

Volume 12, Issue 4/2012

PRINT ISSN 2284-7995

e - ISSN 2285-3952



SCIENTIFIC PAPERS

**SERIES “MANAGEMENT, ECONOMIC
ENGINEERING IN AGRICULTURE AND RURAL
DEVELOPMENT”**

PRINT ISSN 2284-7995 e - ISSN 2285-3952

Volume 12, Issue 4/2012

Copyright 2012

To be cited: Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development", Volume 12, Issue 4/2012

Publishers :

University of Agricultural Sciences and Veterinary Medicine of Bucharest, Romania. Address: 59 Marasti, District 1, 011464 Bucharest, Romania, Phone: + 40213182564, Fax: +40213182888, www.managusamv.ro
S.C. Editura Ceres S.A., Address:1 Piata Presei Libere, District 1, Bucharest, 013701, Phone/Fax: +40213179023, Email: edituraceres@yahoo.com
All rights reserved

The publishers are not responsible for the content of the scientific papers and opinions published in the Volume. They represent the authors' point of view.

EDITORIAL BOARD

Editor in Chief: Prof. Ph.D. Toma Adrian DINU

Executive Editor: Prof. Ph.D. Agatha POPESCU

Members:

Prof. Ph.D. Ioan Nicolae ALECU, University of Agricultural Sciences and Veterinary Medicine, Bucharest, Romania
Prof. Ph.D. Manea DRĂGHICI, University of Agricultural Sciences and Veterinary Medicine, Bucharest, Romania
Prof. Ph.D. Mihai BERCA, University of Agricultural Sciences and Veterinary Medicine, Bucharest, Romania
Prof. Ph.D. H.C. Miguel Moreno MILLAN, University of Cordoba, Spain
Prof. Ph.D. Doc. Svend RASMUSSEN, University of Copenhagen, Denmark
Prof. Ph.D. Mogens LUND, Institute of Food and Resource Economics, Denmark
Prof. Ph.D. Pascal Anton OLTENACU, Oklahoma State University, United States of America
Prof. Ph.D. Rangesan NARAYANAN, University of Nevada , United States of America
Senior Lecturer Ph.D. Ove MADSEN, Grinsted Agricultural Academy, Denmark
Ph.D. Patrick ANGEL, US Department of the Interior, Office of Surface Mining Appalachian Regional Office, United States of America
Prof. Ph.D. Gerhard MOITZI, University of Natural Resources and Applied Life Sciences, Vienna, Austria
Prof. Ph.D. Paolo GAJO, University of Florence, Italy
Prof. Ph.D. Diego BEGALLI, University of Verona, Italy
Ph.D. Alistair Mc CRACKEN, Agri-Food and Biosciences Institute, Belfast, United Kingdom
Prof. Ph.D. Drago CVIJANOVIC, Institute of Agricultural Economics, Serbia
Prof. Ph.D. Nebojša RALEVIC, University of Belgrade, Serbia
Ph.D. Jonel SUBIC, Institute of Agricultural Economics, Serbia
Associate Professor Ph.D. Zuzana PALKOVA, Slovak University of Agriculture, Slovakia
Acad. Prof. Ph.D. Hab. Pavel MOVILEANU, The Agricultural State University of Moldova, Republic of Moldova
Senior Lecturer Ph.D. Veronica PRISĂCARU, The Agricultural State University of Moldova, Republic of Moldova
Senior Lecturer Ph.D. Veronica MOVILEANU, The Agricultural State University of Moldova, Republic of Moldova
Senior Lecturer Ph.D. Mariana DOGA-MIRZAC, Moldova State University, Republic of Moldova
Associate Prof. Ph.D. Rashid SAEED, International Islamic University, Pakistan
Dr. Adrian TUREK-RAHOVEANU, Research Institute for Agricultural Economy and Rural Development, Bucharest, Romania
Prof. Ph.D. Emilian MERCE, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania
Prof. Ph.D. Gheorghe MUREȘAN, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania
Prof. Ph.D. Nicoleta MATEOC-SÎRB, University of Agricultural Sciences and Veterinary Medicine of Banat, Romania
Prof. Ph.D. Ion DONA, University of Agricultural Sciences and Veterinary Medicine , Bucharest , Romania
Senior Lecturer Ph.D. Radu Lucian PĂNZARU, University of Craiova, Romania
Senior Lecturer Ph.D. Gavrilă ȘTEFAN, University of Agricultural Sciences and Veterinary Medicine, Iasi, Romania
Prof. Ph.D. Vasile Gosa, University of Agricultural Sciences and Veterinary Medicine of Banat Timisoara
Senior Lecturer Ph.D. Tiberiu Iancu, University of Agricultural Sciences and Veterinary Medicine of Banat Timisoara
Senior Lecturer Ph.D. Ioan Brad, University of Agricultural Sciences and Veterinary Medicine of Banat Timisoara

Publication Committee:

Dr. Mariana Burcea

Ing. Teodora Popescu

This volume includes the scientific papers of the
The International Conference of the University of Agricultural Sciences and Veterinary Medicine of Bucharest
"Agriculture for Life, Life for Agriculture"; 160 Years of Romanian Agricultural Higher Education",
Section 7 "Management and Engineering in Rural Areas",
October 4-6, 2012, Bucharest
University of Agricultural Sciences and Veterinary Medicine of Bucharest, Romania

C O N T E N T S

1.DIFFERENCES IN THE ATTACHMENT TO AGRICULTURAL LAND PROPERTIES BETWEEN FORMER COLLECTIVIZED AND NON-COLLECTIVIZED COMMUNITIES IN ROMANIA Maria ARDELEANU, Birgit ELANDS, Rosalie VAN DAM	3
2.ORGANIC CROPS' ECONOMIC EFFICIENCY BASED ON A CASE STUDY FROM THE CĂLĂRASI COUNTY Aurelia-Vasilica BĂLAN, Elena TOMA.....	9
3.THE KEY POSITIONS OF STRATEGIC MANAGEMENT AT THE ENTERPRISE Elena BARANOV.....	13
4.AGRICULTURE IN THE REPUBLIC OF MOLDOVA: PRESENT AND FUTURE Simion CERTAN, Ion CERTAN.....	19
5.ECONOMIC IMPACT OFBIODIVERSITY CONSERVATION IN AGRICULTURE EXPLOATATION IN SOUTH OF ROMANIA Anisoara CHIHAIA, Georgiana Melania COSTAICHE, Octavian CHIHAIA.....	29
6.AGRICULTURAL SUBSIDIZING POLICY AND ITS EFFICIENCY: THE CASE OF MOLDOVA Liliana CIMPOIES.....	33
7.THE QUANTIFICATION OF THE DIVERSIFICATION'S IMPACT OF COMMERCE WITH AGRI-FOOD PRODUCTS ON THE EFFICIENCY OF EXTERNAL TRADE Boris CORETCHI, Silvestru MAXIMILIAN.....	37
8.EFFECTS GENERATED BY THE ACCESSION TO THE EUROPEAN UNION IN THE FIELD OF TRADING CEREAL PRODUCTS Ion DONA, Ramona MĂTUSA (DUMITRU).....	43
9.ECONOMIC EFFECTS OF AGRICULTURAL INTEGRATION OF ROMANIA INTO THE EUROPEAN UNION. CASE STUDY: THE CONTRIBUTION OF AGRICULTURE TO ECONOMIC GROWTH OF THE NORTH-WEST REGION Ion DONA, Anamaria-Aurelia (MORNA) SIMUT.....	51
10.NEW CORRELATION COEFFICIENT FOR DATA ANALYSIS Dragos FALIE, Livia DAVID.....	57
11.DISTRIBUTION ASPECTS OF THE DIRECT PAYMENTS BETWEEN EU MEMBER STATES Gina FINTINERU, Elena COFAS.....	61
12.CAUSES OF INSUFFICIENT FINANCIAL RESOURCES IN THE ENTERPRISES Svetlana GHERJAVCA, Mariana DOGA-MÎRZAC.....	65
13.POTENTIAL OF FRUIT PRODUCTION IN THE UPPER DANUBE REGION Biljana GRUJIĆ, Radojica SARIĆ, Predrag VUKOVIĆ.....	69

14.RURAL TOURISM PROMOTION ANALYSIS BY ROAD VÂLCEA TOURIST MOTEL "EVRIKA" IN COSTESTI VALCEA COUNTY Adelaida Cristina HONTUȘ.....	77
15.LAUNCH INTERNATIONAL CIRCUIT IN RURAL TOURISM DEVELOPMENT THROUGH A TOURIST VILLAGE POLOVRAGI GORJ Adelaida Cristina HONTUȘ.....	83
16.EFFECT OF SUBSIDIZING EXPORT OF AGRO-FOOD PRODUCTS AFTER THE ACCESSION OF POLAND TO THE EUROPEAN UNION Daniela POPA.....	91
17.RESEARCH ON THE USE OF EXTRA-EARLY CULTIVARS FOR INCREASING ECONOMIC EFFICIENCY IN WATERMELON GROWING IN THE SOUTHERN ROMANIA Agatha POPESCU.....	95
18.RESEARCH ON ROMANIA'S WATERMELON AND MELON MARKET Agatha POPESCU.....	103
19.LAND – PRICE DETERMINANTS USING THE SPATIAL ECONOMETRICS MODELING IN THE MOLDAVIAN REAL ESTATE MARKET Anatol RACUL, Dragoș CIMPOIEȘ.....	113
20.THE REFLECTION OF RURAL POPULATION'S OCCUPATIONAL SITUATION AT ITS REVENUES AND EXPENDITURES LEVEL Olga SÂRBU.....	123
21.THE IMPACT OF THE EU INSTRUMENT FOR PRE-ACCESSION FOR RURAL DEVELOPMENT (IPARD) TO TURKEY Coskun SEREFOGLU, Tecer ATSAN.....	133
22.FACTORS AFFECTING THE VEGETABLE FARMING EFFICIENCY IN BULGARIA Teodora STOEVA.....	141
23.INTENSIVE AND EFFICIENT AGRICULTURE AND THE NEED FOR ITS SUSTAINABLE DEVELOPMENT Elena TIMOFTI.....	145
24.PROSPECTS FOR AGRICULTURAL COOPERATIVES IN ROMANIA IN THE CONTEXT OF CAP REFORM 2014-2020 Maria Magdalena TUREK RAHOVEANU, Adrian TUREK RAHOVEANU, Luiza CRISTEA.....	151
25.THE ROMANIAN EXTERNAL TRADE IN LIVE ANIMALS AND ANIMAL PRODUCTS Ionela Mițuko VLAD, Silviu BECIU, Paula STOICEA, George PATRASCU	155

DIFFERENCES IN THE ATTACHMENT TO AGRICULTURAL LAND PROPERTIES BETWEEN FORMER COLLECTIVIZED AND NON-COLLECTIVIZED COMMUNITIES IN ROMANIA

Maria ARDELEANU ¹, Birgit ELANDS ², Rosalie VAN DAM³

¹Wageningen University & Research centre, Forest and Nature Conservation Policy Group, P.O. Box 47, 6700 AA, Wageningen, the Netherlands, Phone: +31 (0)645220897, E-mail: viatalatara@yahoo.com

²Wageningen University & Research centre, Forest and Nature Conservation Policy Group, P.O. Box 47, 6700 AA, Wageningen, the Netherlands, Phone: +31 (0)317486365, E-mail: birgit.elands@wur.nl

³Wageningen University & Research centre, Alterra / Public Administration and Policy Group P.O. Box 47, 6700 AA, Wageningen, the Netherlands, Phone: +31 (0)317481876, E-mail : rosalie.vandam@wur.nl

Corresponding author : Maria ARDELEANU, viatalatara@yahoo.com

Abstract

Physical, structural and social transformations during the period of collectivisation in Romania call for the need of understanding how these transformations have affected people's attachment to their agricultural land properties (ALP). By studying the functional and emotional attachments of a former collectivized and a non-collectivized community, this paper addresses how people in the two communities nowadays are attached to the ALP's and, if there are differences, to what extent these differences are related to the former collectivisation process. It has been found that people in both communities are attached to the land both functionally, through social and economic benefits, and emotionally through various feelings such as feelings of identity, passion and indifference, but to a different extent. As a final conclusion, in the former collectivized rural areas, people are less attached to the agricultural land properties compared with the people in the non-collectivized rural areas and these differences can be linked to the transformations triggered by the former collectivisation process.

Key words: *collectivisation, agricultural land properties, place attachment, NE Region, Romania*

INTRODUCTION

About 90% of the rural communities in Romania had been for many years under the communist collectivisation process which implied various transformations at physical, structural and social level [1], [2], [3]. These changes may be related to the problems that the rural areas face nowadays, especially cropland abandonment, poverty and depletion of the natural rural resources [4], [5], [6]. Although people have regained their agricultural land properties (ALPs) for the past 20 years, it is uncertain if people in these affected areas still maintain a bond with these areas after being parted from it for a long time. Though, not all rural communities had been collectivised; in almost 10% of rural areas, the ALPs were left outside the collectivisation process. Hence, we

are dealing with two types of communities that emerged after the collectivisation process, the former-collectivised and the non-collectivised community. In this research, it is assumed that the people in the former collectivised community are less attached to their ALPs as it is known that when people are separated from a place for a long time they experience a kind of rupture in their affinity to the land [7]. A known concept for understanding people's relation with their place is the concept of 'place attachment' that can be either functional, which refers to the (dis)satisfaction of user needs in terms of quantity and quality of the place [8] or emotional, which refers to those dimensions of the self that define the individual's personal identity in relation to the place [9]. A strong attachment is a prerequisite in helping rural people to take responsibility

for their ALPs which means that less abandoned cropland will occur, the natural resources in these areas will be better managed and also people will have an extra mean of surviving. Consequently, this paper aims at comparing the two types of communities for finding out how people nowadays are attached to their ALPs and, if there are differences, to what extent these differences are related to the former collectivisation process. These findings provide valuable information for planners and politicians involved in rural development.

MATERIAL AND METHOD

We have carried out a qualitative comparative case study research and selected two communities from East Romania, a formerly collectivised community called Prohozesti and a non-collectivised community called Lapos. Generally in the two study areas, there are individual peasants with agricultural land properties divided into more plots and practicing subsistence agriculture. On average, the total surface of the land does not exceed more than two hectares. The data has been collected through semi-structured interviews with respondents from the two communities (N=13 for Prohozesti and N=13 for Lapos) covering a high range of individualities: age, gender, and social status. The respondents were mainly selected through snowball sampling[10]. The analysis of the data was done according to the following steps [11]: *familiarizing* with the data, *developing a coding scheme* for analysing the themes that occurred most, *indexing* or coding the data, *charting* or rearranging the data by theme in a table, and the last step was *mapping and interpretation* of the results by looking at relationships between and within the themes and the typologies developed from them. For more in-depth information see the original research report [15].

RESULTS AND DISCUSSIONS

Functional attachment

Functional attachment was expressed through two types of benefits: **social benefits** referred

as immaterial goods and **economic benefits** referred as material goods that the ALPs can provide for the people. Each of the two types of benefits can be either positively, which implies a high functional attachment, or negatively which implies a low functional attachment. When comparing the level of attachment in the two communities, in the community where more positive satisfactory benefits were mentioned it was assumed that in that community the functional attachment is higher.

Social benefits. The following positive social benefits were predominantly expressed in Lapos (n=16): recreation (e.g. “*being in the garden and just sitting on the grass and looking around relax me very much*”), commodity (e.g. “*the lands near the house*”), and healthiness (e.g. “*food is very healthy and tasty because we don’t apply chemicals*”). Regarding the ‘healthiness’ aspect people in Lapos seem to care not only about their own healthiness and of the livestock but also about the present and the future healthiness of the land. They consider it is very bad to use chemical fertilizers or pesticides for the soil because in time they will weaken the soil. With other words, place attachment is also associated with future conditions of the place and not only the present conditions like it was argued in literature [12]. In Prohozesti (n=4), social benefits were poorly mentioned and only including the recreation and healthiness categories. The following negative social benefits were predominantly mentioned in Prohozesti (n=3), while in Lapos none: harsh working conditions (e.g. “*there are only barren hills with no shade... hard to work all day long in the sun*”) and need for pest control (e.g. “*during collectivization time the seeds were treated, nowadays I must buy new seeds every year and even though grows only weeds*”).

Economic benefits. In both communities these types of benefits were predominant negative. There were only few people in each community (n=6 for Lapos and n=5 for Prohozesti) that find worthier to work the land as a source of revenue (e.g. “*it helps my family to carry on our livelihood in a decent*”).

way”). Most of the people talked about the negative economic benefits that they encounter when working the ALPs. In Lapos (n=11) people find that some crops don't grow that well like in other parts of Romania which means that they cultivate only certain crops that brings them the best benefits (e.g. *“suitable for producing hay but not for maize”*). Despite the negative benefits, people in Lapos they keep maintaining the land as it is. At the other hand, in Prohozesti (n=12), most people complained that the general crop production is low compared to the past, few people said that the crop productivity is much lower than in other places of Romania and few other people told that is not worthy to cultivate the land because of the crop theft that occurs in the area (e.g. *“harvest got stolen during collectivisation time and gets stolen also nowadays”*).

There are three main reasons for the low levels of productivity. One reason is the necessity to fertilize the soil with chemical fertilizers because of being used to it during collectivization times (e.g. *“I would have preferred to have the land how it was in my grandparents' time because it wasn't dependant on chemicals”*). Thus, the soil quality had been changed during collectivization times and nowadays people still have troubles by restoring back the soil to its initially quality. A problematic factor is that is difficult to find manure in the village as there are not many animals anymore that can produce it. The second reason is the fact that people have difficulties with travelling to their land plots because it is impossible to hire horses (only a few people own horses in this community or to hire tractors. Horses were taken away from the people during collectivization times and nowadays only few people in this village have returned to the old habit of raising horses. Besides, it seems that in Prohozesti there is no available grazing area anymore and this fact discourages people to raise livestock. During the collectivisation period the riparian area along the main river Tazlau was used by the people from Prohozesti as a cattle grazing area. But, nowadays, the riparian area has become a kind

of land fill as people are depositing their garbage in this area and therefore the possibility for grazing in this village is also limited. The third reason is the low financial opportunities people have in this village which implies they have no money to buy chemical fertilizers and also no money to hire tractors (e.g. *“During collectivization times things were much better, we had well-paid jobs and had tractors to work the land with, nowadays we don't have either of them”*). Hence, we can argue that attachment is a dynamic process and can be influenced by different experiences lived in a place like the fact that the people are used to get high productivity rates but also can be influenced by the physical transformations of the place, in this case changes of the soil quality. These findings are contrary to the findings of Low and Altman (1992) who argued that the physical place provides only the background for forming ideas, feelings and memories on place and that actually the experiences lived in place influences people's attachment to that place.

Figure 1 depicts the functional attachment in both communities. The difference between the two communities is that in general in Lapos there are more positive benefits associated with the ALPs than in Prohozesti. Although the economic benefits are seen predominant negatively in both communities, in Lapos people are most satisfied with the social benefits offered by the ALPs while in Prohozeti the social benefits are overlooked by the negative satisfactory economic benefits.

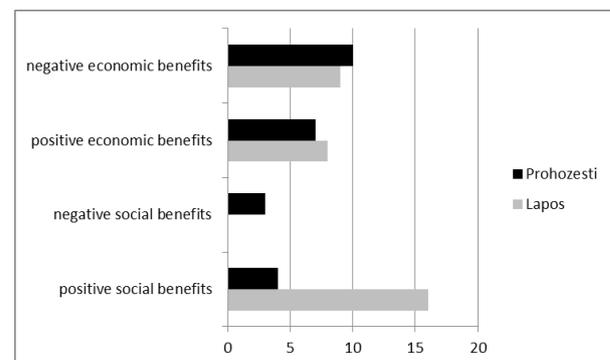


Fig. 1 Differences in functional attachment to the ALPs of Lapos and Prohozesti

Emotional attachment was expressed through verbal feelings that are either positively or negatively.

Positive emotional attachment

Feelings of identity were expressed in both communities through different individual meanings that people attribute to ALPs by means of shaping people’s sense of who they are. In Lapos (n=6) people see the ALPs as an integrated part of their peasant existence (e.g. “*The land is my origins; my life is built around this land*”) while in Prohozest (n=3) ALPs are making people identify as ‘*hard workers*’; ‘*being destined to work the land as the thing they know best to do*’ or even feeling like ‘*the master*’ after having the land taken away from the people during collectivisation time.

Feelings of passion appeared to be the type of feelings that make people from Lapos (n=11) the most attached to the ALPs while in Prohozesti (n=6) this type of feeling was expressed to a lower extent compared to Lapos. There are two ways people in the two communities showed their passion for the ALPs. Firstly, feelings of passion were described as an attraction people feel for the land expressed in words such as: ‘like’; ‘love’; ‘enjoy’; ‘passion and ‘interest’ in Lapos, and ‘pleasure’; ‘hobby’; ‘like’; ‘enjoy’ among respondents from Prohozesti. Secondly feelings of passion were expressed through the willingness people have to not depart with the ALPs. In Lapos 9 people told how determined they are to keep the ALPs (e.g. “*If I would be forced to sell a piece of land, for me it would feel like a painful goodbye*”) while in Prohozesti only 4 people expressed similar feelings.

Feelings of morality are related to the reasons why people would not consider quitting working on the ALPs. People from Lapos (n=19) and Prohozesti (n=14) gave quite similar answers, which can be divided in three categories of reason. The first category relates to the fact that the land is inherited from the ancestors. People see the heritage as a moral duty to take care of the land because in this way people can show their appreciation to the ones that “*fought in the war*” or “*sacrificed*

themselves” to get in the possession of this land. It is not only the land as an object passed from older generations but also the knowledge about how to work the land, the appreciation for the land, but also the feelings of love for the land (e.g. *We are attached to the land through the love inserted by our parents*). The second reason is related to the religious thoughts people believe in, like for example it is being a “*sin to sell or abandon the inherited land*”. The third reason why people wouldn’t consider departing with the ALPs is because they can pass the land to their children. In both communities it is normal that when one of the children gets married, the new couple inherit a piece of land from the parents, therefore for the people it is an important issue to keep the land for their children and in this way a kind of continuity is maintained by the family in passing the land from generation to generation: “*If I wouldn’t know that my descendants will come back for the land I wouldn’t work the land anymore, but I hope one day my children will return here.*” (Prohozesti).

Negative emotional attachment

Feelings of concern were expressed most of all among the people in Prohozesti that although their wishes to pass the ALPs to their children, they also expressed their concern that their children would not take care of the land the way they did it: “*I fear after I will die that weeds will grow as big as the house, no one will care about my land.*” (Prohozesti). This type of concern was also present in Lapos expressed among two people.

Another reason to be concerned about the ALPs is due to the high amount of land that is abandoned in Prohozesti. Some expressed their concern in terms of grief for seeing the land abandoned (“*I feel sorrow*”, “*I feel sad*”), others showed their frustrations (e.g. “**people where more devoted to the land in the past**”).

Feelings of indifference were expressed among the youngest respondents from Prohozesti, they expressed their indifference (e.g. “*don’t like working the agricultural land*”, “*having a job is more important than working the land*”).

Feelings of inability were expressed by people from Prohozesti that would like to maintain the land but they find it difficult to do so and therefore they abandoned some land plots for reasons like: the big distance to the land; the low financial possibilities or the impossibility to sell local products (e.g. “the EU is destroying us; nothing that we produce is satisfying our markets. Only imported products are good enough”). More than this, some people from Prohozesti expressed their willingness to give up the land to a ‘land owners association’ because they believe that this would be the solution to prevent more land to be abandoned in their village. We considered this type of answer surprising as a high number of studies have found that place attachment is greater in physical settings wherein people’s goals have been achieved [13], [14]. Our findings on attachment to the ALPs in context to the non-former collectivized community have proven the opposite. When the communism system ended, the most ardent goal for those deprived of their property rights due to the former collectivization of agricultural land, was to get these properties back [3]. Thus, the goal was achieved but not the satisfaction and therefore people started abandoning their lands. It means that not always does the achievement of a goal on a setting; also increase ones attachment to that setting. By comparison, in Lapos, although most of the ALPs are located more than 5 km away from people’s homes; the distance or the financial means weren’t considered reasons for land abandonment like it was found in Prohozesti.

Figure 2 summarises the emotional attachment of both communities. We can see that the people of Lapos experience more positive feelings than the people of Prohozesti, who express rather negative feelings. This means that the level of emotional attachment among people in Lapos is higher than in Prohozesti. Feelings of *morality* predominates the positive emotional attachment in both communities while the negative emotional attachment that was mostly expressed in Prohozesti and is mainly expressed through feelings of *inability*.

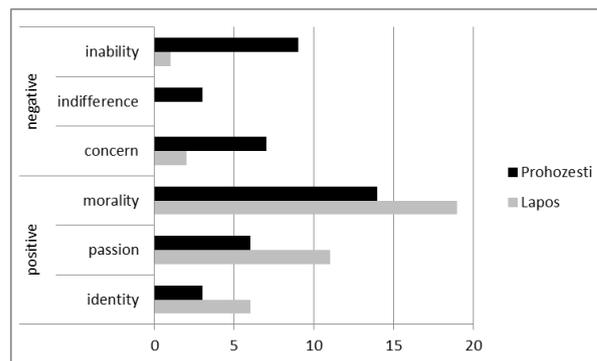


Fig. 2 Differences in emotional attachment to the ALPs of Lapos and Prohozesti

CONCLUSIONS

1. It can be concluded that the level of attachment to the ALPs differs largely between both communities. The low functional attachment found in Prohozesti is triggered by the fact that in this community people value their land mainly in terms of economic gains, and not so much in social gains. The economic gains, mainly the crop productivity are not as much as satisfactory nowadays as they used to be during collectivisation times and the social gains don’t seem to compensate people’s needs., These findings can be linked to the former collectivization period because in these days people from Prohozesti experienced high crop productivity rates, so it is something that people became used too. Nowadays, due to the fact that they do not have the financial means to invest in fertilizers, mechanization and transportation that are needed to reach high crop productivity, people in Prohozesti show low satisfaction with the benefits that can be obtained from the land and thus a low functional attachment.

On the other hand, in Lapos, people see the ALPs, to a lesser extent important for the economic gains but rather they attribute social meanings more related to the quality of the ALPs such as a clean, friendly and peaceful work environment; the land as much as possible in one place, and most importantly, to obtain healthy and tasty food products, which explains their high satisfaction with the ALPs. All these achievements are possible due to the fact that in Lapos people are working the land in the old traditional way by making use of

horses for most of the work and fertilizing the soil with manure.

2. Looking at the emotional attachment, in Lapos the positive feelings (identity, passion and morality) predominate this type of attachment. Besides the feelings of morality that has to do with their ancestors/ family bond, it seems that also the social benefits obtained from the land triggers also positive feelings such as identity and passion for the land. In Prohozesti, although feelings of morality are predominant, the negative feelings (concern, indifference and inability) are present and they are triggered by the low satisfaction levels with their land and in consequence are triggered by the changes brought by the former collectivism in people's lives.

3. Based upon our two cases, we could assume that in the former collectivized communities of Romania people are less attached to their agricultural lands than the people in the non-collectivized communities were functionally and emotionally they account for a more positive attachment. The changes produced by the former collectivisation system such as land spatial changes in the village, change of soil quality, changes in people's habits and people's orientations combined with the low financial opportunities are the main reasons influencing the low functional attachment to agricultural land properties among people from Prohozesti. Based on these findings it would be advisory to take in account the historical background of the involved communities in the proposed measures in rural developing plans.

ACKNOWLEDGEMENTS

This research work is part of a more extended master thesis that included besides the part about attachment to the ALPs also attachment to the village and the forests surrounding the two communities, as well aspects of pro-environmental behaviour and how this varies with the attachment. The thesis was carried out by Maria Ardeleanu and conducted as requirement for the MSc study “Forest and Nature Conservation” at Wageningen University, the Netherlands. The authors express their gratitude to the respondents from

Romania for their kindness and willingness to share their information with the authors.

REFERENCES

- [1] Kideckel, David A., 1993, *The Solitude of Collectivism: Romanian Villagers to the Revolution and Beyond*. Ithaca: Cornell University Press, p. 58-91.
- [2] <http://destinatii.liternet.ro/articol/152/Dorin-Dobrincu/Scoala-de-Vara>, viewed on 10-10-2010.
- [3] Verdery K., 2003, *The Vanishing Hectare: Property and Value in Postsocialist Transylvania*. Ithaca, NY: Cornell Univ. Press, p. 163.
- [4] World Bank, Romania, country review, 2007, “Integrating Environment into Agriculture and Forests: Progress and Prospects in Eastern Europe and Central Asia”. Vol.2 (<http://www.worldbank.org/eca/pubs/envint/Volume%20II/English/Review%20ROM-final.pdf>).
- [5] Lakes, T., Müller, D., Kruger, C., 2009, Cropland change in southern Romania: a comparison of logistic regressions and artificial neural networks. *Landscape Ecology* 24, p. 1195–1206.
- [6] Müller, D., Kuemmerle, T., Rusu, M., Griffiths, P., 2009, Lost in transition: determinants of post-socialist cropland abandonment in Romania. *Journal of Land Use Science* 4, p. 109–129.
- [7] Brown, B., and Perkins, D. D., 1992, Disruptions to place attachment. In I. Altman, and S. Low (Eds.), *Place attachment*, New York: Plenum, p. 279-304
- [8] Shumaker, S.A. and Taylor, R.B., 1983, Towards a clarification of people-place relationships: a model of attachment to place. In: N.R. Feimer and ES. Geller (Editors), *Environmental Psychology: Directions and Perspectives*. Praeger Press, NY, p. 219-251.
- [9] Proshansky, H. M., 1978, The city and self-identity. *Environment and Behaviour*, 10, p. 57-83.
- [10] Woods, P., 2006, Qualitative research. Unpublished paper. Viewed on: <http://www.edu.plymouth.ac.uk/resined/qualitative%20methods%202/qualrshm.htm>
- [11] Green, J. and Thorogood N., 2009, *Qualitative Methods for Health Research. Second Edition*. London: SAGE Pub. Ltd.
- [12] Scannell, L., and Gifford, R., 2010, Defining place attachment: A tripartite organizing framework. *Journal of Environmental Psychology*, 30, p. 1-10.
- [13] Proshansky, H. M., Fabian, A. K. and Kaminoff, R., 1983, Place-identity: Physical world socialization of the self. *Journal of Environmental Psychology*, 3, p. 57-83.
- [14] Moore, R.L., Graefe, A.R., 1994, Attachments to recreation settings: the case of rail-trail users. *Leisure Sciences* 16, p. 17–31.
- [15] Ardeleanu, M., 2012, Place attachment and pro-environmental behaviour in former collectivized VS non-collectivized rural communities of Romania. Unpublished MSc thesis, University of Wageningen, The Netherlands (<http://edepot.wur.nl/199663>).

ORGANIC CROPS' ECONOMIC EFFICIENCY BASED ON A CASE STUDY FROM THE CĂLĂRASI COUNTY

Aurelia-Vasilica BĂLAN¹, Elena TOMA¹

¹University of Agricultural Sciences and Veterinary Medicine, Bucharest, 59 Marasti, 1st sector, 011464, Bucharest, Romania, Phone: +40 21 318 25 64/232, Fax: + 40 21318 28 88, E-mail: aurelia_florescu2004@yahoo.com

Corresponding author email: aurelia_florescu2004@yahoo.com

Abstract

The development of organic agriculture in the past years has placed Romania among the first 25 countries that have cultivated areas under organic systems. In this field, there are over 9 thou producers, with over 500 thou hectares. In the Călărași County, in 2010 were only 19 authorized operators. On the basis of field observations, we generated technological and economic charts for the budgets of five different crops: wheat, sunflower, maize, alfalfa and peas. For each crop we will monitor the input quantities, yield, costs and prices and we will calculate crop budgets finalized with efficiency rates, which will be compared to the budget forecasts for conventional agriculture. This paper aims at showing that organic crops are economically more efficient than the crops obtained within conventional agriculture, while their yield per hectare is lower.

Key words: organic agriculture, efficiency rate

INTRODUCTION

The area under organic cultivation in Romania has increased in the last years, reaching almost 568 thou hectares in 2011. The number of registered operators reached over 9 thou, over 50% of which were concentrated in the Suceava and Bistrita-Năsăud Counties. In the Călărași County the area under organic cultivation in 2010 had the following characteristics: 6.4 thou ha; 19 operators; four operators over 700 ha with 70% of total area. The sector been increasing continuously due to the implemented support measures but the important issue is that the majority of ecological farms are subsistence farms with under 20 ha. In these circumstances, the purpose of the present paper is to present the economic efficiency achieved by a 700 ha farm in the 2007-2010 interval.

MATERIAL AND METHOD

The research was conducted in an organic farm of over 700 ha in the Călărași County in the interval 2007-2010 and on the basis of the field observations we created technological charts and economic budgets for five crops:

wheat, sunflower, maize, lucerne and peas [1]. In our approach we monitored input quantities, yield, costs and prices and calculated crop budgets finalized with efficiency rates that were compared to budget forecasts for conventional agriculture.

RESULTS AND DISCUSSIONS

SC Auger Petrus SRL is the fourth largest producer of organic crops in the Calarasi County in terms of cultivated area. The company had a number of 42 plots in place in the interval 2007-2010. The company policy in this interval was to ensure the proper rotation of crops and provide rest periods for land restoration. This policy was implemented in a model of cultivating the land which provided profitability even under drought conditions.

The company opted for the permanent cultivation of five main crops: wheat, corn, sunflower, peas and lucerne. These crops were grown on about 80-90% of the total certified organic area. Also, some crops such as barley and soybeans were cultivated as a necessity of crop rotation so as to ensure higher productivity and a range of crops such as

potato, mustard and fenugreek were grown for experimental purposes.

Table 1. Cultivated organic area during the interval 2007-2010

Crops	2007	2008	2009	2010
Potato	1		0.75	
Sunflower	304.07	184.3	221.2	249.82
Wheat	164.19	342.6	264.18	298.06
Lucerne	38.58	86.7	82.95	29.6
Peas	73.23	14.57	21.85	58.04
Maize	139.22	96.08	125.43	96.8
Beans	11.76	94.94		
Barley			103.36	20.65
Soybeans		18.2	26.6	27
Fenugreek		4.3	0.75	
Medicinal plants		1		
Vetch				0.75
Mustard	20.73			
Oats	35			
TOTAL, of which :	787.78	842.69	847.07	780.72
Main crops (5)	719.29	724.25	715.61	732.32
%	91,31	85,95	84,48	93,80

The rotation model used by the company for the five main crops was as follows:

Table 2. The rotation patterns for the main five crops during the interval 2007-2010

Type	Years			
	I	II	III	IV
4-year model				
1	Maize	Wheat	Wheat	Sunflower
2	Maize	Wheat	Sunflower	Peas
3	Wheat	Wheat	Maize	Wheat
4	Peas	Wheat	Maize	Wheat
5	Sunflower	Sunflower	Maize	Wheat
6	Sunflower	Maize	Wheat	Wheat
7	Peas	Wheat	Wheat	Sunflower
8	Lucerne	Lucerne	Lucerne	Wheat
3-year model				
	I	II	III	
1	Maize	Wheat	Sunflower	
2	Sunflower	Lucerne	Lucerne	
3	Maize	Maize	Wheat	

To highlight the economic efficiency of organic crops, we calculated the main efficiency indicators for five crops (wheat, sunflower, maize, lucerne and peas) for the interval 2007-2010, and we made a comparison with the estimated values for the same crops but grown in conventional systems. Note that for the years 2006 and 2007, the estimated budgets for sunflower, peas and maize were for irrigated systems.

Under these circumstances, we noticed for starters that wheat and lucerne crops yields per hectare were lower in the ecological system than those obtained in the conventional one. For maize, sunflower and peas the yields obtained were higher, even without irrigation.

Wheat efficiency

The wheat gross margin obtained in the ecological system was higher in 2007 and 2008, responding well in drought conditions (2007) due to a higher amount of nutrient and treatments per hectare. In 2009 and 2010, taking into consideration that the input quantities used increased and the yields per hectare were lower, the ecological efficiency rates were lower than the rates obtained in the conventional system.

Table 3. Wheat main indicators during the interval 2007-2010

Indicators	UM	2007	2008	2009	2010
Average yield	kg/ha	3500	4500	3700	3500
Unit cost	lei/to	737.7	636.7	788.7	894.3
Unit price	lei/to	850.0	850.0	900.0	1000.0
Specific consumption					
Diesel fuel	l/ha	128.5	128.5	128.5	128.5
Phosphate rock	kg/ha	300	300	300	300
Seed	kg/ha	300	300	300	300
Treatments	kg/ha	5	5	6	6
Electricity	Kw/ha	45	45	45	45
Technological expenses					
Total expenses	lei/ha	2486.9	2770.4	2823.4	3035.0
Mechanical work	lei/ha	1095.0	1181.0	1181.0	1181.0
Share	%	44.0	42.6	41.8	38.9
Manual work	lei/ha	130.0	130.0	130.0	150.0
Share	%	5.2	4.7	4.6	4.9
Raw materials and supplies	lei/ha	1261.9	1459.4	1512.4	1704.0
Share	%	50.7	52.7	53.6	56.1
Budget indicators					
Gross margin	lei	523.1	1089.6	541.6	520.0
Return rate	%	12.8	28.1	11.8	9.9
Conventional farm indicators					
Average yield	kg/ha	5000	5000	5000	5000
Gross margin	lei	774.9	1247.4	1162.0	1497.4
Return rate	%	9.6	14.6	14.5	12.6

Maize efficiency

Maize responded unfavourably in terms of gross margin and profit rate in the analyzed interval. Without irrigation, the efficiency obtained is seven times lower than in

conventional agriculture. Along with the increasing amounts of fertilizers and treatments and the use of irrigation, the production per hectare obtained increased, allowing to obtain a return rate of 27.1% in 2010 compared to the return rate in conventional agriculture (10.6%).

