 1% (3.3 million EUR) in Netherlands, compared to the EU-28 average of 15%. Romania shared 32% GVA in national rural regions, accounting for 37.2 million EUR, and 41% in intermediate regions corresponding to 48.2 million EUR, summing 73% of total GVA produced in rural together with intermediate regions.

The structure of the economy varies greatly by type of region and by country. By the share of GVA gained in agriculture, in predominantly rural and intermediate regions the agricultural

sector prevails in Bulgaria (7.7%), in Greece and Romania (7.3% each), in Netherland and Lithuania (6.6%-6.3%), followed by Latvia, Croatia, Greece and Hungary (8%-9%). By contrast, the agricultural sector in Luxembourg and Sweden represents less than 1% of their total GVA in rural and intermediate regions, preceded by Slovenia, Slovakia, and Germany with 1.2%-1.3% shares.

As fig. 2 shows, service sector is the main source of labour force employment in the EU. The economy of predominantly rural regions mainly depends on the service sector, however, in the EU-N13, the contribution of agriculture remains important.

Figure 2. Gross value added in EU-28 rural regions*, by economic sectors (average 2004-2013) (% of total GVA)
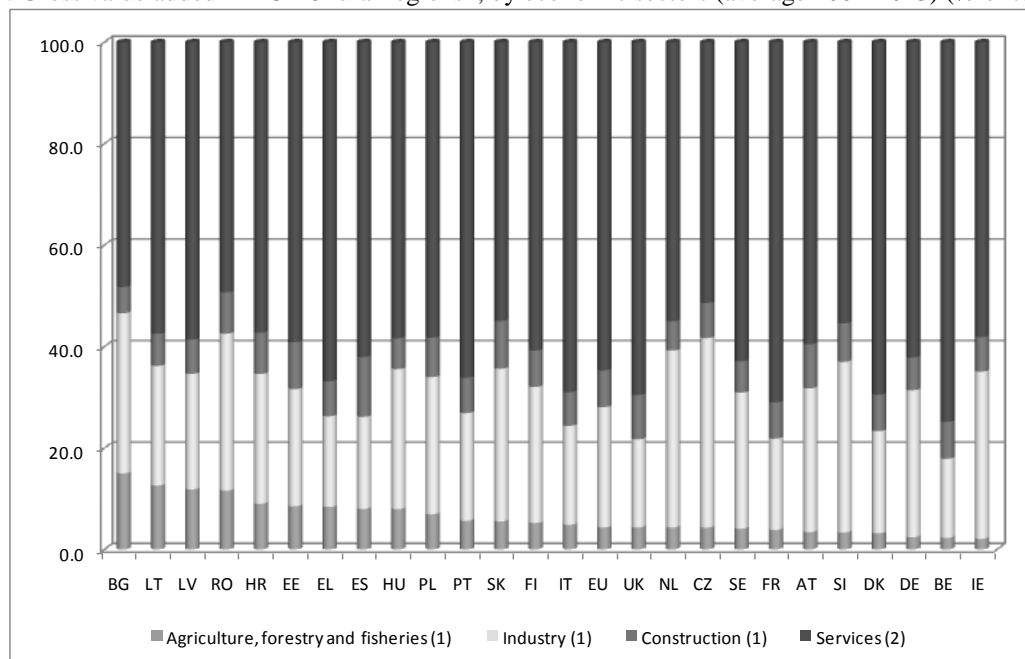
Source: author's processing of data from Eurostat - Economic Accounts for Agriculture.
* Exempt for Cyprus, Luxembourg and Malta for (1) and as well Poland for (2).
Note: by urban-rural typology there are classified 100% urban regions in Malta and 100% intermediate regions in Cyprus, Luxembourg and Slovenia.

By economic activity, agriculture employed nearly 10 million people in 2014 which represented 4.4 % of total employment in the EU-28 (table 2). In 2014, the highest employment rates in agriculture were found in Romania (27.8%), Greece (13%) and Poland (10.9%), in contrast with the United Kingdom, Malta, Belgium, Luxembourg, Sweden and Germany, where agriculture provided less than 2% of employment. Employment in agriculture and its share in total employment in EU-28 had a decreasing trend over last five years, representing in absolute terms more than 1 million persons. While the decline in EU-28 was of -2.1%/year, the trend was more accentuated in the EU-N13 states (-2.5%/year) than in the EU-15 (-1.6%/year). Nevertheless, the number of people employed in agriculture increased in six Member States *i.e.* Luxemburg, United Kingdom, Malta, Cyprus and Ireland, while the most accentuated annual average was in Croatia (-10.0%) and Portugal (-7.6%).

Although with smallest shares in total employment of the EU-28, forestry was important for about half of million of people employed in 2014 in this sector of EU-28, most of them being in Latvia (2%) and Estonia, Finland, Lithuania and Slovakia (1% in each), while Romania (0.6%) was slightly above the EU-28 average (0.3%). Among the least shares of employment in forestry were in Netherlands, United Kingdom, Cyprus, France Spain, Germany and Denmark (0.1% or less).

Food industry in EU-28 employed almost 5 million people in 2014. The distribution of employment in food industry placed in top Bulgaria and Croatia (3.8% each), followed by Hungary (3.4%), Greece and Poland (3.3% each), while sharing below 1% in Luxembourg.

While service sector generally accounts for the majority of jobs, the weight of services sector in employment presents large gaps among states, ranging from 42% in Romania to 83% in the Netherland.

Table 2. Employment in EU-28, by economic activity (2014)

NUTS code	Label	Agriculture		Forestry		Food industry		Tourism	
		1000 persons	% of total	1000 persons	% of total	1000 persons	% of total	1000 persons	% of total
EU	European Union	9,558	4.4	546	0.3	4,957	2.3	9,936	4.6
BE	Belgium	53	1.2			113	2.5	155	3.4
BG	Bulgaria	181	6.1	26	0.9	112	3.8	155	5.2
CZ	Czech Republic	108	2.2	27	0.5	115	2.3	195	3.9
DK	Denmark	62	2.3	3	0.1	60	2.2	105	3.9
DE	Germany	528	1.3	35	0.1	950	2.4	1,527	3.8
EE	Estonia	16	2.6	7	1.1	17	2.7	26	4.1
IE	Ireland	103	5.4	3	0.2	54	2.8	137	7.2
EL	Greece	461	13.0	5	0.2	116	3.3	297	8.4
ES	Spain	678	3.9	25	0.1	483	2.8	1,404	8.1
FR	France	695	2.6	31	0.1	611	2.3	932	3.5
HR	Croatia	128	8.2	15	0.9	60	3.8	96	6.1
IT	Italy	738	3.3	53	0.2	465	2.1	1,269	5.7
CY	Cyprus	15	4.2	1	0.1	11	3.1	28	7.8
LV	Latvia	46	5.2	18	2.0	28	3.2	29	3.3
LT	Lithuania	106	8.0	14	1.0	41	3.1	34	2.6
LU	Luxembourg	3	1.3	:	:	1	0.6	8	3.1
HU	Hungary	167	4.1	23	0.6	139	3.4	172	4.2
MT	Malta	2	1.2	:	:	4	2.1	14	7.8
NL	Netherlands	170	2.1	2	0.0	129	1.6	325	3.9
AT	Austria	187	4.5	12	0.3	71	1.7	235	5.7
PL	Poland	1,734	10.9	78	0.5	522	3.3	334	2.1
PT	Portugal	363	8.1	14	0.3	97	2.2	276	6.1
RO	Romania	2,392	27.8	48	0.6	187	2.2	181	2.1
SI	Slovenia	84	9.2	4	0.4	19	2.1	41	4.4
SK	Slovakia	59	2.5	24	1.0	50	2.1	119	5.0
FI	Finland	76	3.1	26	1.1	37	1.5	86	3.5
SE	Sweden	62	1.3	29	0.6	45	0.9	159	3.3
UK	United Kingdom	341	1.1	23	0.1	423	1.4	1,598	5.2

Source: author's processing of data from Eurostat - Labour Force Survey.

Among these, tourism accounted for 10 million employed persons in EU-28 (4.6%), in 2014, most of them found in Greece and Spain (8.4%-8,1%), but also in Cyprus, Malta and Ireland (7.8%-7.2%). Romania ranks the last place with 181 thousand people employed in tourism, preceded by Poland (2.1% each) .

Labour productivity in agriculture accounted for 167 billion EUR in the period 2012-2014, of which the highest performances had Netherlands, Denmark and Belgium (table 3). Romania was below the EU-28 average, with a 27% share corresponding to an average amount of 6.9 billion EUR, however, the annual average trend was one of the highest (10%), after Belgium (17%) and Luxembourg (15%).

Gross fixed capital formation in agriculture quantifies the part of value added invested, that is a key element for determining competitiveness. In the period 2007-2013, the agricultural sector in the EU-28 invested in average 59 billion EUR, accounting for 35% of the total agricultural GVA, of which 90% was invested in the EU-15, especially in France, Italy and Germany (table 4). As an average of the period, the highest shares of GFCF in agricultural GVA were found in Luxembourg (125%), Denmark (85%) and in the Netherlands, Austria and Estonia (64%). The lowest levels of investments in agriculture have registered in Cyprus (4%), Poland (9%), in Slovakia and Bulgaria (11%) and in Romania (16%).

In the period 2007-2013, GFCF in agriculture in the EU-28 increased in average with 1.3% as annual growth rate, with a lower trend in the EU-15 (1%) than in the EU-N13 newest Member States (3.6%), while Cyprus (-14.4%), Croatia (-11.9%) and Denmark (-5.3%) and Greece (-4.5%) showed the highest decline of GFCF.

Table 3. Labour productivity in agriculture, in EU-28 (average 2012-2014)

Country / Indicator	GVA	Employed persons	Labour productivity		
	EUR million	1000 AWU	EUR/AWU	Index EU-28	Annual average growth rate (%)
EU-28	167,431	9,917	16,884	100	3
Belgium	2,376	58	40,989	243	17
Bulgaria	1,696	322	5,267	31	7
Czech Rep.	1,426	105	13,537	80	2
Denmark	3,200	53	60,309	357	-6
Germany	17,985	507	35,482	210	-7
Estonia	346	22	15,380	91	7
Ireland	2,001	164	12,175	72	2
Greece	5,176	460	11,256	67	0
Spain	21,792	852	25,581	152	5
France	28,377	781	36,338	215	2
Croatia	1,108	196	5,653	33	-6
Italy	31,138	1,108	28,099	166	1
Cyprus	331	25	13,174	78	1
Latvia	268	82	3,284	19	7
Lithuania	1,083	147	7,382	44	8
Luxembourg	121	4	33,277	197	15
Hungary	2,892	447	6,472	38	4
Malta	60	5	12,004	71	2
Netherlands	9,737	146	66,646	395	2
Austria	2,819	124	22,813	135	3
Poland	8,964	1,930	4,645	28	3
Portugal	2,404	284	8,477	50	6
Romania	6,976	1,523	4,580	27	10
Slovenia	430	82	5,260	31	2
Slovakia	593	55	10,760	64	4
Finland	1,312	79	16,638	99	-6
Sweden	1,704	62	27,456	163	2
United Kingdom	11,117	295	37,703	223	2

Source: author's processing of data from Eurostat - Economic Accounts for Agriculture.

Table 4. Gross fixed capital formation in agriculture, in EU-28 (2007-2013)

Country / Indicator	GFCFA	GFCFA / GVA in agriculture	Growth rate of GFCFA
	EUR million current prices	%	% per year
EU-28	59,087	35	1.3
Belgium	1,114	51	3.4
Bulgaria	173	11	3.2
Czech Rep.	600	29	3.9
Denmark	1,610	85	-5.3
Germany	8,054	48	2.1
Estonia	184	64	3.4
Ireland	889	48	0.2
Greece	1,488	26	-4.5
Spain	4,793	21	2
France	11,156	38	3.9
Croatia	359	19	-11.9
Italy	10,249	39	-5.2
Cyprus	12	4	-14.4
Latvia	265	57	3.4
Lithuania	365	41	12.1
Luxembourg	135	125	5.9
Hungary	782	24	6.8
Malta	14	19	-0.3
Netherlands	4,561	52	5.5
Austria	1,974	64	5.2
Poland	1,049	9	5.6
Portugal	838	32	0.3
Romania	1,164	16	3
Slovenia	243	39	-1
Slovakia	182	11	4.1
Finland	1,176	70	0.6
Sweden	1,112	60	2.2
United Kingdom	4,545	46	4.4

Source: author's processing of data from Eurostat - Economic Accounts for Agriculture.

Nevertheless, GFCF in agriculture had an increase trend in other countries, in top with 12% being Lithuania, followed by Hungary sharing 5.9% and Luxembourg with 6.8%. Romanian investment had the highest percentage found among EU-N13, with an average value of 1164 million EUR, had a positive trend, rising with a moderate 3% in average per year.

CONCLUSIONS

Europe 2020 Strategy is the ten-year growth strategy for the European Union envisaging three principles for the future growth: *smart*, *sustainable* and *inclusive*. The Member States targets to comply tot these objectives, as well as those related to rural development level are fore guiding to the common aim of growth. The analysis of socio-economic indicators results aspects of risk for rural economic growth in some countries, among which for Romania the following are striking:

- Most significant development differences are observed between urban and rural areas.

- Low added value obtained in agriculture and the lack of economic diversification in rural areas hampers the development of a sustainable rural economy.

To these signals should be highlighted the evaluations results of Council on the Convergence Programme of Romania, contained in COM (2016) 343 final Brussels, which concludes that Romania is experiencing one of the highest risks of poverty and social exclusion in the EU and labour market activation is very limited, especially in rural areas. Romania needs to take action in the short term so as *to improve access to public integrated services, to extend basic infrastructure and encourage economic diversification, particularly in rural areas*.

According to a study on research an innovation (EC, 2013) *the field of agriculture, fisheries and forestry which has a lot of potential in Romania for economic growth given the existing raw materials, is not supported by a comparable scientific specialization*. This can be expected to raise awareness at the highest political levels on the added value of innovation in various sectors *i.e.* agriculture, transport, services etc..

Finally, to meet multiple challenges that rural zones are facing, the main efforts might focus on enhancing competitiveness, restructuring, modernization and value added in the agricultural sectors, on diversification of rural economy mainly with non-agricultural activities and services, on business development, on bio-economy and circular economy, education and knowledge transfer, all that in favor of sustainable economic growth and creation of employment opportunities. In this context, it has to be stressed that employment contributes to economic performance, quality of life and social inclusion, making it one of the cornerstones of socioeconomic development and welfare.

REFERENCES

ECORYS, (2010). *Study on Employment, Growth and Innovation in Rural Areas*, managed by DG AGRI, Netherlands.

European Commission (2015a). *Rural Development in the EU – Statistical and Economic Information Report.* DG AG and RD, Brussels.

European Commission (2015b). *CAP context indicators* 2014-2020, DG AG and RD, Brussels.

European Commission, (2013). *Research and Innovation performance in EU Member States and Associated countries Innovation Union progress at country level 2013*, Directorate-General for Research and Innovation. Luxembourg: Publications Office of the European Union.

European Commission, (2010a). Europe *2020 - A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Communication from the Commission, Brussels, 3.3.2010. http://eur-lex.europa.eu/

European Commission, (2010b). *The CAP towards 2020: Meeting the food, natural resources and territorial challenges of the future,* COM(2010) 672 final, Brussels, 18.11.2010.

Eurostat, (2015). *Sustainable development in the European Union - 2015 Monitoring Report of the EU Sustainable Development Strategy*. Statistical books, Luxemburg. http://ec.europa.eu/eurostat/

Eurostat, (2016). *Smarter, greener, more inclusive? Indicators to Support The Europe 2020 Strategy.* Luxembourg: Publications Office of the European Union.

ICEADR (2015). *Agricultural Economics and Rural Development - Realities and Perspectives for Romania*, Proceedings of The 6th edition of the International Symposium, organized by RIAERD, Ed. ASE: pp. 17-22.

Ministry of Agriculture and Rural Development (2015). National Program for Rural Development 2014-2020 Romania.

SECTION 4: PROJECT ADER 16.1.2

*"*Models of development of the short chains for capitalizing along the pathway service-primary production-storage-processing-sales market*"*

MODELS FOR SHORT VEGETABLES' CHAIN

ION RALUCA ANDREEA[1]

Abstract

The paper presents models for short chains of vegetables, considering integration as the main mechanism of coordination agents' activities on the chain. Among other mechanisms, such as subsidies system, price, contracts, horizontal and vertical integration, the latter has been chosen because, as other research show, it provides the highest performance for operators of agro-food system. The research question is how efficient are activities of vegetables' chain in this particular form of integrated operations of collecting vegetables, store and process them into cans and sell them to the market in a single economic unit. The objective of the research is to assess business' efficiency. In achieving this purpose, economic data regarding investment, production, revenues and expenses have been analysed, for an associative form of processing and selling vegetables, which develops such a business. The results show that investment is feasible, because revenues are higher than expenses, the rate of return is 22.6 per cent, and the return of investment is ten years, less than the machineries' period of operation. The model can be implemented by farmers who want to apply for structural funds and to develop, as such, their business in the direction of integrating activities down-stream the chain.

Key words *short chain, vegetables, efficiency, integration*

JEL classification: Q13

INTRODUCTION

This article aims to identify models for short vegetables' chain within the wider concern for increasing performance. The need of this piece of research consists in offering solutions to farmers who face difficulties in selling their output to the market. As seen in previous research (Manole, 2006; Turek, 2008), farmers deliver small quantities of vegetables, difficult to be sold to hypermarkets and supermarkets who require large and homogenous batches of products. In addition, vegetables chain registers high level of losses, 37 per cent of total production (Istudor, 2007). These shortcomings can be overtaken by integrating post-harvest activities into one single economic unit, creating, as such, the short chain of vegetables.

Vegetables chain and market in Romania were studied in numerous papers (Istudor, 2000, Preda, 2001, Ion, 2005, Manole, 2005). This piece of research emphasis, particularly, the role of integration and it aims at designing a model for short chain in agriculture. The research question is whether short chain of vegetables is efficient or not, considering the short chain as a business where post harvest activities are integrated and performed in one single economic unit.

In order to answer this question, economic data regarding investment, production, revenues and expenses have been analysed and indicators of economic efficiency have been assessed. The research objective is to identify the feasibility of the business which integrates post harvest activities of collecting and processing vegetables and selling cans.

According to Manole (2006) "the highest performance is recorded if the chain is coordinated through the mechanism of integration, because efficiency, equity, economy of transaction costs and access to markets are high, just prices and income stability are average". In this paper, a model of a short chain is presented, in a form of a project that can be used as an example for farmers who want to set up a cooperative of processing vegetables and apply for structural funds in order to finance their

---

[1] Associate Professor, PhD. Ion Raluca Andreea, The Bucharest University of Economic Studies, Faculty of Agro-food and Environmental Economics, raluca.ion@eam.ase.ro

investment. Thus, the present study is useful for farmers who plan to develop their businesses in the direction of integrating post harvest activities and increase, as such, profitability.

MATERIAL AND METHODS

The short chain involves post harvest activities integration in one economic unit which collect and process vegetables and sell cans. The business is developed in a form of a cooperative set up as initiative of farmers who apply for structural funds in order to finance this project. It aims at establishment of new production or processing lines for broth and tomato juice and pickles, optimum use of labour resources in rural areas affected by unemployment, labour productivity growth by making post-harvest activities in semi-automated system, using machinery and equipment purchased by the project, obtaining products with higher added value, namely broth and tomato juice and pickles, compared to tomatoes and vegetables that have lower values. Specific project objectives are subscribed to measure 4.2. Support for investments in processing / marketing of agricultural products: DI 3A Improving the competitiveness of primary producers through better integration in the agrifood chain through quality schemes, adding value to agricultural products, promoting local markets, short circuits, producer groups and interbranch organizations and DI 6A Facilitating diversification, creation and development of small businesses and creating jobs (National Program for Rural Development, 2016).

The investment refers to purchase fixed assets: machinery and equipment for processing vegetables, land for the location of the plant and factory and warehouse construction. The latter will have spaces for processing vegetables, for its storage and end products, laboratory, office, boardroom for meetings of cooperative members. The products have been selected following a market study. Its results reveal the fact that, among vegetables cans, tomatoes juice and broth and pickles are the most demanded. The structure of production is presented in Table 1.

Table 1 Production structure

Product	Number of cans
Broth	20359
Tomatoes juice	37845
Pickled cucumbers	5920
Pickled cabbage	8120
Assorted pickles	3160
Seedlings	2500*

Source: authors' calculations, *pieces

Production of broth is 12 kilograms per hour, meaning 20.6 jars of 580 ml, or 11,808 kilograms per year or 20,358 jars per year. Production of tomatoes juice is 38.46 litters per hour or 37,845 bottles of one litter per year. Production of pickles is 10 jars per man hour, or 2,400 jars per man month. Seedlings are obtained during early spring, to ensure continuity of activity in the plant.

The raw materials used in processing tomatoes into juice and pulp, obtaining pickles and seedlings are: tomatoes, cucumbers, cabbage, tomatoes, cauliflower, carrots, salt, sugar, water, jars, bottles, cartons, vegetable seeds, seedbeds, diesel, electricity and water. Projecting the assurance needs of these material resources is performed starting with production expressed in jars per hour and specific consumption of these resources. For projecting the fuel consumption, the movement of the means of transport to collect vegetables (9 shifts per month) is taken into account; the average interval between two successive supplies is 3.5 days.

Staffs are projected based on cooperative activities that take place, according to the schedule of activities in the field, especially to phased harvest of vegetables. Cooperative staff consists of permanent staff: manager, assistant manager and driver; and seasonal staff: 7 productive workers and auxiliaries.

Market and marketing mix

Product policy focuses on achieving three main products: tomato broth, tomato juice and pickles. The first two products have similar processing technologies, so they use the same equipment. Also, in order to obtain tomatoes juice and broth, the same raw materials, tomatoes, are used, which, after receiving and sorting, are selected to obtaining juice or broth, depending on the pulp consistency. Product policy emphasizes traditional recipe for obtaining tomatoes juice and paste without addition of chemicals. This message can be used in the communication policy and justifying the establishment of higher selling prices than those of competitors.

Promotion policy. The products are released under own brand name, which will be accompanied by specifying "cooperative". The main values communicated through the promotion policy are safety, freshness and quality, using vegetables collected from local growers, cooperative members, and natural ingredients without added chemicals.

Price policy. Product prices are slightly higher than those of the products perceived by consumers as similar. Therefore, in order to differentiate products from the competition, the denomination "cooperative" and quality of raw materials used shall be communicated to the target audience, mainly by brand and label information source. The extra price is justified because it is perceived by consumers as an emotional investment in the development of agricultural production and supporting the phenomenon of cooperation so necessary for Romanian agriculture.

Distribution policy. The distribution channel is short: manufacturer (cooperative) - retailer - consumer. The main customers are small grocery stores and large supermarket and hypermarket stores. Currently, Carrefour, Metro and Mega Image stores carry their own insurance programs with products from local producers. The cooperative will apply to these programs.

The sales program is presented in Table 2. Tomatoes juice has the highest weight in total sales, 60 per cent, followed by tomatoes broth with 27 per cent. Pickles are obtained to add value to vegetables and to ensure continuity of activities for farmers during late autumn and winter. It means that obtaining pickled vegetables is justified not only economically, but also socially. Almost the same reason drives the production of seedlings.

Table 2 Sales program (lei)

Product	I	II	III	IV	VIII	IX	X	XI	XII	Total
Broth	0	0	0	0	35918	35918	34759	35918	0	142513
Tomatoes juice	0	0	0	0	81074	81074	78458	81074	0	321679
Pickled cucumbers	0	0	0	0	12400	12400	4800	0	0	29600
Pickled cabbage	7440	7440	0	0	0	0	2160	3720	3600	24360
Assorted pickles	0	0	0	0	0	0	2880	4960	4800	12640
Seedlings	0	0	1250	1250	0	0	0	0	0	2500
Total	7440	7440	1250	1250	129392	129392	123058	125672	8400	533292

Source: authors' calculations, *pieces

RESULTS AND DISCUSSIONS

The production of vegetables cans implies investments in fixed assets: equipments, machineries, buildings. For financing the assets, the cooperative may apply for structural funds of the National Program for Rural Development. The latter provides 50 per cent of total eligible expenses (for associative forms). The rest of investment is financed 50 per cent through cooperative's members' own financial resources and 50 per cent through taking a loan. From total investment of 1,175,523 lei, the loan is 357,736, meaning 30.4 per cent. The same amount comes from the cooperatives' members' own contribution. The remaining amount of 460,051 lei comes from grant aid of European Fund for Agriculture and Rural Development, EFARD (39.4 per cent), as seen in Table 3.

Table 3 Revenues from operational activity and investment (lei)

No.	Specification	Year 1	Year 2	Year 3	Year 4	Year 5	Total years 1-5
I	Total revenues, of which:	1708814	533291	533291	533291	533291	3841978
1	Broth	142512	142512	142512	142512	142512	
2	Tomatoes juice	321679	321679	321679	321679	321679	
3	Pickled cucumbers	29600	29600	29600	29600	29600	
4	Pickled cabbage	24360	24360	24360	24360	24360	
5	Assorted pickles	12640	12640	12640	12640	12640	
6	Seedlings	2500	2500	2500	2500	2500	
7	Investment financing	1175523					
7.1.	Own contribution	357736					
7.2.	Loans	357736					
7.3.	Grant from (EFARD)	460051					

Source: authors' calculations

Table 4 Expenditure from operational activity and assets' acquisition (lei)

No.	Specification	Year 1	Year 2	Year 3	Year 4	Year 5	Total years 1-5
I	Total expenditure, of which:	1610311	434788	434788	434788	434788	3349463
1	Materials	200371	200371	200371	200371	200371	
2	Salaries	116820	116820	116820	116820	116820	
3	Amortization	71772	71772	71772	71772	71772	
4	Other expenditure	9600	9600	9600	9600	9600	
5	Loans and interest paid	36225	36225	36225	36225	36225	
6	Assets acquisition	1175523					
II	Available cash at the end of the year	98503	98503	98503	98503	98503	492515

Source: authors' calculations

In the first year of operation of the cooperative designed, total revenues are 1,708,814 lei and include operating revenues or production activities and financing of the investment from internal and external sources. As a result, income from financing cooperative activity is 60.8% of total revenues. Data in Table 3 show that income calculated for 2-5 years only refers to those obtained from production. At the product level, income is equal for all five years, because the quantities sold and prices of products remain, for comparison, the same.

In the situation of contracting a loan, total expenditure increases compared to the situation in which the economic unit uses only their own contribution and grants. In the first year of production, the growth is 36,225 lei, meaning about 2.3 per cent. By year, total expenditure is 434,788 lei and the total expenses for the first five years are 3,349,463 lei. Total expenses consist of materials, salaries, depreciation, and interests on credit and loan rate. The volume of material costs in the first year is 12.4 per cent (in total expenses including credit), and in the following years they are equal proportions of 46.0 per cent. Depreciation of machinery for which was made the investment was calculated in equal shares, which means that each year it is 71,772 lei or 4.4% in the first year and 16.5% in the following four years. In total, depreciation expense represents 10.2% of spending.