Table 4. Maize main indicators during the interval 2007-2010

Indicators	UM	2007	2008	2009	2010
Average yield	kg/ha	5500	7500	7000	7000
Unit cost	lei/to	305.8	484.4	578.7	657.8
Unit price	lei/to	350.0	500.0	700.0	870.0
Specific consumption					
Diesel fuel	l/ha	80.5	130.5	180.5	180.5
Phosphate rock	kg/ha	250	300	300	300
Seed	kg/ha	25	25	25	25
Treatments	kg/ha	2.5	2.5	2.5	2.5
Technological expenses					
Total expenses	lei/ha	1587.1	3537.7	3955.7	4509.9
Mechanical work	lei/ha	954	1684	1704	1904
Share	%	60.1	47.6	43.1	42.2
Manual work	lei/ha	50	520	520	540
Share	%	3.2	14.7	13.1	12.0
Raw materials and supplies	lei/ha	583.1	1333.7	1731.7	2065.9
Share	%	36.7	37.7	43.8	45.8
Budget indicators					
Gross margin	lei	292.9	637.3	1369.3	2025.1
Return rate	%	12.1	2.7	17.6	27.1
Conventional farm indicators					
Average yield	kg/ha	4000	6000	6000	6000
Gross margin	lei	611.2	1354.3	1890.5	1888.3
Return rate	%	4.8	19.7	17.8	10.6

Table 5. Sunflower main indicators during the interval 2007-2010

Indicators	UM	2007	2008	2009	2010
Average yield	kg/ha	2500	3000	2000	2000
Unit cost	lei/to	642.5	903.4	1336.8	1390.8
Unit price	lei/to	800.0	1200.0	1500.0	1800.0
Specific consumption					
Diesel fuel	l/ha	80.5	132.5	132.5	132.5
Phosphate rock	kg/ha	0	300	300	300
Seed	kg/ha	170	170	170	170
Treatments	kg/ha	0	2.5	2.5	2.5
Technological expenses					
Total expenses	lei/ha	1511.2	2615.3	2578.6	2686.6
Mechanical work	lei/ha	670	1130	1130	1130
Share	%	44.3	43.2	43.8	42.1
Manual work	lei/ha	460	460	460	460
Share	%	30.4	17.6	17.8	17.1
Raw materials and supplies	lei/ha	381.2	1025.3	988.6	1096.6
Share	%	25.2	39.2	38.3	40.8
Budget indicators					
Gross margin	lei	853.8	1349.7	786.4	1278.4

Indicators	UM	2007	2008	2009	2010
Return rate	%	20.6	27.6	10.3	24.7
Conventional farm indicators					
Average yield	kg/ha	1600	2200	2200	2200
Gross margin	lei	450.2	688.1	860.1	1349.6
Return rate	%	6.1	9.8	10.8	10.6

Sunflower efficiency

Sunflower is also a crop that has responded very well to organic cultivation even without irrigations. The gross margin per hectare obtained in 2008 was almost twice as much as the one achieved in conventional agriculture.

Table 6. Peas main indicators during the interval 2007-2010

Indicators	UM	2007	2008	2009	2010
Average yield	kg/ha	3500	4000	2500	3000
Unit cost	lei/to	521.7	639.4	1068.9	956.8
Unit price	lei/to	600.0	750.0	1200.0	1200.0
Specific consumption					
Diesel fuel	l/ha	63	114.5	119.5	124.5
Phosphate rock	kg/ha	0	200	250	300
Seed	kg/ha	500	290	290	290
Treatments	kg/ha	2.5	2.5	2.5	2.5
Technological expenses					
Total expenses	lei/ha	1731.0	2462.7	2577.2	2775.5
Mechanical work	lei/ha	677	1102	1172	1172
Share	%	39.1	44.7	45.5	42.2
Manual work	lei/ha	90	90	90	90
Share	%	5.2	3.7	3.5	3.2
Raw materials and supplies	lei/ha	964.0	1270.7	1315.2	1513.5
Share	%	55.7	51.6	51.0	54.5
Budget indicators					
Gross margin	lei	364.0	532.3	417.8	819.5
Return rate	%	12.6	14.5	10.3	21.3
Conventional farm indicators					
Average yield	kg/ha	3000	4000	4000	4000
Gross margin	lei	650.0	592.9	719.5	1123.3
Return rate	%	8.8	7.4	6.6	7.2

Lucerne efficiency

The lucerne yield per hectare was very low compared to forecasts for conventional agriculture, but the return rates were higher each year.

Table 7. Lucerne main indicators during the interval 2007-2010

Indicators	UM	2007	2008	2009	2010
Average yield	kg/ha	12000	13000	14800	16000
Unit cost	lei/to	500.5	474.0	441.9	452.5
Unit price	lei/to	600.0	630.0	650.0	700.0
Specific consumption					
Diesel fuel	l/ha	146	146	146	146
Phosphate rock	kg/ha	400	400	400	400
Seed	kg/ha	20	20	20	20
Treatments	kg/ha	2	2	2	2
Technological expenses					
Total expenses	lei/ha	5911.5	6066.5	6445.6	7145.7
Mechanical work	lei/ha	3300	3190	3585	3689
Share	%	55.8	52.6	55.6	51.6
Manual work	lei/ha	350	300	350	350
Share	%	5.9	4.9	5.4	4.9
Raw materials and supplies	lei/ha	2261.5	2576.5	2510.6	3106.7
Share	%	38.3	42.5	39.0	43.5
Budget indicators					
Gross margin	lei	1543.5	2328.5	3429.4	4309.3
Return rate	%	16.7	27.7	39.5	45.9
Conventional farm indicators					
Average yield	kg/ha	25000	25000	25000	25000
Gross margin	lei	897.6	1376.5	1412.6	1512.6
Return rate	%	13.5	24.4	23.9	26.6

CONCLUSIONS

The organic crops are generally more efficient than the crops under conventional farming but the yields obtained per hectare are lower. The situation is specific to a 700-hectare farm in the Călărași County that observed the crop rotation and implemented at the farm level a management system that aimed at increasing soil fertility and plant quality.

The principal characteristics observed are:

-the applied technologies undergo very few changes;

-the modifications in technologies concern the specific consumption of seed, fuel, phosphate rock and treatment substances;

-the irrigations were introduced gradually during the analysed interval.

The main conclusions that result from the research are:

-Wheat crop: return rate between 9.9-28.1%; over 50% of expenses are raw materials and supplies expenses; the gross margin is 0.5 thou lei per ha;

-Maize crop: return rate between 2.7-27.1%; over 45% of expenses are raw materials and

supplies expenses; the gross margin is 2.0 thou lei per ha;

-Sunflower crop: return rate between 10.3-27.6%; over 42% of expenses are mechanical work expenses; the gross margin is 12.8 thou lei per ha;

-Peas crop: return rate between 10.3-21.3%; over 54% of expenses are raw materials and supplies expenses; the gross margin is 0.8 thou lei per ha;

-Lucerne crop: return rate between 16.7-45.9%; over 50% of expenses are mechanical work expenses; the gross margin is 43.1 thou lei per ha;

The main conclusion that we reach following our research is that even with a lower yield, the organic crops obtain a higher return rate and therefore better efficiency than those obtained in conventional agriculture.

REFERENCES

- [1] S.C. Auger Petrus S.R.L. data base; field observations;
- [2] I.C.A.D.E.R. - Practical Guide techno-economic and management-production.

THE KEY POSITIONS OF STRATEGIC MANAGEMENT AT THE ENTERPRISE

Elena BARANOV¹

¹State Agrarian University of Moldova, Chisinau, 42 Mircesti, sector Rascani, MD-4224, Chisinau, Republic of Moldova, Phone: +373 69310329, e-mail: el.bernic@mail.ru

Corresponding author email.: el.bernic@mail.ru

Abstract

The external environment in which there are now a variety of forms of economic organization, it is qualitatively different: it is constantly increasing degree of uncertainty, there are unaccounted for risk factors. Management must now be better able to market self-regulation. More and more talk about the new role of management, new approaches to strategic planning and management. The strategy is not only as a tool to study, develop and implement long-term goals and objectives of the industrial, scientific, technical, economic, organizational and social nature, not only as a factor that regulates the activities of the organization until such time as the planned goals and objectives are achieved, but also as a means of communication enterprise with foreign market environment.

Keywords: *strategic management, strategic analysis, corporate of the solution, competitive solutions, functional solutions.*

INTRODUCTION

Examples of the use of a strategic approach to the management of enterprises began to be traced as far back as the 20-30-s of the XX century. But the concept of strategy, of has entered the lexicon management only in the 50-s, when the reaction of companies and firms to unexpected changes in the external market environment became crucial.

There are many definitions of strategy, but they can be reduced to one - as a set for a sufficiently long period of set of rules, guidelines, directions, areas, methods and rules of conduct to ensure high growth and competitiveness of the organization, strengthening market position, enhance the ability to survive in the particular situation.

If the enterprise is a holistic organism, and its strategy must be comprehensive, to consider the relationship between the individual subsystems of the enterprise and the influence of the external environment.

Many enterprises the Republic of Moldova has not yet appreciated the opportunities that are opening up before them with the introduction of strategic management in the

face of uncertainty. This is partly explained by the lack of formalization of the process of strategic management and the absence of thorough methods of strategic analysis and management of high complexity of the problem. The lack of suitable tools that satisfy at least the majority of problems solved in the development and implementation of the strategy also hinders the implementation and reduces the attractiveness of strategic management [5].

MATERIAL AND METHOD

Developing an effective strategy - constant challenge enterprise managers, which includes the task of analyzing the situation, intensive interaction with the buyer and the accumulation of huge amount of knowledge through experimentation and constant trial and error.

The ideology of strategic management best suits the peculiarities of the modern state the enterprises of Republic of Moldova, which determines the relevance of research the potential of strategic management.

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

RESULTS AND DISCUSSIONS

The strategy in one form or another is inherent in any system of management, although the specifics will vary depending on its type - a portfolio, or corporate, competition, or business strategy; functional. Are allocated, respectively, and three levels of strategic decisions. [3]

Level 1 - Corporate (portfolio) of the decision relating to activities of the enterprise as a whole. Historically, business has been single-product, then it occurred to diversify, so this level is currently associated with the management of multi-product enterprise. The main purpose of portfolio strategy is the selection of those units, which should be directed to the investment. The main points of this strategy include the allocation of resources between units based on portfolio analysis; diversification of production in order to reduce economic risk and obtain synergy effects, changes in the organizational structure of the enterprise, the production of a single strategic orientation of units.

Level 2 - Competitive solutions apply to the business units of the enterprise. Their purpose - to provide a business plan to show how the enterprise will compete in a particular product market, to whom and at what price will sell products, how to advertise, how to win the competition, etc.

Level 3 - Functional solutions occurring in the interests of departments and services of the enterprise. This strategy production, marketing, finance, personnel, innovation, etc. Their objective - efficient allocation of resources department (service), as well as finding an effective behaviour within a given function. It is believed that the formation of an independent functional strategies - unexplored questions of management, there is a vast reserve of efficiency.

Corporate strategy in enterprises with one type of activity will coincide with the business strategy. In turn, the hierarchical structure of management suggests that corporate strategy consists of a number of business and functional strategies. In addition, the strategy

of the higher hierarchical level serves as targets at a lower level.

The starting point for the formation of enterprise strategy is primarily a recognition of his leadership can not be maintained and strengthened the position of the company operating in a congested market, relying on the traditional policy. It follows the reorientation management methods development the enterprise based on the results already achieved, developed products and technologies used (internal factors) to study the constraints imposed by the external market environment (external factors).

The main emphasis in the development the company strategy is on the analysis of specific market segments to evaluate the favourable penetration in the planned spheres their use to strengthen its position and competitiveness. Consideration is also given the possibility of success in a particular market sector, production of new products, development of advanced technologies, activities, areas of management.

The result of the procedures for developing the organization's strategy is a preliminary draft the development the future. It usually includes the selection of specific spheres of the market, the activity should be focused company, identifying the source and type of resources used, an inventory of technologies planned for use, selection methods, industries, and future directions, as well as the type of product produced. Taken together, this is the strategy of the organization.

Strategic management - is a programmatic way of thinking and management, ensuring that the objectives, capabilities the enterprise and interests of employees. It involves not only the definition of the general rate activities (conduct) of the enterprise and affairs of the organization based on it, but also improve motivation, commitment of all employees in its implementation.

Birth of strategic management is associated with long-term planning of large-scale military campaigns with the participation of different genera and species of troops, in alliance with the armies of other countries. However, its continued very rapid growth was

due to the increasing dynamics of the socio-economic development, competition, technological progress, increasing the role of human factors in management, the emergence of new methodologies for predicting and modelling the trends of social development.

Today, the scope of strategic management is extremely diverse. It gives huge advantages to organizations operating in different spheres of modern society. These advantages include the rational use of limited resources and mainly time. In addition, strategic management creates a sense of confidence the personnel and managers of organizations, promotes consistent the development and implementation of management decisions, focuses on sustainable development in market conditions.

Strategic management - not only to develop a program of development, and adoption and implementation of strategic decisions. It is also a set of processes, phenomena and characteristics, reflecting the priority objectives and the dynamics of development, the timeliness of decisions and actions, anticipating the future, analysis of the impact of control actions and innovations. Strategic management is reflected in the methodology and the organization of management in an unstable environment, technology, models and concepts of the paradigm of participatory administration.

According to some researchers, the essence of strategic management is to answer three key questions:

- what is now the organization;
- in what direction, according to top management it should develop in the future;
- how it is going to get into a position where it wants to see leadership.

The answers to these questions provide strategic analysis, strategic choice (or the actual strategic planning) and implementation strategies (strategic decision), as shown in the figure.[1]

Strategic analysis requires a clear understanding from the leadership on what stage of development of the enterprise is located before you decide where to go. This requires effective information system that provides data for the analysis of past, present and future situations. Well-held diagnostics

business strengths and weaknesses activity of the enterprise gives a realistic assessment of its resources and capabilities, as well as a starting point for developing a strategy. Important and knowledge of the competitive environment in which the company operates.

Feature of strategic management is its orientation to the future and, therefore, necessary to determine what to strive for, what goals to set. Along with the analysis of the internal environment, the organization also requires diagnosis of the external environment in order to know the opportunities and threats for the future.

Analysis of the external environment is carried out in seven areas (areas), which are economics, politics, market, technology, competition, the international situation and socio-cultural behaviour. Thus, the strategic analysis is the most important step in the development of an effective management strategy, which is based generally on three components:

- ✓ properly developed long-term goals;
- ✓ understanding of the external competitive environment;
- ✓ real evaluation of their own resources and capabilities.

Strategic choice includes the formation and evaluation of alternative directions of business development. Whichever is the preferred option. There are special methods for predicting and evaluating future situations on the basis of development scenarios and portfolio analysis. It is believed that the formation and evaluation of development alternatives is an independent value to the administration and implemented in the strategic planning process. It identifies time frames, resources, sources and amounts of financing and are responsible for the implementation of planned activities.

There are rapid and perspective planning. The first is to ensure the effective organization of the current activity of the enterprise, and the second - survival of the organization in the future.

As part of strategic planning usually distinguish the traditional long-term and strategic. The main factor in the strategic

planning serves the state of the environment. It is (as opposed to traditional long-term) does not use the ideas about that the future better than the past and does not rely in the future of the method of extrapolation. The strategic planning is, first, an analysis of the real state of the environment or its individual segments from the perspective of the enterprise. Second, the choice is promising sectors of the environment, the development of long-term orientations and activities.

The implementation of the chosen strategy involves adjustment of the two previous stages. The activity leadership is aimed at upgrading (if necessary) management system alignment with strategic objectives of the organizational structure of the company, the allocation of resources, as well as training of personnel. In other words, strategic management is formed so as to help guide the enterprise to predict business trends, monitor external influences.

Among the strategic decisions at this stage include: reconstruction of the enterprise, the introduction of new products and technologies, organizational changes in the legal form of enterprise, production and management, remuneration, etc., entering new markets, as well as the acquisition (merger) enterprises, etc. Strategic management is based on certain principles, general rules of administrative activity. In modern conditions the most widely used are as follows: *control* - is used when the

predicted stable development of economic systems; *extrapolation* - is applied when the projected future manifestation of the same trends as in the previous period, the development of new strategies - is used when the new trends are evident the development, and the *development of strategic plans* is carried out for periods; *operational decision-making* - is used in case of unexpected situations, rapidly changing trends in the economic system as a whole or its major subsystems, and the re-ordered strategic objectives.

Strategic management is also inherent in the algorithm: what to do (conceptual aspect, the formation of the general purpose); how to do it (technological aspect) with the use of public resources (the resource aspect); and in what timeframe and what sequence (temporal aspect); who will do (personnel aspect); what should be the organizational structure of management (organizational and managerial aspects).

In recent years, has changed the paradigm of the development enterprise strategy. Whereas previously it was thought that the strategy should be known only to a narrow circle of top leaders and should not be made public, in these days in preference openly stated. The strategy should be a matter of not only the management of the enterprise, but also all of its rank and file employees.

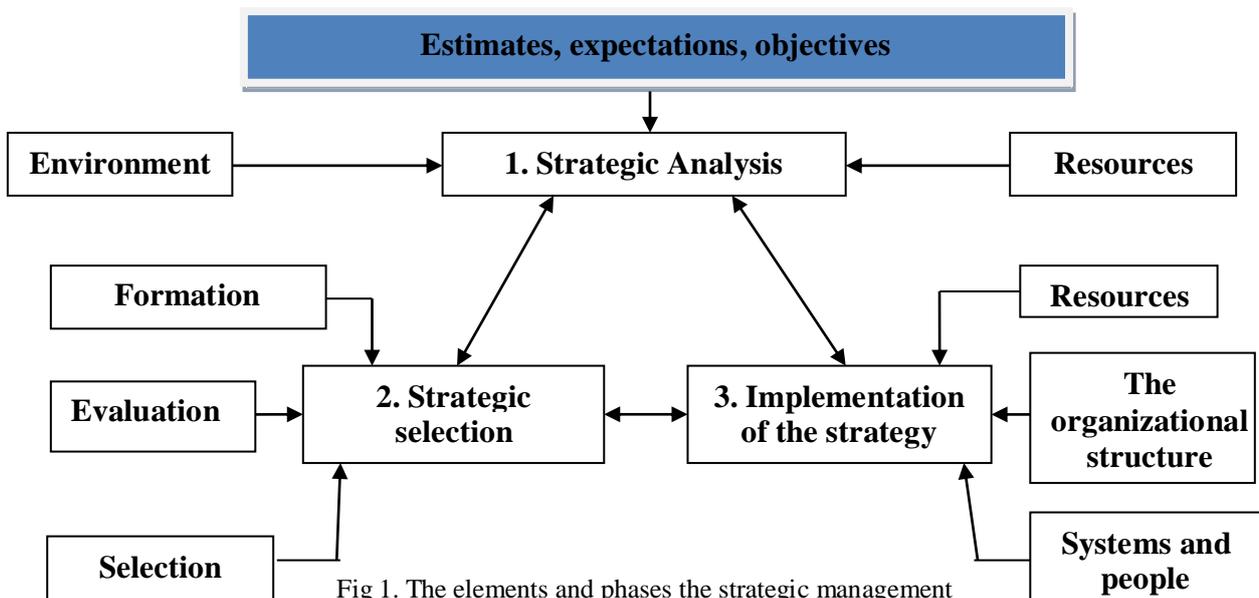


Fig 1. The elements and phases the strategic management of the enterprise

As you can see, the strategic management - rather complex system of governance based on the prediction of the environment and develop ways to adapt the enterprise to its changes.

Foreign experience of theory and practice of modern management suggests that the transition from the stream of corporate planning for long-term, and then in a strategic market economies due to accelerating scientific-technical and socio-economic development, strengthening the elements of uncertainty and unpredictability in foreign relations. The development and realization corporate strategy, which would better meet the rapidly changing external environment has become extremely important part of the management of most companies.

Among the new methods that were used in the strategic management and planning are primarily the construction of scenarios, modelling, development plans based on predictive hypotheses, expert evaluation of the various options of the economic behaviour, the construction of matrices, etc. However, corporate planning has faced great difficulties in implementing policies that flowed from a gap between senior management and operational structural units of the corporation, that is those who are directly involved in the implementation of the plans.

The fact that the culture of the corporation (organizational culture) technocratic type that prevailed until recently and dominated the style of management based primarily on the decision-making and control over their execution. Efforts were made mainly to the implementation of large-scale changes, which are involved only senior executives responsible primarily for staff functions. In fact, the strategy has become a privilege of senior management. Strategic planning helped strengthen the role and position of those professionals who plan goals and objectives, and then compare results with goals.

In strategic management the 90s of the XX century, the center of gravity moved to the scope of the strategy. The focus is not so much control over ongoing activities as monitoring the general course development of the organization. This approach operatively enough

to make adjustments not only in methods but also the strategy itself. For this purpose the comprehensive development of entrepreneurial initiative, especially among professionals operating structural units. Strategic management is just the prerogative of the executors, that is, those who show initiative, not only at the stage of planning and implementing the strategy.

The current stage involves a departure from the technocratic rationalism, the initial belief that the firm's success is determined by the rational organization of production and improvement of organizational structures, reducing costs through effective use of all resources. In the traditional approach, an economic organization is considered "closed" system, its goals and objectives are defined and are, like other conditions of the activity, stable enough for a long time, and in the governance arrangements decisive importance are diligence and effective control over all the activities.

The philosophy of modern strategic management (as opposed to technocratic rationalism) is based on the system, and situational approaches. Business organization is considered "open" system. The main prerequisites for success are not being sought inside and outside of it, that is, the success of the activities associated with how quickly and successfully the firm adjusts to economic, social, political, socio-cultural environment.

The Western experts believe that the strategic management of the 90s - it's management in a rapidly changing environment. Put forward new goals and objectives, and, of course, require adequate response changes within the company. Among these the principal circumstances, which need to respond to the organization, should be made first of all, increasing globalization, more intense competition, high prices for raw materials, reducing the life cycle of products, difficulties in obtaining funds for research and development, the need to constantly increase the flexibility and adaptability of the intra-organization, to introduce new forms of cooperation, including international.

Strategic decisions under the new conditions have the following characteristics: a significant

effect on the company's ability to make a profit, the company concerned as a whole, accepted the supreme executive organ and board of directors, have long-term in nature and therefore are not made so often reflect the values of the top echelon of management and must agree with the corporate philosophy and culture of the organization.

CONCLUSIONS

To create and implement a strategy is a rather laborious procedure. However, the significance of this process for the company considerably exceeds the cost of its implementation. The fact that the mere process of thinking about the situation of collective discussion, analysis of different options in different areas of the enterprise are extremely useful, increasing the degree of consistency and validity of decision-making and management of the enterprise as a whole.

It is interesting that discussing the strategy of improving management, consolidated group, reduced the level of conflict in the interests of owners, managers, employees of the enterprise. Most of the enterprises of the Republic of Moldova does not have a documented strategy that does not prevent them succeed. Moreover, the lack of a strategic plan does not indicate that the management companies "drifting" The leaders of successful companies tend to understand what are their advantages over the competition and take concerted action to strengthen its market position. In this sense, they have a strategy.

The problem is that it does not understand or do not accept those who are to participate actively in its implementation: top-level executives, middle, and lower-level employees. In our opinion, the main purpose of a formalized strategy is to create a common vision, able to coordinate the efforts of staff and managers at all levels. Therefore, the head of the enterprise is not enough to "invent" strategy. Necessary to ensure that it has become "our" strategy.

REFERENCES

[1] M.D.Aistov, 2003, *Restructuring of the enterprises: questions of management*, Moskow, Alpina Publisher.

[2] Ansoff, 1999, *New corporate strategy*. St.Peter, burg: Peter.

[3] B. Karloff, 1991, *Business strategy: the Concept*. The contents. Symbols, Moskow, The Economy.

[4] G.B.KIejner, 1998, *Strategy of business: the Analytical directory*, Moskow, CONSECO.

[5] V.O. Chichkina, 2007, №5, *Problems of the theory and practice of management*.

AGRICULTURE IN THE REPUBLIC OF MOLDOVA: PRESENT AND FUTURE

Simion CERTAN¹, Ion CERTAN¹

¹Moldova State University, 60 A. Mateevici str., MD-2009, Chisinau, Republic of Moldova

Corresponding author email: simcertan@yahoo.com, certan@yahoo.com

Abstract:

Agriculture was and still is the most important source for human being and, thus, constitutes the strongest factor for economic development harmonization in any country. Agriculture is the key branch of economy in Moldova. Weather conditions together with the available land resources could assure the growth of any kind of plant, excepting tropical and subtropical ones. The development of this branch could be also influenced by number of persons employed in agriculture. Another important factor is the number and quality of tractors or other agricultural equipment that, according to the latest specialized research, is completely deteriorated – 20% and partially 60-70% out of total number. These underline the outdated technologies and necessity of massive investments in fixed assets that automatically will increase the final price of local production above the imported ones. Meanwhile each country, including Moldova, dreams to be self-sufficient in terms of assuring of internal market with agri-food products and export the surplus. Small size of internal market of our country creates good premises for export but the share of agri-food products registered the continue decrease from 63% in 2001 to 44% in 2010. Thus current situation in agriculture of Republic of Moldova impose the necessity of major changes in respective policies that will be consider in this article.

Keywords: agriculture, resource, efficiency, internal market, export, import, agricultural policies

INTRODUCTION

Agriculture was and still remains for all countries the support of human existence and, therefore, is the most balance powerful factor in harmonizing the economic development. For Moldova, agriculture represents the backbone of the national economy. The national agricultural reform was initiated after independence by removing the managed centralized system and establishing market relations with all the effects of reform processes that have often been marked by dynamism, uncertainty and risk, sometimes even hostility.

MATERIAL AND METHOD

National and international legal acts, textbooks, monographs, national and international conference proceedings and other publications on the specific theme are the materials used in the research. The study is performed on selected and processed by the authors' data on the basis of Statistical Yearbooks of Moldova, EUROSTAT and other publications that have provided meaning and

relevant explanations in relation to phenomena or processes that take place in the food sector in our country.

RESULTS AND DISCUSSION

3.1 Agriculture of the republic of Moldova: general characteristics

The national economy is characterized by a continuous growth of gross domestic product (GDP) at current prices, from about 7.7 in average years 1995-1997 to 58.8 in average years 2007-2009 or by 7.6 times and at 71.8 billion MDL in 2010, that is more than 1.22 times compared with the average of 2007-2009. This increase is due mainly to prices, given the fact that in comparable prices, calculated on the average of 2000, in 2008 it increased only by 1.5 times as compared with 2001.

It is significant to mention that goods are involved more and more modest in the formation of GDP. So, if in 1995-1997 the share of goods in GDP stood at 49%, then in the average of 2007-2009 they accounted only for 22.7%, in 2010 increasing to 25.2%. Major changes have occurred in the national economy

sectors' contribution to the GDP. If in the years 1995 - 1997 the GDP structure was dominated by agriculture, hunting, forestry and fishing (27.39%), followed by industry (22.5%), then

in the years 2007 to 2009, agriculture (9.03%) came on the last place. In 2010 the share of agriculture in GDP formed 11.9%.

Table 1. Agricultural production by forms of ownership

	2003	2004	2005	2006	2007	2008	2009	2010
Total, current prices, mil MDL	10354	11819	12688	13734	12825	16503	13300	19873
Total, comparable prices (2005) mil. MDL	10179.0	12301.3	12402.2	12266.7	9432.5	12460.3	11259.5	12146.7
Including: - public	68.9	139.5	117.4	106.5	74.9	137.2	61.8	78.4
- private	10111.0	12161.8	12284.8	12160.2	9357.6	12323.1	11197.7	12068.3
of which:- collective	2402.1	3722.6	3508.0	3359.1	2589.6	4311.1	3373.1	3613.6
- households and peasant farms	7708.9	8439.2	8776.8	8801.1	6768.0	8012.0	7824.6	8254.7

Source: Made by the author on the basis of Statistical Yearbooks of the Republic of Moldova

If the total amount of agricultural production in current prices in our country (Table 1) increased from 10,354 in 2003 to 19,873 mil MDL in 2010 or by 1.92 times, then in comparable prices of 2005 it increased more modestly from 10179 in 2003 to 12146.7 mil. MDL in 2010, or by 1.19 times. The crop production dominates the reference years (68.4% in 2003 and 68.5% in 2009).

3.2 Natural resources in national agriculture

Agriculture is considerably influenced by *natural potential* and as P. Bran [2.20] claims, it participates with "the force of its laws and its "goodies", substance (s), energy (e) and information (i)".

Natural potential is shown, first, by the weather conditions which were characterized by average annual air temperature of 10.6, with the absolute maximum of 36.8 and absolute minimum of -21.8 Celsius degrees in 2010, at the Chisinau meteorological station. Annual amount of precipitation made up 446 mm in 2009 and 734 mm in 2010. The relative air humidity was 68 and respectively 74 percent. Climatic conditions and water resources are favourable for cultivation of all plants, except of those tropical and subtropical.

Agricultural land accounted for 22498.3 thousand hectares, forming 73.8% of the land fund. Arable land surface formed 72.6 percent of the total agricultural land. The main focus of national policy on the land fund was, is and still

remains de-monopolization of the state ownership of the land.

Reforming the land ownership, as it is noted in the statistical survey of households and farms activity, has caused the situation that "the average size of land on plots near the house amounted to 0.4 ha on average per household surveyed. The average size of worked land by private citizens was 1.62 ha". We must add that agricultural land, even in the composition of a household have often been fragmented into several parcels.

Most representatives of public authorities and a large part of specialists claim that the decline in agriculture in our country is a consequence of the small size of farms as a result of excessive parcelling of land. We believe that such views are at least questionable if not erroneous for the following reasons:

First, we believe that to this medium size (of 1.62 ha) of agricultural land processed by the citizens individually, the land around the house (0.4 ha) must be added. Indirectly, the idea is confirmed by the same statistical research showing that "from the total number of surveyed households, 80% had both land around the house and lots of land allocated to citizens in the shares of parcels of equivalent land".

Therefore, if we begin with the fact that a person was assigned with a land parcel equivalent with 1.62 ha in size, and within the most families there are three holders of parcels, then the size of a farm should be a minimum of

about 4-5 ha. In addition, according to the same statistical research, "over half of households (54%) have fully transmitted the land plot in use (rent etc.) to other users and about 46% were processed individually the land."

The area of land owned by companies and organizations increased from 798,500 in 2003 (Table 2) to 871 300 ha in 2010 or by 9.1 %.

Table 2. Agricultural land by categories of land owners, at the beginning of the year, thousand ha

Indices	2003	2004	2005	2006	2007	2008	2009	2010
Total	2269.6	2264.0	2257.4	2254.0	2245.8	2240.2	2239.4	2236.9
Of which:								
Companies and organizations	798.5	835.2	841.2	848.0	839.0	858.0	867.8	871.3
Farm households	743.5	706.7	692.9	685.6	678.9	668.6	672.4	661.4
Including the average size of the land less than 50 ha	607.1	611.7	604.1	620.0	605.8	603.3	600.4	591.0
Of which the average size of the land less than 10 ha	600.4	586.5	601.9	611.6	591.3	585.3	579.4	565.6
Households auxiliary annexes (land near the house and gardens)	305.2	298.6	299.1	306.9	308.5	307.8	303.5	313.6
Other landowners	422.4	423.5	424.2	413.5	419.4	405.8	395.7	390.6

Source: Authors' calculations on results of statistical research on agricultural activities of small agricultural producers in Moldova, Ed. Statistica Chisinau

Increase occurred from the account of agricultural lands owned by farm households, whose surface respectively decreased from 743.5 to 661.4 thousand ha or by 11.1%.

Nowadays, the world is directed towards the development of small and medium legal-organizational forms. The study on the experience of countries with developed agriculture shows that one farm has in Britain - 67.9 ha, Denmark - 34.7 ha, Sweden - 33.7 ha, Luxembourg - 32.4 ha, France - 28.4 ha, Ireland - 26.1 ha, Germany - 17.9 ha, Netherlands - 16.2 ha, Belgium - 15.9 ha, Spain - 15.8 ha, Finland - 12.8 ha, Austria - 12.2 ha, Portugal - 6.9 ha, Italy - 5.6 ha, Greece - 4.2 ha. According to the results of statistical researches, individual auxiliary households of citizens and farm households with the land size up to 10 hectares and that have only about 40% of agricultural land produced 70% of the total agricultural production in the country, including 58% of the vegetable production and about 87% - of animal production, which proves incontestably that small farmers are more efficient.

We support the land consolidation if this process occurs through donation, lease, sale and purchase of land, association and cooperation. For consolidation of small

farmers' lands it is extremely important that the state not to impose any of the listed ways, but impartial to publicize and encourage them by applying economic instruments and mechanisms.

At this stage we consider appropriate to set the lower limit of the price of rent and registration of contracts by the local public authorities. To encourage the growth of land through sales and buying, it is necessary to form a special fund in the state budget that would cover the interest rate of commercial banks that grant loans on a term of about 10 years in order to purchase land plots.

3.3 Human resources in national agriculture

The *human potential* can be emphasized among the "definition factors" that create the mass of agricultural goods. Total active population fell from 1473.6 thousands in 2003 to 1235.4 thousands in 2010 or by 16.2%. Activity rate respectively decreases from 51.6% to 41.6%.

Number of people employed in agriculture of the Republic of Moldova fell from 583 thousands in 2003 to 315 thousands in 2010 or by 46%. The share of rural population employed in economic activities in agriculture,

hunting and fishing is even more definitely reduced. If the number of people employed in agriculture in 2003 accounted for 75.3% of those employed in rural economic activity, then in 2010 it accounted for 52.1%. In fact, 25.5% of the total active persons were involved in the national agriculture in 2010.

We mention that where the eternity was born, those engaged in economic activities work basically on their own. More than two third (72.8% in 2008 and 69.4% in 2010) of those who practice agriculture, hunting and fishery work on their own.

The most large group (table 3) from the employed population is formed from people of

age 45 – 54 (28.3% in 2008 and 27.2% in 2010), followed in 2008 by those of 35 – 44 (24.6%), and those of 25 -34 years (24.1%) in 2010. In rural areas those aged 45-54 years accounted for 29.3 in 2008 and 28.6 in 2010. Most of the population employed in agriculture age. If those aged 15-24 years employed in agriculture constituted 43.6% in 2008 and 41.7% in 2010 of all people employed in rural areas, then those aged 55-64 made up 63.9% in 2008 and 62.0% in 2010. Practically, all those who are aged over 65, 94.5% in 2008 and 93.1% in 2010 were involved in economic activities in agriculture, hunting and fishing

Table 3. Employed population on age groups in the Republic of Moldova

	Year	Total	From the total on age groups, years					
			15-24	25-34	35-44	45-54	55-64	< 65
Total, thousand persons	2008	1251.0	124.3	254.2	308.1	354.6	169.2	40.7
	2010	1143.4	117.8	275.8	262.8	311.1	113.4	22.5
including: - in rural areas	2008	691.8	67.4	122.3	170.7	202.9	96.1	32.5
	2010	605.0	65.2	119.8	146.5	173.1	86.1	14.4
Of which: - in agriculture	2008	371.7	29.4	57.5	84.8	107.9	61.4	30.7
	2010	314.7	27.2	55.7	70.5	94.5	53.4	13.4

Source: Author's calculations after the Workforce in Moldova. Employment and Unemployment, National Bureau of Statistics of the Republic of Moldova, Chisinau, 2009, 2011

In the structure of population involved in agriculture, those with higher education made up only 2.6% in 2008 and 3.8% in 2010 of all the

people employed in this branch or almost 3.8% in 2008 and 4.6 % in 2010 of the total of those with higher education in our country.

Table 4 Inactive people from the Republic of Moldova declared as left to work abroad, thousand people

	Year	Total	From	Of the total		From rural area on age group, years				
			Rural area	Men	Wome n	15-24	25-34	35-44	45-54	55-64
Total	2008	309.7	212.6	201.4	108.3	58.1	59.8	51.7	38.4	4.6
	2010	311.0	220.5	198	113	57.3	70.5	48.9	37.3	6.4
Israel	2008	8.0	5.8	0.0	6.6	0.0	1.5	2.8	2.8	0.0
	2010	8.2	6.6	0.8	7.4	0.0	0.0	2.2	2.2	0.0
Itay	2008	55.4	33.9	17.2	38.2	6.8	8.7	9.6	7.6	0.0
	2010	58.6	38.5	18.5	40.1	6.1	10.7	8.9	10.4	2.2
Russia	2008	191.1	137.8	147.5	43.6	40.2	38.9	33.0	22.8	2.9
	2010	191.9	142.5	147.2	44.7	42.8	45.0	32.1	20.1	2.6
Turkey	2008	7.9	5.6	1.6	6.2	1.7	1.8	0.0	0.0	0.0
	2010	9.0	6.3	1.5	7.5	1.6	2.0	0.0	0.0	0.0
Ukraine	2008	10.9	6.1	8.4	2.0	1.8	0.0	0.0	0.0	0.0
	2010	6.5	3.8	5.3	0.0	0.0	0.0	0.0	0.0	0.0

Source: Author's calculations based on Workforce in Moldova. Employment and Unemployment, National Bureau of Statistics of the Republic of Moldova, Chisinau, 2009, 2011

Human potential is part of the resources that circulate freely throughout the earth. It is natural that our country is also part of the area of free flow of human resources. But in our country people who go to work abroad dominate. If the number of immigrants in 2009 stood at 2010 people, then the number of emigrants - 6663 or 3.3 times higher.

309.7 thousand people were declared to work abroad in 2008 and 311 thousand people in 2010 (Table 4) which forms respectively 24.7% and 27.2% of the total employed population in Moldova. The share of persons leaving the rural areas is increasing from 68.6% in 2008 to 70.9%.

Most of people (61.7% of total) go to work in Russia, followed by Italy, where left about 18% of the total. Of all people going to work abroad, the group of people aged 25-34 years (27.3% in 2008 and 26.0% in 2010) followed by the one with the age of 15-24 (28.1% in 2008 and 32% in 2010) dominates.

The fact that the population, mainly people of working age, leave our country in search of a better paid job generate serious issues to the national economy, including agriculture. Given that more than half of those who leave are aged between 15 and 35 years, the demographic

situation will worsen considerable in the future and will become extremely difficult to assure the economy with those who need to produce goods and provide services. Economic and social measures are necessary to motivate human resources to work in the national economy.

3.4 Longterm tangible assets, investments in national agriculture

Application of innovative and modern technologies requires technical efficiency, performance, use of chemical and natural fertilizers, irrigation systems, etc. The value of machines, tools and transmission facilities in current prices increased from 552 mil MDL in 2000 to 1694 mil MDL in 2010 or slightly more than three times. This growth is not accompanied by an appropriate increase of physical technical means used in national agriculture. The number of tractors (Table 5) increased from 39.5 in 2004 to 42.6 thousand in 2009 or by 7.8 percent. To each tractor in 2009 corresponded 42.7 ha of arable land. In the period 2004 – 2009, the number of harvester increased by 23% in 2009 and to each harvester correspond 383.3ha of arable land.

Table5 Technical means in national agriculture

	2004	2005	2006	2007	2008	2009
Tractors	39500	40400	40454	40700	40800	42600
Harvesters	3852	3828	4170	4170	4170	4748
Ploughs	13888	14307	14900	14900	14980	15000
Seeders	9354	9445	10150	10150	10200	10250
Cultivators	13860	12209	13560	13560	13600	13600

Source: Made by authors based on data from the Ministry of Agriculture and Food Industry

Research [3,105] indicates that "about 20% of the total number of tractors are fully used and can not be repaired, the ones which still work are obsolete at a level of about 60-70%, and half of agricultural machines are being operated more than 15 years". Obviously, current and / or capital repairs of such technical means require imposing costs, which ultimately result in an unjustified increase of cost at agricultural products.