Available cash resulting from the difference between income and expenses is presented in Table 5.

Table 5 Economical and financial results, lei

No.	Specification	Year 1	Year 2	Year 3	Year 4	Year 5	Total years 1-5
I	Total revenues, of which:	533291	533291	533291	533291	533291	2666455
1	Broth	142512	142512	142512	142512	142512	
2	Tomatoes juice	321679	321679	321679	321679	321679	
3	Pickled cucumbers	29600	29600	29600	29600	29600	
4	Pickled cabbage	24360	24360	24360	24360	24360	
5	Assorted pickles	12640	12640	12640	12640	12640	
6	Seedlings	2500	2500	2500	2500	2500	
II	Total expenditure, of which:	434788	434788	434788	434788	434788	2173940
1	Materials	200371	200371	200371	200371	200371	
2	Salaries	116820	116820	116820	116820	116820	
3	Amortization	71772	71772	71772	71772	71772	
4	Other expenditure	9600	9600	9600	9600	9600	
5	Loans and interest paid	36225	36225	36225	36225	36225	
III	Results	98503	98503	98503	98503	98503	492515

Source: authors' calculations

Table 5 presents the economic results obtained in cooperative in the scenario of contracting a bank loan for financing part of investment. The total income is 2,666,455 lei; total expenses, including interest on the loan and credit, are 2,173,940 lei, which means a gross result of 492,515 lei and a profit rate of 22.6%. As a result, when the cooperative of processing and marketing of vegetables applies to credit, there is a rise in costs and a decrease in the rate of return.

The return of investment, calculated by dividing investment to yearly profit is ten years, less than the machineries' period of operation of twelve years.

CONCLUSIONS

This piece of research aimed at answering the question how efficient is the short vegetables' chain, when activities of collecting vegetables, store and process them into cans and sell them to the market are developed in a single economic unit. The economic and financial results show that such a business is feasible, because revenues are higher than expenses, the rate of return is 22.6 per cent, and the return of investment is ten years, less than the machineries' period of operation. As regards the products, broth and tomatoes juice have the highest profitability, and pickles the lowest. In the same time, the social role of obtaining pickles is underlined.

The model of short chain can be implemented by farmers in their efforts of reduce losses, ensure income stability and developing, as such, their businesses. The European Fund for Agriculture and Rural Development offers opportunities for financing part of such businesses of farmers who want to integrate activities down-stream agriculture.

BIBLIOGRAPHY

1. Ion, R.A. (2015). *Fruits and vegetables market in Romania: better understand consumers' preferences.* In The Research Institute For Agriculture Economy And Rural Development *Agricultural Economics and Rural Development - Realities and perspectives for Romania* (pp.426-433)*.* Bucharest, Romania: Editura ASE.
2. Ion, R. A. (2005). *Performanţa sistemului agroalimentar din România*. Bucharest, Romania: Editura CERES.
3. Istudor, N. (2000). *Modele de organizare a pieţelor agroalimentare – pe exemplul legumelor si fructelor*. Bucharest, Romania: Editura Economică.
4. Istudor, N., & Ion, R.A. (2007). *Pierderile pe filiera legumelor. Cauze şi modalităţi de prevenire*. *Lucrari stiintifice. Seria Agronomie, 50/3, 157-162.*
5. Manole, V., & Stoian, M. (2006). *Trends in the Romanian Vegetables Market. Lucrari Stiintifice. Seria Horticultura. XLIX(49), 237-243.*
6. Manole, V., & Ion, R. A. (2006). *Coordination Models for Agro-food Chains. Economics of Agriculture. LIII/1, 63-71.*
7. Manole, V., Istudor, N., Boboc, D., & Ion, R. A. (2005). *Filiere agroalimentare*. Bucharest, Romania: Editura ASE.
8. Preda, I. (2001). *Proiectarea structurii de producţie a exploataţiilor legumicole din zona de aprovizionare a Capitalei*, PhD diss., Bucharest University of Economic Studies, Romania.
9. Turek Rahoveanu, A., Turek Rahoveanu, M., Zahiu, L., Ion, R.A, Zaharia, C., Dachin, A., Istudor, N., Manole, V., Dobre, I., & Ignat, R. (2008). *Analiza filierei sectorului legume-fructe în România*. Bucharest, Romania: Editura Cartea Universitara.
10. National Program for Rural Development, 2016.
11. Project 16.1.2. – Models of developing short chains for production-services-storage-processing-market, financed by the Ministry of Agriculture and Rural Development of Romania, 2015.

INVESTMENT MANAGEMENT IN ASSOCIATIVE UNITS

DOBRE IULIANA[1]

Abstract

This paper proposes to find out the investment efficiency of an associative unit in vegetables processing and trading field. For this, a scenario by 100% loan is taken into consideration. This research focuses on broth, tomatoes juice, pickled cucumbers, pickled cabbage, assorted pickles and seedlings, also on how cooperation in processing and trading can determine efficiency, leading to an increasing level of development of unit. In this order, an economic and financial analysis was necessary. Indicators such as production, incomes and expenditures have been studied. The paper consists into the establishment of a processing vegetables to extend their life, mitigate seasonality of supply of vegetables and get products with higher value added that consumer demand; establishing a network for collecting local vegetables, supply of raw materials for the processing vegetables; providing storage and marketing services for cooperative members. As financial objectives, in this project, machinery and equipment for processing vegetables were purchased; the purchase of land for the location of the vegetables making factory and warehouse The obtained results show a positive investment result.

Keywords: *management, associative units, investment, vegetables*

JEL classification: Q13

INTRODUCTION

To facilitate the work of farmers in the vegetables processing and trading, they have been established and operate under associative form recognized as cooperative according to cooperatives Law 566/2004. Generally, these are associative forms organized in the fields of acquisition, processing and supply of agricultural products. Therefore, cooperation in associative form contributes to reducing the efforts of producers on products selling (perishable nature of the products) and producers' position strength in relation to the market (the work of farmers, particularly small producers, is vulnerable to changes in supply and demand). Synthetic, given the fact that cooperatives establishment engaged in "upstream" and "downstream" of agriculture, their role becomes even more important, at least from two points of view: supporting farmers, associates and providing them cost advantages on economy and integration into the national economy flows; contribute to rural development, which is consistent with the organizational structure of European Union agriculture. The objects under associative form statues are to: marketing of agricultural products taken from associate members; providing temporary storage, sorting, packing, transporting products; executing the investment for the cooperative; providing professional guidance to farmers. Agricultural cooperatives listed can be organized by product or group of products: cereals, potatoes, fruits and vegetables; milk, milk products and eggs; meat and meat products; fish and fish products; technical and processing plants. Management of the associative unit consists into administrative activity and production one. The efficiency of management will have to consider customers, market segment, competitors. The managers will estimate future events, especially food demand or financial trend, coordination of production, attending to food fairs, developing the relationships with farmers.

MATERIALS AND METHODS

The establishment and location of these cooperatives in rural areas are subject to some restrictions, such as production volume and its own way, the demand for these products. According to

---

[1] Associate Professor, PhD. Dobre Iuliana, The Bucharest University of Economic Studies, Faculty of Agro-food and Environmental Economics: iulya_dobre@yahoo.com

that, the objectives on establishment of a cooperative in processing and trading vegetables is supported by own financial resources or by National Rural Development Program, 2014-2020, and Agricultural Fund for Regional Development. In the second case the measures refer to Support for investments in processing / marketing of agricultural products (measure 4.2), Improving the competitiveness of primary producers through better integration in the agrifood chain through quality schemes, adding value to agricultural products, promoting local markets, short supply chain, producer groups and interbranch organizations.

The activity of the association consists in collecting and processing vegetables from farmers as tomatoes for juice and broth, cucumbers, cabbage, green tomatoes, cauliflower, carrots for assorted pickled. As material resources are used: salt, sugar, water, cans, bottles, cartons, vegetable seeds, seedbeds, gas, electricity and water technology. The choice of the products range was based both on the demand for them, and the rational use of space for processing vegetables. The activity of production and commercialization are almost continuous: January, February, October, November and December for pickles, March and April for seedlings (as secondary activity), tomatoes juice and broth from August to November. A design assurance need of these resources is performed on production expressed in cans per hour and their specific consumption. For the design of fuel consumption, the movement of the means of transport to collect vegetables (9 rides per month) is taken into account; the average interval between two successive supplies is 3.5 days.

In order to determine total production for each product, the relation is shown below.

Broth total production: 12 kilo per hour = 20.6 cans per hour, cans 580 ml; 11808 kilo broth per year = 20358 cans per year.

Total tomatoes juices: 38.46 litter per hour = 38.46 bottles of 1 litter per hour, (123 days x 8 hour per day = 984 hours) 38.46 bottles of 1 litter/hour x 984 hours = 37844.6 bottles of 1 litter per year.

Table 1 Production

Product	Number of cans
Broth	20359
Tomatoes juice	37845
Pickled cucumbers	5920
Pickled cabbage	8120
Assorted pickles	3160
Seedlings	2500*

Source: authors' calculations, *pieces

RESULTS AND DISCUSSIONS

This is a scenario about an investment in vegetables processing. The total value of investment is 1,175,523 lei, by which 60.8% bank loan and 39.2% European funds. To analyze investment efficiency, total incomes and expenditures from production activity, investment as expenditure, except European funds, were taken into consideration (Table 2).

The economic analysis of the indicators was made for a period of 5 years. In the first year incomes are the biggest as a result of investment. The total incomes for the 5 years are 3,841,978 lei of which 44.4% are income from the first year of activity. In terms of revenues, for the years 2-5 the income are constant and equal to 533,291 lei, which means 13.9% per year. The highest income are assured of selling broth and tomatoes juice, the proportion in total income being 8.33% broth and 18.8% tomatoes juice in the first year. Also for the next years (2-4) the proportion of incomes is 26.7%

broth and 60.3% tomatoes juice. Other incomes are from pickled cucumbers, pickled cabbage, assorted pickles and seedlings.

Table 2 Total incomes and investment (lei)

No.	Specification	Year I	Year II	Year III	Year IV	Year V	Total years I-V
I	Total incomes, of which:	1708814	533291	533291	533291	533291	3841978
1	Broths	142512	142512	142512	142512	142512	
2	Tomatoes juice	321679	321679	321679	321679	321679	
3	Pickled cucumbers	29600	29600	29600	29600	29600	
4	Pickled cabbage	24360	24360	24360	24360	24360	
5	Assorted pickles	12640	12640	12640	12640	12640	
6	Seedlings	2500	2500	2500	2500	2500	
7	Investment, of which:	1175523					
7.1.	Bank loan	715472					
7.2.	European funds	460051					

Source: authors' calculations

Table 3 Expenditures and loan (lei)

No	Specification	Year I	Year II	Year III	Year IV	Year V	Total years I-V
II	Total expenditure, of which	1646537	471014	471014	471014	471014	3530593
1	material	200371	200371	200371	200371	200371	
2	salary	116820	116820	116820	116820	116820	
3	amortization	71772	71772	71772	71772	71772	
4	other expenditure	9600	9600	9600	9600	9600	
5	interest	72451	72451	72451	72451	72451	
6	Loan	1175523					
III	Available cash	62277	62277	62277	62277	62277	311385

Source: authors' calculations

In order to analyze expenditures, consumption of materials, as operating capital, and fixed capital were studied. Expenses are 3,530,593 lei in the five years and are biggest in the first year as a result of investment. Anyway, starting from the second year to fourth ones total expenditure is the constant per year and equal to 471,014 lei. The highest expenses are the materials and interest. The operating expenses represent 12.16% from total expenses in the first year and 42.5% in each of 2-4 years.

The economic results of the associative unit are represented in Table 4. The total incomes obtained into scenario was making from sales and investment, as bank loan and European funds, the total incomes being 2,666,455 lei, total expenses were 2,355,070 lei, including credit and interest on the loan, which means a gross result of 311,385 lei. Annual incomes are 533,291 lei and annual costs are 471,014 lei, which means that the annual profit is equal to 62,277 lei. Therefore, the rate of profit calculated as ratio between gross profit and total expenses is 13.2% per year.

Table 4 Economic and financial results (lei)

No	Specification	Year I	Year II	Year III	Year IV	Year V	Total years I-V
I	Total incomes, by which:	533291	533291	533291	533291	533291	2666455
1	Broths	142512	142512	142512	142512	142512	
2	Tomatoes juice	321679	321679	321679	321679	321679	
3	Pickled cucumbers	29600	29600	29600	29600	29600	
4	Pickled cabbage	24360	24360	24360	24360	24360	
5	Assorted pickles	12640	12640	12640	12640	12640	
6	Seedlings	2500	2500	2500	2500	2500	
II	Total expenditure, by which	471014	471014	471014	471014	471014	2355070
1	material	200371	200371	200371	200371	200371	
2	salary	116820	116820	116820	116820	116820	
3	amortization	71772	71772	71772	71772	71772	
4	other expenditure	9600	9600	9600	9600	9600	
5	interest	72451	72451	72451	72451	72451	
III	Result	62277	62277	62277	62277	62277	311385

Source: authors' calculations

CONCLUSIONS

Investments in the production, processing and marketing of vegetables is not an easy business but involves efforts, adapting to consumer needs, knowing all the factors that can influence all activities. It takes decisions, which implies economic phenomena and processes, hence management, validity of decision, the state of the economic or financial situations, targeting competence which management offers. Study undertaken with reference to business processing vegetables attests this. It was found that the activity of production and marketing of processed vegetables have almost continuous character, which ensures permanent employment and increase performance on chain. The profit is 311,385 lei which means difference between incomes and expenditures (2,666,455 lei incomes and 2,355,070 lei expenditures). From economic point of view, the best results are obtained from broth 26.7%, and then 60.3% from tomato juice; pickled cucumber 5.5%, 4.5% pickled cabbage, assorted pickles 2.3%, 0.46% from seedlings. Also, the share of income is different in the first year of activity due of investment, the highest incomes being provided by broth and tomatoes juice (8.33% broth and 18.8%). This investment returns 13.2% of profit.