In 2001, "2KR Project" that is a technical grant for purchase of agricultural machinery was

launched. According to this program, 43 tractors in 2001 and 518 tractors in 2008 (Table 6) have been sold to farmers annually, in a total amount of 3158 tractors in these ten years, fact that makes up to 7.5% of the total number in 2010. Number of harvesters sold to farmers in the framework of this project varies from 4 in 2004 to 59 in 2008, totalling 338 harvesters in 2001-2010, that form 7.1% of the total number in 2010

Table 6 Agricultural technique realized within the 2KR Project

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Tractors	42	172	310	492	294	405	332	518	198	395	3158
Harvesters	21	23	32	4	46	9	43	59	44	57	338
Aggregates	42	21	30	21	222	11	56	137	70	114	488

Source: Made by authors based on reports of Ministry of Agriculture and Food Industry

Until the 90s of last century, the amount of tractors increased with about 15% and the combines - with 30%. Comments are useless. Even though in the years 2004 – 2010 380 irrigation equipments were made and installed, the surface of irrigated lands has decreased from 302,100 ha in 2004 to 226,300 ha in 2010. The volume of agricultural production depends largely on the additional supply of chemical fertilizers and natural fertilizers. According to the diagram below, even if chemical fertilizers have a tendency to increase from 14.6 kg in 2001 to 24.5 kg of active substance per hectare, they remain insufficient to guarantee an acceptable and stable result. The use of natural fertilizers in the same years has a clear tendency to decrease.

Agriculture, which is undergoing a difficult period of reform by removing the centralized management and establishing a system of mechanisms based on market relations, undoubtedly will successfully be reformed if it is provided with financial resources. Modernization of technologies by increasing the number of technical means used in agriculture and "creative destruction" by practical change of characteristics of these technical means requires considerable investment. Investments in fixed capital on objects of national agricultural production (Table 7) increased from 90.7 mln MDL in 1995 to 455.9 mln MDL in 2005 or by 5 times, then increased to 992.3 mln in 2010 or about 2.2 times compared with 2005.

Table 7 Investment in fixed capital for agricultural development in current prices, mln MDL

	1995	2005	2006	2007	2008	2009	2010
Investment in fixed capital on productive use objects	90.7	455.9	489.2	731.6	1020.2	923.3	992.2
Of which: - public	25.5	41.5	37.5	37.8	41.2	23.7	29.2
- private	64.5	369.6	382.5	558.8	861.9	795.8	818.8
- mixt (public and private)	0.7	6.9	5.4	20.1	14.9	2.6	0.9
Of mixed enterprises	-	32.9	61.8	110.2	98.1	87.2	116.8
Of foreign investors	-	5.0	2.0	5.2	4.0	14.0	26.6

Source: Made by authors on the basis of Statistical Yearbooks of the Republic of Moldova

Investment in private sector increased steadily and sharply. Definitely, investment in national agriculture of foreign investors increased from 5 mil MDL in 2005, to 26.6 mil MDL in 2010 or by 5.3 times, but they remain insufficient and account for just 2.7%. Investments involve a significant mobilization of capital and, obviously, the right choice of means of investment financing is required. It is preferable to finance investment from own means that at the farm level are obtained by selling products

and services both on domestic and foreign markets.

3.5 Market of food products

In all countries, evident in our country also, food production is addressed, primarily to domestic market. Total retail sales of food products (Table 8) on domestic market increase from 1.44 billion MDL in 2000 to 8.05 billion MDL in 2010 or by 5.6 times. But if the share of food products accounted 45.2% from the

total retail sales in 2000, then in 2010 - only about 32%.

Alcoholic products and other beverages sold in retail on the domestic market accounted for 20.3% in 2000 and 24.8% in 2010, which represent the biggest share of food products.

If in 2000 the trade with meat and meat products which accounted for 15.4% of total food products was placed second, then in 2010 trade with bread and bread products which

accounts for 18.3% of total food products retailed ranked the second place.

Moldova's *domestic food market* is limited to those only about 4.3 million consumers and is a subject to their purchasing capacity.

Average monthly disposable income compared to the average value of the subsistence minimum per person increased from 51.4% in 2001 to 92.7% in 2010. Disposable incomes up to 200 MDL per month in urban areas accounted for 0.5%, while in rural areas - 2.2% in 2010.

Table 8 Retail sales value, mil MDL

	2000	2005	2006	2007	2008	2009	2010
Retail sales value, total	3193.7	11030.8	13620.7	16866.6	21387.2	19960.6	25096.5
Including: - food products	1442.9	3611.4	4290.7	5485.1	7094.3	7057.4	8049.2
Of which: - potatoes, vegetables and fresh fruits	56.8	97.1	100.0	147.8	206.9	249.6	361.6
- bread, pastries and cakes	190.2	691.3	803.5	1046.4	1352.8	1277.7	1474.7
-meat, poultry and meat products	222.9	570.0	632.7	747.6	1103.5	1218.0	1237.3
- milk and dairy	83.6	138.3	154.3	204.8	268.8	232.3	255.7
- eggs	67.7	97.0	87.8	98.7	145.7	123.9	127.8
- alcoholic products and other beverages	292.9	1015.5	1264.8	1539.8	1873.2	1847.0	1998.7

Source: Made by authors on the basis of Statistical Yearbooks of the Republic of Moldova

The largest group (15%) is the one that has the monthly disposable income in amount of 800.1-1000 MDL that in urban area consisted of 12.5% and in rural area - 16.7%. If the share of total population with 800 MDL salary

accounted for 6.7% and in agriculture it accounted for 17.5%, then those with salaries of 2500.1-3500 MDL respectively accounted for 19.2% and 19.8%.

Table 9 Exports and imports by sections, mil USD

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total export	565.5	643.8	790.0	985.2	1091.2	1051.6	1341.8	1591.2	1287.5	1541.5
Including animals and animal products	18.3	15.3	28.6	20.2	17.2	16.2	13.6	10.1	9.1	27.0
Of which: - meat and edible offal	6.7	6.1	19.1	8.7	1.9	1.8	4.6	1.4	1.5	10.2
- milk / dairy, eggs	10.9	7.5	5.6	9.5	13.1	10.4	6.6	8.1	5.0	5.3
Vegetal products	78.8	106.1	91.2	120.0	131.9	136.5	162.9	210.1	268.4	340.7
Of which: edible fruits	24.1	32.6	54.5	64.7	60.9	64.6	92.8	85.4	125.4	167.6
- cereals	18.6	47.5	18.5	24.4	43.2	42.0	17.2	50.3	66.5	71.0
Animal or vegetable fats and oils	8.2	16.8	28.9	41.2	37.8	34.9	55.3	62.9	50.7	47.6
Food products, alcoholic and non-alcoholic beverages	251.6	267.4	314.3	345.9	396.0	276.4	276.0	311.9	281.0	316.9
Of which: - fruit and vegetable dishes	34.0	28.2	38.4	40.3	46.5	42.3	79.5	51.4	50.1	52.3
- alcoholic and non-alcoholic production	174.7	195.9	242.1	277.9	314.5	186.6	134.2	195.9	159.5	178.2
Total import	892.2	1038.0	1402.3	1768.5	2292.3	2696.2	3689.9	4898.8	3278.3	3855.3

Including animals and animal products	23.8	23.9	24.8	38.8	57.2	51.9	61.7	100.3	75.3	94.7
Of which: - meat and edible offal	13.3	11.9	12.9	19.9	32.1	19.3	15.3	35.6	13.5	27.6
- milk / dairy, eggs	1.6	2.8	4.5	8.7	10.6	15.1	19.8	21.4	21.7	25.6
Vegetal products	37.6	43.5	82.3	73.5	65.0	72.8	150.4	166.7	132.6	168.8
Of which: edible fruits	5.5	9.5	9.2	10.1	17.7	20.5	28.6	29.5	40.2	58.0
- cereals	3.5	3.5	28.3	8.7	3.6	4.0	15.6	22.5	9.5	9.7
Animal or vegetable fats and oils	3.0	7.1	5.5	7.4	9.9	11.1	16.0	20.9	16.1	19.3
Food products, alcoholic and non-alcoholic beverages	78.9	72.6	92.0	105.3	147.5	179.8	237.9	343.4	289.7	308.6
Of which: - fruit and vegetable dishes	2.6	4.7	5.6	10.5	13.6	14.5	20.8	30.1	20.0	22.7
- alcoholic and non-alcoholic production	13.6	20.8	19.7	25.1	34.0	42.4	47.8	75.5	47.9	44.9

Source: Made by authors on the basis of Statistical Yearbooks of the Republic of Moldova

Both in urban and rural areas definitely dominate expenditures on food products and non-alcoholic drinks. So, in 2010 in urban areas, expenditures for food production formed 37.8%, while in rural areas - 44.1% of the total spending. It is unquestionable that the agri-food production clearly exceeds the needs of the internal market, which requires entering with agri-food products on foreign markets. *Our country is doomed to export agricultural products.* Total exports (Table 9) increased from \$ 565.5 mil USD in 2001 to 1541.5 mil USD in 2010 or by 2.7 times. If the share of agri-food products in the total exports in 2001 stood at 63.1%, including food products, alcoholic and non-alcoholic beverages - 44.5%, then in 2010 the agri-food products accounted for 44.4%, including food products, alcoholic and non-alcoholic beverages - 20.6%. The export of vegetable production showed the largest increase (4.3 times) in 2001-2010. Among them, stand out edible fruits (30.6% in 2001 and 49.2% in 2010) which in growth tempo increased about 7 times. Export of alcoholic beverages increased until 2005 and then declined in 2010 reaching almost to the level of 2001. Total imports increased from \$ 892.2 mil USD in 2001 to \$ 3855.3 mil USD in 2010 or by 4.3 times. If the ratio import / export in 2001 were 1.6: 1, then in 2010 - 2.5: 1, this caused the significant increase of debts.

It is significant that although the share of imported agri-food products remains practically at the same level, forming 16.1% in 2001 and 15.3% in 2010, imports of food products,

alcoholic and non-alcoholic beverages increased by 4.32 times in these years. If in 2001 the ratio of exports and imports of food products, alcoholic and non-alcoholic beverages was 3.2: 1, then in 2010 this ratio is practically 1: 1. In other words, our country from a recognized exporter of food products becomes an importer of them.

The obtained financial resources are insufficient for the sustainable development of agriculture in our country and therefore require financial support.

3.6 Subsidizing policy of the agri-food segment of the national economy

Total of endowments, compensations and subsidies offered to agricultural enterprises (Table 10) increased by 18.7 times. In all the reference years subsidies for agricultural production and compensation of expenditures (which have increased by 46 times) have been offered, and compensations for farms from losses from natural disasters, which increased by about 6.5 times. If in 2003 compensation for losses of agribusinesses from natural disasters with around 92% of the total were dominating, then in 2009 subsidizing of farmers with 67.8% of the total prevails. Fund to subsidize farmers accounted for 300.0 mil MDL in 2010, being later changed to 400.0 mil MDL. Financial support from the state was directed to:

- Subsidizing of 93 beneficiaries of agricultural credit;
- Stimulating of 122 beneficiaries of subsidies for insurance of agricultural risks;

- Planting of 1687.8 ha of orchards and 881.0 ha of vineyards;
- Stimulating of 61 beneficiaries of subventions for purchasing vegetable production on protected land;
- Purchasing agricultural machinery and irrigation equipment, namely agricultural techniques - 467 units, agricultural equipment - 534 units and irrigation equipment - 124 units;
- Extending over 10 hectares of areas framed in ecological conversion, being recorded 65 farmers (*including 41 subsidized* in 2010);
- Subsidizing of 20 beneficiaries who have purchased technological equipment for endowment and modernization of livestock mini-farms located outside the city;

- Purchasing of breeding animals, namely: pigs – 137; cattle – 44; sheep – 297 and queen bees - 67;
- Creation and renovation of 30 refrigerators; 1 drying room; 1 packing house; 9 meat processing companies; 8 grain processing companies; 3 companies processing fruits and vegetables; 3 milk processing companies; 1 company processing oil products;
- Subsidizing of 82 agricultural producers to compensate energy costs for irrigation;
- Subsidizing of 385 beneficiaries who purchased plant protection products and fertilizers.

Table 10. Dynamics of endowments, compensations and subsidies of agricultural companies from the national budget, thousand lei

	2003	2004	2005	2006	2007	2008	2009
Total	2213	73879	76740	72022	357532	328623	413354
Including: endowments for agricultural production and expenditure compensation	40	18	254	3214	24888	30733	18675
Subsidizing the farmers	-	-	-	-	188287	200158	280265
Expenditure compensation for planting the perennial plantations	141	69104	42588	24076	-	-	9561
Compensations for losses of agricultural companies that have suffered from natural disasters	2032	4757	30749	43437	41536	7465	9102
Other endowments, compensations and subsidies	-	-	-	-	102683	90267	94931

Source: Elaborated by the authors based on data from Liliana Cimpoiu's thesis "Development of state regulation of the agricultural sector of the Republic of Moldova", p 63-64

Also, with the state support, through IFAD and RISP programs, in 2010, there was funded the development of: 33 refrigerators, 8 bakeries, 3 fruit drying, 11 grain processing enterprises, 7 meat processing enterprises, 1 fruits and vegetables processing company. In order to revitalize the livestock sector, there have been renovated and re-equipped: 1 cattle breeding farm; 2 pig farms; 2 sheep farms; 6 poultry farms, including 1 incubator; 1 rabbit breeding farm; 2 modern abattoirs. In order to optimize agricultural subsidies we consider appropriate to:

- Cancel the current system of compensation for agri-climate conditions, even if they affect the agri-food sector and to encourage the development and implementation of the assurance system;

- Cancel limits for existing funds, creation of new budgetary and extra-budgetary funds from incomes from agricultural activities for the financial support strictly directed to certain activities in agriculture and processing of agricultural raw material;

- Stimulate exports of food products through preferential rate. Every euro obtained from export to be changed at the increased ratio with 1 – 2 MDL compared with the existing one;
- Ensure transparency of state expenditures for the agri-food sector;
- Quit the *ex ante* support / before getting production / which is usually inefficient and *ex post* government intervention / after obtaining production /. But better after production was sold, in such a way stimulating farmers to produce what domestic and especially foreign

market needs. *Ex post* type support can be provided through two mechanisms:

- a. The state subsidizes a part of the market price covering the production expenditures;
- b. State purchases production at a negotiated price, but higher than the cost. Production is then sold, including to manufacturing industry, at a price that may be lower than that paid to farmers in order to not affect the purchasing power of the population.

In conclusion we mention that only by supporting private property, slow strengthening on the principles of market economy of the agricultural land, development of effective legal forms, implementation of efficient technologies, implementation of economic instruments and mechanisms appropriate to competitive economy, training for those involved in the agri-food sector and amplification of the advisory system will contribute to sustainable development, to a desirable future of agriculture in our country.

REFERENCES

- [1] *Anuarele statistice ale Republicii Moldova, Ed. Statistica, 2003, 2006, 2009, 2011*
- [1] Bran P. *Economica valorii*, Ed. Știința, Chișinău, 1991
- [1] Cimpoie; Liliana, *Perfecționarea reglementării de stat a sectorului agricol al Republicii Moldova*, Teză de doctor în economie, Chișinău, 2011
- [1] Cobzari L. *Restructurarea financiară și tendințele ei în condițiile actuale*. Chișinău: CEP ASEM, 1999
- [1] Peter Drucker, *Despre profesia de manager*, Editura Meteor press, București, 1999
- [1] Smith A., *Avuția națiunilor, cercetare asupra naturii și cauzelor ei*, vol. I, Ed. Universitas, Chișinău.

ECONOMIC IMPACT OF BIODIVERSITY CONSERVATION IN AGRICULTURE EXPLOITATION IN SOUTH OF ROMANIA

Anisoara CHIHAIA¹, Georgiana Melania COSTAICHE¹, Octavian CHIHAIA¹

¹University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59, Bvd. Marasti, zip code 011464, Bucharest, Romania, tel. 021-3182564/ fax. 021-3182888, ani_chihaia@yahoo.com, melania.sanda@yahoo.com, chihai.a.octavian@yahoo.com

Corresponding author email: ani_chihaia@yahoo.com

Abstract

Biodiversity, as variation of life form on Earth is the base of agriculture, in each of its fields, from the food to the services provided by ecosystems, the main streams and links of production. Standards or requirements that farmers must meet to be eligible for subsidies contribute to maintain biodiversity. The purpose of this paper is to estimate the costs needed to implement environmental standards and their implications for farm rentability. This study was made in farms with different size in the south part of Romania. Even if it can be seen a increase of production expenses which lead to a light decrease of farms profitability, the long-term benefit of biodiversity conservation is considerably.

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

INTRODUCTION

Biodiversity embraces the variety of genes, species and ecosystems that constitute life on Earth. We are currently witnessing a steady loss of biodiversity, with profound consequences for the natural world and for human well-being. The main causes are changes in natural habitats. These are due to intensive agricultural production systems, overexploitation of forests, oceans, rivers, lakes and soils, pollution and — increasingly — global climate change.¹ Humankind is itself a part of biodiversity, and our existence would be impossible without it. Quality of life, economic competitiveness, employment and security all rely on this natural capital. The agricultural and industrial revolutions led to dramatic and accelerating changes in land use, intensification of agriculture, urbanisation and land abandonment. This in turn has resulted in the collapse of many practices (e.g. traditional agricultural methods) that helped to maintain biodiversity-rich landscapes. European lifestyles rely heavily on the import of resources and goods from all over the world, often encouraging unsustainable exploitation of natural resources. This leads to loss of

biodiversity which in turn damages the natural capital resources on which social and economic development is based.

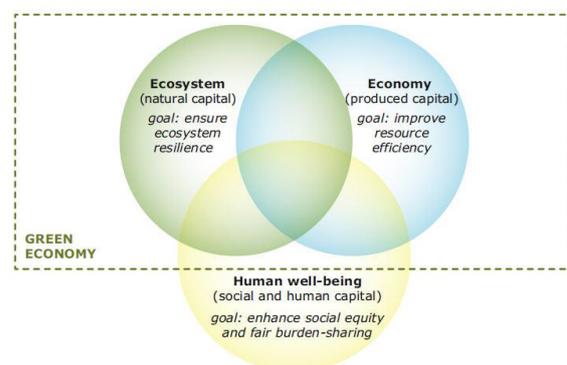


Fig. 1 The 'green economy' concept in the context of sustainable development. (Source: European Environment Agency)

Appears necessary to increase the positive contribution of agriculture to the environment, the need to reduce pollution from agriculture and adoption of agricultural policy so that it takes account of the environment. This can be achieved by practicing sustainable agriculture with cleaner technology that can eliminate all negative aspects about the interaction between environment and agriculture.

That is why, it was necessary to elaborate, and the practical implementation of codes of good agricultural practice. These are a set of scientific and technical knowledge available to farmers, the farmers to be implemented in practice. Acquired by each farmer and

¹The European environment – state and outlook 2010EEA (European Environment Agency), Published: Nov 29, 2010

implemented correctly, agricultural practices can contribute to achieving the profitable and superior quality productions, as well as to environmental conservation, with limited adverse environmental consequences at national, regional, local, short term or longer.

The common agricultural policy on cross-compliance is established by Community regulations. Farmers must comply with Good Agricultural and Environmental Conditions (GAEC) on the whole agricultural area of farms (even if not requested direct payments for those areas) to avoid being penalized to payments.

Good Agricultural and Environmental Conditions² in Romania have been based on standards listed below:

I. STANDARDS SOIL EROSION ON AVOIDANCE

GAEC 1 - During winter, arable land must be covered with winter crops and / or remain fallow after harvest on at least 20% of total arable surface of the farm.

GAEC 2 - The works on the arable land land with a slope greater than 12% planted with weeding plants is performed along the contour.

GAEC 3 - maintain existing terraces on agricultural land on January 1, 2007.

II. STANDARDS FOR MAINTAINING SOIL ORGANIC MATTER CONTENT

GAEC 4 - Sunflower is grown on the same parcel not more than 2 consecutive years.

GAEC 5 - Burning of Arable stubble is not permitted without the consent of the competent authorities for environmental protection.

III. STANDARDS FOR MAINTAINING SOIL STRUCTURE

GAEC 6 - Not allowed ploughing in humid soil conditions.

IV. STANDARDS FOR MAINTAINING A MINIMUM LEVEL OF MAINTENANCE THE AGRICULTURAL LAND

GAEC 7 - Maintenance of permanent grasslands by providing a minimum level of grazing or mowing them at least once a year.

GAEC 8 - No is allowed burning of permanent grasslands

GAEC 9 - not allowed felling of trees and or groups of trees on agricultural land

GAEC 10 - Avoiding installation of unwanted vegetation on agricultural land, including land not used for production

V. STANDARDS FOR PROTECTION AND MANAGEMENT OF WATER

GAEC 11 - Protect water against pollution and run-off, and manage the use of water.

MATERIAL AND METHOD

Compliance with these rules increases variable costs. Therefore, an appropriate method for measuring the profitability of farm production activities would be gross margin calculated for each type of farm activity³.

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

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

At the level of a firm that carries out several activities (with several branches of production), by adding together the gross margins of all branches of production, total gross margin is obtained.

Usually, it offers a image more complex on farm profitability, but for the image to be complete, it requires the correlation of the total gross margin with amount of fixed costs⁴.

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

➤ *Profitability of the branches of production;*

In the branches of production profitable, gross margin will be positive and the production unprofitable branches may have negative gross margin. Gross margin, calculated for each species or category (gross margin / cow / pig / poultry etc..) or for each type of crop (gross

³ Hutu, I. - Family farm management - Guidelines for the management of family farms and primary economy - Ed Waldpres 2004.

⁴Popescu, A., 2010 - Financial management and business management in dairy farms. Ed. Agris. Bucharest, 63

²Annex III of Council Regulation (EC) No 73/2009

margin / ha maize silage / ha barley / rape etc ha.) allows the branches hierarchy according to their profitability.

➤ **Profitability of farm;**

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

RESULTS AND DISCUSSION

We watched the calculation indicators of economic efficiency in two farms, in the southern area of Romania, located in similar climatic conditions, they are differentiated by area cultivated, number of employees and level of technical endowment. In both farms are respected Good agricultural and environmental condition for awarding grants.

Table 1. Farms description

Specification	Cultivated area (ha)	Number of employees	Number of tractors
Farm 1: S.C. ALINAGRA S.R.L. Sageata, county Buzau	300	5	5
Farm 2: S.C. FLAGRA COM S.R.L. Drajna, county Prahova	65	2	2

1. The analysis of economic efficiency in S.C. Alinagra S.R.L., Sageata, Buzau county

Table 2. The analysis of the economic efficiency of wheat – 1 ha -

No.	Specification	Value (Lei)
1.	Gross Product	2982
2.	Variable costs	1428,20
3.	Gross margin (R1-R2)	1553,8
4.	Fixed Expenses	771,14
5.	Gross profit (R3-R4)	782,66
6.	Total expenditure = R2+R4	2191,34
7.	Gross profit rate (%) = R5/R6x100	35,71
8.	Income tax (16 % x R5)	125,23
9.	Net profit = 5-8	657,43
10.	Net profit rate (%) = R9/R6x100	30,00

Calculating like the weighted average to the gross margin per holding we have obtained 1567,32lei/ha

2. The analysis of economic efficiency in S.C. Flagra Com S.R.L. Drajna, jud. Prahova county

Table 3. The analysis of the economic efficiency of corn – 1 ha -

No.	Specification	Value (Lei)
1.	Gross Product	3.464,00
2.	Variable costs	1150,88
3.	Gross margin (R1-R2)	2.313,12
4.	Fixed Expenses	1070,18
5.	Gross profit (R3-R4)	1242,32
6.	Total expenditure = R2+R4	2221,06
7.	Gross profit rate (%) = R5/R6x100	55,93
8.	Income tax (16 % x R5)	198,77
9.	Net profit = 5-8	1043,55
10.	Net profit rate (%) = R9/R6x100	46,98

Table 4. The analysis of the economic efficiency of sun flower – 1 ha -

No.	Specification	Value (Lei)
1.	Gross Product	1963,4
2.	Variable costs	588,82
3.	Gross margin (R1-R2)	1374,58
4.	Fixed Expenses	436,14
5.	Gross profit (R3-R4)	940,44
6.	Total expenditure = R2+R4	1024,96
7.	Gross profit rate (%) = R5/R6x100	91,75
8.	Income tax (16 % x R5)	150,47
9.	Net profit = 5-8	789,97
10.	Net profit rate (%) = R9/R6x100	77,07

Table 5. The influence of crop structure on gross margin in the holding S.C. Alinagra S.R.L. Sageata, Buzau county

Culture	Area		Gross margin Lei/ha	Gross margin /activity
	ha	%		
Wheat	155	51,67	1553,8	240.839,00
Corn	32	10,67	2313,12	74.019,84
Sunflower	113	37,66	1374,58	155.327,54
Total farm	300	100		470.186,38

Table 6. The analysis of the economic efficiency of wheat – 1 ha -

No.	Specification	Value (Lei)
1.	Gross Product	2339
2.	Variable costs	1130,20
3.	Gross margin (R1-R2)	1208,8
4.	Fixed Expenses	645,14
5.	Gross profit (R3-R4)	563,66
6.	Total expenditure = R2+R4	1775,34
7.	Gross profit rate (%) = R5/R6x100	31,74
8.	Income tax (16 % x R5)	90,18
9.	Net profit = 5-8	473,48
10.	Net profit rate (%) = R9/R6x100	26,66

Table 7. The analysis of the economic efficiency of corn – 1 ha -

No.	Specification	Value (Lei)
1.	Gross Product	3.377,00
2.	Variable costs	1278,88
3.	Gross margin (R1-R2)	2098,12
4.	Fixed Expenses	980,18
5.	Gross profit (R3-R4)	1117,94
6.	Total expenditure = R2+R4	2259,06
7.	Gross profit rate (%) = R5/R6x100	49,48
8.	Income tax (16 % x R5)	178,87
9.	Net profit = 5-8	939,07
10.	Net profit rate (%)= R9/R6x100	41,56

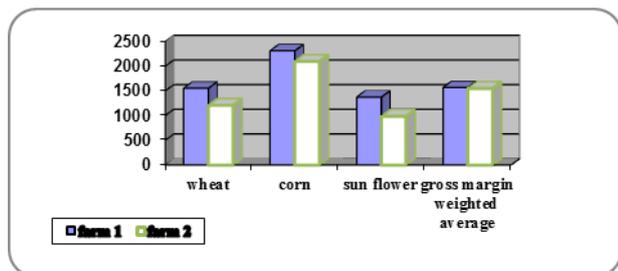
Table 8. The analysis of the economic efficiency of sun flower – 1 ha -

No.	Specification	Value (Lei)
1.	Gross Product	1997,00
2.	Variable costs	1012,28
3.	Gross margin (R1-R2)	984,72
4.	Fixed Expenses	712,68
5.	Gross profit (R3-R4)	272,04
6.	Total expenditure = R2+R4	1724,96
7.	Gross profit rate (%) = R5/R6x100	15,77
8.	Income tax (16 % x R5)	43,52
9.	Net profit = 5-8	228,52
10.	Net profit rate (%)= R9/R6x100	13,24

Table 9. The influence of crop structure on gross margin in the holding S.C. FLAGRA COM S.R.L. Drajna, jud. Prahovacounty

Culture	Area		Grossmargin Lei/ha	Gross margin /activity
	ha	%		
Wheat	15	23,09	1208,8	18132,0
Corn	30	46,15	2098,12	62943,6
Sunflower	20	30,76	984,72	19694,4
Total farm	65	100		100770

Calculating like the weighted average to the gross margin per holding we have obtained 1550,29lei/ha



Graphic 1. Gross margin per activity and weighted average

Usually, if the effect of changes in farm can quantify this is more convincing. For example, calculation of gross margin as the weighted average, leads to results nearly equal in the two farms, even if there are differences in terms the gross margin on culture. This is made possible by a more judicious crop structure chosen for the second holding.

CONCLUSIONS

The activity of the two farms is a profitable, under compliance to the cross- compliance measures for biodiversity conservation. This is possible in conditions of granting of subsidies. Lack of subsidies for the vegetal sector would reduce the profitability of agricultural holdings. Exist the possibility increase crop yield of the farm under biodiversity conservation by increasing gross margin and reducing variable costs.

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

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

REFERENCES

- [1] *The European environment – state and outlook 2010* EEA Published: Nov 29, 2010
- [2] Annex III of Council Regulation (EC) No 73/2009
- [3] Hutu, I. - *Family farm management - Guidelines for the management of family farms and primary economy* - Ed Waldpres 2004.
- [4] Popescu, A., 2010 - *Financial management and business management in dairy farms*. Ed. Agris. Bucharest, 63

AGRICULTURAL SUBSIDIZING POLICY AND ITS EFFICIENCY: THE CASE OF MOLDOVA

Liliana CIMPOIES¹

¹The State Agricultural University of Moldova, Chisinau, 44 Mircesti, Chisinau, Moldova, Phone: +373 22 312258, Fax: + 373 22 312276, E-mail: liliana.cimpoies@hotmail.com

Corresponding author email: liliana.cimpoies@hotmail.com

Abstract

The paper is aimed at analyzing the subsidizing directions, the allocation of subsidies to farmers and its efficiency on farm development in Moldova. For the given study were used data from the Ministry of Agriculture and Food Industry of Moldova, Agency of Interventions and Payments in Agriculture, National Bureau of Statistics, as well as collected data from corporate farms. The data have been analyzed during the years 2006-2011 concerning the main subsidized directions and geographical distribution of subsidies across the country, the access of farmers to the allocated subsidies. In order to establish the efficiency of the allocated subsidies was used the average data for the year 2008-2010 to calculate its impact on the main indicators per hectare as: the gross agricultural output, profit and level of profitability. As a conclusion, is still missing a clear and consistent policy that could be implemented through the allocation of subsidies. The allocated subsidies follow some objectives aimed at the development of the agricultural sector and do not have a stable character, by changing each year, fact that does not allow farmers to forecast their production activity.

Key words: agriculture, Republic of Moldova, subsidies, subsidizing policy.

INTRODUCTION

The state support for agriculture is a widely spread practice. For the Republic of Moldova a common opinion is that the amount of allocated agricultural subsidies is still low. In the same time, is almost not discussed how well grounded are the subsidized directions, and if the allocated resources respond to the needs of the agricultural sector and rural development. Nowadays, the government use various tools aimed at the development of the agricultural sector, one of the most important being farmers subsidizing.

MATERIAL AND METHOD

In order to characterize the evolution of subsidies allocation, the following indicators were used: the structure of allocated subsidies by directions, the impact of the amount of subsidies per hectare, on the obtained profit and level of profitability. The period analyzed in this study is 2006-2011. The analyzed data were provided by the Agency for Interventions and Payments in Agriculture, National Bureau

of Statistics as well as own carried research concerning the farms activity. All data have been processed and interpreted, grouped by the amount of subsidies per ha and analyzed for the given period.

RESULTS AND DISCUSSIONS

The agri-food sector plays a key role in Moldova's economy. Nevertheless the transition to a market economy, together with the number of reforms carried out at the beginning of 90s lead to changes in the agricultural sector. As a result, had decreased the gross agricultural output, increased the number of unprofitable farms etc. The given situation requires a higher support from the government for the agricultural sector.

The state regulation and sustainable development of the agri-food sector of Moldova is reflected in the “National Strategy for the Agri-Food sector's sustainable development for 2008-2015”, with objectives oriented to competitiveness, living standards of rural population and maintenance of the rural areas (e.g. improvement of food security in

terms of quality as well as quantity of production, consumers access to a constant and suitable supply of food according to their demands, and particularly prices, the quality and safety of the agri-food products; the increasing the agricultural sector’s competitiveness through a more efficient production and marketing; ensuring stable incomes for farmers, as well as fair working and living standards; the decreasing agriculture’s vulnerability related to risk factors and environment protection etc). [3]

Under the current situation of the agricultural sector, the governmental financial support is important for its further development. In this context the Moldova’s government had adopted a new “conception for the agricultural producers’ subvention system for the years 2008-2015” which has two main directions:

- the modernization of agricultural sector – through the subsidy of investments activities related to the creation of units for handling and processing agricultural production, endowment with the corresponding equipment, agricultural row materials, establishing vineyards and orchards, improving the sphere of services in agriculture.

- performance agricultural activities for the vegetable and livestock sector – for the growth in productivity and competitiveness in agriculture, market stabilization, insurance of food security and equal incomes for agricultural producers will be given direct payments by taking into account the culture, animal species, the individual average yield in case of corresponding with the regional, as well as regarding the holding area or number of cattle. [2]

The financial support to agricultural producers was allocated from state budget through a number of programs or single actions, as well as from external sources (e.g. Project of Investments and Rural Services, Project of Agriculture Revitalizing, Program Rural Financial Services and Marketing etc.). Nevertheless, a unifying tool of all the programs and projects is the subsidizing fund of agricultural producers.[1]

The subsidizing fund of agricultural producers until 2010 was administrated by four state

institutions, mainly by the Ministry of Agriculture and Food Industry of Moldova. Nowadays the agricultural subsidizing fund is being administrated by the Agency of Interventions and Payments in Agriculture, established by the Government’s decision nr. 60 from February 4th 2010. The establishment of the Agency was 2 years delayed, being planned in the same time with the approval of the Conception of subsidizing agricultural producers in 2007.

The aim of establishing the Agency of Interventions and Payments in Agriculture was the administration of all the subsidizing fund’s financial resources (and not by various institutions as before), monitoring its distribution, and the evaluation of the quantitative and qualitative impact from allocated subsidies, the support of more agricultural producers, increase of transparency and decrease in the bureaucracy level in state support.

Despite the fact that the amount of allocated financial resources to the agricultural subsidizing fund increased during the last years, its amount is still low.

Table 1. The evolution of the agricultural subsidizing fund in Moldova (2006-2011)

Indicators	2006	2007	2008	2009	2010	2011
Total amount allocated in the agricultural subsidizing fund, mil. lei	256	465,3	270	563,5	400	400
Total amount executed in the agricultural subsidizing fund, mil. lei	247,7	546,8	533,2	560,5	400	400
Number of subsidies recipients	1721	2110	3907	3954	3749	2198

Source: based on data from the Agency of Interventions and Payments in Agriculture

According to the carried research we can mention that from the subsidized directions the largest share belongs to subsidizing the purchasing of plant protection materials and fertilizers.

Table 2. The distribution of allocated subsidies by directions, %

Subsidized directions	2010	2011
Stimulating crediting for agricultural producers and by banks non financial institutions	2	1
Stimulating risks insurance in agriculture	6	7
Subsidizing investments for the establishment of multiannual plantations	31	19
Subsidizing the production of vegetables on protected ground	1	3
Subsidizing investments for purchasing agricultural machinery and equipment, including irrigation equipment	25	46
Stimulating the promotion and development of ecological agriculture	1	0.2
Stimulating investments in the use and technological renovation of livestock farms	1	6
Stimulating the purchasing of pedigree cattle and the maintenance of their genetic fund	1	4
Stimulating investments in the development of the processing and post harvesting infrastructure	5	13
Subsidizing agricultural producers for offsetting irrigation energy costs	5	1
Subsidizing purchasing of plant protection materials and fertilizers	22	-

Source: based on data from the Agency of Interventions and Payments in Agriculture

Nevertheless, according to the Government’s decision for approving the distribution of the subsidizing fund’s meanings to agricultural producers for 2012 [4], this subsidizing direction was not included, but which is needed in the context of adverse weather conditions, as the drought from the fall of 2011 and the frosts in the winter of 2012. Also an important share belongs to capital investments. In the same time, the subsidized directions are not stable, being changed from one year to another, as the case with the subsidies allocated to sugar beet producers or to the wine making sector.[5]

Nevertheless, some positives changes occurred in the subsidizing policy during the last years. Among them, the amount of allocated budget financial resources for the subsidizing fund had increased from 300 mil lei in 2010, to 400 mil lei in 2012. Also an advantage is that the entire amount of 400 mil lei allocated for 2012 will be available from the beginning, in contrast with the previous years when the money were given in several stages (e.g. in 2010 at the beginning

was allocated 250 mil lei, and after – 150 mil lei). However, the number of subsidized directions decreased, for 2012 being eligible only 8 subsidizing directions. A negative aspect is the variable character of the subsidized directions that do not allow agricultural producers to forecast better their activity.

Concerning the subsidies allocated to the agricultural farms (1595 enterprises researched during the years 2008-2010) the largest share belongs to crop production (about 70-80%), as a result of the largest share of the crop production in the gross agricultural product (about 70%).

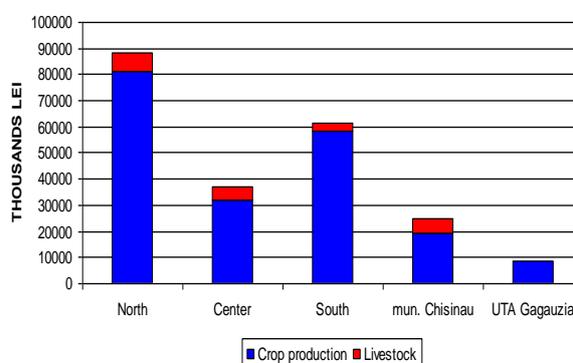


Fig. 1. Subsidies allocation by agricultural branches (2008-2010)

The research carried demonstrates that the subsidies allocation has a higher efficiency for the farms that received a higher amount of subsidies per hectare. For the analysis were used the collected data from corporate farms in average for the years 2008-2010.

As well, a higher level of profitability is noticeable for the farms for last group which benefited from a higher amount of subsidies.

As a result, the group of farms that received in average an amount of 1105 lei per hectare, obtained higher economic results, having a profit of 1799 lei per hectare and a level of profitability of 35,2%.

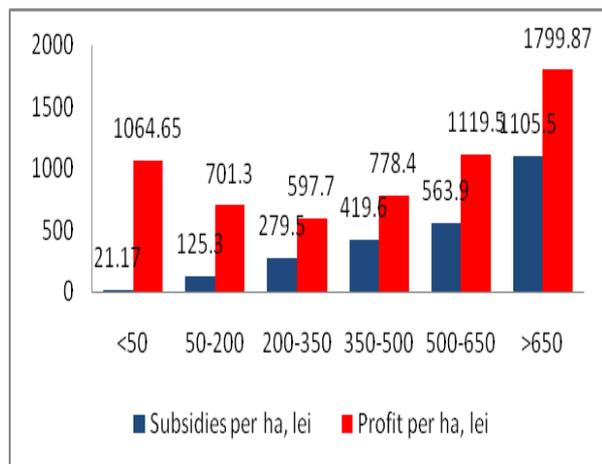


Fig. 2. The impact of subsidies allocation on farms profit per hectare, by farms groups.

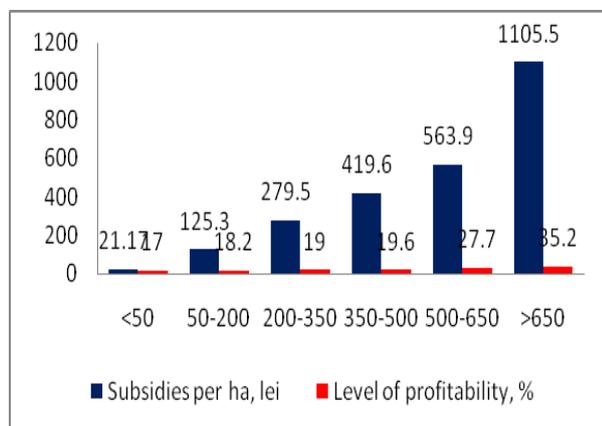


Fig. 3. The impact of allocated subsidies on the farms level of profitability, by farm groups.

such an evaluation is the Ministry of Agriculture and Food Industry.

REFERENCES

- [1] Budianschi D., Prohnițchi V., Savva T., 2012 *Evaluarea eficienței și transparenței utilizării fondului de subvenționare a producătorilor agricoli*, Expert Grup, Chișinău 2012, p. 9-15
- [2] *Government decision nr. 1305 from 28.11.2007 regarding the approval of the Concept concerning the subsidy system for agricultural producers for 2008-2015*, Monitorul Oficial Nr. 188-191 art Nr. 1356, 07/12/2007
- [3] *National Strategy for the Sustainable Development of the agri-food sector of Republic of Moldova*, (2008 – 2015), Chisinau 2007.
- [4] Monitorul Oficial Nr. 25-28 art Nr: 4063 - 4066 *Hotărâre cu privire la aprobarea modului de repartizare a mijloacelor fondului de subvenționare a producătorilor agricoli pentru anul 2012*, p. 39-50.
- [5] Perju I., 2011, *Sistemul de subvenționare în agricultură administrat de agenția de intervenție și plăți în agricultură*, Institutul pentru Dezvoltare și inițiative Sociale „Viitorul”, Chișinău, p. 9-12.

CONCLUSIONS

In Moldova still does not exist a clear and consistent policy that could be implemented for the allocation of agricultural subsidies. So far, the objectives followed by their allocation are aimed only to the development of the agricultural sector but does not take into consideration the objectives of rural development.

The regulation of subsidizing fund is approved every year, also being modified the directions eligible for subsidies and the allocation terms, by this being difficult to make the forecast for the public institutions involved as well as for the recipients.

A major importance for insuring the high efficiency in the agricultural sector would be a evaluation of impact from the allocated subsidies by using a evaluation methodology. The most adequate institution for implementing

THE QUANTIFICATION OF THE DIVERSIFICATION'S IMPACT OF COMMERCE WITH AGRI-FOOD PRODUCTS ON THE EFFICIENCY OF EXTERNAL TRADE

Boris CORETCHI¹, Silvestru MAXIMILIAN²

¹Agrarian State University of Moldova, Chisinau , 42 Mircesti street, MD-4224, Chisinau, Republic of Moldova, Phone: +373 22 432387, E-mail: coretchi_boris@mail.ru

²Free International University of Moldova, Chisinau 52 Vlaicu Parcalab street, Chisinau, MD-2012, Republic of Moldova, Phone: +373 22 739747, Email: s.maximilian@ulim.md

Corresponding author email: coretchi_boris@mail.ru

Abstract

In the context of foreign economical relations, the main aim for the Republic of Moldova is the agri-food trade diversification without intermediaries that can transform it from a poor country in a prosperous one. The consumer's needs, preferences and their satisfaction require a higher effort that leads to strong competition on the agri-food markets. The above mentioned lead to positive changes on the agri-food market by being considerably diversified the assortment of products. As a result, Moldova's agri-food trade relations with the World requires the modernization of the given sector by increasing the amount of manufacturing products with high value-added, supply diversification of exported products and markets.

Key words: *agricultural products, import-export, rural area, the final product diversification of trade.*

INTRODUCTION

Agriculture traditionally remains the basic sector of the Moldavian economy. Some key objectives have been fulfilled during the past reforms, but despite these objectives, an obvious trend of decline has been noticed in the foreign trade balance of the Republic of Moldova over the last decade, which shows the unsatisfactory evolution of the economic sector as a whole.

The export of food products in Moldova is mainly oriented to the traditional markets of the Commonwealth of Independent States (CIS), these are emerging, currently unstable markets, which involves high risks for the export to these countries. The reduction of food products export is influenced by several factors, and namely: low competitiveness of local agricultural products in both national and foreign markets due to poor quality and safety regarding the increasing requirements of these markets. [2, p. 131]

The objective of Moldova's integration in the world economic system as a competitive partner must change the situation. The globalization of the world economy and the scientific and technical progress offer new opportunities to our country to increase the agricultural output at the level of various industries. To implement this task in Moldova one should primarily concentrate on the production of

high quality food and its export, taking into consideration the neighbourhood and demand of one of the most profitable markets of the modern European Community.

Keeping in mind the objectives of the Republic of Moldova to diversify markets, increase exports, attract investments and projects, increase GDP per capita in rural areas, protect environment and society, lower costs, increase customer confidence, food safety and traceability in agriculture.

The diversity of food products structure in Moldova aims at receiving highest revenues by food producers, the compliance with both national and foreign demand, minimizing the unemployment rate in rural areas, reducing the export of agricultural raw materials, increasing the volume of final products, developing original and unique products in Moldova. The diversity of food products can be achieved only if foreign economic partners are diverse. The maintenance of export-import relations with neighbouring countries cannot be always effective. The expansion of economic relations with Arab countries could contribute to the development of new food products specific to the food consumption in these countries, for example grain legumes. Albumin deficiency in food during fasting periods is supplemented by the consumption of grain legumes. Being exported, these goods can be a payment form for oil resources import from these countries.

In our opinion, only the diversity of food products can lead to the increased trade efficiency by diversifying importers of oil products without intermediaries, the fact due to which Moldova, a poor country, can be transformed into a prosperous state.

Thus, there is a problem: the organization of large-scale production of grain legumes in the Republic of Moldova; the initiation of oil resources import from Arab countries. Export-import flows are usually more intensive between neighbouring trade partners. In our case the distance between the Republic of Moldova and Arab countries is quite big, and therefore it is necessary to minimize transportation costs. The problem is difficult because: economic relations are determined by the market, interests of economic subjects are diverse, there may appear some intermediaries in the schemes of "optimal flow" – export beans, import oil – which is usually not good for both producers and consumers, contributing to the unjustified price increase. The problem of "closeness" of oil-exporting countries to the Republic of Moldova can be solved with the help of economic and mathematical methods.

To solve the problem of food products diversification means to increase energy consumption by agricultural producers and the one that process agricultural raw materials. Agriculture, cultivating grain legumes, can diversify its activities, increase soil efficiency and fertility, create new raw materials, increase the volume of end products. And not the least important, agriculture can provide energy resources (oil) in exchange for grain legumes.

The diversity of food products is a complex problem and at the same time it is of the first importance for the Moldovan economy. The solution of diversification problems can contribute to the improvement of management methods, development of the economy at the territorial (district) level. The complexity and multitude of possible variations, uncertainty of economic processes both in the country and abroad can only be analyzed using a mathematical system of imitation, simulation of possible economic situations.

Diversification options must be characterized by a system of indicators: the ratio of population employed in agriculture, processing industries to the total number of population able to work, income per person, final income with specifications: income in agriculture - in processing industries - in trade. [3]

MATERIAL AND METHOD

Research aspirations quantifying the diversification impact of food products trade on the efficiency of foreign trade, there were used a number of methods and procedures such as: the method of analysis, induction, deduction and synthesis that allowed researching the essence of the topic and drawing some conclusions that we believed would be of interest for economics. The end result is to develop economic and mathematical methods to quantify the diversification impact of food products trade, which are scientifically based on the main aspects of perspective and efficiency of foreign trade in the Republic of Moldova.

RESULTS AND DISCUSSIONS

The consumption of agricultural production is determined by the structure of agricultural sector and vice versa. The modernization and improvement of production technologies, creation of new end products is one of the main actual directions, multiplication of both national and foreign demand. The economic development of the Republic of Moldova is conditioned by the current transformation of economic structure to another structure, adequate to demand, potential possibilities of the country. The modernization and diversification of the agricultural products structure includes:

- Moldova's increased participation in the circuit of world economy;
- the increased share of original, principal and new developed products in GNP;
- the aspiration to develop some economy branches, stimulate ideas, technology, machinery in the food production (x_1);
- the occupation and use of human and natural resources in the highly productive industry branches (x_2);
- the harmonization of the socio-economic development of all districts, regions, of the country as a whole, improved working conditions (x_3);
- the increased amount of technical equipment at every working place (x_4);
- the stimulation and motivation of creative activities, design of new products, technologies (x_5);
- the research of both national and foreign markets, demand for foodstuff (x_6);
- the training of specialists in the analysis of the current processes structure used to produce food products (x_7);
- the development of a standard structure (x_8);

- the creation of some mechanisms to motivate convergence processes of two structures (x_9);

The complexity of the listed problems makes us think about the idea of systematic treatment of diversification processes of food products.

Thus, the modernization and diversification of food products structure can be considered as F function which depends on variables x_1, x_2, \dots, x_9 . In their turn, each of the listed variables evolves over time. In

$$\Delta F(x_1(t), x_2(t), \dots, x_9(t)) = \frac{\partial F}{\partial x_1} \times \frac{dx_1}{dt} \Delta t + \frac{\partial F}{\partial x_2} \times \frac{dx_2}{dt} \Delta t + \dots + \frac{\partial F}{\partial x_9} \times \frac{dx_9}{dt} \Delta t$$

The evolution of the current structure in relation to the standard structure may be divergent or convergent. The problem is formally reduced to the creation of the diversification function F^* of the motivation systems in the processes to which asymptotically tends the current function $F(x_1(t), \dots, x_9(t))$.

The economic development of the Republic of Moldova actually means the diversification of the economic structure, the appearance and removal of certain branches, products and technologies. Structural changes in food products are determined by: the pace of economic growth, the development level of productive powers, the government's economic policies, labour productivity, natural and geographic conditions, the creative level of research and scientific analysis institutions, the degree of tech production, the improvement, possibilities, the adaptation of manufacturing technologies for food production, the efficient use of natural and human resources, the capital, the labour division, the increased volume and efficiency of foreign economic exchanges, the effects of natural economic circumstances, the level of national labour division, the quality level of labour, the organization of work. Each of the listed factors in its turn is subject to structural changes. Moldova's economy is characterized by a small number of branches, by the predominance of agriculture, weak connections between branches of production, it is an underdeveloped country. Labour productivity in Moldova's agriculture is lower than in EU countries. [4, p.56] The share of energy resources in the structure of productive expenditures is high, but that of labour resources is reduced. Consequently, the agricultural manufacturer can not usually make any profit. Moreover, there are monopolistic policies of foreign business partners: the agricultural producer in Moldova is “deceived” during both selling and purchasing. Thus, the Republic of Moldova is forced to restructure its end products, international economic relations, to expand exports to Arab countries, to exchange

formal language $F(x_1(t), x_2(t), \dots, x_9(t))$ – the diversification function of agricultural products.

The elements, variables ($x_1(t), x_2(t), \dots, x_9(t)$)

The change of a factor over time generates modification of other factors and therefore, of the structural diversification:

goods for goods with Turkmenistan and other countries that export energy resources.

The reduction of energy procurement costs for farmers in Moldova may result in: the diversification of agricultural raw materials and end products, changes in wages, creation of conditions to store products, development of agricultural processing technologies, change of labour needs; request for skilled workers, improvement of unproductive consumption in rural areas and thus, the increased demand for food products, the creation of favourable conditions for agricultural and manufacturing sectors development. The current structure of the economy of the Republic of Moldova cannot be considered as modern, industry oriented with a high economic potential, strong technological capacity and active participation in the world economy, the current structure of the Republic of Moldova is an agrarian structure, disjointed, with a underutilized economic potential, with a low participation in the international economic cycle. In the last 20 years rural areas in Moldova increasingly have been deteriorating from the economic, social and cultural point of view. Therefore, the diversification of food products and economic partners-exporters of oil resources in exchange for grain legumes in constant ratio (for example) becomes a serious problem for the Republic of Moldova. The increased volume of end products changes the structure and vice versa. The diversification of food products becomes a demand multiplying mechanism, the one that is used to reduce Moldova's dependence on some energy exporting countries and importing agricultural products from Moldova.

The diversification of the Republic of Moldova is a process that has been taking place over time, but with a condition, it can be implemented only after a program-objective that is approved, coordinated, guided by the country authorities. Unadjusted market economy will for sure contribute to the further "depopulation" of rural areas, to the inefficient use of agriculture, the export of

agricultural raw materials, increased unemployment, GNP reduction, increased imports, state debts. In other words, to the country's transformation into a poorer country.

In our opinion, only the diversification of food products and importers of oil products without intermediaries may transform the Republic of Moldova into a prosperous country. The system of agro-industrial production has a complex structure. This complexity requires the use of systemic methods in process analysis. The diversification of food products is identical to the substitution of one vector with another, beginning with the establishment of parties, structural units. A problem appears in the diversification process of agricultural products: diversification measuring (quantifying). There are various methods of analyzing the diversification process. Further we will use vector methods to analyze the structure of the final process. The diversification of food products is equivalent to the increase of the number of coordinates of the vector that consists of final products. Starting with the assumption of the final product in the agro-industrial complex, that is vector $Y = (Y_1, Y_2, \dots, Y_n)$, then the module of this

$$|Y| = \sqrt{\sum_{i=1}^n Y_i^2}$$

vector will be $|Y| = \sqrt{\sum_{i=1}^n Y_i^2}$. To interpret the contents of this economic indicator more persuasively one needs to analyze its variation range. Say the number of vector Y coordinates is n . Under these conditions, for example for $n = 2$, the length (module) of vector

$$Y \text{ is equal to } |Y| = \sqrt{Y_1^2 + Y_2^2}$$

The end product is $Y = Y_1 + Y_1$. Let us solve the task:

$$|Y| = \sqrt{Y_1^2 + Y_2^2} \Rightarrow \min$$

Under $Y_1 + Y_2 = Y$

We develop Lagrange function

$$L = \sqrt{Y_1^2 + Y_2^2} + \Lambda(Y - Y_1 - Y_2)$$

$$\begin{cases} \frac{\partial L}{\partial Y_1} = \frac{1}{2\sqrt{Y_1^2 + Y_2^2}} \times 2Y_1 - \Lambda = 0 \\ \frac{\partial L}{\partial Y_2} = \frac{1}{2\sqrt{Y_1^2 + Y_2^2}} \times 2Y_2 - \Lambda = 0 \end{cases}$$

where we get $Y_1 = Y_2$

The module of the vector Y is minimal

when $Y_1 = Y_2 = \frac{Y}{2}$. The diversification of the end product is maximum; the length of the vector Y is maximum when Y_1 or Y_2 is zero, when the whole mass of the end product is concentrated in a single coordinate $Y_2 = Y$ or $Y_1 = Y$, the end product diversification is minimum. So, one of the possible indicators that could measure the diversity of food products is the module (length) of the end product vector $Y = Y_1 + Y_2 + \dots + Y_n$. In reality the number of vector Y components is very large (there can be hundreds of thousands of end products). Therefore, there appears a necessity of aggregation-disaggregation of the end product vector structure. Aggregation-disaggregation operations logically change the vector. The statement can be exemplified. If the end product is aggregated into one group $(Y_1 + Y_2 + \dots + Y_n)$, then the module of the vector Y will be

$$|Y| = \sqrt{[(Y)_1 + Y_2 + \dots + Y_n]^2} = Y_1 + Y_2 + \dots + Y_n$$

; if each component of the end product will be a coordinate of the vector Y of equal size $Y_i = Y_{i+1} = \frac{Y}{n}, i = 1, 2, \dots, (n-1)$, then the length of the vector will be:

$$|Y| = \sqrt{\left(\frac{Y}{n}\right)^2 + \left(\frac{Y}{n}\right)^2 + \dots + \left(\frac{Y}{n}\right)^2} = \frac{Y}{\sqrt{n}} = \frac{Y_1 + Y_2 + \dots + Y_n}{\sqrt{n}}$$

The end product structure is more diverse, with no concentration, i.e. the volume for each product will

$$\text{be } \frac{Y}{\sqrt{n}} = \frac{Y_1 + Y_2 + \dots + Y_n}{\sqrt{n}} \text{ (the average number).}$$

The diversification of food products will be at the

limit when $\frac{Y}{n} = 1$, of the module $|Y| = \sqrt{1^2 + 1^2 + \dots + 1^2} = \sqrt{n}$. So, one of the possible criteria that would allow evaluating the diversification level is the module of the vector of food products. The aggregation of the end product vector Y can be made through the aggregation matrix.

$$A = \begin{matrix} \begin{matrix} \leftarrow k \rightarrow \\ \uparrow \\ n_1 \\ \downarrow \\ \uparrow \\ n_2 \\ \downarrow \\ \dots \\ \uparrow \\ n_k \\ \downarrow \end{matrix} & \begin{pmatrix} 1 & 0 & \dots & 0 \\ 1 & 0 & \dots & 0 \\ \vdots & \vdots & \dots & \vdots \\ 1 & 0 & \dots & 0 \\ 0 & 1 & \dots & 0 \\ 0 & 1 & \dots & 0 \\ \vdots & \vdots & \dots & \vdots \\ 0 & 1 & \dots & 0 \\ \dots & \dots & \dots & \dots \\ 0 & 0 & \dots & 1 \\ 0 & 0 & \dots & 1 \\ \vdots & \vdots & \dots & \vdots \\ 0 & 0 & \dots & 1 \end{pmatrix} \end{matrix}$$

where:

$n_1; n_2; \dots; n_k$ – the number of end products included in group 1; 2; ... k; $n_1 + n_2 + \dots + n_k = n$.

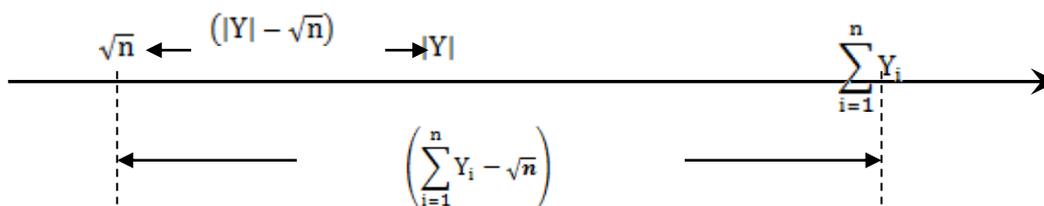


Fig. 1. Diversification degree of the end product
 Source: Elaborated by authors

The potential level for diversification:

$$C_{|Y|}^A = 1 - \frac{|Y| - \sqrt{n}}{\sum_{i=1}^n Y_i - \sqrt{n}} = \frac{\sum_{i=1}^n Y_i - |Y|}{\sum_{i=1}^n Y_i - \sqrt{n}}$$

The end product vector

$$Y = Y_1 + Y_2 + \dots + Y_i + \dots + Y_n;$$

$$\frac{Y_1}{Y} + \frac{Y_2}{Y} + \dots + \frac{Y_i}{Y} + \dots + \frac{Y_n}{Y} = 1 \text{ or}$$

$$P_1 + P_2 + \dots + P_i + \dots + P_n = 1;$$

The end product Y with n components, having been aggregated will be expressed by the vector $Y_{agr}^{(k)}$ with k components $k < n; Y_{agr}^{(k)} = Y \times A$.

The aggregation level can be arbitrarily determined depending on the analysis, highlighting the main share of new food products in the end product structure.

The diversification of food products can be quantified by the coefficient [4].

$$C_{|Y|} = \frac{\text{modululcurent} - \text{modululminim}}{\text{modululmaxim} - \text{modululminim}}$$

The module of the vector in the share of the end product:

$$|P| = \sqrt{P_1^2 + P_2^2 + \dots + P_n^2}$$

The range of possible values of p shares can be deduced:

$$|Y| < \sum_{i=1}^n Y_i$$

From fig. 1. we get

$$\sqrt{Y_1^2 + Y_2^2 + \dots + Y_i^2 + \dots + Y_n^2} < \sum_{i=1}^n Y_i; \sqrt{\frac{Y_1^2}{Y^2} + \frac{Y_2^2}{Y^2} + \dots + \frac{Y_i^2}{Y^2} + \frac{Y_n^2}{Y^2}} < \frac{\sum_{i=1}^n Y_i}{Y} = 1$$

The length of the vector P is minimal when its coordinates are equal $P_i = \frac{1}{n}, i = 1, 2, \dots, n$.

So,

$$\sqrt{\left(\frac{1}{n}\right)^2 + \left(\frac{1}{n}\right)^2 + \dots + \left(\frac{1}{n}\right)^2} < |P| < 1$$

The diversification of food products can be achieved at the expense of the quantitative factor at the expense of a new product.

CONCLUSIONS

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

1. promote the products from grain legumes for the export and cover existing market niches in specific areas by identifying new export markets as the Arab ones and to strengthen existing markets;
2. to implement the laws developed in the agricultural sector to strengthen the control system with the use of additional monitoring measures of

inspection bodies by the competent authority to increase the quality of products designed for export;
3. to diversify and create a system to produce, process and sell organic products designed to meet the needs of both national and international markets;

4. to promote the export of grain legumes and cover existing market niches in Arab countries, especially unoccupied ones, by developing research studies of the traditionally consumed products;

5. to organize large-scale production of grain legumes in Moldova in exchange for the import of oil resources by the partners from Arab countries. Diversification problems can contribute to the improvement of management methods and economy at the level of a region, district or branch.

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

REFERENCES

[1] Berry C. H. Corporate Growth and Diversification. Journal of Law Economics. Princeton, New York: Princeton University Press, 1975.

[2] Burciu A. *Tranzacții comerciale internaționale*. Iași: Polirom, 2010. 615 p.

[3] Gort M. *Diversification and Integration in American Industry*. Princeton, New York: Princeton University Press, 1962.

[4] Maximilian S. *Modelarea proceselor economice*. Chișinău: ULIM, 2009. 226 p.

EFFECTS GENERATED BY THE ACCESSION TO THE EUROPEAN UNION IN THE FIELD OF TRADING CEREAL PRODUCTS

Ion DONA¹, Ramona MĂTUSA (DUMITRU)¹

¹University of Agricultural Sciences and Veterinary Medicine, Bucharest, 59 Marasti, District 1, 011464, Bucharest, Romania, Phone: +40 21 318 04 65, Fax: + 40 21318 28 88, E-mail: ion_dona@yahoo.com

Corresponding author email: ion_dona@yahoo.com

Abstract

The European consumer exigencies, the mechanisms of the Common Agricultural Policy, the European norms and standards, the ecological productions are as many challenges to which the producers, processors, traders and decision makers in the agro food field, and specifically for our research, in the cereals field, must face in order for the Romanian products to be present on an external market, as well as on an internal market that are increasingly competitive. In this paper we have concluded a brief analysis of the cereals market nationally and on a European level, and of the common support policies in this sector, of the common market organizations, as well as of the implications of the accession over the trade of cereal products. Also, we have made several recommendations within this paper targeting the specific sectorial aspects of the cereals sector: in order to fully profit from the possibilities offered by the Common Agricultural Policy instruments and from the demand and prices growth its necessary that Romanian producers organize and make, together, major investments in cereals conditioning and storage systems; the majority of Romanian producers sell the cereals immediately after harvest, when prices are at their lowest level; storage in good conditions of the harvest could allow a substantial increase of profit.

Key words: CAP, cereal market, competitiveness, trading

INTRODUCTION

Cereals occupy an important place in the structure of agricultural crops. In Romania, the structure of the agricultural production is dominated by the cultivation of grains cereals, percentage that has increased after 1990 compared to the '80 situation. In order to analyse the offer on the cereal market we shall first study the cultivated surfaces and the cereal productions.[1] The causes that have determined sudden movements over the years on the cereal production in Romania have been the increase or decrease of the cultivated surfaces and of the output.

MATERIAL AND METHOD

The methodological basis of the carried out investigation consists in the universal method of studying of the material, phenomena, processes as well as dialectical method, and its components analysis, synthesis, induction, deduction.

RESULTS AND DISCUSSIONS

In Table 1 we have emphasized data referring to the surface cultivated with cereals in Romania. Generally, the cereal production is correlated with the seeded surface, though; sometimes there are paradoxes, where even if the cultivated surface is larger, the production is lower. From year to year, farmers and agriculture specialists are confronted with various problems, and find themselves most of the times in the impossibility of facing some difficult situations that might appear. Explanations are multiple: either these are related to weather aspects (repeated floods or prolonged droughts; high or very low temperatures), or the occurrence of different diseases and pests. [9]

Performing an analysis on the **cereal production** level, we found that despite the potential, the cereal production in Romania does not represent more than 5% of the community production. Nevertheless, lately Romania has been among the first five cereal exporters in the EU, thus demonstrating the potential of the Romanian sector of cereal production.

From the point of view of the cereal cultivated surface, with 5.2 million hectares in 2009, Romania occupies the fifth place, and as to the production levels the sixth place among the producer member states of the European Union.

Table 1. Surface cultivated with the main crops in Romania

Years	Total	Wheat and rye (thousands hectares)	Other cereals
2001	5655	1954	3700
2002	6294	2558	3736
2003	6038	2309	3728
2004	5987	2295	3692
2005	6021	2476	3545
2006	5987	2012	3975
2007	5023	1975	3947

Source: National Institute of Statistics

The comparison on productivity shows yet another picture, unfriendly to our country. Therefore, the production of approximately 14.8 million tonnes attained in Romania in 2009, is comparable to the one of Hungary, of 13.57 million tonnes, but which was attained with a surface of only 2.88 million hectares, nearly half of the one cultivated by the Romanian producers.

The comparison is even more disadvantageous if the situation of Romania is considered in relation to France, which from a surface of 9.38 million hectares, attained a production of 69.86 million tonnes, therefore an average productivity of 7.4 tonnes/ha, compared to 2.8 tonnes/hectare in Romania.

What is more striking in the case of Romanian cereal production compared to any other member state is the very significant variation of the harvest from one year to another.

Therefore, in the analysed years the production on Romania has varied from 7.78 to 24.39 million tonnes, meaning more than 213%. During the same period the cereal harvest in the EU has varied from 258.8 million tonnes to 321.8 million tonnes, thus a fluctuation of only 24%.

There are multiple causes, from the agricultural structures situation, to the inputs quality, to the organization of the chain, greater dependence on the climate factors (these being much stronger in Romania) etc.

Of course, a central role in the weak performance in Romania is played also by the additional services, such as those of assistance/advisory in agriculture, or facilities for storage and conditioning of the production, that do not allow the attainment of superior profits with favourable effects over the production. [8]

As to the wheat production, Romania occupies the fourth place for the cultivated production and fifth place for the attained production, obtaining 5.2 million tonnes in 2009.

This production is even lower than the one from Denmark, of 5.94 million tonnes, but which is attained from a surface of only 0.73 million hectares, almost three times lower than the one cultivated in Romania (2.14 million tonnes).

The highest productivity in wheat goes to Germany, with almost 8 tonnes per hectare, compared to an average of only 2.4 tonnes per hectare in Romania.

These numbers indicate clearly an enormous discrepancy between the average values attained in Romania and those from the other member states of the EU. The causes are the same as the ones mentioned for the cereal sector.

The situation is somehow better if only the performances recorded by the trading farms in Romania are analysed, thus obtaining a general average production that exceeds 5 tonnes per hectare.

Such a differentiation, between the production attained by trading farms and the other farms, indicates though the enormous gap that persists for the small farms in Romania, that yet work approximately 55% of the arable land and do not succeed to attain an efficiency that would allow them to develop profitable agricultural activities. [2]

That is why we believe that on the medium term small farms won't be able to face the competition on the European market, and that will lead for sure to the aggregation of the arable land, but much too slow, if there are no acceleration measures taken for the process.

Until then, Romania will continue to record average values that puts it, from the efficiency point of view, among the last places between

the EU member states and that doesn't allow it to profit from the potential it has.

The average production per hectare has also been inferior for most analysed crops: wheat, barley, oat, maize, sunflower, soybean, rapeseed, sugar beet, potatoes, tomatoes, cabbage, carrots, dried onions, peppers, watermelons etc.

Therefore, from table no. 1 analysis it results that, with the exception of 2007, when the climate conditions have especially affected the agricultural production, the Romanian agriculture situation has improved, and peaked in 2008.

This is a normal conclusion if the much bigger subsidies granted to this sector during the post-accession period compared to the pre-accession period are considered.

The highest value of production (over 66 billion lei) for all the analysed years has been recorded in 2008, but this has also been due to the fact that the previous year production was weak, determining an unbalance between offer and demand, having the result of an artificial rise in prices.[3]

From the point of view of the agricultural production structure it cannot be concluded that the accession has brought positive visible changes, variations of the production value in the plant and animal sectors being caused to a larger extent by the climate conditions or due to the circumstances.

As regards to the production per hectare it cannot be stated that during the first three years after accession the application of CAP had any influence, Romania continuing to record some of the lowest average productivities of all the member states of the EU (Table 2, Fig. 1, 2, 3, 4).

Of course, the situation is caused by the large number of farms having reduced sizes that are not capable to record performances comparative to the trading farms. It's possible though, that the system of data collection in agriculture is not appropriate and that the data transmitted does not fully reflect reality.

As a consequence, even if the performances of the trading farms have increased after the accession, the overall amounts received having a greater influence for larger farms, in reality

this cannot significantly reveal in the overall figures of all producers, being encumbered with the low performances of small farms.

During the latest period the cereal market has known important mutations, among which thereof appearing at **prices record level**.

Table 2. The evolution of average production per hectare for the main crops(kg/ha)

Specification	2004	2005	2006	2007	2008	2009
Wheat	3403	2965	2746	1541	3403	2421
Rye	2511	2371	2072	1702	2416	2124
Barley and row barley	3312	2227	2331	1461	3069	2284
Oat	2154	1757	1763	1206	1906	1459
Maize	4441	3952	3565	1526	3215	3409
Sorghum	3270	1304	1799	1128	2608	2359
Rice	4006	3634	3264	3263	4933	5426

Source: Data processed from the Statistical Year-book of Romania

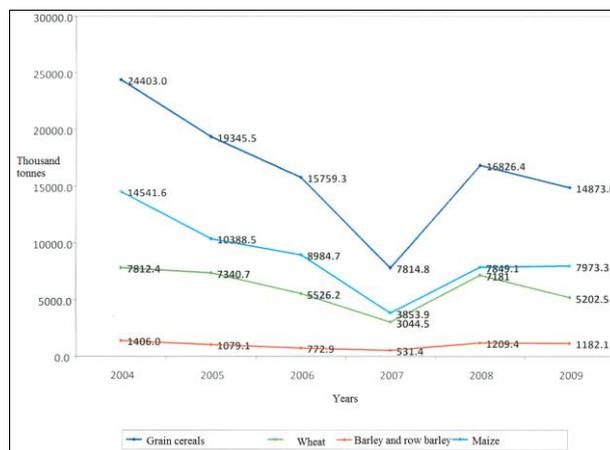


Fig.1. Evolution of the total cereal production (wheat, maize, barley and row barley)

Source: National Institute of Statistics, Statistical Year-books of Romania 2004-2010 and www.madr.ro

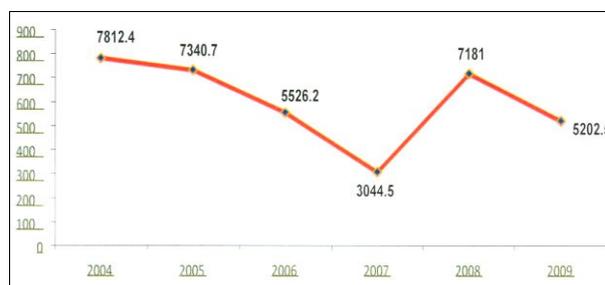


Fig.2. Evolution of the total wheat production

Source: National Institute of Statistics, Statistical Year-books of Romania 2004-2010 and www.madr.ro; years & thousands of tonnes

The factors that have determined the recent evolutions are of the following kinds:

a) structural, such as: the growing demand for basic agricultural products due to some high

economic increase ratios; changes in consumer preferences (especially for meat) in many countries, especially in India, China and Latin America states; bio-fuel market development; b) contextual, such as: reduction of the cereal production as a consequence of unfavourable weather conditions, determined by the drought in Australia, the high temperatures from East Europe (especially in Bulgaria, Hungary and Romania), torrential rainfalls from North-West Europe and in particular, from Germany and France, low temperature in Russia and Ukraine. Combining these factors has generated unfavourable market conditions, the stocks reaching the lowest level in the last 10 years in the EU. [5]

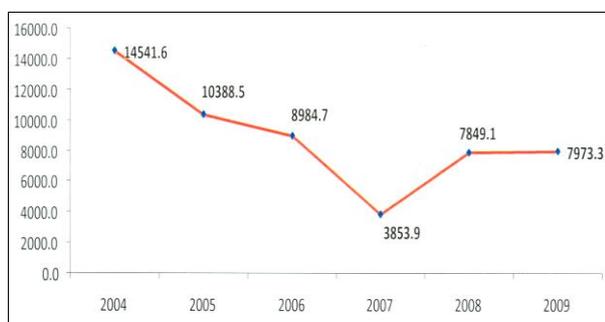


Fig.3.Evolution of the total maize production
 Source: National Institute of Statistics, Statistical Yearbooks of Romania 2004-2010 and www.madr.ro; years & thousands of tonnes

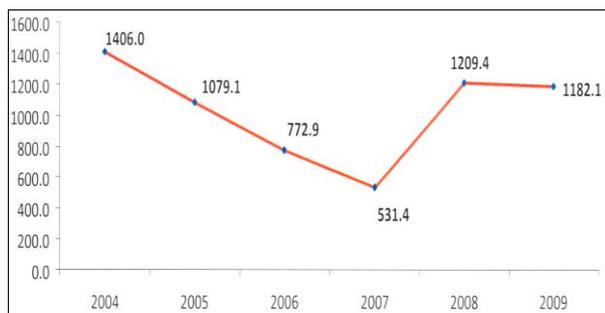


Fig. 4.Evolution of the total barley and row barley production
 Source: National Institute of Statistics, Statistical Yearbooks of Romania 2004-2010 and www.madr.ro; years & thousands of tonnes

On the medium and long term, we consider that the cereal prices in the EU and in the world shall be situated at a higher level than the one of the last decade, the demand of food products being the main determinant of this situation. Under these conditions, is expected for prices volatility to increase.

The growing demand for maize in the United States shall lead to the price increase on the world market, fact that will encourage the EU exports for this agricultural product.

This, correlated with the elimination of the support for maize, shall be able to lead to the fluidization of the market in Hungary and Romania (two of the main maize producers) for the medium term and shall reduce the risk of regional surpluses, even in the case of high harvests and of transportation costs in continuous rise. [4]

In our country, the **cereal prices** have loosened, but have remained under the direct influence of processors, who are better organized and have the interest for this price to be in their advantage, as a consequence, as low as possible. The wheat price has increased each year, but each time the increase was under the annual inflation rate, fact that has made the economic power of the wheat producers to have an upward trend.

On the other hand, the extensive availability and the perspectives of good productions at a global level have led to the increase of pressure over the cereal prices.

The listings, in the case of certain exporters, just as EU is, have been favoured by the American dollar increase compared to the euro.

Table 3.The average price of wheat

Year	Standardized price/kg
2001	2990
2002	3044
2003	5050
2004	5530
2005	5790
2006	6023
2007	6350
2008	6890

Source: National Institute of Statistics

As regards to the exports we present few listings recorded in 2010 for the main products. Following the controls on the CAP implementation, in 2008, the European Commission has proposed to continue the application of SAPS for the new member states until 2013. Romania chose for this option because of its simplicity in the application of direct payments.

It was expected that the cereal surfaces cultivated would grow in order to face the community and world demand, especially because of the consumption increase in emerging countries such as India and China, and due to the demand increase in the bio-fuel sector. [6]. It is worth mentioning that the cereal production was consistently reduced during the past years worldwide, the main cause being constituted by the climate change, that have led to the lack of stocks and significant escalation in prices.

Table 4. Product price

Product	Price	Conditions
Baking wheat	120 Euro/tonne	CpT Constanța, with delivery in August-September
Fodder wheat	105 – 110 Euro / tonne	CpT Constanța, with delivery in August-September
Barley	97 – 101 Euro / tonne	CpT Constanta
Rapeseed	332 Euro / tonne	Matif price, FOB Rouen
Maize (August)	167 Dollar/tonne	Delivery in August
Maize (September)	155 Dollar/tonne	Delivery in September

Source: www.recolta.eu

Since the demand exceeds the supply, there is every chance that much of the uncultivated or abandoned land would be included in the agricultural circuit, of the Romanian sector for cereals, which beneficiaries by the advantage of the world prices increase.[7]

As to the **wheat increase**, this crop traditionally has occupied in our country between 25-30% of the arable land. As a consequence to the price increase, producers shall be stimulated to invest in technologies that would allow the attainment of superior average output per hectare, thus having positive effects over the demand-offer balance.

Also, producers shall be stimulated to increase the wheat cultivated surfaces in order to increase the offer in view of compensating the market deficit. Still, because of the demand increase a decrease in prices is not projected. The growing demand of pastas shall lead also to the growth of the surface cultivated with durum wheat, even if producers won't be able

to beneficiate from the specific subsidy for the durum wheat granted on the community level - Romania did not have, on the accession negotiation moment, data that would determine the allocation of subsidies for this crop .[10]

As to the **maize crop**, under the terms of the demand increase in the livestock sector and the diversification of this product usage, especially for bio-ethanol, maize shall maintain its position of most important crop in Romania. In this context, the application of the common agricultural policy mechanisms shall encourage both the production, as well as the increase of the average output per hectare. Worth mentioning is the fact that the EU support for maize is practically abolished, being applicable only in case of crisis, the only mechanism that remains being that of the direct subsidy for cereals/arable crops. The demand and prices increase do not make the intervention necessary, and the stimulating prices shall determine producers to expand the maize cultivated surfaces. As a consequence the offer will increase allowing among others the development of the livestock sector, that is confronting major difficulties due to the increased prices on fodder; even if the prices for cereals won't go back to the levels recorded before 2007, a significantly better offer shall determine still a stress relief for the maize prices.

CONCLUSIONS

The European Union accession and the undertaking of the specific instruments and measures of the Common Agricultural Policy have strongly influenced the agro-food market and the rural areas from Romania.

The impact of the rural development funds allocated to Romania after accession was significant and constantly offered **increased opportunities aiming for the increase of agriculture and food industry competitiveness**, but above all for the rural environment due to the measures intended for rural infrastructure and economic activity diversification in rural areas.

The Single Area Payment Scheme (**SAPS**) had positive effects both over large farms as well as over the smaller ones, even if it was to a lesser

extent; small scale agriculture uses SAPS to compensate the lack of performance and shall continue in this manner to obtain products with high quality value, from different varieties and breeds, and practice an agriculture that complies with the environmental conditions and maintains diversity.

The accession has allowed the **increase of the services value for agriculture**, even if this is situated yet much under the level of those in the developed member states, as a consequence of important funds being allotted within the two CAP pillars.

From the point of view of the **agricultural production structure** it cannot be concluded that the accession has changed anything, the variations of the cereal sector production value being caused mostly by climate conditions or as a consequence to specific situations; the only sector where production increased substantially after the accession is the one of rice, because of the stimulating foreign investment and the perspective of accessing European funding.