BIBLIOGRAPHY

1. Dobre, I. (2003). *Managementul structurii de productie in exploatatiile agricole*. Bucharest, Romania: Editura ASE.
2. Ion, R. A. (2005). *Performanţa sistemului agroalimentar din România*. Bucharest, Romania: Editura CERES.
3. National Program for Rural Development, 2016.
4. Project 16.1.2. – Models of developing short chains for production-services-storage-processing-market, financed by the Ministry of Agriculture and Rural Development of Romania, 2015.

SHORT CHAIN - A SOLUTION FOR CURRENT CAPITALIZATION OF VEGETABLE PRODUCTION

ANCUŢA MARIN[1]

Summary:

Vegetables market is one of the most important sectors of the global economy is an area characterized by multiple contradictions. According to contract concluded with MARD ICEADR runs from 2015- 2018, ADER project 16.1.2 - "Models of development of short chains for the capitalization of vegetable production on primary production- services - storage - processing - sales market." Project falls under the the objectives of Sectorial Program ADER on mechanization and automation of processes in agriculture and development of conditioning systems - storage - processing of Romanian agricultural products. Among the project objectives are included: stimulating farmers to association / cooperation presenting them the opportunities by organizing a survey among the most important vegetable growing counties. The purpose of this paper is to identify the problems faced by small and medium producers of vegetable and highlighting their opinions to formulate proposals for the effective realization of vegetable production.

Keywords: short chain, vegetable growers, production of vegetables, subsidies

INTRODUCTION

Vegetables market is one of the most important sectors of the global economy is an area characterized by multiple contradictions. Vegetable segment is still insufficiently exploited, both internally and internationally. Although emerges increasingly clearer idea of ecological and healthy diet, data from the World Health Organization indicates that further consumption of vegetables at European level is below the recommended amount per person per day (arround 400 g).

On a national level, things are similar, due to lower production, tax evasion and loopholes in certain norms, practicing above average prices discourage their consumption. Due to the large number of imported vegetables, farmers give up investing in emerging technologies or associate, unable to create a competent market with European standards. In Romania is recorded a consumption of less than 80 kg/year per capita, which is about 200 grams of vegetables available in the daily diet of a person.

 According to contract concluded with MARD ICEADR runs from 2015- 2018, ADER project 16.1.2 - "Models of development of short chains for the capitalization of vegetable production on primary production- services - storage - processing - sales market."

Along with ICEADR who is the project coordinator ASE and USAMV are our partners.

Project falls within the objectives of Sectorial Program ADER:

- *General objective:* mechanization and automation of processes in agriculture;
- *Specific objective:* developing conditioning systems / storage / processing of agricultural products Romanian.

The purpose of this paper is to identify the problems faced by small and medium producers of vegetable and highlighting their opinions to formulate proposals for the effective realization of vegetable production.

---

[1] Dr. Ec. Ancuţa Marin – Scientific Researcher III degree Research Institute for Agricultural Economics and Rural Development, marin.ancuta@iceadr.ro

MATERIAL AND METHOD

For this study we used as a research method "survey based on questionnaire". This method has been expanding gradually in the last half century, from practical requirements dictated by the evolution of society, but also because of the advantages of the method. Muchielli R. (1968) sets 12 stages of the investigation, which Golu P. (1974) synthesizes them into four sections:

a) *preparation of the inquiry:* formulating objectives, according to these objectives, general and specific hypotheses are formulated, which give purpose of the investigation, because they will be tested by asking questions;
b) *drafting and implementation of the questionnaire:* the questionnaire itself is what determines the success of the investigation and must meet two prerequisites: the validity (ie the ability to provide information relevant to the objectives); loyalty (to produce output that varies predictable admitted theory and practice specialty).
c) *c) processing and interpretation of results obtained:* an important stage in the data processing is the encoding of responses and content analysis of questions in order to establish criteria for coding, which allows tabulation and processing.
d) *final report:* regardless of whether starting assumptions are confirmed or not, the results should be presented objectively, using tables, charts, posters, slides etc.

RESULTS AND DISCUSSIONS

Among the project objectives include stimulating farmers to association/cooperation by presenting their opportunities; for this purpose the institute held a poll among the most important counties with vegetable crops. Therefore, the Research Institute for Agricultural Economics and Rural Development conducted under the Project ADER 16.1.2. "Models of development of short chains for the capitalization of vegetable production on primary production- services - storage - processing - sales market" during March-April 2016, a survey question posed to producers of vegetables in Romania, which aimed to identify the problems they face and highlighting their opinions to formulate proposals for efficient capitalization of vegetable production. It was applied a total of 180 questionnaires in 6 counties representative in terms of vegetable production: Dâmbovița, Călărași, Galați, Ilfov, Olt and Dolj. Number of respondents was calculated so that the level of precision of results provided to be +/- 3%, and the coefficient corresponding to the probability that the results are guaranteed to be more than 80%. Thus, 72% of respondents began their work vegetable growing before accession to the EU and only 21% by 2007. In terms of legal organization, 57% are unauthorized individuals, 23% PFA and 1% SRL.
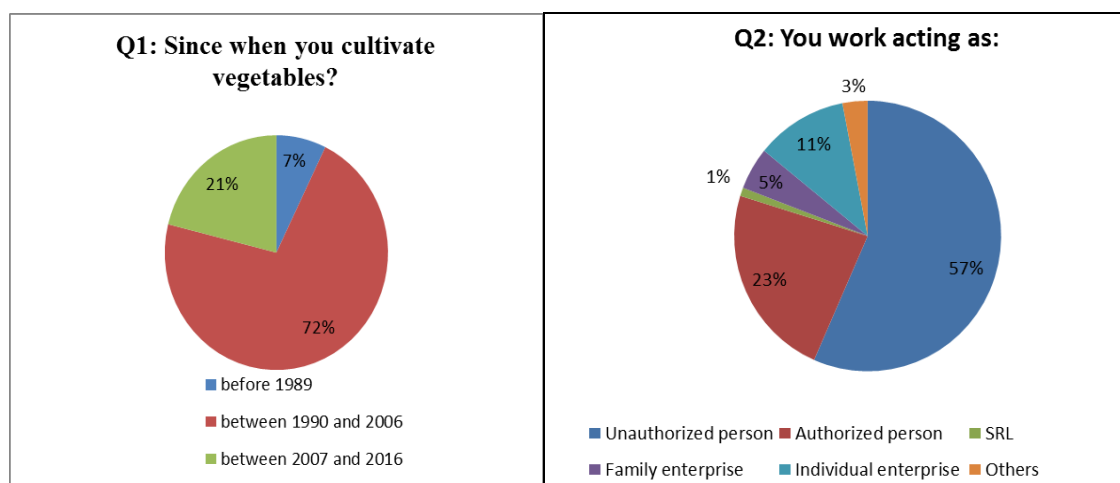
It is overwhelming percentage of those surveyed who do not belong to any form of association / cooperative (97%, 175 in absolute value). 109 people (62%) of the 180 surveyed do not consider accession in

the near future in one of the forms of association. The reasons for this reticence relates primarily to higher taxes (double taxation), and the lack of loans at preferential rates.

Analyzing farm size we find that 62% of respondents have small holdings below 5 ha, areas planted with vegetables in these holdings being 78% under 5 ha for vegetables grown in the field and 73% surfaces up to 2,000 square meters for those grown under shelter.

Q9: What is the area cultivated with vegetables in the field?

- under 1 ha
- 1 to 5 ha
- 5 to 10 ha
- 10 to 15 ha
- 15 to 20 ha
- have not area cultivated with vegetables

Q8: What is the area cultivated with vegetables in the greenhouse / solarium?

- 50 to 100 mp
- 100 to 200 mp
- 200 to 500 mp
- 500 to 1000 mp
- 1000 to 1500 mp
- over 2000 mp
- have not area cultivated with vegetables in greenhose/solarium
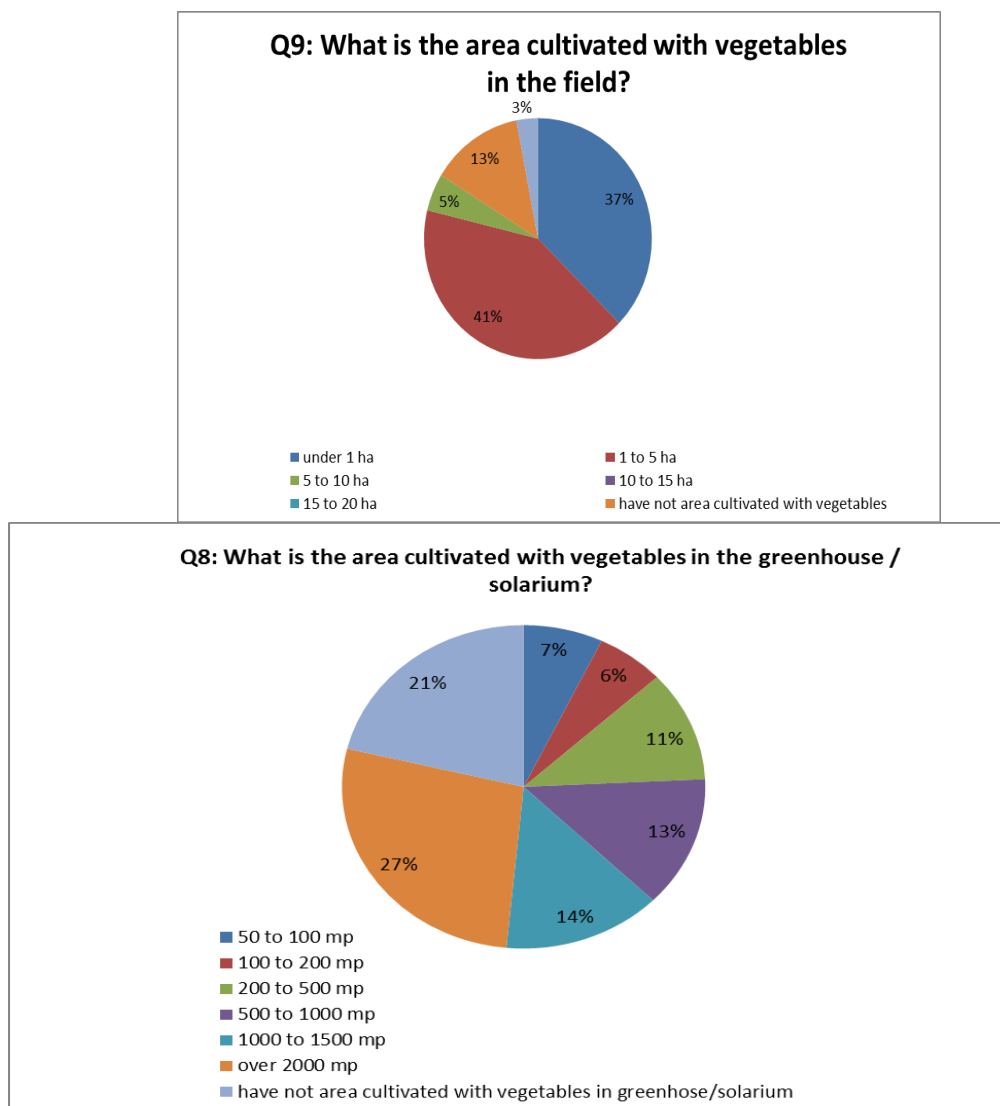
Regarding the structure of vegetable production, area planted with cabbage ranks first, and the county with the largest production is Dambovita. On second place we have the production of peppers, followed by tomatoes and eggplant; to all these cultures on the first place is being placed Calarasi County. 42% of crop varieties used for production come from both imports and domestic production, the domestic production is used in only 17% of cases.

71% of respondents said they use material produced in-house. By analyzing the responses, it appears that only 9% of respondents employ service companies in agriculture, the remaining of 91% applying mechanized works with their own means and private individuals.

The work force employed in these holdings is 93% made up of family (2-4 people), 5% employ skilled workers and 2% unskilled workers/seasonal.

Regarding the use of fertilizers, 51% use both chemical and organic fertilizers, 31% use only natural fertilizers and only 1% said not fertilize crops. As a conventional phytosanitary treatments are 67% of them and only 33% are organic.

It is noted that only 6% of respondents said they did not apply irrigation on the farm and of those who use irrigation systems, 73% use dripped and 23% sprinkler.

Survey results confirm concerns raised by producers on the sale of fresh vegetables, namely:
- 95% of respondents do not have contracts for sale;
- 74% sell directly to farmgate / farm / household;
- 80% of customers are at distances of 10 to 50 km.

Over 80% of respondents receive income exclusively from vegetable growing. Hence the great uncertainty for farmers, their family incomes depending in very large proportion on weather conditions of those years.
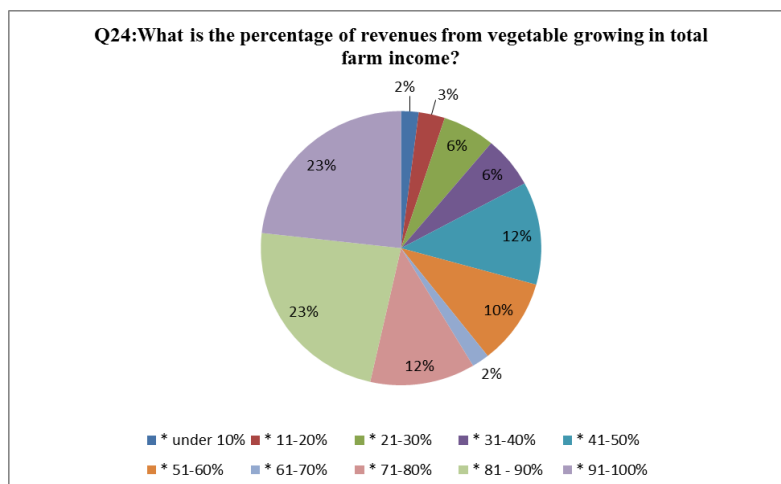

Degree of valorisation for vegetables is different; the best-selling are tomatoes (67% of the produced amount), followed by peppers (59%), cabbage (56%), cucumbers (43%). It follows that the difference is made up by self-consumption and untapped production (losses). Most of the quantities produced (64%) is sold retail, so in small quantities, leading to high qualitative and quantitative losses through increased time of capitalization. Consequently, only 36% of production is sold wholesale, which causes merchants to appeal to massive imports in order to cover the demand of vegetables in supermarkets and catering facilities.

For carrying out the activity, 64% of the farmers are self-funded from the results of previous years and only 17% resort to bank loans. Regarding the state subsidies for this sector, 65% of respondents said they had benefited from them. 70% of vegetable farmers who received subsidies appreciated that could not operate without them. However, state financial support is considered by most manufacturers (67%) as being insufficient, even insignificant.
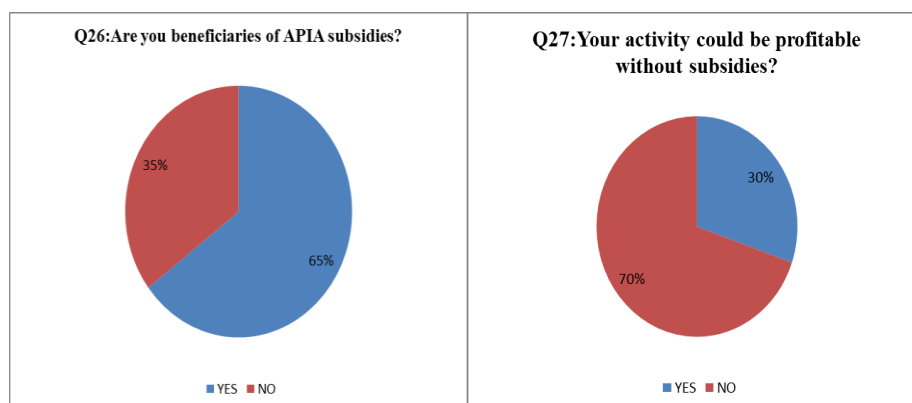
The funds allocated through specific measures from PNDR, however, were accessed only by 26% of respondents, the main reason for those who have not used the EU funding is the high degree of bureaucracy in the process of submitting documentation. Of those who received PNDR funds, 49% have accessed sub-measure 1.4.1. *"Support the subsistence farms"* of PNDR 2007-2013, only 3% Sub-measure 6.1. *"Setting up young farmers"* and 21% Sub-measure 6.3 *"Support for the development of small farms"* of PNDR 2014-2020. The perspective is encouraging, however, since 71% of respondents want to access in the near future PNDR funds.
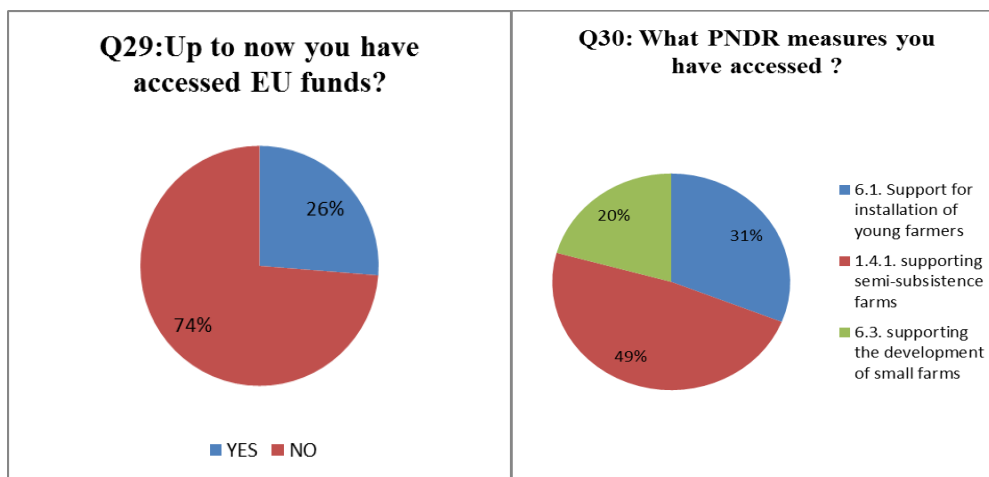
When asked about the solutions they consider necessary in order to develop their business, 89% said that accessing EU funds is an opportunity in this regard, 55% believe that membership in an associative form would be a solution, and 26% felt lending as being a way of business development.

As regards the forms of involvement of the authorities to support vegetable producers:

- 58% of respondents felt that granting of subsidies is an important step in this direction,
- 54% said that further promote the Romanian products can help to support vegetable producers,
- While 59% believe that eliminating unfair competition is necessary to facilitate market access and
- 46% said that it is necessary to amend and adapt legislation in this field for small and medium farmers.

CONCLUSIONS AND RECOMMENDATIONS

In order to obtain bigger productions on vegetable sector, a first recommendation for producers is to place greater emphasis on the use of agrotechnical factors in their work, according to the necessities of their specific, such as phytosanitary treatments, crop rotation and work at ground level.

Fragmentation of farms of vegetables, not belonging to associative forms, lack of contracts for their production, the bureaucracy in accessing funding are the most pressing problems faced by the small and medium producers.

A solution to the problem is the association / cooperation of producers would have easier access to credits and structural funds, concluding of contracts with major retail chains to capitalize production. By carrying out joint activities, manufacturers realize significant savings in the costs of supply, storage and sale. Equity is high because the cooperative members have equal rights and, being many, their economic strength increases, as well as the negotiation of upstream and downstream operators, which puts them on an equal footing with them.

Another viable option would be to create short chains for capitalizing of fresh vegetables with greater strength to eliminate intermediaries and/or processing a part of their production to increase its capitalization.

In conclusion, it is important for farmers to realize the importance of associating, to want to be informed and to implement all the innovations occurring in the agricultural area, access advisory services directly from specialists to deliver effective results. They also should use all opportunities related to accessing grants at national or European level, all these contributing to more efficient agriculture.

BIBLIOGRAPHY:

1. *ADER project 16.1.2 - "Models of development of short chains for the capitalization of vegetable production on primary production- services - storage - processing - sales market."*
2. Manole, V., Stoian, M., Ion, R.A., *Agromarketing*, Publisher ASE, Bucharest, 2003.
3. Manole, V., Boboc, D., Istudor, N., Ion, R.A., *Agrifood chains*, Publisher ASE, Bucharest, 2005.

INFLUENCE OF ENVIRONMENTAL FACTORS – TEMPERATURE AND PRECIPITATIONS – UPON THE TOMATOES CROPS

ANCUTA MARIN[1]

Summary: The diversified way of consumption of tomatoes and versatility of the species that can be grown with good results in different environmental conditions and climate have determined a particular interest for the vegetable producers. Current conceptions about balanced nutrition, grant tomato consumption a priority position, primarily because tomatoes ensures to human body a wide range of vitamins, minerals and water, so necessary for normal physiological activity of the human body. In the present paper I will present a comparative analysis of the temperature and precipitations in the period 2009-2015, during the growing period (March-September) for field tomato crops, and their influence on production. The purpose of the paper is to make some recommendations that could be useful to our vegetable growers who choose to cultivate tomatoes in field.

Keywords: culture, temperatures, precipitation, production, tomatoes.

INTRODUCTION

Tomatoes originated on the American continent, specifically in Mexico, Peru, Ecuador and Central America, were discovered and used in human nutrition since the year 200 BC. The name "tomatoes" comes from the Aztec word "*tomatel*". In the first half of the sixteenth century tomatoes are spreading in Asia (China and Japan). After WWI, tomatoes get spread across the globe, nowadays are ranked first in the world among vegetable crops.

Columbus is the one who brings the tomatoes on the European continent, first in Spain and Portugal. At the beginning of the twentieth century tomato crop for commercialization began in France (1880), then in Belgium (1904) and Germany (1914). The emergence greenhouses and solariums lead to a larger areal of growing to high latitudes in the northern and southern extremes of the temperate zones.

In Romania, tomatoes culture is signalled in the nineteenth century, when practiced on small areas. Extension of tomatoes grown in Romania is mentioned at the beginning of the twentieth century, while increasing urban population and population growth.

The way diversified of consumption of tomatoes (fresh juice, pulp, dried, etc.) as well as the versatility of the species that can be grown with good results in different environmental conditions and climate have determined particular interest for vegetable producers.

There are many varieties and hybrids in grown. In our country more than 40 varieties are approved, and worldwide there are known over 500 varieties. All these varieties are classified in various ways by:

a) Geographical conditions: South American group and West European group,
b) Type of spaces of production: culture in the field and in protected spaces: greenhouses, solariums, tunnels, seedbeds,
c) Vegetation period: early varieties (95-120 days), medium late varieties (120-130 days), late varieties (over 130 days) - most commonly used in our country,
d) Type of consumption: of fresh or processed condition.

---

[1] Dr. Ec. Ancuţa Marin – III degree Researcher, Institute for Agricultural Economics and Rural Development, marin.ancuta@iceadr.ro

The purpose of the paper is to make some recommendations that could be useful to our vegetable growers who choose to cultivate tomatoes in field.

MATERIAL AND METHOD

The importance of tomato as food is given by the varied ways of their consumption - fresh juice, pulp, dehydrated - for those who reach physiological maturity and pickles - for those consumed before maturation. In addition to the high demand of the population for current consumption, tomatoes are very much requested in canning industry of vegetables, meat and fish, and is also an important export product.

They are requested at the export especially greenhouse tomatoes, the early and industrialized products. The provisions of the World Food and Agriculture Organization (F.A.O), recommends consumption of vegetables in varying amounts according to the age of consumers. Current conceptions about balanced nutrition, gives to tomato consumption a priority position primarily because they provide human organism a wide range of vitamins, minerals and water vital, so necessary for normal physiological activity of the human body.

In this paper I will present a comparative analysis of the temperature and precipitation in the period 2009-2015, during the growing season (March-September) for field tomato crops and their influence on the production.

RESULTS AND DISCUSSIONS

According to data published by FAOSTAT, the area cultivated with vegetables in the EU registered slight declines in 2009-2013 (with 8.36%), being small variations from year to year, both in Romania and in the European Union (Table No. 1 and Chart 1).

Table 1

| THE SITUATION OF AREAS CULTIVATED WITH VEGETABLES IN ROMANIA AND MAIN EU COUNTRIES -thousand hectares-					
	Year 2009	**Year 2010**	**Year 2011**	**Year 2012**	**Year 2013**
FRANCE	252,30	245,03	250,49	239,65	235,21
GERMANY	112,55	107,51	108,34	111,18	108,78
ITALY	556,66	556,80	533,27	473,53	509,56
POLAND	212,13	165,97	184,48	181,07	148,47
ROMANIA	270,78	266,94	268,01	263,44	263,75
SPAIN	360,59	352,79	346,39	344,59	336,41
TOTAL EU	**2515,40**	**2409,1**	**2415,00**	**2313,20**	**2305,10**
% ROMANIA/EU	10,76	11,08	11,10	11,39	11,44

Source: FAOSTAT

As reflected in Table 1 and Chart 1, the country with largest surface area of vegetable growing is Italy, with a maximum of 556 800 ha in 2010 and 509 600 ha in 2013. Romania represents from 10.76 to 11.44% of the area cultivated with vegetables in the EU, being 270 780 ha in 2009 and reaching 263 440 ha in 2012. The latest data from the Ministry of Agriculture and Rural Development, the year with the small vegetable growing area in Romania was 2014, when it was only 239.0 thousand hectares with a decrease of 12% compared to 2009.

Chart 1 – Vegetable acreage situation in Romania and EU countries (thousand ha)
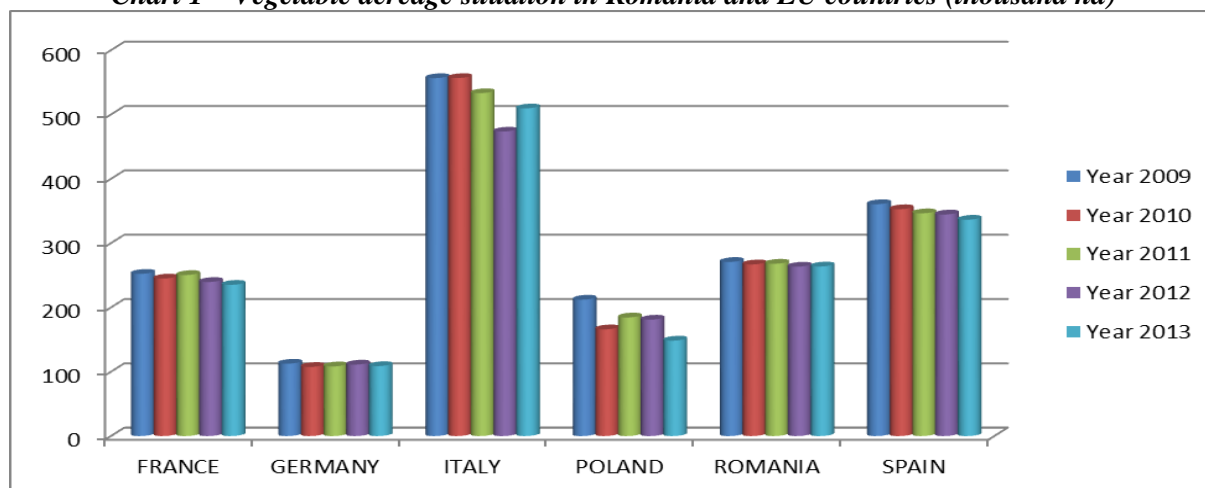

Source: FAOSTAT

As concerning the areas occupied by different types of vegetables in the EU, as illustrated by Chart 2, these have been in relative decline, the decrease is more pronounced at the areas occupied by tomatoes, 22.4% (322.300 ha in 2009, 250 thousand ha in 2013) and potatoes, 16.3% (2096.2 thousand hectares in 2009, 1753.6 thousand ha in 2013), which are the most expanded.