As to the **production per hectare** it cannot be stated that during the first three years after the accession the CAP application had any real influence; the situation is due mainly to the lack of organization on the channel of products and the large number of small sized farms, that are not capable to record performances comparative to those of the trading farms.

After the accession **the trading exchanges of Romania with the EU member states intensified**, but most of all the imports. In recent years and as a consequence of receiving European and national subsidies, Romania has succeeded to produce cereals in quantities that exceed the internal need, becoming one of the most important European cereal exporters.

In view of improving the management administration agricultural markets and the rural environment, both the political factors responsible with the agricultural field, as well as the agricultural producers must consider few aspects namely:

-in order to fully take advantage of the possibilities offered by the instruments of the Common Agricultural Policy and the demand and prices increase its necessary that Romanian producers organize and perform together major

investments in cereal storage and conditioning facilities; the majority of Romanian producers sell the cereals immediately after harvest, when prices are at their lowest level; storage in good conditions of the harvest may practically allow a substantial increase of profits.

-adoption of political measures meant to ensure the fully use of the arable land; Romania cannot allow under the actual conditions to leave outside the productive cycle nearly 2 million hectares every year, while a large part of the products that could be produced on these unworked fields continue to be imported;

-measures for the productivity increase in the agricultural sector and especially with the reduction of the reliance on climate conditions, that presently categorically influence the performances of the Romanian agriculture; establishment of an advanced irrigation system, of some varieties resistant to drought and the creation of protection forest belts represent some of the most pressing measures in this respect;

-acceleration of the development process and consolidation of the agricultural structures;

-increase of the average farm size, by regrouping of the arable land;

-organization of channels by product and facilitation of the agricultural products access to markets; therefore such necessary political measures must be adopted to ensure that a large part of the agricultural products reach the markets and avoid that Romania is a net importer any longer, for a series of products, that quantitative and qualitative, it produces or it could produce itself;

-establishment of a credit system accessible to agricultural producers, with costs similar to those practiced in the member states in West Europe;

-stimulation of the introduction of modern agriculture and food industry systems, efficient in organization, marketing and management.

REFERENCES

- [1] Annette Piorr, Klaus Müller, *Rural Landscapes and Agricultural Policies in Europe*, Springer, 2009
- [2] Chakraborty Kiran Sankar, *Rural Markets and Agricultural Marketing*, Mittal Publications, 2009

- [3] Ciaian Pavel, Kancs d’Artis, Swinnen Johan F.M., *EU Land Markets and the Common Agricultural Policy*, CEPS, 2011
- [4] Clanche Jean-François, *Agricultures, territoires et société*, Educagri, 2010
- [5] Dona Ion, *Economia rurală*, Editura Economică Publishing House, Bucharest, 2000
- [6] Directorate-General for Agriculture and Rural Development, *Prospects for Agricultural Markets and Income: in the EU-25 2005-12*, Dictus Publishing, 2011
- [7] Ministry of Agriculture and Rural Development – www.madr.ro
- [8] European Commission – The CAP explained Luxembourg: EUR-OP*, 2008
- [9] www.infoeuropa.ro
- [10] www.fermierul.ro

ECONOMIC EFFECTS OF AGRICULTURAL INTEGRATION OF ROMANIA INTO THE EUROPEAN UNION. CASE STUDY: THE CONTRIBUTION OF AGRICULTURE TO ECONOMIC GROWTH OF THE NORTH-WEST REGION

Ion DONA¹, Anamaria-Aurelia (MORNA) SIMUT¹

¹University of Agricultural Sciences and Veterinary Medicine, Bucharest, 59 Marasti, sector 1, 011464, Bucharest, Romania, ion_dona@yahoo.com, anamaria_simut@yahoo.co.uk

Corresponding author email: anamaria_simut@yahoo.co.uk

Abstract

Regional development, by its magnitude, includes several fields, making many institutions are involved in the development and implementation. Structural Funds are the main financial instruments used by the European Union to reduce disparities and promote economic and social cohesion in Europe. For Romania, the regional development policy is a relatively new concept. Using multi-criteria method was attempted an analysis of the level of agricultural development and North-West agricultural sector contribution to economic growth in the region.

Key words: *cohesion, economic development, North-West region, regional policy*

INTRODUCTION

Regional development policy aims to reduce economic and social disparities between different regions of Europe, acting on significant areas for development, economic growth, agriculture, urban development, environmental protection, employment and training, education, which is why the region development policy is one of the most important and most complex policies of the European Union.[1] The legal basis of EU regional development policy is established by the Treaty establishing the European Union, which defines the objective of regional policy - "reducing disparities between levels of development of different regions and the backwardness of the less developed regions, or islands including rural areas" - and the principles underlying its achievement. Cohesion Policy is one of the key instruments for achieving the fundamental objectives of the European Union. Implementation of the interventions financed by cohesion policy has proven long-term beneficial effects in the harmonious and balanced development of Union and increased its overall competitiveness, even if economic and financial crisis has generated an increased

socio-economic challenge for most of the EU regions. [9]

Moreover, the policy will contribute decisively to achieving Strategy Europe 2020, emphasizing its role as a true mix of policies for Europe. Romania must strongly support maintaining a significant share of cohesion policy in the EU budget after 2013 [11], considering its scope, funds and instruments, as well as allocation of financial resources adequate for the scope of the defined objectives, essential for an intelligent and inclusive development, sustainable on a European, national and local level. [10]

Regarding Romania, a more harmonious development of regions is required, to better adapt to European requirements and competition in the Single Market, given the fact that regional development policy is a relatively new concept for Romania. In this context, an analysis of the level of agricultural development of North-West has been made. North - West (including counties: Bihor, Bistrita-Nasaud, Cluj, Maramures and Satu Mare Salaj) provides 12% of national GDP. In structure, agriculture region participates with 7.4% to the gross domestic product. In terms of industry, it occupies a share of about 26% above the national level. Buildings have a share

of 9.2%, slightly below the national level. In this region services play an important role, with over 47% of the regional domestic product.

MATERIAL AND METHOD

First a SWOT analysis of the region was made and then a simplified method for multi-criteria analysis was used in order to determine the stage of agricultural development of North-West region. The method allows quantification of the state of an economic process according to its real parameters of developing, which are expressed through a variety of specific technical and economic indicators, backed by the data and information of a qualitative nature. [2]

For use in the analysis of regional development of North-West region agriculture of a diagnosis multicriteria method, available indicators were ordered into 10 groups: (I) The way land was used, (ii) the structure of the main crops applied, (iii) the crop production obtained, (iv) production plant yields, (v) livestock animals, (vi) animal density per 100 hectares, (vii) yields in livestock production obtained, (viii) fleet of tractors and agricultural machinery, (ix) macroeconomic indicators, (x) the value of crop production. Each of these groups is in fact an aggregate for comparative evaluation of branch development stage for the analysis of regional agriculture competitiveness. Each group of indicators was attached a note aggregate (aggregate class); this can be determined either as an average ranking criteria or linking place (rank) held the importance or role agreed for each of the indicators belonging to a group of characterization of the general development of the industry. [4]

$$Nag_l = \frac{\sum_{i=1}^n R_l x k_i}{\sum_l k_i}$$

where:

Nag - note the aggregate to characterize a group of indicators for determining the level of development, this serves as a complex indicator at a level of group/criteria;

l - number of groups of indicators used to assess the level of development which at this stage is 10;

R_i – rank of indicator (criterion) or the place of each region compared to the others, depending on the size indicator considered, so each compared region will correspond to a certain rank;

k_i - importance factor attributed to each indicator (criterion) of the development assessment research;

i - scale of values of importance coefficients, in this case the value scale is from 1-13.

The gap between aggregate rankings notes related to each group of indicators and areas indicates the report between compared units.

Determination of the estimator/indicator of overall performance of the entity that is to be compared is based on correlation of grades (ranks) aggregate or average grades for each criterion related to the specific weight assigned to each criterion adopted. [12]

The relationship indicator for setting size or **overall performance estimator of regional agriculture** is the following:

$$EstGL = \sum Nag_l x G_{S_l}$$

and

$$\sum G_{S_l} = 1$$

where:

EstGL - estimator of overall performance of regional agriculture;

Nag_l - Note aggregate for each group of complex indicators;

G_{S_l} - specific weight for each of the groups of complex indicators characterizing the analyzed proces.

Coefficients of specific importance/weight on criteria for calculating global estimator of regional development of agriculture [13] :

GDP - 0.15

Acreage - 0.10

How to use the land - 0.09

Value of agricultural production - 0.12

Total crop production - 0.05

Crop yield - 0.15

No. of animals - 0.06

Animal density - 0.06

Average production - 0.14

Fleet of tractors and agr. machinery - 0,08
 Total - 1.00

RESULTS AND DISCUSSIONS

SWOT Analysis – North-West Region

STRENGTHS	WEAKNESSES
<p>Good accessibility by air (airports in Cluj-Napoca, Oradea and Satu - Mare), high density network of roads and railways; Significant investments in business infrastructure and the formation of clusters of firms with brands and tradition in construction machinery and equipment, furniture and textiles; Underground resources (minerals complex, bauxite, natural gas), IT sector share in creating GVA is growing, expanding ICT sector thank to private companies; Increasing entrepreneurial capacity; Availability of basic services in rural areas; Traditional cultural centers with well structured cross-border relations (Satu Mare, Oradea, which, Salonta, Baia Mare); Natural and human tourism resources of great value to national and international level; The existence of a town with a long universitarian tradition (Cluj Napoca), the other two growing universities in recent years (Oradea and Baia Mare), and other town with potential academic development (Satu Mare); Tradition of performant health services.</p>	<p>Lack of investment for infrastructure development of related roads, railways and airports in the region; Small number of firms in the region who have certifications in quality management and environment; Low productivity, especially in industry; Low investment in research and development; Very few services and products with high added value; Failure and degradation capacity of the sewerage system and water purification; Many urban centers affected by serious social problems and damage to infrastructure; Poor diversification of rural tourism accommodation infrastructure, low labor specialization in tourism, lack of tourism products and brand development support, local and regional; High stiffness/lack of flexibility of the education system (not offering tools for lifelong learning); Small number of healthcare professionals, especially in rural areas and inadequate utilities of health units.</p>

OPPORTUNITIES	THREATS
<p>Using European funds for construction/rehabilitation of access; The existence of several niche market for industrial products, services and furniture; Reorientation and development banks to support the SME sector through diversification; Development of border regions; increasing social and economic relations with Hungary and Ukraine; Increased international interest in tourism in natural parks and cultural tourism; Interest for the development of metropolitan areas; Increased public investment in education.</p>	<p>Although the region is crossed by seven European roads, there is a regional area to be bypassed by the major European corridors; Transferring production capacity of companies to Moldova and Ukraine, with increasing labor costs as a result of EU membership; Poor training of most SMEs in relation to environmental issues, quality, communication, management practices; Low competitiveness of enterprises in the region in the EU market; High level of emigration, especially of skilled labor; Neglecton of cultural heritage; Poor quality of public utilities, reducing the attractiveness of the region; Cancellation of schools in small villages with few students, favoring the occurrence of illiteracy.</p>

Indicators

(I) Main macroeconomic indicators.

With a gross domestic product of \$ 18.0 billion, North West ranked No. 4, below average by 4.8%. Gross added value was 16.2 billion RON, North-West region assuming the place/rank 4 compared with other regions and is 4.5% below average.

Gross domestic product in agriculture, hunting and forestry represented 4.6% of total (2.64 billion USD), which places North-West region on one of the top positions (rank 7), this level of gross domestic product in agriculture, hunting and forestry was 21.9% higher than average (2.16 billion USD).

(ii) The agricultural production

Total agricultural production made by the North-West region totalled 6034.6 billion Ron, out of which 63.49% being the value of crop production, 36.15% animal production and 0.36% were services.

Both total and as components, the value of agricultural production carried out by North-West region held higher than average ranks, except the value of services. In these conditions, compared to regional average, the total value of agricultural production was higher by 19.5%, the plant production by 18.3% and animal production by 23.6%;

(iii) Way of using the land

Compared to other regions, the North-West region has a high rank (6) in terms of area (3.4 million hectares), which is 14.6% higher than the national average (3.0 million hectares).

(iv) Acreage

In North-West region were cultivated 958,200 hectares, 13.7% less than the regional average. Comparing the acreage in the North-West with those of regional media have highlighted the following main aspects:

- Rank acreage in the North-West from barley, potatoes and vegetables were above the regional average, 77.4% higher for potatoes, 9.4% in barley and 4.3% for vegetables;

- In other cultures considered, ranking acreage in the North-West was below the regional average; acreage situation in the North-West, compared to the regional average, was as follows: they cultivated 559,000 hectares of cereal grain, 19.3% less than the regional average, sugar beet were cultivated on 4400 hectares, with 22.0% less, with corn were seeded 310,600 acres (22.4% more less), with wheat and rye were cultivated 138,300 hectares, 36.7% below average, with plants that oil and sunflower acreage in the North-West totalled 65.7 and 61.7 th. hectares, being with 61.9% and 58.5% below average respectively.

NAG established group of indicators considered for analysis of North-Western cultures structure is 3., a level which is 24.8% below the regional (5203).

(v) Total vegetal production

Aggregate grapes, sunflower, maize and cereal grains were below the regional average of the

total vegetable production related to these crops (to -56.3% in grapes, with -47.4% for sunflower, with -11.1% of maize, with -2.0% in cereal grains).

Over the regional average stood wheat and rye crops (by 15.1%), barley and barley (by 16.2%), fruit (by 48.2%), sugar beet (by 50%) and potatoes (by 75.3%).

NAG obtained for total crop production in the North-West is 5.556 and is similar to the regional average of indicators related to this group.

(vi) Yields in crop production

Average production in the North-West crop sector were over the national average in all cultures.

Comparing the yields obtained in the North-West vegetable sector with regional average we notice that the largest differences were recorded for sugar beet (with 92.3%), wheat and rye (with 81.8%), grains (with 68.9%), sunflower (with 26.7%).

NAG corresponding average production crop production in North-West was 7.429, this level being above the regional average by 33.3%. The gap between NAG corresponding average production and crop production in North-West NAG is 1 to 0.75 for yield in the analyzed region.

(vii) Number of animals

Northwest region, compared with other regions, recorded the highest ranking (9) in pigs and breeding sows, respectively. Compared to the regional average, pigs and breeding sows in North-West are higher with 49.1% and 40.0% respectively.

The total herds of cattle (326,200 heads) and that of cows, buffaloes and heifers (318,700 heads) existing in the Northwest region ranks a leading position compared with other regions, above regional average with 35.8% and 24.1 times respectively.

With 1,039,700 sheep heads, North-West is situated near the regional average (1,015,600 heads).

NAG determined for the group of indicators characterizing livestock in North-West is 8.159, the gap with the regional average is 1 to 0.42 for livestock in North-West.

(viii) Animal density per 100 hectares

Analyzing the density of livestock belonging to different species per unit area reveals the following important aspects:

- In sheep and sheep-mother was a density of 7.7% and 9.9% lower than the regional average;
- In cattle and dairy cows with 24.15 heads/100 ha and 15.65 heads/100 ha, North-West region recorded a relatively high density (rank 8);
- compared to regional media these levels are higher by 19.5% and 27.7%;
- Average density of pigs and the stock of sows in herds (94.84/100ha, 5.79/100ha, respectively) was above the regional average (with 72.9% and 62.3% respectively).

NAG related to animal density in the North-West is 6500 with 50.0% above the regional average size corresponding NAG; gap with the regional average is 1 to 0.67 for NAG related animals of the North-West.

(ix) Efficiency in livestock production

The average production in the livestock sector in the Northwest region was slightly above the national average except wool product.

The highest levels (rank 8) were egg productions, higher than the regional average with 13.0%.

Cow's milk and sheep's milk productions (rank 7 each) were only 3.0% and 10.4% above the regional average.

In these conditions the level of North-West NAG is 6.714, with 80.8% higher than the national average. The gap to the regional average is 1 to 0.55 for yields prevailing in North-West.

(x) Fleet of tractors and agricultural machines

Fleet of tractors and agricultural machines owned businesses from North-West region is above the regional average.

Regarding the number of tractors and plows, the North-West has the highest ranking (9).

Fleet of tractors and agricultural machines in the North West compared to regional average was higher by 36.9% to individual agricultural tractors, with 36.7% in tractor plows, 30.9% for self-propelled combine harvesters straw, corn fodder and 1.8% in mechanical seeders.

Synthesis of the size of tractors and agricultural machinery park in Northwest Region is the area

for one tractor, which was of 33.1 hectares. With this level, North-West is the second smallest (rank 2), and compared with the national average (52.5 ha/tractor), this indicator is 37.0% lower.

Note aggregate set for tractors and agricultural machinery park in the North-West was 6.400 - a level that is 45.5% above the regional average (4400), the gap is 1 - 0.96 for fleet of tractors and agricultural machines from North-West.

Overall estimator of the agricultural sector efficiency

Using the specific notes of the analyzed North-Western indicators on the importance given to each estimator, a specific regional overall efficiency of agriculture was determined. After calculations, the overall efficiency of the estimator specific regional agricultural sector of the North-West is 6.326 and is 26.2% higher compared to the average regional level.

CONCLUSIONS

Although regional agriculture gives only 7.4% to the gross domestic product, for the North-West region the overall efficiency estimator of the agricultural sector is 6.326 and ranks the higher place between development regions (rank 9) and is 26.2% higher compared to the average regional level.

REFERENCES

- [1] Aprodu, I.C., *Decalaje agricole si dezvoltare economica regionala in Romania*, Teza de Doctorat, ASE, 2006.
- [2] Gavrilesu, D. (coord.) Davidovici, I., *Economia cresterii agroalimentare*, Editura Expert, Academia Româna, Bucuresti, 2002.
- [3] Gavrilesu Dinu, Davidovici Ioan, Giurcă Daniela, *Economia României - lecții ale tranziției - spațiul rural și sectorul agroalimentar românesc*, Editura Expert, București, 2001
- [4] Dona Ion, *Economia rurală*, Editura Economică, București, 2000
- [5] Iancu, Aurel, *Problema convergenței economice*, 'Oeconomica', nr.4, 2006.
- [6] Idu, Pompilia, *Instrumentele structurale si convergența statelor in Uniunea Europeana*, 'Oeconomica', nr.3, 2006.
- [7] Quah, Danny T., Twin Peaks: Growth and Convergence in Models of Distribution Dynamics, 'The Economic Journal', vol.106, nr.437, July 1996, p.1045-1055.

[8] Sala-i-Martin, Xavier, *Regional Cohesion: Evidence and Theories of Regional Growth and Convergence*, ‘European Economic Review’, vol.40, 1996, p.1325-1352.

[9] Schreyer, Paul și Pilat, Dirk, *Measuring Productivity*, ‘OECD Economic Studies’, nr. 33, 2001.

[10] Solow, Robert M., *Perspectives on Growth Theory*, ‘Journal of Economic Perspectives’, vol.8, nr.1, Winter 1994, p.45-54.

[11] Ungureanu, M.D., *Analiza echilibrelor la nivelul bugetului comunitar din perspective Statutului României de țară membră a Uniunii Europene*, Teza de doctorat, ASE, 2011.

[12] Zahiu Letiția, Dachin Anca, Alexandri Cecilia, *Agricultura în economia României - Între așteptări și realități*, Ceres, 2010

[13] Institutul Național de Statistică, *Anuarul statistic al României*, 1990-2010.

NEW CORRELATION COEFFICIENT FOR DATA ANALYSIS

Dragos FALIE¹, Livia DAVID²

¹Politechnical University of Bucharest, Romania, 1-3 IuliuManiu, 030791, Bucharest, Romania, E-mail : Dragos.Falie@IEEE.org,

²University of Agricultural Sciences and Veterinary Medicine, Bucharest, 59 Marasti, sector 1, 011464, Bucharest, Romania, E-mail:Livia_David@hotmail.com, Phone:+40722602064

*Corresponding author email:*dragos.falie@ieee.org

Abstract

The proposed correlation coefficient better characterize the statistical independence of two random variables that are a linear mixture of two independent sources. This correlation coefficient can be calculated with analytical relations or with the known algorithms of independent components analysis (ICA). The value of the correlation coefficient is zero when the random variables are a statistically independent and it is one when these are fully dependent.

Keywords:blind separation of sources, correlation, ICA, statistical independence

INTRODUCTION

The dependences between two random variables and is represented generally by a correlation relation and the commonly used is the Pearson correlation coefficient[1]:

$$\rho(\tilde{x}_1, \tilde{x}_2) = \frac{E[(\tilde{x}_1 - E[\tilde{x}_1]) \cdot (\tilde{x}_2 - E[\tilde{x}_2])]}{\sigma(\tilde{x}_1) \cdot \sigma(\tilde{x}_2)} \quad (1)$$

where E is the expectation operator and σ is the standard deviation of a random variable :

$$\sigma(\tilde{x}) = \sqrt{E[(\tilde{x} - E[\tilde{x}])^2]} \quad (2)$$

The correlation coefficient (1) has a simpler relation:

$$\rho(\tilde{x}_1, \tilde{x}_2) = E[\mathbf{x}_1 \cdot \mathbf{x}_2] \quad (3)$$

if the random variables and are normalized:

$$\mathbf{x}_1 = \frac{\tilde{x}_1 - E[\tilde{x}_1]}{\sigma(\tilde{x}_1)}, \quad \mathbf{x}_2 = \frac{\tilde{x}_2 - E[\tilde{x}_2]}{\sigma(\tilde{x}_2)} \quad (4)$$

The simplest situation is when $\mathbf{x}_1, \mathbf{x}_2$ are a linear mixture of two statistically independent normalized random variables s_1, s_2 named sources:

$$\mathbf{x}_1 = a_{11} \cdot s_1 + a_{12} \cdot s_2, \quad \mathbf{x}_2 = a_{21} \cdot s_1 + a_{22} \cdot s_2 \quad (5)$$

In this case the correlation coefficient between $\mathbf{x}_1, \mathbf{x}_2$ is:

$$\rho(\mathbf{x}_1, \mathbf{x}_2) = a_{11} \cdot a_{21} + a_{12} \cdot a_{22} \quad (6)$$

Assuming that the unit vectors along the x, y axis corresponds to s_1, s_2 and $\mathbf{x}_1, \mathbf{x}_2$ are given by (5) then \mathbf{x}_1 can be represented in a \square^2 space by

the vector $[a_{11}, a_{12}]$ and \mathbf{x}_2 by the vector $[a_{21}, a_{22}]$. With this representation the correlation coefficient (6) can be represented geometrically as the scalar product between \mathbf{x}_1 and \mathbf{x}_2 .

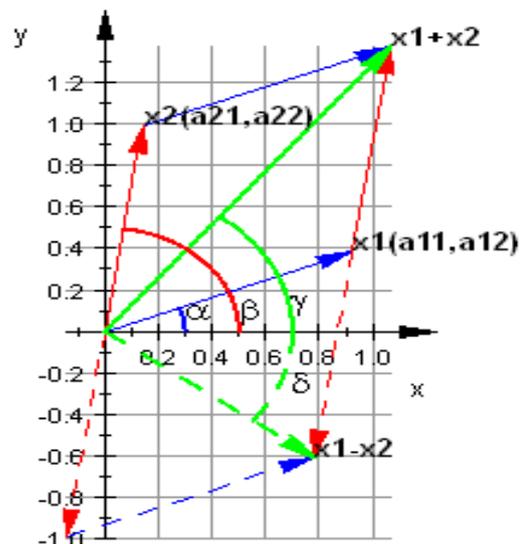


Fig. 1. The dependence of $\mathbf{x}_1, \mathbf{x}_2$ on s_1, s_2 . On the x ax that corresponds to s_1 , the coefficients a_{11}, a_{12} are represented. On the y ax that corresponds to s_2 , the coefficients a_{21}, a_{22} are represented.

Due to the fact that $\mathbf{x}_1, \mathbf{x}_2$ are normalized then $a_{11}^2 + a_{12}^2 = 1$ and $a_{21}^2 + a_{22}^2 = 1$. In this case the relations (5) can be rewritten as:

$$\begin{aligned} \mathbf{x}_1 &= s_1 \cos(\alpha) + s_2 \sin(\alpha) \\ \mathbf{x}_2 &= s_1 \cos(\beta) + s_2 \sin(\beta) \end{aligned} \quad (7)$$

where the α, β are the angles formed by $\mathbf{x}_1, \mathbf{x}_2$ with the x ax respectively.

Using (7) the correlation coefficient takes a very simple trigonometric form:

$$\rho(\mathbf{x}_1, \mathbf{x}_2) = \cos(\alpha - \beta) \quad (8)$$

In the case when both $\mathbf{x}_1, \mathbf{x}_2$ have a Gaussian distribution or any one of the coefficients $a_{11}, a_{12}a_{21}$ and a_{22} equals to zero, then the absolute value of the correlation coefficient measure the statistical dependence between the random variables $\mathbf{x}_1, \mathbf{x}_2$. In this case if the correlation coefficient is zero then $\mathbf{x}_1, \mathbf{x}_2$ are statistically independent. In the other cases the correlation coefficient may not correctly show the statistical dependence between \mathbf{x}_1 and \mathbf{x}_2 .

For example the Pearson's correlation coefficient expressed by Eq. (8) is zero in the case when the random variables are “orthogonal”:

$$\alpha - \beta = \frac{\pi}{2} + k \cdot \pi, \quad k \in \mathbb{Z} \quad (9)$$

In this case the variables $\mathbf{x}_1, \mathbf{x}_2$ are not statistical independent if in (8) $\alpha \neq +k\pi/2$ and quite dependent in the particular case when $\alpha = \pi/4$ and $\beta = \alpha + \pi/2$:

$$\mathbf{x}_1 = \frac{\sqrt{2}}{2}(s_1 + s_2), \quad \mathbf{x}_2 = \frac{\sqrt{2}}{2}(s_1 - s_2) \quad (10).$$

MATERIAL AND METHOD

The random variables $\mathbf{x}_1, \mathbf{x}_2$ given by (5), are independent, when $a_{11}a_{12} = 0$ and $a_{21}a_{22} = 0$. In this case, but not only, the Pearson correlation coefficient (6) is zero. It would be therefore useful to provide an indicator, which is different from zero when the variables \mathbf{x}_1 and \mathbf{x}_2 are dependent but the Pearson coefficient is zero.

The new correlation coefficient that we propose is defined with the following formula:

$$R(\mathbf{x}_1, \mathbf{x}_2) = |a_{11} \cdot a_{21}| + |a_{12} \cdot a_{22}| \quad (11)$$

The value of R is zero only when the random variables (5) are statistical independent and one when these are fully dependent. It has been noted with the Latin letter R similar with the correlation coefficient that is usually noted with the Greek letter ρ .

By using (7) the correlation coefficient R can be expressed as:

$$R(\mathbf{x}_1, \mathbf{x}_2) = \max \{ |\cos(\alpha - \beta)|, |\cos(\alpha + \beta)| \} \quad (12)$$

It can be noticed that the Pearson correlation coefficient expressed as in Eq.(8) is the same with R when:

$$|\cos(\alpha - \beta)| > |\cos(\alpha + \beta)| \quad (13)$$

On Fig. 2 is represented the particular case when $\mathbf{x}_1, \mathbf{x}_2$ are orthogonal $\beta = \alpha + (2k+1)\pi/2$. In this case the Pearson's correlation coefficient (8) is zero but, R may vary from 0 to 1:

$$R(\mathbf{x}_1, \mathbf{x}_2) = |\sin(2 \cdot \alpha)|, \quad \beta = \alpha \pm (2k+1)\frac{\pi}{2}, \quad k \in \mathbb{Z} \quad (14)$$

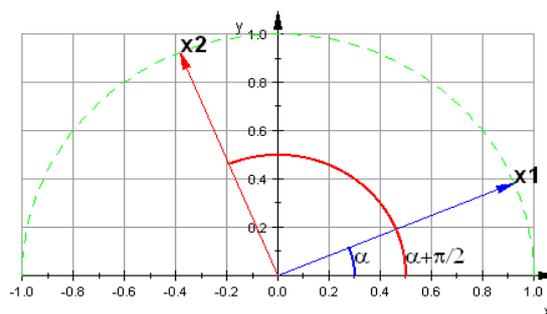


Fig. 2. The dependence of two orthogonal random variables $\mathbf{x}_1, \mathbf{x}_2$ on s_1, s_2 . The x, y axis corresponds to s_1, s_2 .

When $\alpha = \pi/4$ then $R=1$ and $\mathbf{x}_1, \mathbf{x}_2$ are in the most dependent situation. Other particular cases are when $R=1/2$ when $\alpha = \pi/12$ and $R=\sqrt{3}/2$ when $\alpha = \pi/6$.

The random variables $\mathbf{x}_1, \mathbf{x}_2$ are fully dependent and $R=1$ when:

$$R(\mathbf{x}_1, \mathbf{x}_2) = \sin(\alpha)^2 + \cos(\alpha)^2 = 1, \quad (15)$$

$$\beta = \pm\alpha + k \cdot \pi, \quad k \in \mathbb{Z}$$

The correlation coefficient R can be calculated by Eq. (11) if $\mathbf{x}_1, \mathbf{x}_2$ are separated into independent components by using an independent components analysis (ICA) algorithm [2-4].

R may be calculated also with Eq. (12) in which case, what is needed is, to evaluate $\cos(\alpha + \beta)$, $\cos(\alpha - \beta)$ being known via (8).

To compute R with (12) is necessary to know the value of:

$$r(\mathbf{x}_1, \mathbf{x}_2) = \cos(\alpha + \beta) \quad (16)$$

Analytical solution for $r(\mathbf{x}_1, \mathbf{x}_2)$ is:

$$\cos(t)^2 = \frac{k_{40} - 2k_{22} + k_{04}}{k_{40} + 2k_{22} + k_{04}} \quad (17)$$

where:

$$k_{40} = E[\mathbf{o}_1^4] - 3, \quad k_{04} = E[\mathbf{o}_2^4] - 3, \quad (18)$$

$$k_{22} = E[\mathbf{o}_1^2 \mathbf{o}_2^2] - 1$$

Eqs.(17), can be obtained only when the following condition is fulfilled:

$$E[(\mathbf{o}_1^2 + \mathbf{o}_2^2)^2] - 8 = E[\mathbf{s}_1^4] + E[\mathbf{s}_2^4] - 6 \neq 0 \quad (19)$$

For a Gaussian source $E[s_4]=3$ and in this case if both sources $\mathbf{s}_1, \mathbf{s}_2$ are Gaussian (19) is not fulfilled. If for one of the sources $E[\mathbf{s}_1^4]<3$ and for the other $E[\mathbf{s}_2^4]>3$ such as (19) is not fulfilled then the solution cannot be calculated with (17). Also in the case when one of the sources are a mixture of two random variables such as $E[\mathbf{s}_1^4]=3$ and the other source is or not Gaussian but for it also $E[\mathbf{s}_2^4]=3$ then the solution cannot be computed with (17).

When (19) is fulfilled R can be calculated knowing $\tan(t)$ obtained with the Comon’s relation [5] or with the alternative Comon’s formula (ACF)[8,3,14]:

$$\tan(t) = \frac{2k_{22}}{k_{31} - k_{13}} \quad (20)$$

where:

$$k_{31} = E[\mathbf{o}_1^3 \mathbf{o}_2], \quad k_{13} = E[\mathbf{o}_1 \mathbf{o}_2^3] \quad (21)$$

The best results are obtained with the following relation:

$$\tan(2t) = \frac{4(k_{31} - k_{13})}{k_{40} - 6k_{22} + k_{04}} \quad (22)$$

The above relation is known as the approximate maximum likelihood (AML) estimator [10-12,5]. This relation can also be obtained by combining $E[\mathbf{o}_1 \mathbf{o}_2^3]$ and $E[\mathbf{o}_1^3 \mathbf{o}_2]$. Additionally the condition (19) need to be fulfilled.

RESULTS AND DISCUSSIONS

R corrects the Pearson’s correlation coefficient only when all the coefficients a_{11}, a_{12}, a_{21} and a_{22} in (5) are different from zero. If one of these coefficients equal zero then the system (5) reduces to:

$$\mathbf{x}_1 = \mathbf{s}_1, \quad \mathbf{x}_2 = a_{21} \cdot \mathbf{s}_1 + a_{22} \cdot \mathbf{s}_2 \quad (23)$$

and the two correlation coefficients gives the same result.

The correlation matrix ρ and R between the changing rates of different currency are presented in the Tab. 1 and 2 respectively. The difference between ρ and R is presented in Table 3.

A general remark is that there are enough cases where ρ has been corrected by R to justify the

use of the new correlation coefficient. In this example the corrected correlation R has a greater value than ρ .

TABLE 1. CORRELATION MATRIX

	gold	\$ USA	€	£ UK	f Sw	\$ Ca	\$ Au
gold	0.996	0.953	0.230	0.854	0.860	0.940	0.916
\$ USA	0.953	0.996	0.196	0.833	0.820	0.964	0.877
€	0.230	0.196	0.996	0.562	0.479	0.085	0.187
£ UK	0.854	0.833	0.562	0.996	0.915	0.765	0.801
f Sw	0.860	0.820	0.479	0.915	0.996	0.785	0.878
\$ Ca	0.940	0.964	0.085	0.765	0.785	0.996	0.927
\$ Au	0.916	0.877	0.187	0.801	0.878	0.927	0.996

TABLE 2. CORRECTED CORRELATION MATRIX

	gold	\$ USA	€	£ UK	f Sw	\$ Ca	\$ Au
gold	0.996	0.983	0.286	0.999	0.906	0.940	0.954
\$ USA	0.983	0.996	0.279	1.000	0.996	0.964	0.977
€	0.286	0.279	0.996	0.562	0.479	0.085	0.249
£ UK	0.999	1.000	0.562	0.996	0.993	0.984	1.000
f Sw	0.906	0.996	0.479	0.993	0.996	0.999	0.969
\$ Ca	0.940	0.964	0.085	0.984	0.999	0.996	1.000
\$ Au	0.954	0.977	0.249	1.000	0.969	1.000	0.996

TABLE 3. THE DIFFERENCE BETWEEN THE TWO CORRELATION COEFFICIENTS

	gold	\$ USA	€	£ UK	f Sw	\$ Ca	\$ Au
gold	0.000	-0.030	0.056	0.145	0.046	0.000	-0.039
\$ USA	-0.030	0.000	0.083	0.167	0.176	0.000	-0.100
€	0.056	0.083	0.000	0.000	0.000	0.000	-0.062
£ UK	0.145	0.167	0.000	0.000	-0.078	-0.219	-0.199
f Sw	0.046	0.176	0.000	-0.078	0.000	-0.214	-0.090
\$ Ca	0.000	0.000	0.000	-0.219	-0.214	0.000	-0.073
\$ Au	-0.039	-0.100	0.062	0.199	0.090	0.073	0.000

As was expected there are also a lot of cases where the data structure has the simple form as in (23) which case the two correlation coefficients gives the same or very close results.

For example in the 5th row of table 3 the dependence of the Canadian \$ on gold, USA \$ and € has a simple structure but, the dependence on the £ UK and Swiss franc is complex it impose the use of the new correlation coefficient.

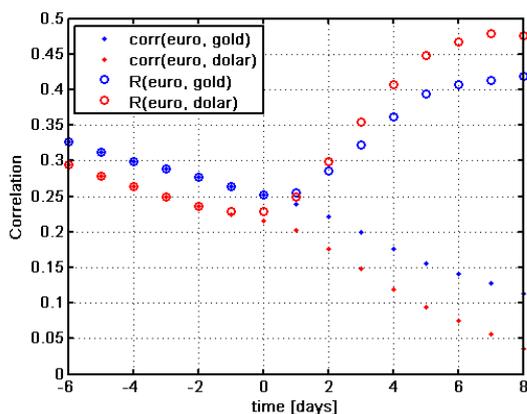


Fig. 3. The time dependence of the correlation coefficients ρ and R between € and the gold price and \$ USA.

The time dependence of the correlation coefficients is represented in Fig. 3. One can observe that if the data of the gold price and USA \$ are shifted in the past with 0...6 days the values of the two correlation coefficients are the same. This indicates that the data structure in these cases has the simple form(23)

The data structure changes if the same data (gold price and USA \$) is shifted in the future with 1...8 days. This example shows that if the data structure is not priory known is better to use the new correlation coefficient.

CONCLUSIONS

The proposed correlation coefficient R corrects the Pearson relation and show the statistical dependence between two random variables that are a linear mixture of two independent sources.

R can be calculated with analytical relations or can be obtained by ICA algorithms also. Beside the known relation to calculate R a new analytical relation has been proposed (17).

There are situations when the random variables does not satisfy the condition (19) and R needs to be calculated using ICA algorithms [7].

Even if to compute R is a little bit more complicate than to calculate the correlation coefficient the advantage to know it (R) are considerable. In many cases the random variables does not have the simple structure of (23) and the Pearson's correlation coefficient may give inaccurate values.

In economics, stock market [9] and other fields the dependences between different random variables cannot always be correctly evaluated with the correlation coefficient but R can easily clarify the problem.

REFERENCES

- [1]Back, A.D. and A. S. Weigend, *A first application of independent component analysis to extracting structure from stock returns*, International Journal of Neural Systems, vol. 8, pp. 473-484, Aug 1997.
- [2]Comon, P., *Separation of Stochastic Processes*, in Proceedings Workshop on Higher-Order Spectral Analysis, 1989, pp. pp. 174-179.
- [3]Comon, P.,*Separation of sources using higher-order cumulants*. Vol. 1152, 1989.
- [4]De la Rosa,J.J.G. et al., *Higher order statistics and independent component analysis for spectral characterization of acoustic emission signals in steel pipes*, Ieee Transactions on Instrumentation and Measurement, vol. 56, pp. 2312-2321, Dec 2007.
- [5]Harroy, F. and J.-L. Lacoume, *Maximum likelihood estimators and Cramer-Rao bounds in source separation*, Signal Processing, vol. 55, pp. 167-177, 1996.
- [6]Hyvarinen, A.,*Fast and robust fixed-point algorithms for independent component analysis*, Ieee Transactions on Neural Networks, vol. 10, pp. 626-634, May 1999.
- [7]Hyvarinen,A.,*The fixed-point algorithm and maximum likelihood estimation for independent component analysis*, Neural Processing Letters, vol. 10, pp. 1-5, Aug 1999.
- [8]Lacoume, J.L. et al., *Statistiques d'Ordre Supérieur pour le Traitement du Signal*. Paris: Masson, 1997.
- [9]Stuart, A. and J. K. Ord, *Kendall's Advanced Theory of Statistics*, sixth ed. vol. I. London: Edward Arnold, 1994.
- [10]Zarzoso,V. et al., *Optimal pairwise fourth-order independent component analysis*, Ieee Transactions on Signal Processing, vol. 54, pp. 3049-3063, Aug 2006.
- [11]Zarzoso, V. and A. K. Nandi, *Closed-form estimators for blind separation of sources - part II: Complex mixtures*, Wireless Personal Communications, vol. 21, pp. 29-48, Apr 2002.
- [12]Zarzoso, V. and A. K. Nandi, *Closed-form estimators for blind separation of sources - part I: Real mixtures*, Wireless Personal Communications, vol. 21, pp. 5-28, Apr 2002.
- [13]Zarzoso, V. et al., *A contrast for independent component analysis with priors on the source kurtosis signs*, Ieee Signal Processing Letters, vol. 15, pp. 501-504, 2008 2008.
- [14]Zhang, Z. et al., *Blind source separation by combining independant component analysis with complex discrete wavelet transform*, 2007 International Conference on Wavelet Analysis and Pattern Recognition, Vols 1-4, Proceedings, pp. 549-554, 1924, 2007.