Chart 2 – The structure of vegetable crops in the EU
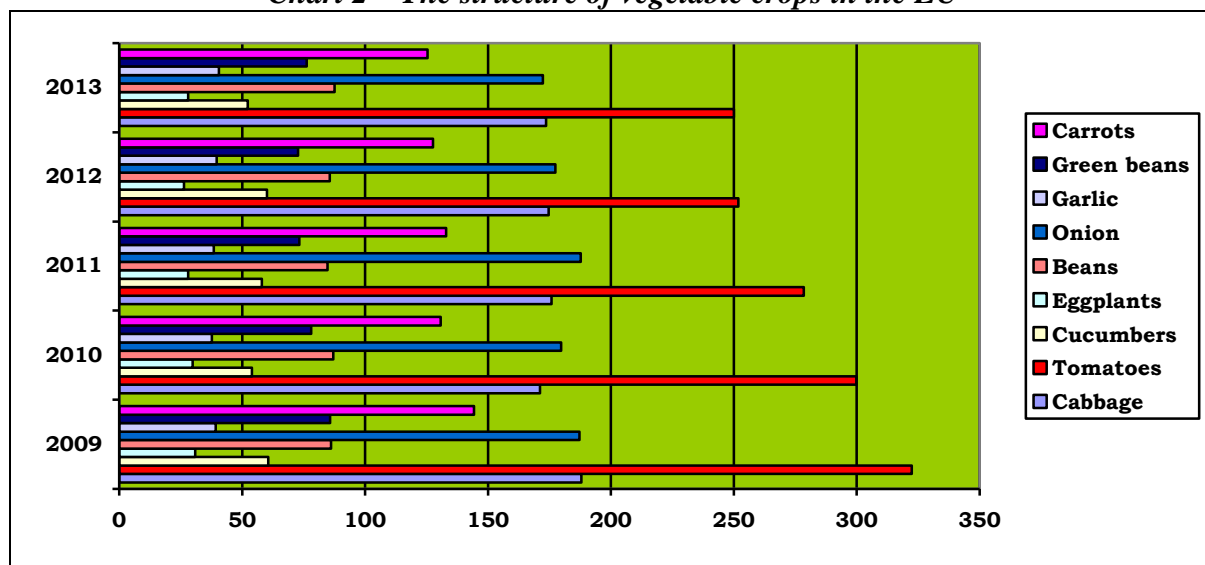
Source: FAOSTAT

In Romania, according to data from the National Statistics Institute, the structure of vegetable crops is shown in Chart 3. We note that tomatoes ranks 2 after white cabbage, followed by onions, peppers and root vegetables.

Chart 3 – The structure of vegetable crops in ROMANIA
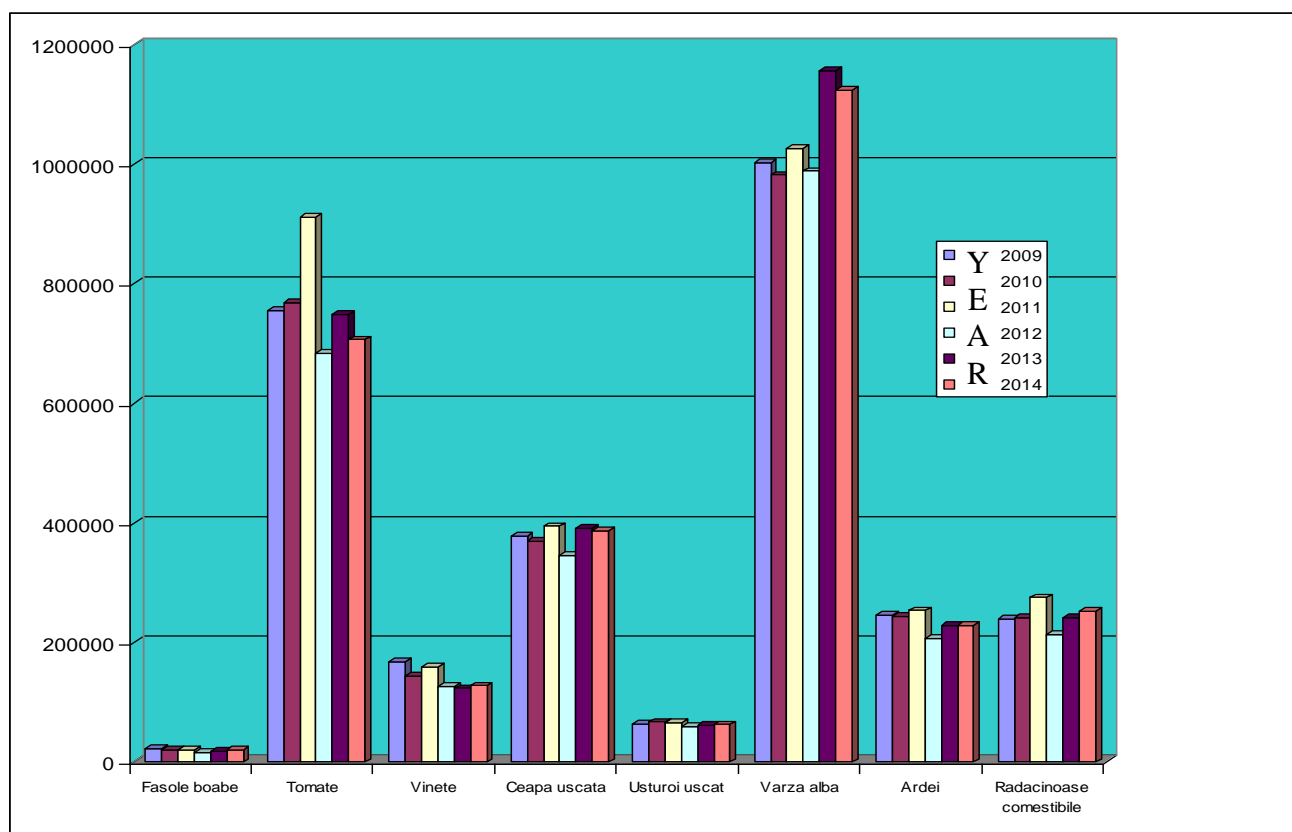
Source: National Institute of Statistics

Analysis of vegetable production in Romania and major EU countries reveals that they declined within 2009 to 2013. Thus the total vegetable production in 2009 was 69080.2 thousand tons, reaching in 2013 at the 64658.0 therefore a decrease of approximately 7%.

Table 2

SITUATION OF VEGETABLES PRODUCTION IN ROMANIA AND MAIN EU COUNTRIES - thousands tones -					
	Year 2009	**Year 2010**	**Year 2011**	**Year 2012**	**Year 2013**
FRANCE	5.685,1	5.593,0	5.494,5	5.283,5	5.235,3
GERMANY	3.662,0	3.350,7	3.593,6	3.820,7	3.416,1
ITALY	15.481,8	14.565,0	14.242,3	12.960,9	13.049,2
POLAND	5.804,8	5.113,4	5.801,7	5.656,0	5.210,7
ROMANIA	3.912,8	3.876,8	4.191,5	3.550,6	3.976,6
SPAIN	13.342,9	12.728,8	12.714,1	12.962,8	12.701,3
TOTAL	**69.080,2**	**65.497,2**	**67.466,5**	**64.421,5**	**64.658,0**
% ROMANIA/UE	5,66	5,92	6,21	5,51	6,15

Source: FAOSTAT

The highest production of vegetables is registered in Italy (20% of EU total), followed by Spain (19.6% of EU total), while Germany is the last among the leading EU countries (5.3% of total EU). Romania produced in 2013, 6.15% of EU totals (Table 2). In 2014 total production of vegetables in Romania was 3807.0 thousand tons, 4.26% less than in 2013 and

9.17% less than the maximum range of 4191.5 thousand tons. There could be many explanations. Most vegetable producers prefer to sell at a loss than to join or form a group of producers to negotiate a better price.

The data provided by the Ministry of Agriculture and Rural Development have synthesized information concerning the areas and production of tomatoes in the period under review (Table 3, Chart 4 and Chart 5).

Table 3

SITUATION OF AREAS CULTIVATED WITH TOMATOES AND TOMATOES PRODUCTION IN ROMANIA BETWEEN 2009 AND 2014							
SPECIFICATION	UM	2009	2010	2011	2012	2013	2014
Surface	thousands ha	49,1	19,8	51,8	49,7	48,4	44
TOTAL Production	thousands to	755,6	768,5	911	683,3	749	711

Chart 4- Tomatoes crops surface   *Chart 5 – Tomatoes production*
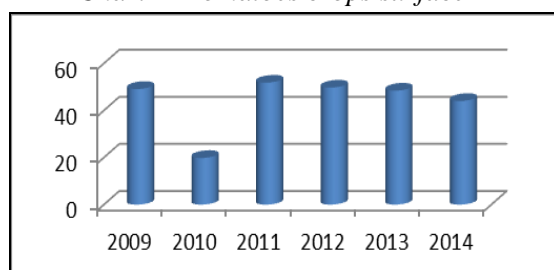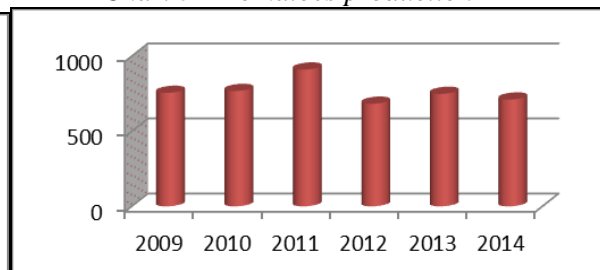
Thereby, 2010 was the year with the smallest surface it represents only 38% of the area that was cultivated with tomatoes in 2011, for example, that is the year with the maximum surface cultivated in the range of years studied. However production recorded in 2010 was ranked second in the interval 2009-2014. The average production of 763 thousand tons interval, only in 2010 and 2011 were recorded above average production of 5.5 thousand tons, 148 thousand tons respectively.

We can draw two conclusions: either was used better performing varieties either temperature-rainfall weather conditions were more favourable to plant development. Following further graphs of temperature and precipitation in the period 2009-2015 we appreciate that the second conclusion is more plausible.

Pedoclimatic conditions allow Romania's annual crop of tomatoes, although the regions of origin, they are perennials. According to data recorded by weather stations in the country in the period 2009-2015 (chart 6), temperatures ranged as follows:
- Between 0ºC in March 2012 and 8ºC in March 2014,
- Between 12ºC and 14ºC the two exceptions were in April 2009 and April 2012,
- Between 17,4ºC in May 2014 and 19,4ºC in May 2015,
- Between 21,2ºC in June 2014 and 24,6ºC in June 2012,
- Between 22,1ºC in July 2014 and 28,9ºC in July 2015,
- Between 24,5ºC in August 2009 and 27,8ºC in August 2015,
- Between 18,6ºC in September 2013 and 22,5ºC in September 2011.

It follows that the wettest year was 2014, the driest being in 2009.

The tomatoes are thermophilic plants (heat love). Minimum seed germination temperature is 10°C (depending on variety), and the optimum temperature is 24°C. The soil temperature is an important factor in root growth. At temperatures below 10ºC and 37ºC over plant growth stops. The optimum temperatures for normal growth of the root system of tomato plants are between 15 and

35ºC. That is why we will further analyze the influences that have had exceptions temperature and precipitation on the essential moments of the tomato crop - germination and pollination.

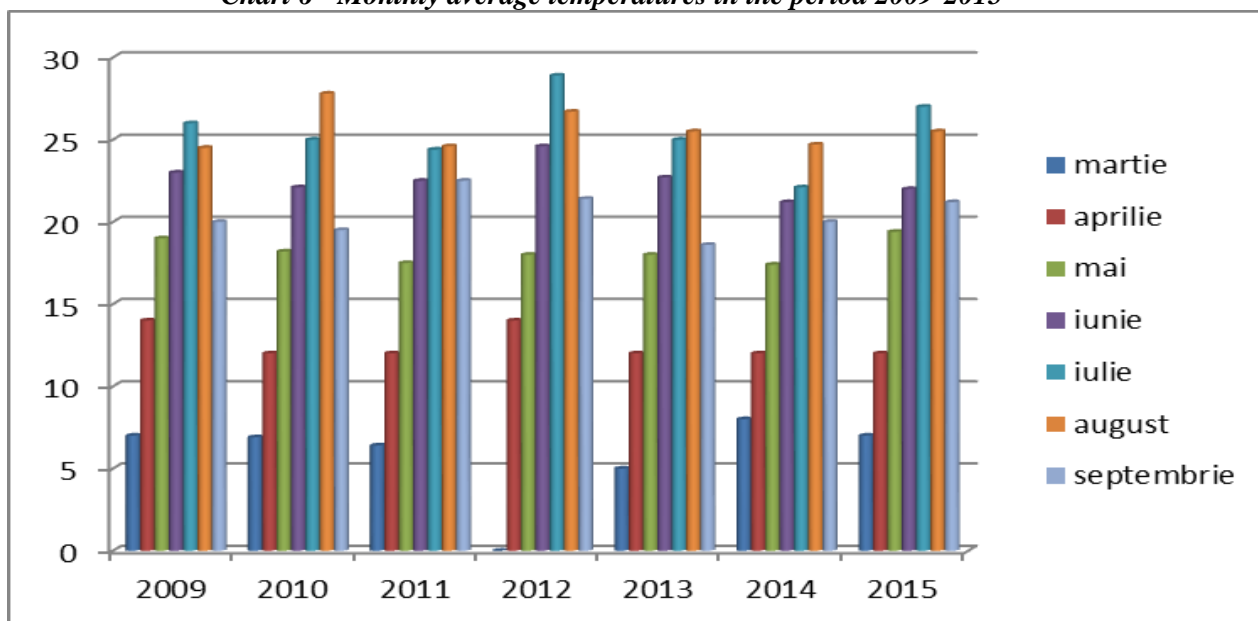*Chart 6 - Monthly average temperatures in the period 2009-2015*

Chart 7 shows that the germination of the seed field tomato is practically impossible in March and has minimal chances in April. That is why it is recommended germination in protected spaces and replanting seedlings in field when the temperature is optimal.

Tomatoes are self-pollinating plants, meaning that each flower has both female organs (pistil) and male (stamens). The stamens are located at the top of the flower and the pestle is located at the bottom. Fertilization occurs by gravity, pollen from the stamens "gliding" over pestle. Where this "slip" does not occur or is insufficient quantitative, fertilization does not occur and flowers falls without fruition (bind).

As gravity is a phenomenon that acts permanently, I can think of two main causes that prevent fertilization. Primarily "sliding" does not occur when pollen is too glued to the stamens and cannot break away from them. Secondly, even if the "slippage" occurs, the pollen that falls is too dry to stick to the pistil and fertilize it.

Chart 7 - Optimum temperature range for germination.
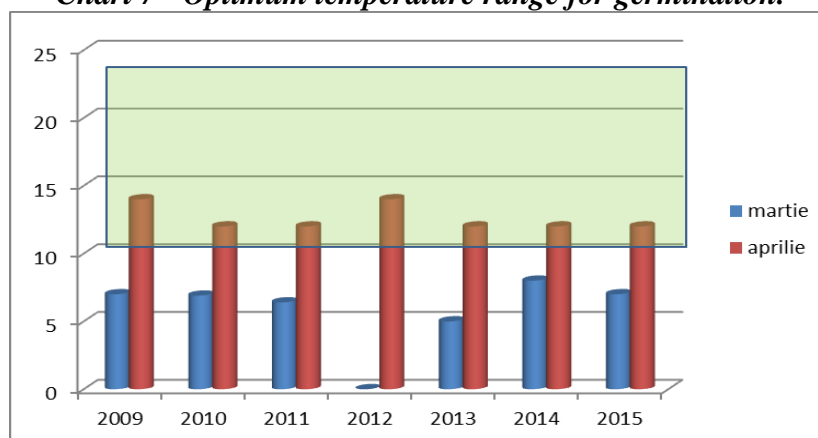
The optimum temperature of occurrence of pollination is between 13ºC and 25ºC. Tomatoes are plants that can tolerate temperatures outside this range, only that, especially if

the situation lasts for several days in a row, they lose their "interest" for pollination and "focus" more on the problems of survival. At temperatures above 35ºC, the pollen becomes sterile.

Chart 8 - Optimum temperature range for pollination
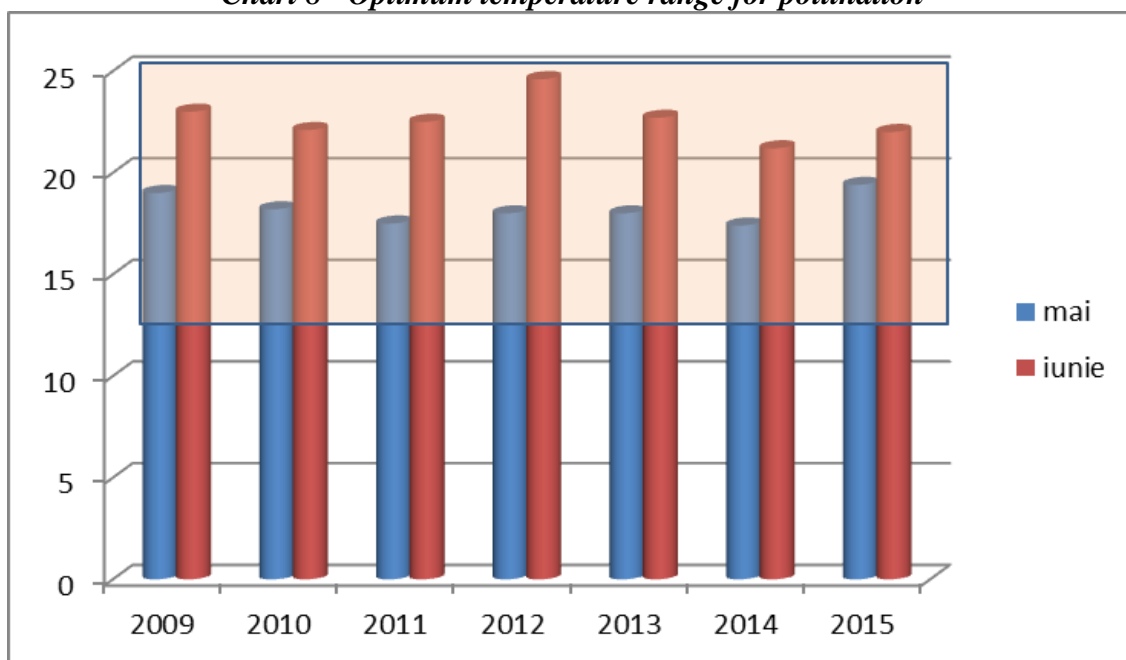
From INMH records we obtain the data about annual rainfall values. Minimum and maximum temperatures recorded during the growing season between March and September is shown in Graph 8, for all the studied period 2009-2015. These varied between:

- 0 mm in March 2009 and 2010 and 125 mm in March 2013,
- 0 mm in April 2009 and 150 mm in April 2014,
- 0 mm in May 2009 and 200 mm in May 2010 and 2012,
- 0 mm in June 2009 and 300 mm in June 2010,
- 10 mm in July 2010 and 175 mm in July 2014,
- 10 mm in August 2009 and 2011 and 125 mm in August 2014,
- 10 mm in September 2012-2014 and 175 mm in September 2015.

Another important component in influencing the development of tomato (tomato productions) is humidity. If it's too low, the pollen is dry. If it is too high the pollen grains stick together pollination is insufficient. In both cases there are recorded low productions of tomatoes. Regarding the precipitations, it follows that 2010 has seen the largest amount of water in May-June, cumulating an average of 500 mm.

Chart 7 - Annual rainfall in the period 2009-2015
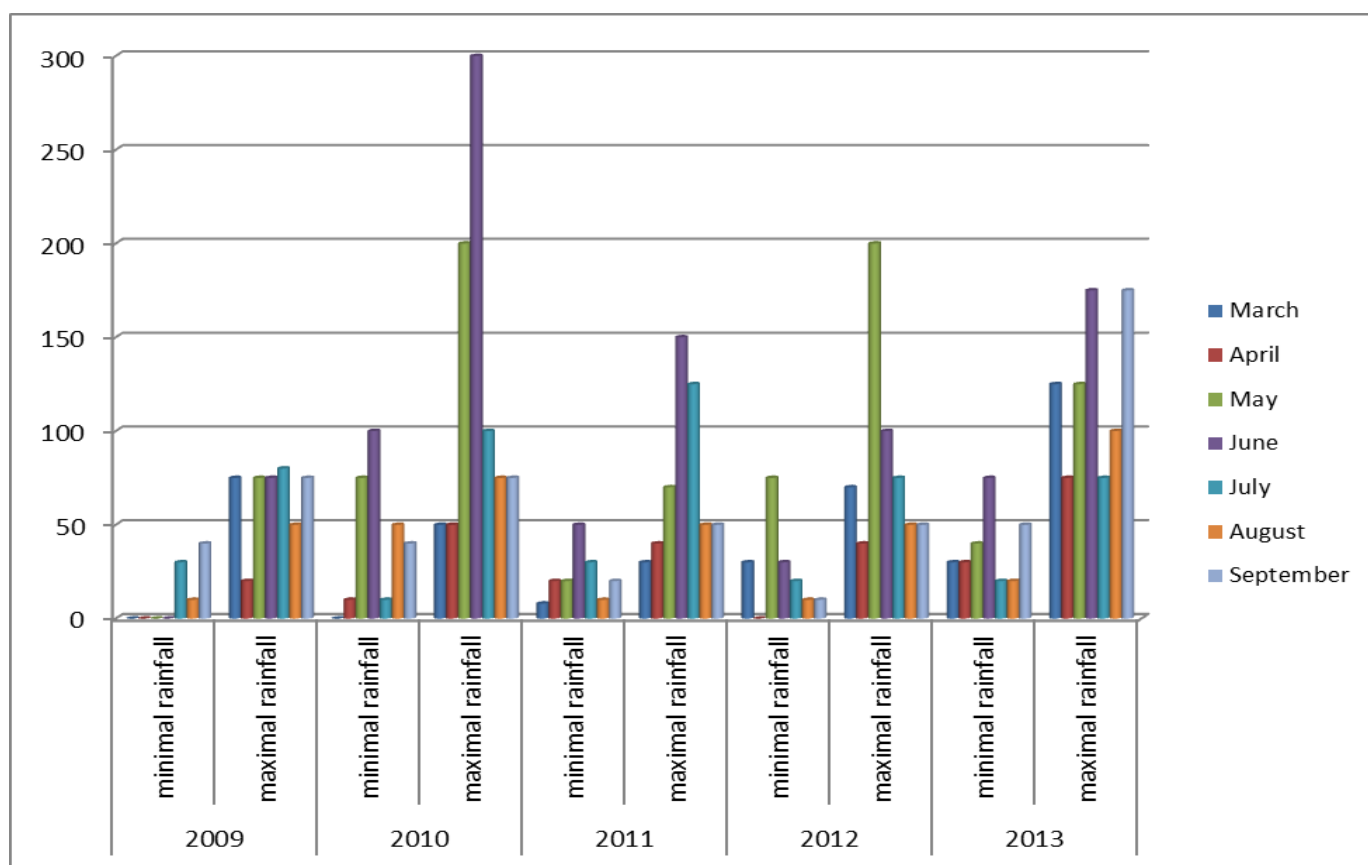
CONCLUSIONS

In the present work is demonstrated that the best productions were achieved when they were used varieties less demanding regarding the temperature and humidity; also the best productions were recorded when they were met cropping technologies. The use of indigenous varieties would be a plus for Romanian producers, primarily because consumers find our products, even if they are smaller, tastier and secondly because they are already adapted to the environment and climate from our country.

For a better capitalization of obtained productions, the producers of vegetables should form groups of producers or associations to ensure their quality seedlings, fertilizers and technologies. Also through associations could purchase specific equipment (accessing European funds or bank loans), they can use them in common for the elimination of manual work and thus reducing production costs.

For a better capitalization of production, considering that there is a decreased degree of capitalization for fresh tomatoes of only 67%, the difference being self-consumption and losses, it could create short chains of capitalization, associations / groups of producers being able to build halls with mini tomato processing lines that do not meet the quality requirements for selling fresh.

Not in the least, expanding the range of cultivation by building protected spaces could lead to higher productions.

BIBLIOGRAPHY:

1. ADER project number 16.1.2. - Developing models of short chains for valorification of vegetables production on the route primary production - services - storage - retail market
2. Maier, I., *Vegetable growing* , Ed. Agrosilvică, Bucharest, 1969.
3. Manole, V., Stoian, M., Ion, R.A., *Agromarketing*, Ed. ASE, Bucharest, 2003.
4. Manole, V., Boboc, D., Istudor, N., Ion, R.A., *Agrifood chains*, Ed. ASE, Bucharest, 2005.
5. Popescu, V., *Vegetable growing,* vol.I, Ed. CERES, Bucharest, 1996
6. www.insse.ro
7. www.madr.ro
8. http://faostat3.fao.org/browse/FB/CC/F

ECONOMIC PERFORMANCE OF INTEGRATED VEGETABLES CHAIN

Raluca Andreea ION[1], Iuliana DOBRE[2]

Abstract

The paper presents the economic efficiency of integrating activities down-stream agriculture in an associative unit from the region around Bucharest, which collect vegetables from farmers, process them into vegetables cans and sell them to the market. The research question is whether the investment of such a business is efficient or not. Analysis, synthesis and calculation of economic indicators are used to assess the activity efficiency. The main results show that investment is feasible from economic and financial point of view; the rate of return is 33.8 per cent, the return of investment is 8.7 years and the economic return of investment is 103 per cent, meaning that total profit calculating by multiplying the yearly profit by ten years, the average period of using the industrial equipment, is higher than the quantum of investment.

Key words: *vegetables chain, specific investment, integration, economic performance*

INTRODUCTION

The paper investigates the feasibility of investing money in a business of processing vegetables, trying to answer the questions how efficient is this activity and what are the levels of its profit, rate of return, economic return of investment and other economic and financial indicators of business achievement.