DISTRIBUTION ASPECTS OF THE DIRECT PAYMENTS BETWEEN EU MEMBER STATES

Gina FINTINERU¹, Elena COFAS¹

¹University of Agricultural Sciences and Veterinary Medicine, Bucharest, 59 Marasti, District 1, 011464, Bucharest, Romania, Phone: +40(21)3182266; E-mail: gina.fintineru@usamv.ro; elacofas@yahoo.com

Corresponding author email: gina.fintineru@usamv.ro

Abstract

EC proposals concerning CAP reform for 2014-2020 try to cope both with the wide variety of agricultural systems and economic structures of the 27 EU MS but also with current global challenges that agriculture has to face: food security and poverty reduction, climate changes or biodiversity loss. This article aims to analyse the proposed measures consistency with the current situation of Romanian agriculture. Distribution aspects of the direct payments between Member States are concerned. The data are originated in FADN and Eurostat statistics, and a non parametric approach is used in order to better understand the correlation between the direct payments proposed for 2014 -2020 and some socio economic criteria. The paper provides a brief analysis of the existing research concerning the distributional aspects (studies and statistics) and contributes to the debate by examining if the proposed redistribution is a consistent and coherent answer to the future challenges the agriculture has to meet in the future and to the targeted equity criteria.

Key words: common agricultural policy, direct payments, redistribution, 2014 -2020 programming period

INTRODUCTION

Several reforms have led to the actual configuration of the EU CAP. Starting with 1992, its market orientation has increased while providing direct support to producers. The Agenda 2000 introduced environment focus and strengthen rural development dimension. During the last decades, demand for a better distribution of direct payment across Member States has raised. The current CAP reform proposes more equity in the support distribution across Member states, while also changing the direct payment system.

The current EU direct payment system, includes a SPS covering 16 Member States (EU-15 plus Slovenia) and a SAPS, operating in the new MS. SPS is not linked to farmers' current production but based on historical references. It remained strongly positively correlated with the productivity of farm (past crop yields and livestock herd stocking) and therefore difficult to justify [1]. Bringing rational criteria into the future distribution of CAP payments will contribute to the fulfilment of CAP's objectives.

The Commission proposed to replace the current schemes (SPS and SAPS) with: a single basic payment scheme across the EU, an additional payment (30% of annual national ceiling) for farmers following agricultural practices beneficial for the climate and the environment (greening), a voluntary additional payment (up to 5% of annual national ceiling) for farmers in areas facing specific natural constraints, an additional payment (up to 2% of annual national ceiling) for young farmers, a simplified scheme for small farmers (up to 10% of annual national ceiling) and a voluntary coupled support scheme (up to 5% of annual national ceiling) for specific types of farming; possibility to maintain Complementary National Direct Payments for Bulgaria and Romania and includes a specific payment for cotton [5].

Acknowledging the merit of this proposal, the first in a long series of CAP reforms, trying to introduce more equity by the redistribution of agricultural payments among and within MSs, in order to make the CAP support equitable and balanced [European Commission, 2010, p. 6], we express some concerns regarding the

adaptability of these measures to the Romanian socio-economic and environmental situation.

This paper contributes to the debate by examining if the proposed redistribution is a consistent and coherent answer to the future challenges the agriculture has to meet and to the targeted equity criteria

MATERIAL AND METHOD

The data for this paper are mainly originated in the Commission proposal and strategic documents. The socioeconomic indicators from FADN and Eurostat database have been statistically processed and interpreted. A non parametric approach was used in order to better understand the correlation between the direct payments proposed for 2014 -2020 and some socio economic criteria : the farmers ‘income level, agricultural area, agricultural employment, the inputs cost, the farm structure. A Spearman's coefficient was used as statistic test to establish whether the analyzed variables may be regarded as statistically dependent.

RESULTS AND DISCUSSIONS

The proposals on the multi-annual financial framework (MFF) 2014-2020 are based on a "nominal freeze" of the CAP (both pillars) at the 2013 level. Direct payments remains the most important feature of CAP, being proposed their redistribution across MS so as to achieve more equity and to enable agriculture to meet the future objectives: viable food production; sustainable management of natural resources and climate action; balanced territorial development. For 2014, the first pillar budget is forecasted to be at €42.5 billion, to be dedicated mostly (80%) to the old MS, with big disparities of the national payments: Greece and Netherland with €550 respectively €420 per hectare; on the other side, Latvia and Romania with €89, and €107 per hectare.(Table 1). The 2011 Commission proposal aims a better distribution of support, both across the Member States and within them, in order to improve resource efficiency and to make payments more understandable to the taxpayer and more linked to policy objectives.[5]

Table 1: National ceilings for the basic payment scheme, 2014-2020

	2014	2020		Per ha 2014	
	000 EUR	%	000 EUR	%	EUR
Belgium	553521	1,3	525.205	1,2	406
Bulgaria	655661	1,5	812.106	1,9	130
Czech R	892698	2,1	890.229	2,1	252
Denmark	942931	2,2	909.353	2,1	357
Germany	5275876	12,4	5.156.970	12,1	312
Estonia	108781	0,3	134.749	0,3	117
Ireland	1240652	2,9	1.235.779	2,9	296
Greece	2099920	5,0	2.014.751	4,7	550
Spain	4934910	11,6	4.988.380	11,7	216
France	7732611	18,2	7.619.511	17,8	220
Italy	4023865	9,5	3.841.609	9,0	302
Cyprus	52273	0,1	50.290	0,1	432
Latvia	163261	0,4	218.159	0,5	89
Lithuania	396499	0,9	458.267	1,1	147
Luxemborg	34313	0,1	34.123	0,1	262
Hungary	1298104	3,1	1.294.513	3,0	224
Malta	5316	0,0	4.917	0,0	532
Netherlands	806975	1,9	762.521	1,8	420
Austria	707503	1,7	705.546	1,6	223
Poland	3038969	7,2	3.121.451	7,3	194
Portugal	573046	1,4	610.800	1,4	155
Romania	1472005	3,5	1.939.357	4,5	107
Slovenia	141585	0,3	138.096	0,3	302
Slovakia	386744	0,9	402.067	0,9	200
Finland	533932	1,3	535.075	1,3	233
Sweden	710853	1,7	713.681	1,7	232
UK	3624384	8,5	3.662.774	8,6	205
Eu 27	42409202	100,0	42.782.299	100,0	231
Eu 12	8613910	20,3	9.466.221	22,1	167
Eu 15	33795292	79,7	33.316.078	77,9	256

Source: own calculation based on COM(2011) 625 final/2,

In the Commission view, direct payments should have two closely related purposes: to respond to low farm income and to encourage the provision of basic public goods.

We applied a non parametric approach to analyse the correlation between the direct payments distribution scheme proposed for 2014 -2020 and some socio economic criteria in order to understand if the distribution scheme

represents a coherent tool to fulfil these objectives. A Spearman's coefficient was used to establish whether the analyzed variables may be regarded as statistically dependent. The Spearman's rank-order correlation is a nonparametric coefficient and a measure of the strength of association between two ranked variables.

The following indicators were used: the utilised agricultural area, GDP per capita in PPS, the factor income, the farm net added value (FNVA). As FNVA is used to remunerate the fixed factors of production (work, land and capital), whether they be external or family factors, holdings can be compared regardless of the family/non-family nature of the factors of production employed.

The value for both income indicators is given per AWU in order to take into account the differences in the scale of farms and to obtain a better measure of the productivity of the agricultural workforce.

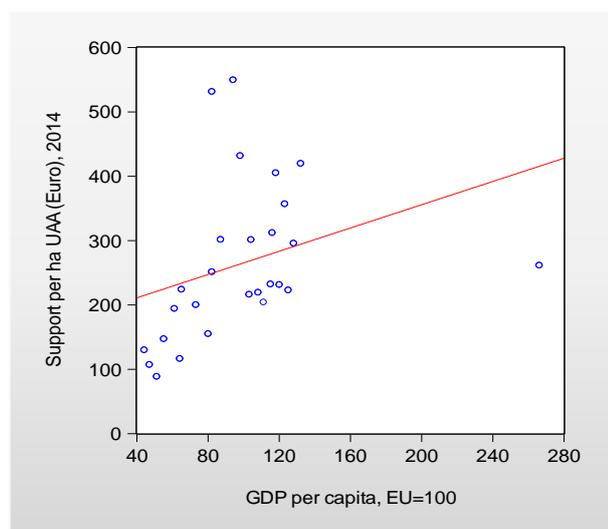


Fig. 1. GDP per capita (PPS, 2010) vs. Direct payments (EUR/ha, 2014) - a non parametric estimation across Member States

Table 2: Spearman's Rank Correlation coefficients

	GDP per capita (PPS, 2010)	Direct payments (EUR/ha, 2014)
GDP per capita (PPS, 2010)	1.000000	0.616089
Direct payments (EUR/ha, 2014)	0.616089	1.000000

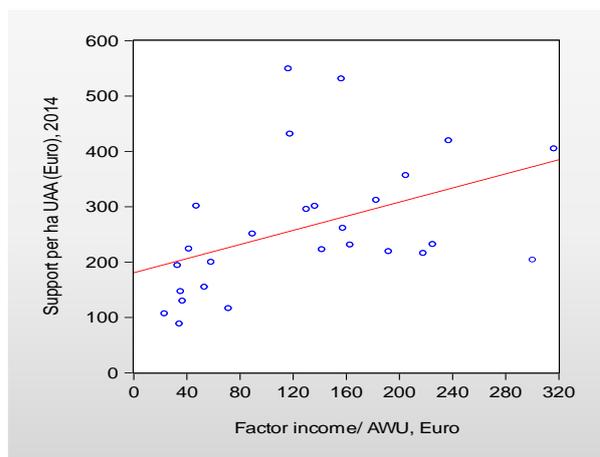


Fig. 2. Farmers' Factor income/ AWU (2009) vs. Direct payments (EUR/ha, 2014) - a non parametric estimation across Member States

Table 3: Spearman's Rank Correlation coefficients

	Farmers' Factor income/ AWU	Direct payments (EUR/ha, 2014)
Farmers' Factor income/ AWU	1.000000	0.539072
Direct payments (EUR/ha, 2014)	0.539072	1.000000

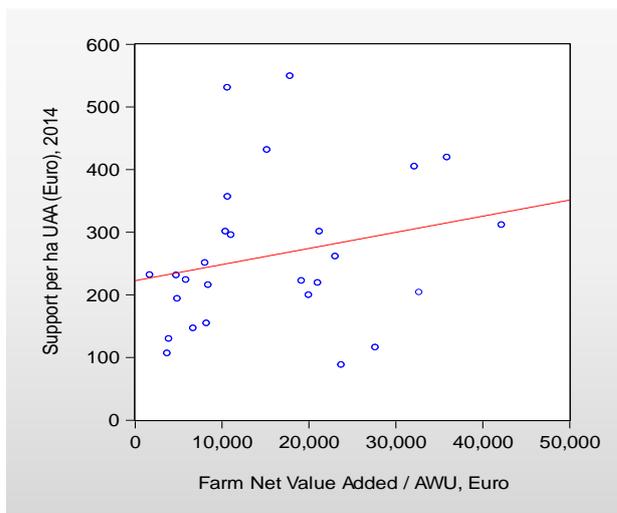


Fig. 3. FNAD/AWU (2009) vs. Direct payments (2014), a non parametric estimation across MS

Table 4: Spearman's Rank Correlation coefficients

	Farm Net Value Added / AWU (2009)	Direct payments (EUR/ha, 2014)
Farm Net Value Added / AWU (2009)	1.000000	0.283272
Direct payments (EUR/ha, 2014)	0.283272	1.000000

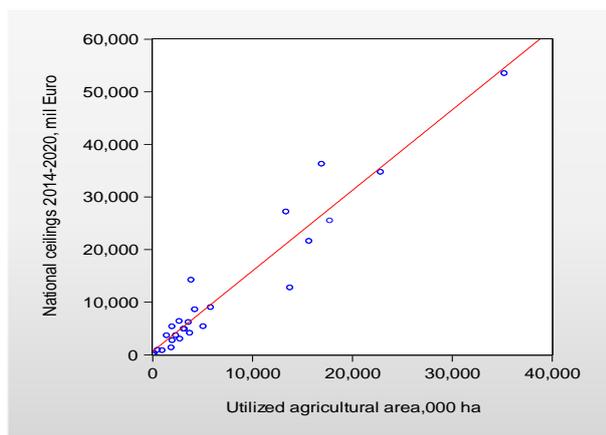


Fig. 4. Utilized agricultural area (2010) vs. Direct payments (EUR/ha, 2014), a non parametric estimation across Member States

Table 5: Spearman's Rank Correlation coefficients

	Utilized agricultural area (2010)	Direct payments (EUR/ha, 2014)
Utilized agricultural area (2010)	1.000000	0.941392
Direct payments (EUR/ha, 2014)	0.941392	1.000000

The results confirmed the existence of a positive agreement between the ranks of all analysed variables, though with different degrees of strengths with the direct payments level (EUR/ha). The level of support is positive and strong correlated with the utilised agricultural area and GDP per capita variables. The approach also shows a lower association between Farmers' Factor income/ AWU and the Direct payments per ha as well as between Farm Net Value Added/AWU and the support level, revealing a lower focus of the chosen redistribution criteria on structural and income gap. Some authors consider that a higher level of income is needed in rich countries to ascertain a fair standard living for farmers and prevent land abandonment, justification being the higher wages in non-agricultural jobs in these countries compared to agricultural employment[4]. But this direction of the DP distribution is not focusing on equity but on non-efficient functional concerns.[3]. Agricultural income in the EU-15 remains much higher than in the EU-12, due to larger farm structures, better yields, but also to a higher income levels in the overall economy [6]. By contrast, real income per AWU has declined in Romania after 2005 [Table 6, Fig 5.]

Table 6: Indices of real income AWU in EU27 and Romania

	(2005 = 100)					
	2005	2006	2007	2008	2009	2010
RO	100,0	99,3	76,8	114,4	97,1	87,7
EU-27	100,0	103,9	114,3	110,4	98,5	111,1

Source : EC, Eurostat EU Agriculture, Statistical and Economic Information, 2011

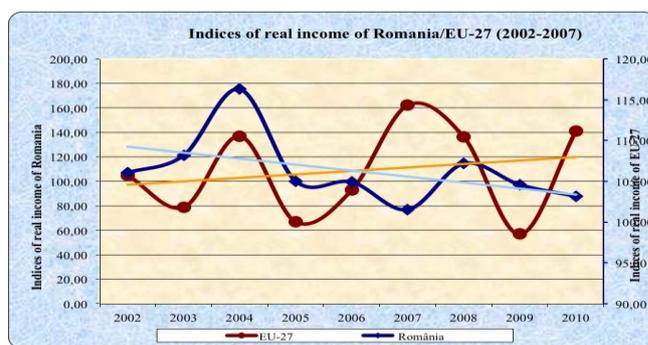


Fig. 5. Indices of real in EU27 and Romania, 2002-2005

CONCLUSIONS

If direct payments were to respond to their basic income function, then a more consideration of relative needs, of actual farm income is necessary. Challenges are real and important for agriculture and all EU farmers should have the chance to strengthen the competitiveness, contributing to a balanced territorial development.

REFERENCES

- [1] Arovuori K, Jyrki Niemi, 2011, *The political feasibility of the fundamental CAP reform the IFAMA World Symposium*, Frankfurt, Germany.
- [2] Henke R., Monteleone A. and Pierangeli F, 2012, *The CAP after 2013: what criteria for resources allocation?*, the 126th EAAE Seminar, Capri (Italy).
- [3] Tangermann S., 2011, *Direct Payments in the CAP post 2013*. Note for the European Parliament's Committee on Agriculture and Rural Development.
- [4] Zahrt, V., 2009. *Public Money for Public Goods: Winners and Losers from CAP Reform*, European Centre for International Political Economy (ECIPE).
- [5] *Proposal for a Regulation Of The European Parliament And Of The Council establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy*, 2011 Brussels.
- [6] *Developments in the income situation of the EU agricultural sector*, 2010, EC, DG Agri, Brussels.

CAUSES OF INSUFFICIENT FINANCIAL RESOURCES IN THE ENTERPRISES

Svetlana GHERJAVCA¹, Mariana DOGA-MÎRZAC¹

¹Moldova State University, 60 A. Mateevici, MD 2000, Chişinău, R. Moldova, Phone: +373 22 577460, E-mail: gherjavcasveta@yahoo.com

Corresponding author email: gherjavcasveta@yahoo.com

Abstract

The paper aimed to present causes of insufficient financial resources in the enterprises. To reach the set goals it was used statistics on activity of enterprises in Moldova as well as data on bank interest rate. To carry on its normal activity, the enterprise needs human, financial and material resources. As for the first two categories of resources (especially human resources), they are sufficient, or even records a surplus, and financial resources are almost always insufficient to business. In terms of the market economy, economic agents by their selves determine the amount and sources of funding, and the ways of increasing them, that's why they are responsible for effective use of financial resources. The importance of effective management of financial resources lies in the fact that it ensures the strategic and tactical objectives, and its participate in increasing activity for foreign investors.

Keywords: financial resources, enterprises, effective management

INTRODUCTION

Efficient management of financial resources is one of the main problems which require to be solved by domestic enterprises today. In market economy, businesses or herself and determine the funding sources and ways of their growth and therefore liable for financial resource efficiency. The importance of the effective management of financial resources is the fact that the latter is responsible for the strategic objectives and tactical, participating in raising the attractiveness for foreign investors. It should be noted that in order to carry out its normal business, the needs of human resources, material and financial resources. As regards the first two categories of resources (particularly human resources), they are sufficient, or even record a surplus, and financial resources are insufficient at the enterprise virtually always.

MATERIAL AND METHOD

In order to illustrate the difficulties of local agents financing were used the next indicators: the average interest rate for loans, people income, GDP. The information was collected from the sites of the Ministry of Economy, the National Bureau of Statistics and from the annual bulletin of the National Bank.

RESULTS AND DISCUSSIONS

Problems faced by domestic enterprises at present for training and use of financial resources can be classified into several categories depending on their nature: [1]

- I. General (which influence the activity of all enterprises);
- II. specific (for some companies that can be attributed to the same group as the active branch, either by regional or by size);
- III. private (characteristic for an enterprise).

Next, we analyze the *general* problems of increasing needs for financial resources, characteristic of the current stage of the economy, namely:

- 1) Low demand. Thus, growth is influenced by a number of social factors such as low salaries, lack of stimulating factors to work more productively, and other factors.

Although the current level of GDP is increasing the share of insolvent enterprises increases too. Thus, one of the factors that restrict the development of enterprises is the low ability to pay customers.

- 2) Uneven distribution of non-financial resources in the territory of the Republic of Moldova. Thus, most of the resources are

concentrated in the capital against outside enterprises.

3) The level of informatization of the country. Contemporary evolution of humanity leads to the realization that somehow unnoticed, but quite perceptibly, information has replaced industrialization. So, much as it did on the last to serve it. Neither substance nor energy, but information and scientific knowledge determines the level of development of the States and now dictates its future industry. It should be noted that, although Moldova remains far behind the developed countries by level of computerization, Information Technologies and Communications Ministry is working on the development of the Republic of Moldova's transition to an information society.

4) High share of shadow economy, reflecting the different problems that face the fiscal policy. This situation tells us that those have yet to find optimal parameters of the tax system which, on the one hand would provide the state with sufficient financial resources and on the other hand contribute to the dynamic development of the economy. Should be noted that the beginning of the transition shadow economy played the role of the social dampers and was an additional source of income of the population, new workforces and cheap goods. At the moment when the metastases of the shadow economy already affected young state, they create significant barriers to attracting investment and civilized forms of entrepreneurship development. Shadow economy accentuates material differentiation of the population, worsening poverty, which the state, even with rapid GDP growth, will not be solved, if the income in the budget funds will be obtained only from the legal economy, and not to be implemented effective mechanism for distribution of income from business.

The *specific* problems of formation and use of financial resources are the following:

- 1) The low level of profitability, since profits are the main source of funds training.
- 2) Limited access of the companies to the borrowed resources (primarily average lending rate about 15% [3], which is above the economic profitability of most enterprises in Moldova).

3) Underdevelopment of the capital market. Thus, to attract capital by issuing shares or bonds is a complicated procedure even for large firms today.

4) Inefficient use of available financial resources and reserves, and the irrational structure of the balance sheet. Financial instruments of analysis and management of current assets can not be applied by enterprises in Moldova due to the unstable environment in which the last activity, namely: irregular deliveries of raw materials, goods that require companies to create excessive stocks, lack of short-term investment opportunities of temporarily free cash in high-liquidity assets, losses caused by the irrational use of temporarily free funds.

Each enterprise is an economic unit complex, whose development is influenced by a number of the external and internal factors (conditioned by the particular enterprise creation, training and other financial resources). Thus, the main factors, characteristic of all branches of national economy, which stops the growth of businesses are: high level of taxation, low capacity to pay clients, contracting credit conditions, economic and political instability, weak demand on foreign markets, the high level of competition. Thus, enterprises face a number of problems (special problems) that stops their development, as well as the economy as a whole.

The main directions of improving the training and use of funds from business

The human and the fix capital development, conditioned by the new technologies, creates a high competitiveness in countries that possess it. New conditions of world economy, namely globalization and the transition to the computerized economy, creates necessary conditions for changing financial relations. The changing of financial relations at the enterprise level are the following:

- 1) The modification of enterprise's costs structure, share of services in production costs increasing. These changes are conditioned by such factors as: delegation of part of tasks, so with production as well service functions related to basic production, transport, management, and other organizations. In

addition, in condition of an accelerated development of technologies, it is no rational to invest a lot of resources in equipment and also in different areas. This entails capital expenditures reducing, costs of purchase of fixed assets, maintenance of equipment, but also increase the rent payments. The costs related to collection and processing the information are reduced too;

2) Possession of a flexible financial structure that allow the use of available resources with maximum efficiency and of those attracted. A flexible structure allows to minimize costs on the one hand, and on the other hand allows rapid adaptation to changing market conditions. In this regard, a particular importance acquires financial resources management and especially management of current assets. Thus, effective management of assets optimizes stocks of goods and materials, stocks of finished products, respectively, accelerating their rotation. A great importance in this case one has and the efficient management of the Revolving Fund, in particular the control of its sufficiency. The consequences of insufficient working capital can be quite imposing for the enterprise's activities, and sometimes fatal. The necessity to increase working capital appears as to extend the volume of enterprise's business. If the enterprise is not assured with a proper capital structure, and if the receipts and payment were not correctly projected, then it may have an insufficiency of liquidity. Consequently, business leaders must take operative measures to improve the situation as follows: to find money to pay salaries. Often, in these situations, business leaders focused their attention on solving the questions created by neglecting the problems that increase shareholder's value, and this can lead to a lower competitiveness and profitability. Solutions in this case may be:

- The radical solution is to decrease the volume of business. The company will have to deny the profitable orders due to the lack of resources for financing the working capital. If, however, orders are inevitable, which means a risk to increase the acceptable level of indebtedness, execution of these orders must be made so that expenses related to indebtedness won't be

greater than the losses that may appear in case to avoiding the orders;

- The easiest way is to increase capitalization. One of the strategies to finance the assets is an aggressive strategy that will be realized through small capitalization. This situation creates insufficiency of working capital. In this case the problem can be solved by increasing permanent assets, which will be accompanied by an adequate increase in permanent capital, preferably is the issuing of shares or contracting for long-term loans;

- Another way is the judicious control over the use of working capital. Permanently analysis of the working capital state and cash flows generated by this one allow the enterprise to limit the use of additional sources necessary to finance the base activities.

3) Globalization means the searching of partners in the worldwide, it means that the economy have not to know geographical, ethnic, political or other borders. Thus, the existence of modern information helps to make markets for goods and services in markets with perfect competition, open access to information on prices and make the competitors to know about features of products and services. The customer may contact the manufacturer (without involving a third person), even if the parties are in different parts of the world.

4) Acceleration of payments, financial cycles, increasing the share of electronic payments in total payments, reducing cash payments. At the same time, it has found that the reduction in the duration of the operational cycle time affects directly the growth of the efficiency of utilization of assets and indirectly decrease the necessity in loans and maintain a satisfactory balance sheet structures, and also increase financial stability.

5) introduction of new information technologies in business relationships with its contractors: State, banks, employees and other businesses.

In addition to the solutions proposed above, regarding the increasing of the financial resources volume at the enterprise level, it is necessary by a number of measures at the state level. Each state has its own economic development scenario. Regarding the Republic

of Moldova, here must be focused primarily on demand, without which we can not speak of any development. One of the main components of internal demand is the demand of the population. So, it is necessary to undertake various measures to increase the demand volume, which will lead to export increasing. Chronic insufficiency of financial resources imposed reciprocal lending businesses, which often is cheaper than loans offered by commercial banks. It has worsened and the co-report between accounts payable and receivable average per economy, being 2 [2]. Substantial increase of overdue debt does not mean anything other than reducing of the resources volume. Unfavorable dynamics of the correlation's indicator between accounts payable and receivable, and the overdue debts share in the total debts is caused primarily by lower production volumes, which is followed by the reducing of the amount of own sources of financing the production. As a result, the reproduction takes place on account of borrowed sources, which involves the increasing of servicing credit costs. All that mentioned above tell us about an imbalance in the financial system as a whole. In condition which the companies face great difficulties of financing, the foreign investments have an important role. In the last years, due to the large deficits in the State budget, financing economic programmes of the State budget is quite limited. However, if funding from the state budget can be excluded as funding source, then the absence of credit to finance business activity is in total contradiction with the rules of normal development of market economy. The solving of this problem is a condition of reducing the interest rate on loans provided by commercial banks and involves a maximum amount of resources in production.

Today, the majority of the capital investments is covered on account of the internal sources of financing, in particular on account of depreciation Collections.

It should be noted that for tax purposes companies use linear methods for calculating depreciation, which is to their detriment, given the high inflation, scientific and technical progress. The unpopularity of the accelerated

depreciation mechanism may be explained by a high depreciation deductions that lead to high production costs. However, depreciation deductions artificially leads to a high profit. At the same time, the high depreciation deductions leads to an artificial decrease of the profit, that misleading the creditors investors and other users regarding the financial state of the company. Thus, most businesses, not only use accelerated methods of calculating depreciation, but decreases the existing rules for reducing the cost of production, respective of the price to face the existing competition.

CONCLUSIONS

In conclusion, we can say that the measures proposed above will increase productivity, the efficiency of using company's financial resources, and the enterprise's profitability. In addition, since the company's profitability influences the formation of other business resources, so the increasing of their profitability will increase the volume of financial resources of society as a whole.

REFERENCES

- [1] ПАЙК Р., НИЛ Б., 2006, Корпоративные финансы и инвестирование, издательство Питер.
- [2] www.statistica.md
- [3] www.bnm.md

POTENTIAL OF FRUIT PRODUCTION IN THE UPPER DANUBE REGION

Biljana GRUJIĆ¹, Radojica SARIĆ¹, Predrag VUKOVIĆ¹

¹Institute of Agricultural Economics, Belgrade, 15 Volgina street, 11000 Belgrade, Serbia, Phone: +381 (11) 2972 842, biljana_g@iep.bg.ac.rs, radojica_s@iep.bg.ac.rs, predrag_v@iep.bg.ac.rs

Corresponding author email: biljana_g@iep.bg.ac.rs

Abstract

This paper includes analysis of used agricultural areas, areas covered with fruit orchards, and areas covered with realized production in the Republic of Serbia, Central Serbia and AP Vojvodina for the period 2007-2010. Data on the fruit production in the municipalities of the Upper Danube were absent due to lack of such indicators (Sombor, Apatin, Bač and Bačka Palanka). Share of area under fruit plantations in the total agricultural area of Serbia is 4.75%, and a particular area amounts to 1.0% of AP Vojvodina, Sombor 0.6%, Apatin 0.5%, Bač 0.3% and Bačka Palanka 1.0% (2010). Regarding the fact that regions of Central and Western Serbia are known as the largest producers and exporters of fruits, three districts: Zlatibor, Morava and Šumadija were particularly analyzed, participating in Serbian total area covered with fruit plantation in 2010 with 25.4%. Analysing the production (yield) of important species of fruit, it was found that the highest yield was achieved with plum and apple, and the lowest with quince. In the period 2007-2009 the fruit trees has constantly increased its yield in Serbia and in the already mentioned lower territorial units. Reaching 2010 yield has dropped significantly, some fruit species has recorded half of yield, which is attributed to the strong influence of climatic factors acting as the primary specificity of practicing agriculture.

Key words: areas under fruit trees, fruit-growing regions, used agricultural areas, yield fruit.

INTRODUCTION

Republic of Serbia has all the amenities for the rational production of fruit followed by its long tradition. The extremely favorable natural conditions for the production of raspberries, cherries, plums and apples, and other fruit species exists. Areas covered by orchards are insufficient, regarding the fact of our region natural characteristics diversity to freely raise plantations of different fruit depending on its climate, soil and topographic characteristics. Certainly, the best for fruit production are mountainous areas. Growth of the agricultural land percentage under fruit plantations will increase fruit production proportionally, and Serbia can become a serious competitor in the European market. This paper analyzes data on used agricultural land and orchards owned by companies, cooperatives and family farms (2007-2010). The data collected from official statistics (RSO Belgrade - Serbia) show that used agricultural area of 5.051 million ha accounted for 57.13% of the total area of Serbia, and the area under fruit plantations used in agricultural areas with 4.75%. Area under fruit plantations in AP Vojvodina achieved a 7.5% share of the total area under fruit orchards in Serbia, while the share of area under fruit plantations in the total of the used agricultural area of AP Vojvodina represents about 1%. The largest proportion of land covered with

fruit is in Šumadija, Morava and Zlatibor District (Central and Western Serbia), representing also the biggest producers and exporters of fruit. Those districts have organized fruit production covering the 61.254 ha, with a share of 25.5% in the total area under orchards of Serbia during 2009, in 2010 with 61.051 ha accounted for 25.4% of the total area under orchards. Consequently, the region of Central and Western Serbia 2010 had 203 ha of orchards or less (- 0.33%) compared to 2009 year. The increase in surface area in 2010 compared to 2007 year has achieved in Šumadija district by 0.5%, while the reduction was achieved in Zlatibor (2.67%) and Morava (3.01%).

Data on yield/production of important fruit species were analyzed for the period 2007-2010, indicating that it has increased in the period 2007-2009, and in 2010 a sharp decline was noticed, and regarding certain types of fruit yield was reduced by half. These statements are valid for Serbia and for the AP Vojvodina. During 2010 the largest producing region of Serbia was covered with plums (426.846 t), apples (239.945 t) and raspberries (83.870 t). That same year, in the municipalities of AP Vojvodina the highest production of apples (104.661 t), plums (46.748 t) and peaches (15.150 t) was recorded. In Serbia, the fruit production is organized mainly on family farms. However, fruit farms are producing enough for their own needs, while increasing the volume of production

necessary to introduce new technology. Obstacle intensification of fruit production on farms is reflected in the fragmentation of holdings and lack of motivation for the new technology introduction.

MATERIAL AND METHOD

The main of this paper is to analyze total of agricultural land in Serbia, AP Vojvodina and municipalities in the Upper Danube (Sombor, Apatin, Bač and Bačka Palanka), determining the share of land under fruit plantation in the mentioned areas, and a summary of the most important fruit yielding species grown in Serbia and AP Vojvodina, for the period 2007-2010. Data were collected using desk research on which the authors give their own view of the potential fruit production and future development directions. A local literature was used and official publications produced by the Statistical Office of Serbia. The available data are presented in tables, processed by mathematical - statistical methods (average value, the relative structure), with the interpretation of the obtained parameters.

RESULTS AND DISCUSSIONS

Utilized agricultural area - Regarding the fact that Serbia has a surface, one may say that it is not fully exploited. This claim is based on available and used data in agricultural areas, with special emphasis on the degree of utilization of the area under fruit plantation. If the percentage of utilization of agricultural land to raise fruit plantations is increased, Serbia could become a serious competitor in the European market.

The largest proportion of land planted by fruit have family farms, and producing to the extent ensure the survival, which is the cause of lack of funding for the introduction of new technologies. These farms mainly need bulking properties and application of modern agricultural methods to increase soil quality and yield [1]. Problems of modern agricultural methods applying squeeze in all aspects of the fruit manipulating organizational process, starting from manufacturer to wholesalers, cold storages, distributors and exporters of fruits [6]. Fruit production per area unit employs about 20 times more labor compared to the production of wheat [2], with 10-15 times more realized value of production.

Participation of used agricultural area (5.051 million ha) in the area of Serbia (88.407 km²) is 57.13% [5]. Taking into account the total area under fruit plantations of 240.000 ha, we get a share of

2.71% of total land area or 4.75% of the used agricultural area (2010). That same year, used agricultural area of AP Vojvodina represented a share of 35.33% in used agricultural areas of Serbia. Area under fruit plantations in AP Vojvodina, represents a share of 7.5% in area under fruit orchards of Serbia, while the share of area under fruit plantations in the total of the used agricultural area of AP Vojvodina is approximately 1%. The following table shows the operation data of absolute and relative terms of movement of orchards available in Serbia (*table 1*)

Table 1. The structure of the area under fruit plantation in Serbia 2007-2010

Year	Utilized agricultural land (000 ha)	Orchards land (000 ha)	Percentage in the orchards land of the utilized agricultural area (%)
2007	5.053	240	4,75
2008	5.055	242	4,79
2009	5.058	240	4,74
2010	5.051	240	4,75

Acreage used in Serbia in the observed years has changed, caused by the change of agricultural land use. Therefore, year 2010 records 5.051 million ha of agricultural land, representing 0.04% less comparing to 2007 or total acreage was reduced by 2.000 ha. Areas planted with orchards in the observed years represented on average about 240.500 ha, and only in 2008 the largest surface area of 242.000 ha was recorded. Comparing the area under orchards with a total agricultural area in the analyzed period, one can notice average share of about 4.7% of orchards. This involvement had the lowest value in 2009 (4.74%) and the highest in 2008 representing (4.79%).

While analyzing the area under fruit plantations at the level of Serbia, it is important to mention the region of Central and Western Serbia, classified as leading manufacturer and exporters of fruits, with emphasis on Šumadija, Morava and Zlatibor District [4]. The significance of the area stems from the fact that these lands are the largest covered by fruits and generate the highest yields. *Figure 1* shows the movements of the area under fruit plantations (in ha) in these districts during the period 2007-2010.

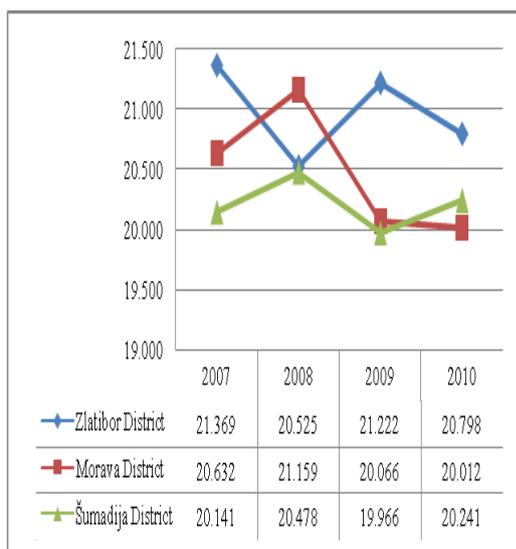


Fig. 1. Areas under fruit plantations (ha) in the three districts of Serbia with the highest share in the total areas of orchards (2007-2010)

Graphic representation of the area under fruit plantation yields indicates that only Šumadija county increased as the area under fruit plantation in 2010 compared to 2009 by 1.38%, while the Zlatibor district has decreased by 2% and Morava district by 0.27%. Comparing 2010 to 2007 year, Šumadija District retained the upward trend in the area by 0.5%, while in the Zlatibor District there was a decrease by 2.67% and 3.01% in Morava. These districts in 2010 had fruit production organized on the 61.051 ha, with a share of 25.4% in the total area under orchards of Serbia. In 2009, a total of 240.000 ha of orchards in Serbia, Central Serbia accounted for 222.000 ha, representing 92.5% of total area under orchards, and Districts with 61.254 ha accounted for 25.5% of the total area under orchards. In 2008 year, in a total of 242.000 ha of orchards in Serbia, Central Serbia accounted for 219.757 ha, accounting for 90.81% of the total area under orchards, and Districts with 62.162 ha accounted for 25.69% of the total area under orchards. In 2007 year, in a total of 240.000 ha of orchards in Serbia, Central Serbia accounted for 222.044 ha, accounting for 92.52% of the total area under orchards, and Districts with 62.142 ha accounted for 25.89% of the total area under fruits. In Šumadija District (2010), the largest area of orchards belonging to the City of Kragujevac had occupy 6.761 ha or 33.4%. In Morava District the largest area of orchards belong to the City of Čacak and occupy 6.892 ha, accounted for 34.4%. Zlatibor District has its largest area of orchards in the City of Užice occupying 3.700 ha or 17.79%. Objectively speaking, the leading producers of fruit originate from the region of West and Central

Serbia, with the largest share of Zlatibor, Morava and Šumadija District.

After displaying situation of area under fruit plantations in Central and Western Serbia, it is important to mention the participation of thus area in AP Vojvodina, where administratively and territorially above mentioned municipalities of the Upper Danube: Apatin, Bač, Bačka Palanka and the City of Sombor belong. The average share of agricultural used areas of AP Vojvodina in Serbian total of used agricultural area is about 35%. The average share of area under fruit plantations of AP Vojvodina in the area under fruit orchards of Serbia represents approximately 7.5%, where the average area is 17.990 ha of fruit plantations. The following table (Table 2) gives a fuller examination of used agricultural land and land under fruit plantations in Serbia, AP Vojvodina and these municipalities of the Upper Danube, also and the participation of area under fruit plantations in the used agricultural area in the period 2007 - 2010.