The need for this investment lies in the external environment and market opportunities that can be exploited by chain operators and the many weaknesses of vegetables chain which can be overcome. The main shortcomings consist of high level of losses on the chain of 37 per cent (Istudor, 2007), and collecting vegetables from many small producers who obtain small quantities of production (Manole, 2005, Turek, 2008). They deliver to markets small and non-homogenous batches of products, therefore, it is difficult for farmers to sell their output in hypermarkets and supermarkets, which requires large and homogeneous batches of vegetables. To meet these requirements, farmers have the choice of integrating activities of processing and marketing into a single economic unit. Processing vegetables requires investment in production lines of high value. This is the reason why it is recommended that the work of processing to be achieved within an associative form.

As the model involves conducting several activities down-stream agriculture in a single unit, called cooperative, and it comprises many members farmers, the vegetables chain is integrated vertically and horizontally: vertically, as all the post harvest activities: collection, reception, storage, sorting, processing, conditioning, packaging, marketing are undertaken in the same unit; and horizontally, since the cooperative include several farmers who act as operators at the same stage of the chain.

Economic performance depends on the mechanism of coordination. These mechanisms are subsidies system, price, contracts, horizontal and vertical integration (Marion, 1986). Previous research (Manole, 2006) assesses the impact of coordination upon agro-food system performance. It was found that performance increases as activities are more integrated. This is the reason why in this article integrated activities of vegetables chain are investigated for assessing their economic efficiency.

---

[1] Associate Professor, The Bucharest University of Economic Studies, Faculty of Agro-food and Environmental Economics, email: raluca.ion@eam.ase.ro,

2 Associate Professor, The Bucharest University of Economic Studies, Faculty of Agro-food and Environmental Economics, email: iulya_dobre@yahoo.com

MATERIALS AND METHODS

The associative form is set up in a vegetable region around Bucharest. The business domain has been chosen considering the results of a survey which show that, among vegetable cans, tomatoes juice, tomatoes broth and pickles are the most demanded (Ion, 2015). For producing these products, investments in equipments and buildings are needed. The technical objectives of the business are to build a factory for processing vegetables and a warehouse for storing them, to establish a local network of collecting tomatoes, to provide storage and marketing services. The members of the associative form are local individual producers. The financial objectives of the business are to buy a mean of transport for collecting vegetables from farmers and delivering the vegetables cans to markets in Bucharest, to purchase machineries and equipments for sorting, packaging, temporary storage and handling vegetables in warehouse and to build the warehouse and the factory. The total investment is 1,175,523 lei.

The program of production is made up considering the schedule of activities in the field (staggered harvesting) and storage, sorting and packaging capacities. The production starts in July and ends in October, for tomatoes juice and broth, and the period of processing pickles is July-January the following year, for some vegetables which are not so perishable, such as cabbage. Table 1 presents the production program for the first year of activity.

Table 1 Production's volume and value

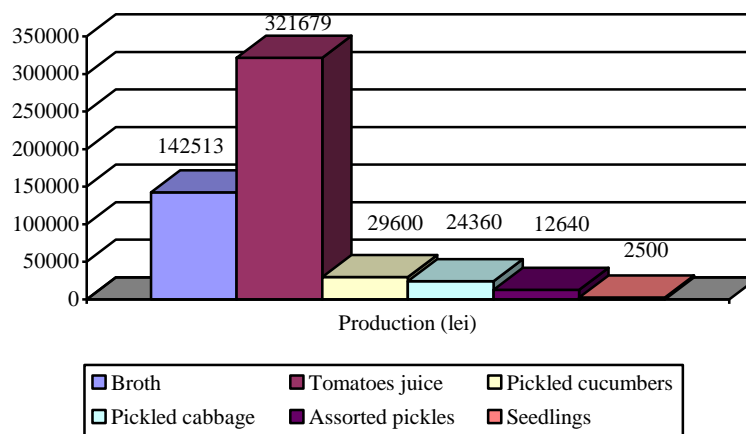| Product	Number of cans	Value (lei)
Broth	20359	142513
Tomatoes juice	37845	321679
Pickled cucumbers	5920	29600
Pickled cabbage	8120	24360
Assorted pickles	3160	12640
Seedlings	2500*	2500

Fig.1 Production's value (lei)
Source: authors' calculations, *pieces

Supply market. Vegetables' suppliers are members of the cooperative and the maximum distance to collect the raw material is 10 km. The business aims at setting up a local network for the collection of vegetables, which will create opportunities for farmers to capitalize production.

Sales market. Processed vegetables market is characterized by fluctuations in consumption, with demand increasing during the winter; the season when fresh vegetables are lacking from the

market. The trading program is designed taking into account the monthly output and applying the principle of first in first out, which means that the production sold in the current month is equal to that obtained in the previous month.

Income and expenditure are presented in Table 2 and 3.

Table 2 Revenues from operational activity and investment (lei)

| Product	Revenues				
	Year I	Year II	Year III	Year IV	Year V
Broth	142513	142513	142513	142513	142513
Tomatoes juice	321678	321678	321678	321678	321678
Pickled cucumbers	29600	29600	29600	29600	29600
Pickled cabbage	24360	24360	24360	24360	24360
Assorted pickles	12640	12640	12640	12640	12640
Seedlings	2500	2500	2500	2500	2500
Total	533291	533291	533291	533291	533291
Total revenues	2666455				
Investment					1175523
- own sources					715472
- National Rural Development Program					460051
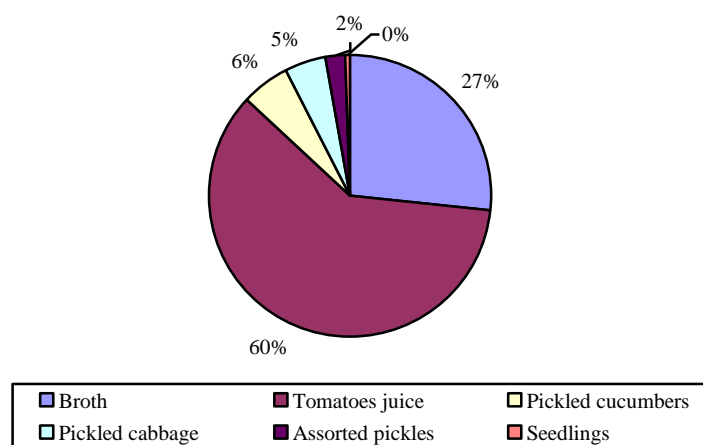
Fig.2 Sales structure (%)
Source: authors' calculations

Data in Table 2 reflect the operating income by year and total. The goal is to render production economic value and identify to what extent the activity becomes effective. It can be noticed that while the quantity of each type of product and selling price remain unchanged, the annual product revenues are equal to 533,291 lei. Variation of some of these indicators, to increase or decrease, can generate changes in total revenue per product. It should also be considered how the annual costs involved and the product, especially with regard to variable expenses. Total amount of revenues from economic activity in those five years is 2,666,455 lei. The structure of revenues from production is 20 per cent annually, and by product and during the whole period and the total income is: 26.7 per cent in tomato broth, tomato juice 60.3 per cent, 5.5 per cent pickled cucumbers, 4.5 per cent picked cabbage, 2.5 per cent in assorted pickles and 0.5 per cent in seedlings.

Total amount of investment is 1,175,523 lei, made up of members of the cooperative's own contribution and grant the European Fund for Agriculture and Rural Development. The share of investment of member contributions is 60.9 per cent and the European Fund for Agriculture and Rural Development is 39.1 per cent. The investment is allocated in the first year of operation of the cooperative, so that the total amount of income, meaning the sum between operating revenue and total investment is 3,841,978 lei.

Table 3 Expenditure from operational activity and assets' acquisition (lei)

Total expenditure, of which:	1574086	398563	398563	398563	398563	3168338
Materials	200371	200371	200371	200371	200371	
Salaries	116820	116820	116820	116820	116820	
Amortization	71772	71772	71772	71772	71772	
Other expenditure	9600	9600	9600	9600	9600	
Assets acquisition	1175523					
Available cash at the end of the year	134728	134728	134728	134728	134728	673640

Source: authors' calculations

The total expenditure includes operating expenses and investment, recovered as payment in respect of European Fund for Agriculture and Rural Development for the acquisition of fixed assets. Within the total operating costs, the largest share is held by the materials, 12.7 per cent in the first year of operation (when taken into account the allocation of investment expenses) and 50.27 per cent in the years 2, 3, 4 and 5. It is recognized that the costs of raw materials have high shares because they depend on the production volume and dispense the product.

Expenditure to acquire assets is equal to the amount of investment and total expenses, including operating expenditure and investment for 5 years, are 3,168,338 lei. Available cash at end of period is 673,640 lei, allocated equally over the 5 years, resulting in 134,728 lei/year.

RESULTS AND DISCUSSIONS

Adding the foregoing, it appears that the scenario developed offers, at least economically, significant positive results. This is evident both at the product level and the total activity. Consequently, total revenues are 2,666,455 lei, operating expenses are 1,992,815 lei, which include the amortization of fixed assets, and the operating profit as the difference of the two indicators is equal to 673,640 lei. Thus, there is a rate of return (rate of resources consumed), calculated as the ratio of total profit and total expenses, of 33.8 per cent and a profit margin (calculated as the ratio between net profit and total income, in this case) of 21.2 per cent, which indicates that the business is profitable.

2.1 Assessment of basic indicators of investment

The calculation of basic indicators of investment is presented in Table 4. It was considered that the average effective duration of operating the equipment is equal to 10 years. Regarding the normal production capacity expressed in value, this is shown by the annual revenue.

In assessing the economic efficiency of investment, the yearly income on a variety of products was considered in order to determine their specific investment value. Also, the annual costs of production activity and total annual profit have been used.

Table 4 Basic indicators of investment (lei)

No	Indicators	Value
1	Value of investment (I_t)	1175523
2	Yearly capacity of production expressed as value (Q), of which:	533291
2.1	Broth	142512
2.2	Tomatoes juice	321679
2.3	Pickled cucumbers	29600
2.4	Pickled cabbage	24360
2.5	Assorted pickles	12640
2.6	Seedlings	2500
3	Yearly expenditure of production (Ch)	398563
4	Yearly profit (P_a)	134728
5	Period of exploitation (D_e), years	10

Source: authors' calculations

2.2 Assessment of investments' indicators

After the calculation, it results a total specific investment of 2.2 lei invested for 1 leu of product sold, and by the type of products it varies by production value. The lowest value of the investment is recorded at broth and tomato juice, as they have the highest sales revenue and the highest values are cucumbers and cabbage, assorted pickles and the seedlings. It can be noticed that investment effort is very high and it is not recovered in the products. However, their production is not only of economic interest, but also social, meaning the use of resources in the area where the project will be implemented.

It can be noticed that annual profit provides the recovery of investment in 8.7 years (payback period of 8.7 years was calculated with VAT reporting investment amount to annual profit). Given the fact that a complex unit is design to be projected, which combines the manufacture, processing and marketing, and the idea that related constructions are needed, demanding high investment efforts, the situation is positive. This is fully confirmed by the economic return on the investment which exceeds the investment value; the total profit (recorded throughout the period of use of equipments) is higher than the investment of 1.03 times or 103 per cent.

Table 5 Indicators of investment (lei)

No.	Indicators	Value
1	Specific investment ($I_s = I_t/Q$), lei	2.2
1.1	Broth	8.2
1.2	Tomatoes juice	3.65
1.3	Pickled cucumbers	39.7
1.4	Pickled cabbage	48.2
1.5	Assorted pickles	93.0
2	Seedlings	470.2
3	Recoverable profit ($P_a=I_t$), lei	134728
4	Total profit ($P_t = P_a \cdot D_e$), lei	1347280
5	Final profit ($P_f =P_t – P_r$), lei	1212552
6	Economic return on investment ($R = P_f/I_t$) %	103.0
7	Return of investment I_t/P_a, years	8.7

Source: authors' calculations

CONCLUSIONS

This study aimed at answering the question whether integrating chain's activities of collecting, processing and selling vegetables in a single economic unit is feasible or not. The economic results show high profitability of such an activity, because the rate of return is 33.8 per cent, the return of investment is 8.7 years and the economic return of investment is 103 per cent, meaning that total profit is higher than the quantum of investment.

The project can be implemented in renowned vegetables' areas, where farmers develop activities of collecting vegetables, processing into cans and sell them to the market. Integrated chain empowers performance of chains' operators, reduces the losses of vegetables and ensures farmers' income stability. The European Fund for Agriculture and Rural Development offers opportunities for financing part of such businesses and the project proposed in this piece of research can be used as model for applying to these funds for developing businesses down-stream agriculture.

REFERENCES

1. Ion, R.A. (2015), FRUITS AND VEGETABLES MARKET IN ROMANIA: BETTER UNDERSTAND CONSUMERS' PREFERENCES, *Agricultural Economics and Rural Development - Realities and perspectives for Romania*, 426-433.

2. Istudor, N. & Ion, R.A. (2007). Pierderile pe filiera legumelor. Cauze şi modalităţi de prevenire, *Lucrari stiintifice. Seria Agronomie. 50/3,* 157-162.

3. Manole, V., Istudor, N., Boboc, D., & Ion, R.A. (2005). Filiere agroalimentare. *Editura ASE, Bucuresti*.

4. Manole, V. & Ion, R. A. (2006). Coordination Models for Agro-food Chains, *Economics of Agriculture. LIII(1)*, 63-71.

5. Marion, B. (1986). The organization and performance of the U.S. food system. *USDA. Lexington Books, Massachusetts.*

6. Turek Rahoveanu, A., Turek Rahoveanu, M., Zahiu, L., Ion, R.A, Zaharia, C., Dachin, A., Istudor, N., Manole, V., Dobre, I., & Ignat, R. (2008), Analiza filierei sectorului legume-fructe în România. *Editura Cartea Universitara, Bucuresti*.

7. Project 16.1.2. – Models of developing short chains for production-services-storage-processing-market, financed by the Ministry of Agriculture and Rural Development of Romania, 2015.