Table 2. Share of area under orchards (%) in the used agricultural areas by territories (2007-2010)

Territory	Utilized agricultural land (ha)	Orchards land (ha)	Percentage (%)	Utilized agricultural land (ha)	Orchards land (ha)	Percentage (%)
	2007			2008		
Srbija*	5.053.000	240.000	4,75	5.055.000	242.000	4,79
AP Vojvodina	1.747.441	17.555	1,0	1.781.253	18.578	1,0
Sombor	99.020	685	0,7	100.846	700	0,7
Apatin	22.577	117	0,5	24.541	119	0,5
Bač	25.842	67	0,3	26.314	61	0,2
Bačka Palanka	46.697	291	0,6	47.905	1.333	2,8
	2009			2010		
Srbija*	5.058.000	240.000	4,74	5.051.000	240.000	4,75
AP Vojvodina	1.780.756	17.833	1,0	1.784.352	17.994	1,0
Sombor	100.730	670	0,7	101.612	628	0,6
Apatin	24.618	124	0,5	24.479	124	0,5
Bač	26.228	68	0,3	26.899	75	0,3
Bačka Palanka	46.816	369	0,8	48.281	490	1,0

Used agricultural land and orchards in the municipalities of AP Vojvodina Upper Danube differently range by years. One of the factors of reduction/increase in area under orchards and changes is land use. This depth of analysis lies in determining the average value of their land, as well as participation in area under orchards total of the used agricultural area. Table view shows the oscillations of used agricultural land in the municipalities. Measured in relative terms, this land in 2010 (the highest value of the analyzed time

series) increased by 2.11% compared to 2007 (the lowest value of the analyzed time series), while the absolute figures show an increase of 36.911 ha. Therefore, the average acreage used for AP Vojvodina is 1.773.451 ha and in the municipalities: City of Sombor 100.552 ha, Apatin 24.054 ha, Bač 26.321 ha and Bačka Palanka 47.425 ha. Oscillations are visible regarding the area under fruit plantation. Participation of orchards in AP Vojvodina in the total agricultural area in the analyzed years is about 1%. The relative value of increased area under fruit plantation in the municipalities in 2010 (17.994 ha) compared to 2007 (17.555 ha) was 1.58%, ie. absolute increase is 278 ha. However, in 2010 the area under orchards was lower by 3.14% (745 ha) compared to 2008, when it was the largest area (18.578 ha). The average area under fruit plantation in AP Vojvodina is 17.990 ha, and observed by the municipalities: City of Sombor 670.75 ha, Apatin 121 ha, Bač 67.75 ha and Bačka Palanka 620.75 ha. The following table (Table 3) shows the share of area under fruit orchards in the municipalities of the Upper Danube in the total area under orchards in AP Vojvodina in the period 2007-2010.

Table 3. Share of area under fruit orchards (%) in the municipalities of the Upper Danube in the total area under fruit plantations of AP Vojvodina (2007-2010)

Year	2007		2008		2009		2010	
	Area (ha)	Percentage (%)						
Teritory								
AP Vojvodina	17.555	-	18.578	-	17.833	-	17.994	-
Sombor	685	3,90	700	3,77	670	3,76	628	3,49
Apatin	117	0,67	119	0,64	124	0,70	124	0,69
Bač	67	0,38	61	0,33	68	0,38	75	0,42
Bačka Palanka	291	1,66	1.333	7,17	369	2,07	490	2,72

Table 3 provides greater visibility of participation area under fruit orchards in the municipalities of the Upper Danube in the total area under fruit plantations of AP Vojvodina. During the observed four-year period Sombor has achieved average percentage of the fruit orchards of 3.73% in area planted by fruit in AP Vojvodina, Apatin 0.68%, 0.38% and Bač and Bačka Palanka 3.41%. Of course, the obligation to preserve the existing area under fruit plantations is imposed, with the possible increase, not allowing further decline and fragmentation of land. Primarily, to consider further sustainability of farms / producers must be aware of strategic importance for the future development of

agriculture of AP Vojvodina, which is consequently reflected in the development of agriculture in Serbia.

The yield of the major types of fruit - Fruit production potential of Serbia, Central Serbia and AP Vojvodina were analyzed in terms of actual yield (manufacture) of the most important fruit species [7]. Figure 2 shows the total production of major species of fruit in Serbia in the period 2007-2010.

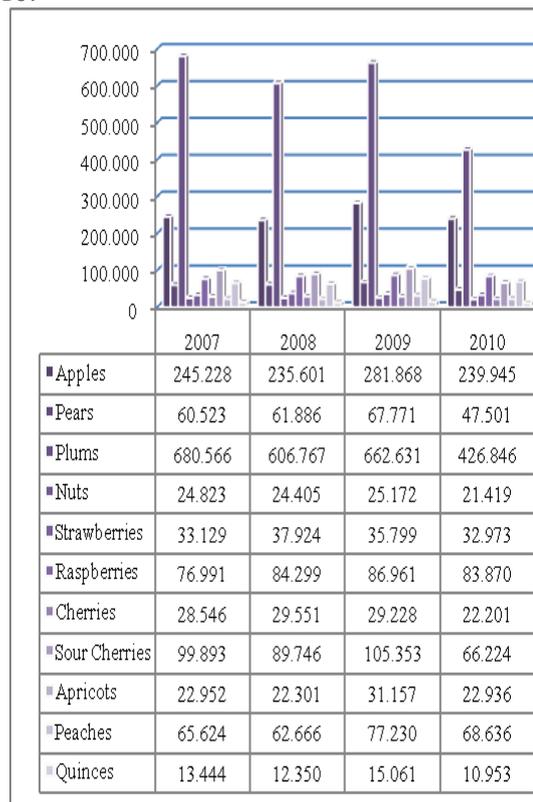


Fig. 2. Total yield (t) of principal fruits grown in Serbia in the period 2007-2010

Figure 2 graphically and in tabular form indicate that the fluctuations in the realized yield / production are expressed in all types of fruit and none has achieved a constant growth, which may be attributable to the impact of weather conditions (drought, the hail) in fruit production due to lack of modern anti-hail protection systems of drip irrigation as well as late spring frosts. Production was generally on the rise in the period of 2007 - 2009, and in 2010 showing a sharp decline in production volume. Yield increase in 2010 compared to 2007 was realized only 8.93% for raspberries and 4.59% for peaches. The reason for the production reduction may be a change of areas use for the fruit production or the reorientation of production to another type of fruit. Considering only year of 2010, the highest yields were obtained in the production of plums (426.846 t), followed by

apples (239.945 t) and raspberries (83.870 t) and lowest is the production of quinces (10.953 t). *Figure 3* shows the total yield of important fruit species (in t) in Central Serbia in the period 2007-2010.

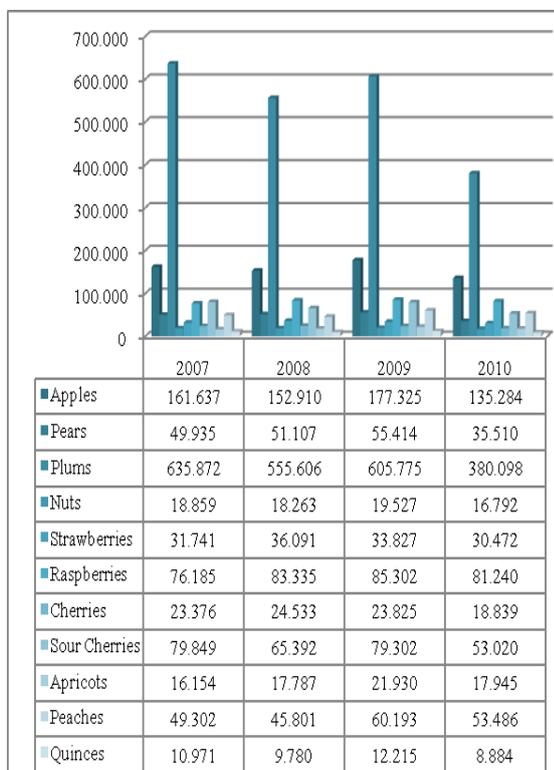


Fig. 3. Total yield (t) of principal fruits grown in Central Serbia in the period 2007-2010

Figure 3 represents the yields in Central Serbia decreased in 2010 compared to 2007 for all types of fruit. The deviation was found only in raspberries, apricots and peaches. Raspberries yield was increased by 6.64%, apricots 11.09% and peaches to 8.49%. In 2010, the highest yields were obtained in the production of plums (380.098 t), apples (135.284 t) and raspberries (81.240 t) and lowest in the production of quinces (8.884 t). In *Figure 4* the total yield of important fruit species was presented in the territory of AP Vojvodina in the period 2007-2010.

Analyzing yield of important fruit species in AP Vojvodina an identical trend as the entire territory of Serbia might be observed. In the period of 2007-2009 production was generally moving upward, in spite that 2010 saw a sharp decline in the genus. The upward trend in the four-year period took place only in strawberries and raspberries. Yield of strawberries in 2010 compared to 2007 increased by 80.19%, ie. by 1.8 times, and raspberries to 226.3%, ie. to 3.26 times. Regarding the 2010, the highest yield was of apples (104.661 t), plums (46.748 t)

and peaches (15.150 t), while the lowest production achieved quinces (2.069 t).

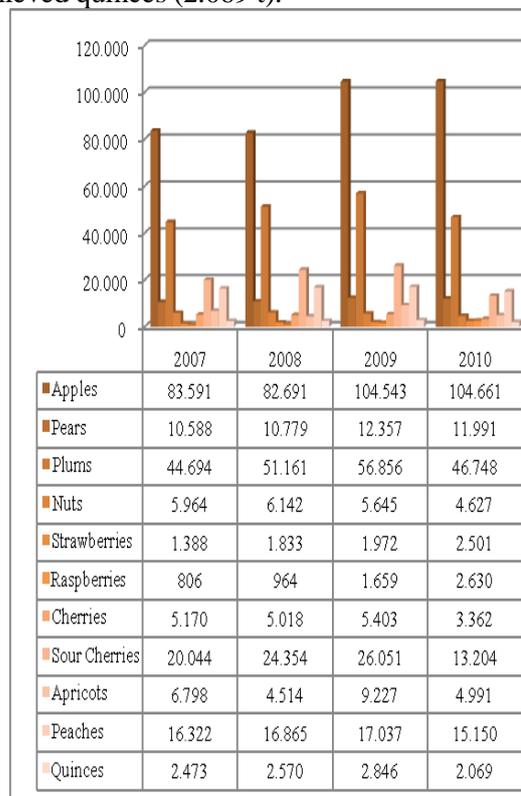


Fig. 4. Total yield (t) of principal fruits grown in AP Vojvodina in the period 2007-2010

The yield of the remaining fruit species is not to ignore, both in Serbia and AP Vojvodina, because their volume forming the structure of fruit production. The structure of fruit production in Serbia depends on the smallest territorial units (in this case the municipalities of the Upper Danube) that make participation in the structure of fruit production of AP Vojvodina and finally Serbia. On the next chart the participation of Central Serbia and AP Vojvodina in Serbian total fruit production in 2010 will be shown.

Analyzing only the year of 2010, *Figure 5* indicates that the region of Central Serbia in total Serbian realized fruit production accounts for over 70% (except in the production of apples 56.38%). Central Serbia achieved the highest share in the production of raspberries (96.86%), while the AP Vojvodina accounts for only 3.14%. In addition to raspberries, there is an obvious representation of the region in strawberries production (92.41%), representing a proportion of AP Vojvodina with 7.5%. The significance of the site is in production of cherries (84.86%) and the percentage of AP Vojvodina is 15.14%.

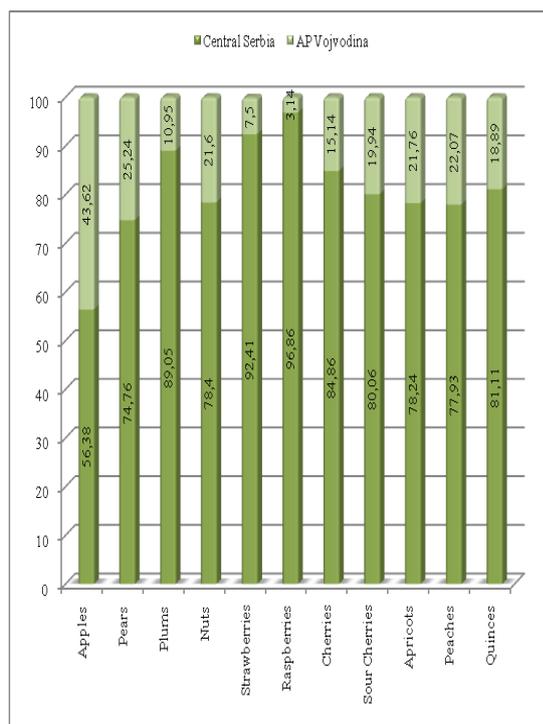


Fig. 5. The share of fruit production (%) in Central Serbia and AP Vojvodina in the total production of fruits in Serbia in 2010

The smallest representation of Central Serbia is reflected in the production of apples, with the participation of 56.38%, while AP Vojvodina covers 43.52% of the maximum achieved in the produced fruit species.

CONCLUSIONS

Regarding the potential that Serbia has in the amount of arable land, it may be underlined that they are not fully exploited. Although the growing of fruit reaches 10-15 times the value of production per hectare comparing to the production of wheat and corn, fruit production was not represented sufficiently. Share of area under fruit crops in total agricultural land is changed by particular years. One of the factors of orchards representation is change of use of the land on which the fruit is grown by then, due to the reorientation of producers in other lines of production or plant fruits. Undeniable fact is that West and Central Serbia has the largest area of orchards; achieve maximum fruit production, and also have the largest share in the actual production.

Fruit production in Serbia is characterized by unfavorable structure of fruit species, significant amortization of fruit plantations, unfavorable utilization of processing capacity, inconsistent with the needs of the varieties of processing and exporting fresh fruit and

processed fruit, reduction or stagnation in the number of fruit trees and lack of organization and production plants, with pronounced reduction in the fragmentation of production plants [3].

Fertility of the most important fruit species grown in Serbia augmented in the period 2007-2009. However, due to the lack of organized and planned production there was a hyper production, which creates a higher offer than demand. Already, in 2010 yield has dropped significantly, in some fruits even halved, which is attributed to the strong influence of climatic factors acting as the primary specificity of practicing agriculture. Fruit production is organized mainly on family farms. However, fruit farms are producing only for their own needs, while increasing the volume of production necessary to introduce new technology. Obstacle intensification of fruit production on farms is reflected in the fragmentation of holdings and lack of motivation for the introduction of new technology. Exploitation of fruit plantations last few decades, and is fully justified to say that it is the most profitable branch of plant production.

The basic postulate of increasing fruit production is the increase in area under fruit plantations. Since not all farms are able to invest the accumulated funds in rising new or expansion of existing plants and production capacity, the greater necessary budget allocations are. The current support of the Ministry of Agriculture to fruit production includes the payment of funds for subsidizing crop insurance, fruits, nursery and young orchard [8]. Part of incentives to improve fruit production, manufacturers can achieve by applying regulations to support rural development through investments in manufacturing and marketing of fruits and regulations for the use of incentives to raise production orchards of fruit trees. However, due to fragmentation of land recourse those individual producers are getting scarce, although the subsidies covered all types of expenditure. Of course, it is necessary to harmonize the views of the Ministry of Agriculture, Trade, Forestry and Water

Management of Republic of Serbia with regional chambers of commerce, Associations, Societies and finally agricultural advisers who receive direct contact with producers on farms. Adequate and timely implementation of these regulations by the manufacturer can gradually improve the situation in fruit growing to the mutual satisfaction of the producers and the state.

ACKNOWLEDGEMENTS

Paper work is part of the project research 46006 "Sustainable agriculture and rural development in function of Republic of Serbia strategic goals achievement within the Danube region" financed by the Ministry of Education and Science Republic of Serbia.

REFERENCES

- [1] Mihailović, B., Simonović, Z., Cvijanović, D., 2008, *Voćarsko-vinogradarska proizvodnja u Srbiji*, vol. 54, no. 5-6, Časopis Ekonomika, Društvo ekonomista „Ekonomika“, Niš, p. 157-164.
- [2] Milić, D., Lukač-Bulatović, M., 2005, *Stanje i tendencije proizvodnje voća u Srbiji*, vol. 9, no. 3-4, Časopis za procesnu tehniku i energetiku u poljoprivredi, Nacionalno društvo za procesnu tehniku i energetiku u poljoprivredi Novi Sad, p. 94-97.
- [3] Milić, D., Bulatović, M., Kukić, Đ., 2005, *Ocena ekonomske efektivnosti podizanja zasada jabučastog voća*, vol. 9, no. 5, Časopis za procesnu tehniku i energetiku u poljoprivredi, Nacionalno društvo za procesnu tehniku i energetiku u poljoprivredi Novi Sad, p. 118-120.
- [4] *Statistical Office of the Republic of Serbia*, Municipalities and regions in the Republic of Serbia, 2008-2011., Belgrade, Serbia.
- [5] *Statistical Office of the Republic of Serbia*, Statistical Yearbook, 2010 - 2011., Belgrade, Serbia.
- [6] Štrbac Maja, 2009, *Analiza proizvodnje voća i grožđa u Republici Srbiji*, monografija, Institut za ekonomiku poljoprivrede, Beograd, Srbija, p. 13.
- [7] <http://webrzs.stat.gov.rs/WebSite>, on-line database Statistical Office of the Republic of Serbia, Belgrade, Serbia.
- [8] http://www.mpt.gov.rs/documents/list/126/uredbe-poljoprivrede.html?menu_id=73, Ministry of Agriculture, Trade, Forestry and Water Management, section: Laws, regulations and rules.

RURAL TOURISM PROMOTION ANALYSIS BY ROAD VÂLCEA TOURIST MOTEL "EVRICA" IN COSTESTI VALCEA COUNTY

Adelaida Cristina HONTUȘ¹

¹University of Agronomical Sciences and Veterinary Medicine - Bucharest, Faculty of Management, Economical Engineering in Agriculture and Rural Developments, No. 59, Mărăști Boulevard, no.1 Sector, Bucharest, cod 011464, Romania, e-mail: adelaidahontus@yahoo.com

Corresponding author email: adelaidahontus@yahoo.com

Abstract

Vâlcea County has no less than three of the nine resorts in the country, recognized nationally and internationally for potential and curative value. In most resorts, there are infrastructure, however, whether belonging to the state sector or private, it is mostly in poor condition. Most accommodation are two stars or less. There is an oversupply of accommodation in terms of quantity and a lack of accommodation in terms of quality. There are also private providers of travel services to private resorts upgrading and expanding their facilities and offer products to meet market expectations. To promote rural tourism in the county of Vâlcea we did an analysis of tourist traffic to the motel "Evrica" from Costești, the calculation and interpretation of the most important tourism indicators of tourism demand and supply.

Key words: *tourism indicators, tourist traffic, monthly traffic ratio tourism, environmental tourism packages, tourist traffic density, the evolution of overnight stays.*

INTRODUCTION

At the beginning of this century and millennium is the most dynamic tourism sector worldwide and at the same time, the most important generator of jobs. However, tourism can be the main source of income for countries and regions have significant tourist resources and exploit them properly [1].

In this context and taking into account the existing potential, tourism is considered priority Valcea county. Justifications this priority status are:

- Tourism is an economic sector with long-term growth prospects, tourism resources are practically inexhaustible;
- tourism acts as an activator element of the entire economic system, creating a specific request for goods and services in the other sectors of the economy;
- tourism is a reliable labor market and redistribution of the unemployed from other sectors restructured;
- the best use of resources, effective promotion and marketing of tourism products on external markets can be a significant source of foreign revenue increase in the county;

- sustainable tourism development contributes to economic growth and social development and alleviating imbalances, improving living conditions and increasing household income especially in rural areas;
- tourism is a means of protection, preservation and potential of cultural, historical, architectural and folklore of the county;
- tourism can also have ecological vocation through sustainable exploitation of the fundamental values of human existence (water, air, flora, fauna, ecosystems etc.)
- tourism can be an active education and training and raising people's civilization, having a special role in the use of public leisure.

MATERIAL AND METHOD

To analyze traffic tourist area in Valcea county, in order to better tourist facilities, I will analyze the most representative tourism indicators in the motel "Eureka" and the county, as follows: average daily number of tourists, no. overnight stays, average length of stay, tourist traffic density and the rate of use of accommodation capacity, and others. Data were taken from

NIS, Bucharest and Valcea and statistically processed and interpreted.

RESULTS AND DISCUSSIONS

Motel "Evrca", the two stars, was in depression Horezu, specifically within the county of Valcea Costesti village, 38 km from Ramnicu Valcea and only 5 km from Horezu. Due to its position near the center of the county, you have many recreational opportunities: hiking (trails for ecotourism), visiting regional attractions (museums, monasteries, nature reserves) and technical climbing routes and easy or engaging in other sports.

The motel offers the following facilities: direct dial phone, Internet access, access to fridge / chest cold, guarded parking.

Eureka is a small and friendly motel that was established years ago because of a thought, and

has become a family business today. Located near the heart of Valcea county and is surrounded by some of the most beautiful mountains in the country, offers countless opportunities for hiking enthusiasts all tourism (ecotourism routes), adventure (rock climbing routes, climbing, rappelling and extreme sports) and events of religious and folk ("Perched by Hurez", "Dance of Longing").

Accommodation

Capacity of our pension is 40 beds, but capacity can be expanded to 56 beds for groups. Rooms are equipped with color TV, bathroom with shower.

The restaurant has a capacity of 300 seats, where you can serve international cuisine.

Tourist traffic analysis to the motel "EVRICA" 2 star

Table 1. Number of nights, number of tourists and average stay at Motel Evrica

Indicators	2006	2007	2008	2009	2010	2011
Number of nights	0	362	402	480	808	800
Number of Romanian tourists	0	107	205	302	357	350
Number of foreign tourists	0	21	26	32	54	30
Accommodation from motel	0	40	40	40	46	46
Total number of places in hostels in the village	40	40	40	56	56	56
Average stay	0	2,81	2,42	2,38	3,54	3,40

Source: Statistical Yearbook 2010 Valcea county.

Average stay is calculated using the following formula:

$$S_H = \frac{NH}{T}$$

Where: NH - number of registered hotel nights;

T - total tourist arrivals;

SH - average stay in the hotel.

Average stay = no. nights / (No. Romanian tourists + No. foreign tourists)

Leading indicators of tourism demand and supply, we consider the following [2]:

1) **Changing tourism demand:**

$$\Delta CG_{o-i} = \frac{CG_i}{CG_o} \cdot 100 \text{ Wher}$$

e: CG_i- global tourism demand (current year no night's accommodation) in "i";

CG₀ - global tourism demand (no. night's accommodation the previous year) in "0".

$\Delta CG_{0-1} = (\text{No. Overnights Current year} / \text{No. Nights spent the previous year}) * 100$

$$\Delta Ct_{2008-2007} = (402/362)*100 = 111,04\%$$

$$\Delta Ct_{2009-2008} = (480/402)*100 = 119,40\%$$

$$\Delta Ct_{2010-2009} = (808/480)*100 = 168,33\%$$

$$\Delta Ct_{2011-2010} = (800/808)*100 = 99,00\%$$

From the above calculations we see that 2010 was the year the highest growth of 168.33% which is unlike 2011 when it dropped to 99%.

2) **Index variation in demand for tourism:**

$$ICE_{0-i} = \frac{CE_i}{CE_0} \cdot 100$$

$$ICI_{0-i} = \frac{CI_i}{CI_0} \cdot 100$$

where: ICE_{o-i} - the index of variation in external demand;

ICI_{o-i} - the index of variation in domestic demand.

$ICE, ICI = (No. \text{ tourists Current year} / No. \text{ Tourists last year}) * 100$

$$ICI_{2008-2007} = (205/107)*100 = 191,58\% \text{ (romanian)}$$

$$ICE_{2008-2007} = (26/21)*100 = 123,80\% \text{ (foreign)}$$

$$ICI_{2009-2008} = (302/205)*100 = 147,31\% \text{ (romanian)}$$

$$ICE_{2009-2008} = (32/26)*100 = 123,07\% \text{ (foreign)}$$

$$ICI_{2010-2009} = (357/302)*100 = 118,21\% \text{ (romanian)}$$

$$ICE_{2010-2009} = (54/32)*100 = 168,75\% \text{ (foreign)}$$

$$ICI_{2011-2010} = (350/357)*100 = 98,03\% \text{ (romanian)}$$

$$ICE_{2011-2010} = (30/54)*100 = 55,55\% \text{ (foreign)}$$

It may be noted that internal tourism demand had the largest increase in 2008 to 191.58% and in 2010 dropped to 98.03%. Foreign tourism demand was the highest growth of 123.80% in 2007-2008 and in 2011 dropped to 55.55%.

3) Accommodation capacity development indicator:

$$\Delta C_{t_0-i} = \frac{LC_i}{LC_0} \times 100$$

$Icc = (no. \text{ of beds} / no. \text{ Beds}) * 100$

$$Icc_{2008-2007} = (40/40)*100 = 100\%$$

$$Icc_{2009-2008} = (40/40)*100 = 100\%$$

$$Icc_{2010-2009} = (46/40)*100 = 115\%$$

$$Icc_{2011-2010} = (46/40)*100 = 115\%$$

Accommodation capacity was constant in the years 2007-2009, no. Accommodation places is 40 places, and in 201-2011 years increased by 15%, because no. Accommodation places increased to 46 places.

4) Index distribution of global tourism demand:

$$I_{CTI} = \frac{CI}{CG} \cdot 100; I_{CTE} = \frac{CE}{CG} \cdot 100$$

where: CI - domestic tourism demand;

CE - external tourism demand.

CG - total tourism demand (internal + external)

$Irct = [no. \text{ tourists} / (No \text{ Romanian tourists} + No. \text{ foreign tourists})] * 100$

$$Irct_{2007} = (107/128)*100 = 83,59\% \text{ (romanian)}$$

$$Ircte_{2007} = (21/128)*100 = 16,40\% \text{ (foreign)}$$

$$Irct_{2008} = (205/231)*100 = 88,74\% \text{ (romanian)}$$

$$Ircte_{2008} = (26/231)*100 = 11,25\% \text{ (foreign)}$$

$$Irct_{2009} = (302/334)*100 = 90,41\% \text{ (romanian)}$$

$$Ircte_{2009} = (32/334)*100 = 9,58\% \text{ (foreign)}$$

$$Irct_{2010} = (357/411)*100 = 86,86\% \text{ (romanian)}$$

$$Ircte_{2010} = (54/411)*100 = 13,13\% \text{ (foreign)}$$

$$Irct_{2011} = (350/380)*100 = 92,10\% \text{ (romanian)}$$

$$Ircte_{2011} = (30/380)*100 = 7,89\% \text{ (foreign)}$$

Analyzing global travel distribution index, we observe that the number of Romanians is higher than the number of foreign tourists. But no. Romanian tourists increased in 2011 to 350 from 2007 in which only 107 were tourists. No. Foreign tourists was greatest in 2010, 54 tourists and the lowest no. Foreign tourists was recorded in 2007 of 21 foreign tourists.

5) Index evolution pension customers:

$$\Delta TP_{i-0} = \frac{TP_i}{TP_0} \times 100$$

where: TP_i - no. Total tourists board in "i";

TP_0 - No. Total tourists board in "0".

$\Delta TP_{i-0} = (No \text{ Romanian tourists.} + No \text{ Foreign tourists current year}) / (No \text{ Romanian tourists.} + No \text{ Foreign tourists last year}) * 100$

$$\Delta TP_{2008-2007} = (231/128)*100 = 180,46\%$$

$$\Delta TP_{2009-2008} = (334/231)*100 = 144,58\%$$

$$\Delta TP_{2010-2009} = (411/334)*100 = 123,05\%$$

$$\Delta TP_{2011-2010} = (380/411)*100 = 92,45\%$$

No. customers on board was an increase from year to year, in 2010 recorded the highest

number of tourists, both Romanian and foreign.
 In 2011 no. customers has fallen since 2010.

6) Overnight index evolution is:

$$\Delta NP_{i-0} = \frac{NP_i}{NP_0} \times 100$$

where: NP_i - overnights in guesthouse in "i";
 NP_0 - nights on board in "0".

$\Delta NP_{i-0} = (\text{no overnight stays current year} / \text{no. overnights previous year}) * 100$

$$\Delta NP_{2008-2007} = (402/362) * 100 = 111,04\%$$

$$\Delta NP_{2009-2008} = (480/402) * 100 = 119,40\%$$

$$\Delta NP_{2010-2009} = (808/480) * 100 = 168,33\%$$

$$\Delta NP_{2011-2010} = (800/808) * 100 = 99,00\%$$

No. Overnight on board increased from year to year, but in 2011 fell less than 800 nights, from 2010, when he registered the highest number. Overnight stays for 808 nights.

7) Employment of pension - Coefficient of utilization capacity accommodation (Cuc):

$$Cuc = \frac{NP}{(LP \times Z)} \times 100$$

where:

Cuc - occupancy percentages;

NP - number of nights;

LP - Number of accommodation places in the board;

Z - number of days of supply pension;

$Cuc = [\text{no. overnights} / (\text{no accommodation places} * \text{no. day hall})] * 100$

$$Cuc_{2007} = [362/(40*365)] * 100 = 2,47\%$$

$$Cuc_{2008} = [402/(40*365)] * 100 = 2,75\%$$

$$Cuc_{2009} = [480/(40*365)] * 100 = 3,28\%$$

$$Cuc_{2010} = [808/(46*365)] * 100 = 4,81\%$$

$$Cuc_{2011} = [800/(46*365)] * 100 = 4,79\%$$

Employment of pension increased from year to year, with a maximum of 13.23% in 2010 and decreased in 2011 to 12.66%.

8) Coefficient using of capacity ccommodation (Cuc)

$Cuc = [\text{no. of nights (no. day tourist)} / (\text{no. of beds} * \text{no. day operation})] * 100$

$$Cuc_{2007} = [362/(40*365)] * 100 = 2,47\%$$

$$Cuc_{2008} = [402/(40*365)] * 100 = 2,75\%$$

$$Cuc_{2009} = [480/(40*365)] * 100 = 3,28\%$$

$$Cuc_{2010} = [808/(46*365)] * 100 = 4,81\%$$

$$Cuc_{2011} = [800/(46*365)] * 100 = 4,79\%$$

Accommodation at guest house has grown every year analyzed, with the highest value of 4.81% in 2010 and in 2011 recorded a slight decrease of 4.79%.

Tourist traffic analysis to the county VÂLCEA

Table 2. Number of nights, number of tourists and average stay Valcea County

Indicators	2006	2007	2008	2009	2010	2011
Number of nights	1316000	1274000	1272000	1257000	1280000	1086000
Number of Romanian tourists	188480	195128	183380	210384	185029	205180
Number of foreign tourists	4517	4011	2252	3035	3795	3737
No. total tourists	192.997	199.139	185.632	213.419	188.824	208.917
Total Accommodation	10058	10380	10223	10556	10596	10877
Total number of places in hostels	2555	2648	2771	2625	2639	2447
Average stay	6,82	6,40	6,85	5,89	6,78	5,20

Source: Statistical Yearbook 2010 Valcea County

1) Accommodation capacity development indicator:

$$\Delta C_{t_0-i} = \frac{LC_i}{LC_0} \times 100$$

$$Icc = (\text{no. of beds}_i / \text{no. beds}_0) * 100$$

$$Icc_{2007-2006} = (10380/10058)*100 = 103,20\%$$

$$Icc_{2008-2007} = (10223/10380)*100 = 98,48\%$$

$$Icc_{2009-2008} = (10556/10223)*100 = 103,25\%$$

$$Icc_{2010-2009} = (10596/10556)*100 = 100,37\%$$

$$Icc_{2011-2010} = (10877/10596)*100 = 102,65\%$$

Capacitatea de cazare a fost în creștere între anii 2006-2007, a scăzut în anul 2008, iar din 2009 în 2011 a fost din nou în creștere. De la 10.058 locuri de cazare în 2006, s-a ajuns la 10.877 locuri de cazare în 2011.

2) Index evolution pension customers:

$$\Delta TP_{i-0} = \frac{TP_i}{TP_0} \times 100$$

where: TP_i - no. Total tourists board in "i";

TP_0 - no. Total tourists board in "0".

$$\Delta TP_{i-0} = (\text{No Romanian tourists.} + \text{No Foreign tourists current year}) / (\text{No Romanian tourists.} + \text{No Foreign tourists last year}) * 100$$

$$\Delta TP_{2007-2006} = (99139/192997)*100 = 51,36\%$$

$$\Delta TP_{2008-2007} = (185632/199139)*100 = 93,21\%$$

$$\Delta TP_{2009-2008} = (231419/185632)*100 = 124,66\%$$

$$\Delta TP_{2010-2009} = (188824/213419)*100 = 88,47\%$$

$$\Delta TP_{2011-2010} = (208917/188824)*100 = 110,64\%$$

No. customers on board was an increase from year to year, but in 2009 recorded the highest number. of tourists, both Romanian and foreign tourists 231,419. In 2011 no. customers increased from 2010, recorded 208,917 visitors in 2011 to 188,824 in 2010.

3) Monthly concentration ratio of 2011:

is calculated by dividing the number of tourists in the month with most of the total number of tourist arrivals a year A_t .

$$C_c = \frac{LM}{A_t}$$

C_c value is between 0.083 and 1.

$$C_c = [\text{no. tourists month} / (\text{number Romanian tourists} + \text{No. foreign tourists})]$$

For this we consider the year 2011, and the number of tourists each month is as follows:

January 382, February 312 March 289 April 325 May 262 June 408 July 493 August 610 September 360 October 214 November 202 December 401.

$$C_{cian} = (382/4258) = 0,089$$

$$C_{cfeb} = (312/4258) = 0,073$$

$$C_{cmar} = (289/4258) = 0,067$$

$$C_{capr} = (325/4258) = 0,076$$

$$C_{cmai} = (262/4258) = 0,061$$

$$C_{ciun} = (408/4258) = 0,095$$

$$C_{ciul} = (493/4258) = 0,115$$

$$C_{caug} = (610/4258) = 0,143$$

$$C_{csep} = (360/4258) = 0,084$$

$$C_{coct} = (214/4258) = 0,050$$

$$C_{cnoi} = (202/4258) = 0,047$$

$$C_{cdec} = (410/4258) = 0,096$$

Coef. Monthly concentration in 2011 had the highest value in August with a value of 0.143, while the lowest was in November of that year of 0.047.

4) Indicator in relation to population density tourist

$$D_{t_{i-0}} = \frac{T_{t_{i-0}}}{\text{Population}}$$

where:

$T_{t_{i-0}}$ - total Romanian tourists + strangers;

Pop - county population = 413,570 inhabitants (2011),

$$Dt_{2011} = (208917/413.570) = 0,50$$

5) Indicator relative to the surface density tourist

$$D_{t_{i-0}} = \frac{T_{t_{i-0}}}{\text{Suprafata}}$$

where:

T_{i-0} - total Romanian tourists + strangers;

S - County = 5765 km² area,

$Dt_{2011} = (208917/5765) = 36,23$

[5] Valcea INSSE site.

[6] Statistics Prefecture and Valcea County Council.

[7] Law 5/2000 concerning the approval of national planning - the Third section - protected areas.

[8] Statistical Yearbook of Valcea county, INSSE, Bucharest.

CONCLUSIONS

In Valcea county can delineate four major areas of tourist interest already established, that "mountain tourism," resorts "," cultural tourism and monastic "and finally" agrotourism. "To these we can add yet another tourist destination, namely" sports tourism and leisure "(hunting and fishing).

Mountain area, representing one third of the county, offers tremendous attractions: keys, waterfalls, caves, more than 80 marked and maintained trails, climbing ability, skiing, fishing and hunting sports and numerous lookout points. Getting a great mountain tourism accommodation and vacations in the resorts now famous Voineasa and otter.

Rich springs that abound some geographical areas and picturesque landscape that you "wash" spread the greatness of the leading spas County: Calimanesti - Căciulata, Baile Olanesti Baile Govora Ocnele - Ocnita known not only in Europe but worldwide, with an impressive card.

Numerous other actions taken in each commune, are designed to develop the tourism offer Valcea, to make a more significant contribution to the development of Romanian tourism and national economy

Achieving sustainable tourism markets has become an urgent necessity because only such a market can generate investment in the sectors most promising and profitable investment that will result in the development of the areas they will showcase and make known locally, nationally and internationally all the beauty that God has endowed Valcea.

REFERENCES

- [1] Minciu Rodica, 2000, *Tourism Economy*, Uranus Publishing House, Bucharest.
- [2] Honțuș Adelaide, 2005, *Planning and agrotouristic territory*, CERES Publishing House, Bucharest.
- [3] www.incdt.ro.
- [4] Law 750/2001 on spatial planning and urban.

LAUNCH INTERNATIONAL CIRCUIT IN RURAL TOURISM DEVELOPMENT THROUGH A TOURIST VILLAGE POLOVRAGI GORJ

Adelaida Cristina HONTUȘ¹

¹University of Agronomical Sciences and Veterinary Medicine - Bucharest, Faculty of Management, Economical Engineering in Agriculture and Rural Developments, No. 59, Mărăști Boulevard, no.1 Sector, Bucharest, cod 011464, Romania, e-mail: adelaidahontus@yahoo.com

Corresponding author email: adelaidahontus@yahoo.com

Abstract

Tourism in rural areas, complementary to other forms of tourism, contribute to its support, giving them the necessary conditions to transform tourism travel holiday circuit. This area of the county, village Polovragi can and should become a tourist area of residence, a holiday destination for spending the whole year, because it responds not only motivation and knowledge of cultural tourism, but also other modern requirements: that the party free time in nature, which in fact seen in other countries. Along with other places in the county, Polovragi keeps the traditions and craftsmanship of Gorj, tourists can visit the workshops of craftsmen here or participate in folk events such as Fair or Fair Nedeia Polovragi year (from July 20, attracting a large number of tourists in Oltenia). Therefore, the tourist offer of settlement may include a folk product.

Key words: attractive tourism, crafts and traditions popular tourist area of residence, speleological and religious tourism

INTRODUCTION

Polovragi village is situated at the foothills southwest of Skull Mountain, in the depression of the same name, in the north-east of the county Florida, on the left bank of Oltetului. Depression Depression is part of Subcarpathian Polovragi Oltean, located between Bistrita Valcea / Costesti Hill, east and Motru River to the west. Oltetului Valley separates Parang Mountains (west) of Capatana Mountains (East), with a steep limestone relief of about 200-300 m height.

Polovragi village consists of two villages: Polovragi - and Racovita common residence. Like all mountain areas of Gilort and Bistrita Valcea, the village population suffered Polovragi demographic and ethno-cultural influences from Sibiu Surroundings. The result of this interference is found in language, port and similar villages Marginime pastoral tradition, something which is a strength in developing tourist town, the cultural elements unique value you can give potential visitors. Preserving this heritage ethno cultural must represent, along with infrastructure and utilities, the main objective of development strategy of the city [3].

MATERIAL AND METHOD

Rural tourism is an important part of expression orientation contemporary tourists to nature because of the implications of post-industrial civilization. Today nature becomes a pretext for reflection, discovery Peter, for education, and treatment, sporty performance and thus for a new life.

Promotional activities must secure a suggestive image of Romanian rural tourism, both in terms of tourism potential, as well as characteristics of social, cultural, psychological specific to our people.

This work was intended presentation rural tourism potential of our country in the context of European tourism needs alignment and tracking the best ways to promote the development and correlation with existing resources.

Launch into the international tourism Polovragi rural village and highlights some specific issues: Polovragi - European tourist village, tourism planning and analysis activities in the rural tourism and pursued policies and strategies are applied to regional SWOT analysis of tourism Oltenia, Romania and

tourism in the context of integration and launch of the international circuit.

RESULTS AND DISCUSSIONS

Romanian tourism is currently supported almost exclusively by natural resources and historical remains, infrastructure contribution is minor [2]. Quality of tourist services not only attracts foreigners, but it away and the Romanian, who found that the same money can get excellent in Turkey, Bulgaria and Greece.

In order to increase competitiveness on national and international markets offer necessary product development and modernization of the Romanian tourist. In this respect we mention that the Ministry of Transport, Constructions and Tourism has established *a number of national strategic objectives*:

- improving and strengthening the tourism product in those areas, resorts, cities, routes which are currently the best known Romanian and foreign tourists and where there is already created one structure;
- tourism product development and modernization so that Romania to distinguish from other tourist destination countries;
- raising the standard of services according to category and tourist unit rate used;
- optimization and development to maximize the cultural component of tourism;
- increase quality and expand capacity travel arrangement;
- protecting and improving the environment in tourist areas, improve the level of protection of tourists, knowing that the repercussions on the environment increase with volume of tourism.
- completion and promoting a small number of tourism products for international markets, well developed;
- developing a strategy for improving the services to hotels and restaurants;
- turning points of Romania's unique attraction: the areas of cultural tourism, and rural folk;
- collaboration with regional partners to sell software packages with multiple destinations;

- providing quality services to capitalize on attractive tourism products and encourage current and potential tourism markets.

Internal promotion of Romanian tourism product will track emphasizing its *two major advantages to the tourist market* as a whole:

- diversity and complexity of Romanian tourism product that covers and includes all major tourism: tourism summer, spa, winter sports, cultural and rural tourism and can point to different segments of customers of different ages, with low incomes or high etc;
- price and quality, beneficial to the majority of the population compared to foreign destinations, more expensive, in many cases for a similar offer.

It is absolutely necessary and facilities associated with the development of infrastructure: highways, sufficient fuel stations (in this regard, progress is evident), presenting signs and traffic routes crossed areas of automobile, possibility to rent a car as diversity, parking, washing and repair stations, etc..

In addition, we believe is necessary to provide a range of products offers the kind souvenir. Consideration should be given maps, brochures, postcards and handicrafts.

SWOT analysis of tourism Oltenia

SWOT refers to strengths and weaknesses of the tourist business, opportunities and threats associated with the existing market at a time. This analysis applies to the environment in which business is conducted and is the first step of the marketing department staff should make it to assess the degree to which the objectives and not least to identify the problems it faces.

Strengths

- High natural potential;
- Well preserved natural environment, deosebita diversity, clean air, the natural proper relaxation;
- Special landforms;
- Attractive landscapes (with forests, rivers, lakes, mountains);
- Hospitality of the inhabitants and traditions;
- Cultural and spiritual existence of settlements;

- Agrotourism, ecotourism (green tourism);
- Tourism product development type "niche" (ecological tourism, mountain);
- Cultural centers, historical museums, houses memorials, unique monuments in the world;
- Infrastructure specific accommodation well represented;
- Local gastronomic specialties (cuisine);
- Folklore and festivals, New Year customs, music traditional dances;
- Agrotouristic hospitality.

Weaknesses

- Lack of communication and cohesion between human communities to achieve objectives of common interest;
- Transport disruption due to condition access roads (poor infrastructure, pits, indicating lack of), no phone in certain areas;
- Insufficient specialized training of workers in the hospitality industry, lack of motivation of employees, poorly qualified, certified and licensed;
- Poor quality of tourism services;
- Existence in some cases of precarious living conditions, lack of cleanliness;
- Weak tourism partnership (between local government and travel companies);
- The lack of a framework agreement and enacted a code of conduct between the hotels and travel agencies;
- Insufficient development of existing tourism potential;
- Low interest for investment;
- External appearance seen poverty and neglect impression even in areas many historical monuments.

Possibilities

- Development of new tourist resorts;
- Restoring county roads network, proioritate with access to those sights;
- Existing financing programs;
- Extreme sports, mountain adventures, walking;
- Creating partnerships with organizations and foreign investors in the tourism sector; integration in EU funded programs;

- Creating a travel scholarship;
- Organizing traditional rental houses holiday period, they could be integrated into one or several professional European network location and distributed network of travel agencies in Romania;
- Providing care facilities with conference rooms;
- Encouraging development of new forms of tourism (eg adventure);
- Support projects that place of tourism, and cultural and spiritual goals;
- Improving infrastructure;
- Setting up a network of tourist information centers near major tourist attractions.

Threats

- Real incomes of population decline, inflation;
- Diminishing availability of free time;
- Changing consumer preferences;
- Manifested fierce competition in domestic and international tourism, illegal;
- Instability of government policies on tourism and taxation;
- Tourists in the region tend to migrate to other regions (countries) and an insufficient influx of foreign tourists;
- Increasing expectations of tourists, which can not be satisfied;
- Decisions based on inaccurate information;
- Any degradation of monuments of art and architecture;
- Increased competitiveness among regions and lack of cooperation between them;
- Poor perception of Romania abroad.

European integration is a gradual process sequentially tourism, by which the organization, working relationships inside and outside the system "tourism" is similar to the existing EU practice [1].

The main objective of this process is to create a system compatibility in institutional-structural level, legal and operational principles and mechanisms of this domain. In perspective wider European integration process must generate sustainable development of the Romanian tourism pa free market laws.

Polovragi - European tourist village

The tourist offer consists, in general, both elements of the tourism potential, natural and anthropogenic, as well as the tourist structures and labor involved in tourism activities.

For Polovragi current tourism offer is based on a valuable tourist potential and the technical-material base of tourism, in its current stage of development. The existence of a minimum accommodation and food services creates the conditions for the development of tourist activities.

Polovragi tourism product promotion is the result of two symbols belonging to the locality: Cave Polovragi and respectively Polovragi Monastery.

Both sights are valuable enough to offer the possibility to promote tourism as speleology and the religious. Polovragi Cave is one of the most famous and accessible karst formations in the country. Polovragi Monastery is located in a picturesque setting at the foot stone Polovragi in Oltetului Gorge vicinity.

Along with other cities in the county, is the guardian Polovragi Gorj traditions and crafts, tourists can visit the workshops of craftsmen here or participate in folk events such as Fair or Fair Nedeia Polovragi year (from July 20, attracts a large number of tourists from Oltenia). Therefore, a touristic village folk may include a product.

Cave Polovragi

Polovragi cave is located on the left bank of Oltetului, at an altitude of 670m and 20m height from the thalweg of the river. It is located 6km north of Targu-Jiu DN 67 Ramnicu Valcea and the Holy Monastery Polovragi 500m.

The cave was shaped by the waters Oltetului band Jurassic limestone in southern Parang Mountains and skull, 1-1.5 km wide, here having its origin of a karst spring appearing in key, right in the cave portal.

Cave entrance is near the dirt road that climbs keys.

It is one of the largest caves in our country, with a length of 9300M (with side galleries),

which is intermediate in this regard, the 5th from caves in the country. It is made out of a horizontal gallery principala from that fall, especially in the first and last portion of her small side galleries, many of them clogged with silt. Polovragi cave was know in ancient times, cercetraile revealed archaeological material traces from the Bronze Age.

The first description of them was made by Joannes, in 1868, because in 1901, writer Al. Vlahuta to remember in his famous work "Romania picturesque". In 1929, it is researched and Emil Racovita and R.Jeannel, for archaeological cercetrarile be made by CS Nicolaescu Plopsor in 1952.



Fig. 1. Cave Polovragi

Monastery Polovragi

It is located northeast of Tg. Jiu, on the road Tg. Jiu - Rm, in a picturesque setting at the foot stone Polovragi. Monastery entrance is through a massive wooden gate, beautifully carved, which reads: "Blessed is he that cometh in the name of the Lord". On the right side of the gate is a beautiful wooden crucifix carved concrete base, dedicated to Romanian heroes and martyrs.



Fig. 2. Monastery Polovragi

Dedicated to the Holy Sepulchre of the second founder of his monastery redeemed Constantin Brancoveanu from Dositei Patriarch of Jerusalem, in 1693 and made the monastery Hurez subdued. During his Constantin Brancoveanu was restored church, which he ascended the tower and porch added Brancoveanu style, was painted inside the cells recovered, bell tower and city walls. During the Austrian domination in Oltenia was last randl monasteries proper defensive fortifications. General Stainville chose as a residence, nestled between its walls an army battalion (1718-1739). Later, on April 27, 1802, the monastery

was plundered by bands of robbers Pasvantoglu's. Legend says that when the monks monastery hidden treasures Oltetului water.

The church dedicated Polovragi "Assumption" is built in Byzantine style. Brancoveanu style porch is spacious, light, supported by eight stone columns. The porch is founder tombstone sister.

Polovragi The church is surrounded by cells, forming a strong fortress. In it penetrates through a massive gate which rises above the bell. The monastery has a museum collection, which houses a rich collection of icons on wood and glass, coming from the eighteenth century and nineteenth century and rare book store of over 3000 volumes in Romanian, Slavic and Greek.



Fig. 3. Incinta Mănăstirii Polovragi

These two sights, add and possibilities to practice of extreme sports such as mountaineering, paragliding, flying fox, funicular or Descend (down a steep wall with a double rope system) - in the keys Oltetului.

Therefore, the current offer is Polovragi village consists of a combination of possible forms of tourism practiced in terms of their appropriate tourism potential and existing minimum of travel.

Promoting village Polovragi is done only at the sights without a complete plan to achieve promotion to the whole village. City is promoted to a low, with other locations in the county, so poorly. Using the two symbols dispersed without following the logic of marketing that do not provide efficient means any promotion.

Touristic village of Polovragi

Although tourism has various resources that allow practicing different forms of tourism such as religious tourism, speleological tourism or tourism for extreme sports has shaped Polovragi efficient tourist activity, identifying these problems and failures of current tourism offer :

- Tourist accommodation structures less diverse in type and category of comfort (only two pensions of 2 and 3 daisy);
- Insufficient food tourist structures in relation to the actual number of places;
- Lack of specific design approval;
- Tourist activity inconsistent with the value of tourism potential;
- Lack of effective distribution and promotion actions.

To restore tourist markets believe that the promotion policies of the hospitality industry, should consider the following *steps*:

- Differential stimulation of interest to different categories of tourists visit Romania;
- encouraging proactive attitude of tourism and travel industry in our country and promoted the local communities to exploit the tourism potential;
- increase the efficiency of the Romanian tourism promotion campaign;
- development of information centers, documentation and related activities in all major points of access in the country (it is unacceptable in our opinion, that in a city like Bucharest was no tourist information office);
- restoration, update and enrich the range of advertising and making them available to consumers of tourism;
- and principled close collaboration with all ministries, embassies, consulates and tourist offices to promote the image of Romania's tourism offer;
- rotation organization in as many states, regions and resorts, the symposia, communications sessions, exhibitions, trade fairs to promote the image of Romanian tourism product;
- active involvement of Romanians from abroad with outstanding positions in business, art, culture, science in the promotion of

Romania initiated programs in their countries of adoption;

- streamline business travel agency promotional messages abroad and adapting to the particularities of each market, achievement pertinent periodical analysis of these markets, combined with statistical profile of these countries.

Some solutions that can lead to more pronounced development of tourism:

a) preservation and promotion of widespread national cultural and historical heritage; achieve the restoration of monuments legislation, financial incentives, tax credit and investment in this area;

b) protecting the environment, duty-free imports of equipment to clean up and promulgated the Law on Environmental Protection and Urban and Spatial Planning Law;

c) organization of tourism, creating the institutional framework to keep the recovery of this area of activity, and achieving organizational arrangements for horizontal cooperation in the fields of economic agents that complete the tour of services or contribute to them.

These are just some of the statutory issues by solving and they can lead to more pronounced development of tourism in general and the countryside, in the alternative.

To accelerate these activities, a particular part to play professional associations, local associations, consortia, initiative groups, opinion leaders throughout civil society.

CONCLUSIONS

The analysis highlights the main points made the inner workings of the Romanian rural tourism, the strengths and weaknesses, which can be designed in terms of "7P": product, price, position in the chain of distribution, promotion, personnel, physical premises, profit. Foreign Policy is shaped by the opportunities and threats whose examination will allow us detect their influence on the evolution and becoming the Romanian rural tourism. They (opportunities and threats) can be studied and STEP through factors (sociological, technological, economic and political) factors

as the vision the competitive environment (market, bargaining power, competition, costs). The complex analysis can reveal new valences interdisciplinary rural tourism product and aspects that make the Romanian rural tourism product is not perceived as expected.

As a result of SWOT analysis, a first issue in Romanian rural tourism is insufficient knowledge of tourism products domestically and internationally, so a reduced promotional activity. In fact, one of the areas of tourism marketing is promoting products.

Rural tourism product-vacation in the country is a mixture of products and services whose individual components are provided by different companies, in general, knowledge about tourist destinations tourists are vague, so the role of marketing is to create an image unique destination, a place offers particular benefits for tourist needs.

Image of tourist destinations created and designed by travel agents was studied by many researchers in studies detach the three important issues. Of these, the most important is that the image projected by travel agencies is the best source of ideas about tourist destinations for the tourist potential in quantitative expression it can be considered insignificant. Image projected by the media, personal experience of holidays past experience of visitors and potential visitors of personal contacts is more important than the right image promoted tourist destinations.

A second problem drawn from the research on the effects of image tourist destinations tourist image to the elements and connections between them to achieve the ultimate goal of marketing activity. Clarity, simplicity and a minimum of disagreement and images are essential for success.

Finally, the third tourist image design problem is the conflict or, at best, complementary images designed for different purposes in the same region and same destination images projected by different agencies.

A variant of this problem is the fact that this conflict can occur on spatial scale, given the reality that different authorities are responsible tourist image at national, regional and local.

Important is that the image created by tourism marketing activities do not differ from reality, the difference is quickly discovered by the consumer. Most prudent solution would be projected through generalized so that there are no differences to the other bidders, resulting in the same general effect.

REFERENCES

- [1] Cristureanu C., *Strategies and transactions in international tourism*, CHBeck Publishing House, Bucharest 2006
- [2] Hontuş Adelaida, *Territorial Planning Farmhouses*, CERES Publishing House, Bucharest, 2005
- [3] Hontuş Adelaida, *Tourism Geography of Romania*, CERES Publishing House, Bucharest, 2005
- [4] Law. 750/2001 on spatial planning and urban
- [5] Law 5/2000 concerning the approval of national planning - the Third section - protected areas
- [6] www.rotravel.ro
- [7] www.gorjulturistic.ro

EFFECT OF SUBSIDIZING EXPORT OF AGRO-FOOD PRODUCTS AFTER THE ACCESSION OF POLAND TO THE EUROPEAN UNION

Daniela POPA¹

¹State Agrarian University of Moldova 44, Mircesti St., MD – 2049, Chisinau, Republic of Moldova,
tel: (+373 22) 43-24-90, fax: (+373 22)31-22-76, d.popa@uasm.md

Corresponding author email: d.popa@uasm.md

Abstract

*Together with the accession of Poland to the European Union, the conditions of commodity exchange with the abroad have been considerably changed. Trade of Poland with the European Member State has been covered with the regulations of the Common European Market. Pursuant to the Accession Treaty, Poland has adopted *acquis communautaire* of the Community concerning trade policy, including all instruments and rules of common commercial policy, including external customs tariff and out-tariff measures as well as system of agreements with the commercial partners outside the European Union. Accession to the European Union meant the extension of greater protective barriers over Poland in the field of import of agricultural products from third countries and the possibility of taking an advantage of export subsidies to agro-food products exported to third countries on equal rights as other European Union entrepreneurs.*

Key words: Agriculture, Common Agricultural Policy, foreign trade, export subsidies

INTRODUCTION

The agri-food products have always held an important position in Polish foreign trade structure. Agri-food trade plays a vital role in development of Polish agriculture and the whole economy. Suitably developed and export-oriented production is one of the sources of import financing, and gives a chance of gaining the high possible advantages of dealing on the world market. As far as surplus production is concerned, export contributes to capacity utilization more efficiently, as well as causes a growth of employment and investments. Import's role is to supply goods, which are not produced in Poland or enrich the market offer. Competing with domestic production, import can give incentives to simplification and modernization of production, quality improvement and production cost saving.

Together with world trade liberalization process, becoming Polish agro-food sector more and more open, and Poland's accession to the European Union, some dynamic changes in Polish agro-food trade were observed. They resulted from existing trade rules, as well as

internal and external macroeconomic conditions. Hence, the aim of the paper is to assess main trends and changes in commodity structure of Polish agro-food trade.

MATERIAL AND METHOD

At the basis of this scientific paper served the informations from the Ministry of Agriculture and Rural Development from Warsaw, Agricultural Market Agency from Warsaw, Agency for Restructuring and Modernisations of Agriculture from Warsaw, Agricultural Property Agency, and data about investments from the Statistics National Bureau of Republic of Moldova, Ministry of Economy of Moldavian Republic, different groups of national and international experts and also our own researches in this domain, were applied the following methods: selective, comparison and tabular methods.

RESULTS AND DISCUSSIONS

Polish agriculture is characterized by significant dispersion, as an average size of agricultural holdings is about 10,15 ha of agricultural land, and more than half of the

holdings produce only or mainly for their own use, thus reducing their expenses on the purchase of food as well as other family expenses. Such agricultural holdings of a relatively small area employ traditional production methods, consisting in limited use of mineral fertilizers and chemical plant protection products, as well as of industrial feed in feeding farm animals, especially cattle.

Despite these phenomena and the prevalence of soils with low usefulness for agriculture, Poland is an important European and global producer of agricultural and horticultural products, as well as products of animal origin.

Presenting a special interest in studying the experience of Poland for the state regulation viewing the problem of subsidies and the guarantees for the credits. Starting from the year 1994 Poland was supposed to regulate the program of "Agency for restructuring and modernization of agriculture" on regions. The level of sustaining the agriculture by the given program consists in offering the interests for the preferential credits: 10 % for the programs connected to the field of zoo-techniques for a period of 8 years; 6, 25 % - for the young farmers for a period of 15 years. Guarantees for the agricultural enterprises and for the ones of production processing in the measure of 80 % to the agricultural producers and till 70 % for the enterprises of processing the agricultural production.

Studying the mechanism of credits functioning, insurances, prices, dues and other economical factors that compose the mechanism of farming from Poland.

Structure of Polish agriculture has changed imperceptibly. Today the average number of Polish farms constitutes about 6-7 hectares. As a result of economical reforms from the last few years, there appears the trend to make the polarization of family sector of Poland – there is increasing the number of the small and big farms.

The agricultural sector is subject to governmental regulation in the developed, as well as in developing countries. Governmental regulation of agricultural markets in EU countries is directed towards the increase of living standards of rural population and the

development of competition for agricultural products. The regulation of agricultural markets for EU countries is based on the following principles: the abolition of any restrictions in trade between EU countries; the establishment of unique prices for products and agro-industrial mechanisms which contribute to their stabilization; the protection of internal market against third countries products; the farmers funding from the unique fund made from the participating countries contributions.

Is necessary to mention, that prices are one of the most important instruments of the economical mechanism of regulation for EU producers. Towards its price policy EU increased the level of food security and its own insurance with the main categories of agricultural products, to the reduction of imports, to the increase of exports and as a result to the improvement of its balance of payments.

The regulation of agricultural production and agricultural markets mainly suppose the establishment of a price interval according to the main types of agricultural products, prices at a higher level for producers and in the same time affordable for consumers. In this way is allowed prices variation, but only in the established levels without leading to negative consequences. In the same way for supporting the activity of agricultural farms are necessary large subsidies. The creation of such an interval needed the introduction of prices supporting system in the EU countries.

Poland also holds a leading position in production of berries (strawberries, raspberries and currants) and outdoor vegetables, such as: onions, cabbage and cauliflowers.

Soil and climatic conditions, as well as regional traditions, determine production specialization. In 2008, similarly as in 2007, there was an increase in agricultural production: however, pace of growth was definitely slower than in the preceding year when very good production results were achieved. Global agricultural production rose by 3,1% till 2007, which is an outcome of increased plant protection (by 6,8%) and decreased animal production (by 1,5%).

Slower GDP growth in 2008 (by 1,9% when compared to 2007), resulting from economic slowdown and a considerably better tolerance of agricultural sector to the crisis – related factors, led to an increased share of agriculture, hunting and forestry in GDP.

Since the EU integration, a growing demand for agricultural land has been observed, resulting in an increase in land prices. The growing number of transactions in land marketing differs regionally and is conditioned mainly by: supply, different agrarian structure, economic power of agricultural holdings and diversified reasons for purchasing land. The relatively smallest turnover has been observed in southern and central Poland, where holdings are most fragmented and where the custom of passing land to growing up children still predominates. The highest increase in prices has been observed in case of the cheapest land with no value for agriculture, which indicates that the demand for land is not associated with agricultural production.

Table 1. Average prices of farmland and meadows in private trade

	Price per 1 ha	
	Years	in PLN
Arable land	2000	4786
	2005	8244
	2008	15388
Fertile (wheat and beet root)	2000	6712
	2005	11001
	2008	18747
Medium (rye and potato)	2000	4920
	2005	8603
	2008	16096
Barren	2000	2725
	2005	5843
	2008	12222
Meadows good	2000	4883
	2005	6144
	2008	12489
Meadows poor	2000	2753
	2005	4003
	2008	9275

Source: Agriculture, CSO (GUS). Warsaw, 2009

Dynamic growth of average farmland prices continued also in 2008. However, the price increase was slightly slower than in the

previous year – both in the private trade and in case of Agricultural Property Stock of the State Treasury. By the end of June 2009, the Agency sold 1.877 thousand ha, i.e. 62% of the land remaining in the Stock. The supply of land from the Agricultural Property Stock of the state Treasury is declining; factors hampering the sales include reprivatization claims, which concern approx 500 thousand ha. Currently, the Agency has 315,5 thousand ha of land at its disposal which are planned to be sold or leased; however, only 215 thousand ha (68% of the total land) is fit for agricultural production. The agency, since the beginning of its activity in this area, has conducted approx 680 thousand tenders, including 20 thousand restricted tenders. In certain cases, existing leaseholders have the right of pre-emption.

Starting prices for the tenders are established on the basis of market criteria. In sale transactions of arable land constituting the Stock, the average price per 1 ha in 2008 mounted to PLN 12,540. In the first quarter of 2009, the average transaction price was PLN 13,666 per 1 ha, (Fig. 1).

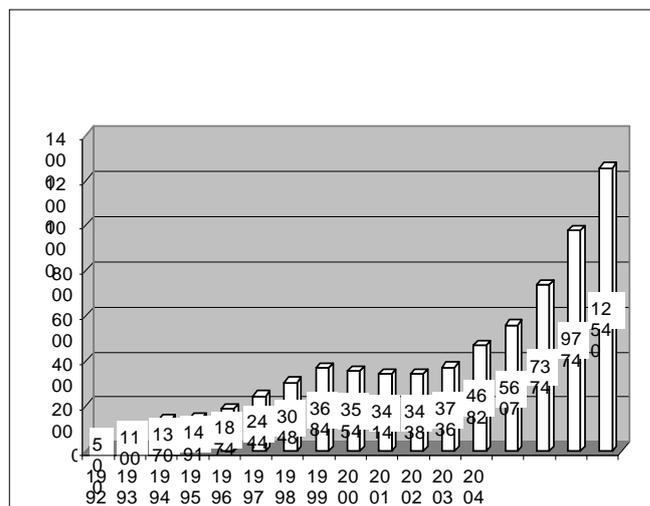


Fig. 1. Sale prices of agricultural property owned by the APA in PLN/ha

Source: APA

In 2008, the value of global agricultural production reached the level of PLN 82,96 billion and was by 3,1% higher than in 2007. The value of plant protection, amounting to PLN 46,07 billion, was by 6,8% higher than previous year, while animal production,

reaching the level of PLN 36,88 billion, was by 1,5% lower.

In 2008, market conditions for agricultural production deteriorated, especially in comparison with the previous year, which was particularly favourable in this regard. Agricultural economy and production in 2008 were influenced by increased cereals harvests and declining supply of slaughter pigs, which affected the prices of agricultural products in the country. Developing economic downturn on global cereals and milk markets was one of the main factors which led to the price decrease. The prices of means of production, on the other hand, were on the rise in 2008. as the prices of agricultural products rose slower than the prices of the means of agricultural production, the index of price relations (price scissors) declined from 107,7 in 2007 to 91,0 in 2008 (Fig. 2).

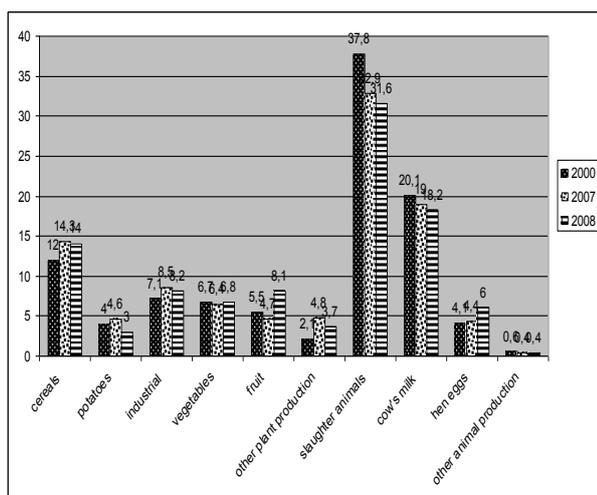


Fig. 2. Structure of commercial agricultural production in 2000 and 2007 (in % - current prices)
 Source: Agriculture, CSO (GUS). Warsaw, 2008

One of the most actual problem of the management of agricultural sector in Poland is organic farming. Organic farming is a system of farming based on balanced plant and animal production. Organic production combines best environmental practices, high degree of biological diversity and protection of natural resources with keeping high standards of animal welfare and production methods, all of which satisfy the requirements of consumers opting for products mate with the use of natural substances and natural processes.

The number of organic farms varies depending on the region. Most of them are located in south – east Poland, where farms are small in size and run by families.

Organic farming is the most environmentally friendly method of agricultural production, enhancing soil fertility and preserving landscape diversity. In order to enhance biological activity and fertility of soil, crops are need to be appropriately rotated.

Recent years have witnessed a growing interest in organic food production methods all over the world, and especially in the EU. The world's area of organic farming exceeds 35 million ha, 20% of which is in the EU. Despite favourable conditions, Poland lags behind the EU average as regards organic farms and the area under organic farming.

CONCLUSIONS

The experience of the EU countries demonstrates that in the conditions of market economy farmers' activity, the efficiency of the food economy complex, the improvement of economical and ecological sphere are subjects of governmental regulation of agricultural products.

For achieving these objectives is necessary to propose to governmental institutions responsible for regulation, development and control of agricultural sector the following actions:

- To implement the system of compensation payments and exports subsidies which demonstrated their high efficiency in protecting EU local producers and to increase exports of agro-food products;
- To undertake actions for government intervention on agricultural markets for purchasing agricultural products on guarantee prices according to the model of mechanisms implemented in EU countries.

REFERENCES

- [1] www.arimr.gov.pl
- [2] www.anr.gov.pl
- [3] www.minrol.gov.pl

RESEARCH ON THE USE OF EXTRA-EARLY CULTIVARS FOR INCREASING ECONOMIC EFFICIENCY IN WATERMELON GROWING IN THE SOUTHERN ROMANIA

Agatha POPESCU¹

¹University of Agricultural Sciences and Veterinary Medicine, Bucharest, 59 Marasti, District 1, Zip code 011464, Bucharest, Romania, Phone: +40 21 318 25 64/232, Fax: + 40 21 318 28 88, E-mail : agatha_popescu@yahoo.com

Corresponding author email: agatha_popescu@yahoo.com

Abstract

The paper aimed to study the influence of two cultivars: Crisby and Karistan, with a different maturation length, upon economic efficiency in watermelon growing in an experiment running on sandy soils at SC Casa Pepenilor Verzi SRL Dabuleni, Dolj County, Romania in the year 2011. The experience was organized on 1.25 ha divided into 2 plots: V1-cultivated with Crisby F1 cultivar, an extra-early type and V2-cultivated with Karistan cultivar, a tardy type. The main economic indicators followed in the experiment have been the following ones: watermelon yield, production cost, income, profit, profit rate and gross margin. Crisby cultivar produced 30 t fruit per ha, starting from the 1st part of June when the selling price was Lei 1.2/kg and assured Lei 22,611 profit/ha. Karistan cultivar generated 70 t fruit per surface unit beginning from the 2nd part of July when the selling price was Lei 0.3/kg and produced Lei 6,051 profit per ha. As a conclusion, the use of an extra-early cultivar could assure a more efficient watermelon growing because fruit could be delivered earlier in the market covering in a better way consumer's demand and increasing producers' income and profit.

Keywords: extra-early cultivar, economic efficiency, Romania, watermelon growing

INTRODUCTION

Watermelons are sweet, tasty, juicy, nutritive and healthy fruits consumed as such divided into slices, salad or juice, especially in summer season [16].

It is a healthy fruit with a good impact on people's diet because of its nutrients and energetic value [7,13]. It also has a good effect on metabolism and blood pressure [2].

Watermelon juice is also a promising feedstock supplement, diluent and nitrogen supplement for ethanol biofuel production [3].

Watermelon growing is suitable mainly in the hot areas where the conditions for fruit development and maturation are fulfilled. Watermelon can be successfully cultivated on sandy soils [1,5,6,8,10, 11].

Watermelon production depend on cultivar, fertilization and irrigation [4, 9,12,13].

In Romania, the traditional region for watermelon growing is the Southern part, especially the Oltenia region where more than 10,000 households are growing watermelons on

sandy soils in the communities of Danesti, Bechet, Calarasi and Dabuleni.

Dabuleni is “ the country” of watermelons”, because 70 % of the 3,600 existing households, that is 2,500 households are cultivating in average one hectare with watermelons [17].

The yield varies between 50 and 100 t/ha depending on watermelon cultivar, its productive potential and the moment of maturation.

Traditionally, watermelons are harvested at the beginning of August in Romania, but the use of the early and extra early cultivars and varieties has determined as harvesting to start even in the first part of the month of June.

In Romania, both Romanian and imported cultivars, tested and adapted to the local conditions of soil and climate are cultivated (Dulce de Dabuleni, De Dabuleni, Crimson Sweet, Sugar Baby, Lady F1, Farao F1, Granit F1, Crisby F1, Red Star F1, Top Gun F1 [6].

The main characteristics of watermelon cultivars are: maturation moment, shape and

weight of the fruit, vigour and stress resistance of the crop.

Fruits earlier harvested have a smaller weight, 4-5 kg and are more sensitive to diseases and pest. On the contrary, fruits later harvested are heavier, weighing 8-10 kg and even more and are more resistant to stress conditions.

Some research results have proved that watermelon plants treated with foliar fertilizers based on Boron (Complex Boron, Cupribor and Folibor) registered a yield by 43-47 % higher compared to the untreated and unfertilized ones [8,14].

Watermelon growing is achieved in various technological systems such as: in the field, in greenhouses and in the tunnels. The applied technology has also an important influence both on fruit production and maturation period [6].

The most important factor influencing the performance per surface unit is watermelon cultivar and variety, considering that soil and climate conditions are similar.

In this context, the paper aimed to present a comparative experiment in watermelon growing on sandy soils under a dripping irrigation system at SC Casa Pepenilor Verzi SRL, Dabuleni, Dolj County, Southern Romania, in 2011 in order to identify the effects on fruit yield, production cost, income, financial results, and economic efficiency. In this purpose, two cultivars with different maturation length were used as follows: Crisby, an extra-early cultivar and Karistan, a tardy watermelon cultivar.

MATERIAL AND METHOD

In order to study the effect of watermelon variety on the economic performance, the experiment was carried out in the year 2011 at SC Casa Pepenilor Verzi SRL, Dabueni, Dolj County, Southern Romania on the surface of 1.25 ha, divided into 2 plots: V1-0.625 ha cultivated with Crisby cultivar, an extra early variety, and V2- 0.625 ha cultivated with Karistan cultivar, a tardy variety.

The watermelon crop was grown on a sandy soil in the field under a dripping irrigation system. The crop technology consisted of tillage, cultivar selection, transplants

preparation, fertilization, transplanting of the small plants into the field, integrated weed and pest control, irrigation, crop maintenance and harvesting.

In order to analyze the economic efficiency in watermelon growing, the following economic indicators have been taken into account: watermelon yield and production, production cost by cost item (cost of producing transplants and transplanting in the field, tillage and crop maintenance, weed and pest control, irrigation cost etc), income coming from marketed fruits, selling price, profit, profit/ha and profit per kg, cost/ha and cost/kg, income/ha and per kg, and profit rate.

All the calculations have been made both per surface unit (ha) and total cultivated area with the 2 watermelon cultivars.

The data were collected from farm evidence [15] and were processed according to the modern methodology for 1 ha, for 0.625 ha cultivated with each variety and 1.25 ha cultivated with the both cultivars in the experiment.

RESULTS AND DISCUSSIONS

The choice of cultivars. The two varieties chosen to be used in this experiment are different concerning the period of maturation and production potential: V1-Crisby is an extra-early variety and V2-Karistan is a tardy cultivar.

Table 1. The main characteristics of watermelon cultivars

Characteristic	V1-Crisby	V2-Karistan
Maturation	Extra-early	Tardy
The moment of maturation	June 10, 2011	July 15, 2011
Fruit shape	Oval	Oval
Shell thickness	Fine	Fine
Fruit weight (kg)	7-10	8-10
Pulp (flesh)	Crispy, very sweet, fine, dark red and small black seeds	Crispy and sweet, carmine red, black seeds
Yield (t/ha)	30	70
Crop technology	In the field	In the field

Similar features are mentioned in other research results [6, 18,19,20].

Tillage. The sandy soil was worked with the tractor and plough and then with the disk harrow.

Fertilization was achieved at the same time with tillage paying attention to the amount of fertilizer per surface unit and the moment of application, taking into account that for 50 t production per ha, watermelons extract from soil 85 kg Nitrogen, 65 kg Phosphorus and 135 kg Potassium [6].

The fertilizers were incorporated into the ground at ploughing using the disk harrow. The dose of complex fertilizer was 550 kg/ha for assuring a balanced NPK ratio so that P and K to be in a higher amount as the fruit flesh to remain crispy.

During the vegetation period, the Elite foliar fertilizer was supplementary applied (N₂₀P₆₀K₁₅) as a powder dissolved in 300 litres water. The dose was 4-5 kg Elite powder per ha.

Transplanting of the small plants into the field was carried out in the 2nd part of the month of April. A number of 5,000 transplants were used for planting 1 ha. The distance between rows was 1.8-2 m and between plants 0.5-1 m.

Integrated weed control was achieved after harvesting, in summer season, using Glicos, a universal herbicide (also it could be used Roundup, Clinic 360 SL with similar effect) in the corresponding dose of 4-5 litres/ha, diluted with 300-350 litres water. Also, the Toxin fungicide (Adonis fungicide could be also used) has been also applied in a dose of 30-40 g for 10-15 litres water in order to assure a good watermelon production without causing damages by diseases and pest.

Irrigation was compulsory in order to support production because Dabuleni area is “the pole” of hot summers in Romania. In 2011, only 5 wettings were applied in the period of high temperatures over 30 degrees. Even thou watermelons are resistant to drought, due to the strong root system, in the stage of intense fruit growth, irrigation is compulsory. The modern dripping irrigation method used in the experiment has had a lot of advantages as follows: water was centrally and automatically distributed at the same pressure at the root of each plant as much as it needed, water

consumption was kept at an optimum level, soil aeration was a corresponding one, a diminished weeding degree was recorded and pest attack was successfully prevented. The Elite foliar fertilizer was applied at the same time with irrigation. The irrigation water was assured by the well drilled at 35 m depth into the ground, from where water was directly pumped into the water pipes transporting it to the plant roots. The amount of water used per one wetting was 250 cubic meters/ha but due to the high temperature in the stage of the fruit growth, 4 wettings were required, meaning 1,000 cubic meters water consumption for V1-Crisby cultivar and 6 wettings, that is 1,500 cubic meters for V2-Karistan cultivar.

Harvesting was manually done depending on the moment of each cultivar maturation: June 10-15, 2011 for Crisby variety and later than July 15 2011 for Karistan cultivar. The fruits were collected from the field in the moment of maturation, recognized based on the following criteria: thin short tail, tendril dried at the end, shinny shell, leaving white traces when it is scratched and turning yellow at the contact with the soil, the appearance of a specific cracking sound when we press the fruit or touch it by finger.

Watermelon Yield was 30 t/ha for V1-Crisby cultivar and 70 t/ha for V2-Karistan cultivar, determined by each variety production potential.

Table 2. Production, Sale Price and Gross Product per ha by cultivar in 2011

	MU	V1- Crisby	V2- Karistan	Difference V2-V1
Yield	Kg/ha	30,000	70,000	+40,000
Average sale price	Lei/kg	1.2	0.3	-0.9
Gross Product	Lei/ha	36,000	21,000	-15,000

Watermelon Production counted for 18.75 t for V1-Crisby cultivar and 37.5 t for V2-Karistan variety, taking into account that each cultivar was cultivated on 0.625 ha. The total watermelon production corresponding to 1.25 ha was 56.25 t.

Marketed Fruit Production was represented by 56.25 t of which: 18.75 t Crisby watermelons, sold at Lei 1.2/kg average price

in the 1st part of June 2011 and 37.50 t of Karistan watermelons sold in the 2nd part of July 2011 at Lei 0.25/kg, average price.

Gross Product, resulted from watermelon commercialisation to various retailers, counted for Lei 36,000 in case of V1-Crisby cultivar and Lei 15,000 in case of V2-Karistan variety.

Planting Cost. The expense of transplanting of the small plants into the field counted for Lei 6,000 taking into consideration that 5,000 plants were planted per surface unit both for Crisby and Karistan cultivar and the production cost per transplant was Lei 1.2 in 2011.

For the surface planted with each cultivar, 0.625 ha, the planting cost was Lei 3,750 and for the whole surface planted with the both varieties, 1.25 ha, the expense counted for Lei 7,500.

Cost of own mechanical works needed for tillage made with the tractor, plough and disk harrow (fuel, lubricant, machine parts, repairs etc) counted for Lei 855/ha and the cost of the related labour Lei 95/ha, totalizing Lei 950/ha, similar for the both watermelon varieties, Crisby and Karistan.

Fertilization Cost was determined by the type of fertilizer, the dose per surface unit, the number of sacs purchased from the market and purchasing price per sac. The dose of complex NPK fertilizer was 550 kg/ha. The farmer bought 11 sacs of 50 kg each at Lei 130/sac, meaning Lei 1,430 per ha.

For the cultivated area with each cultivar, 0.625 ha, this meant Lei 893.75 both for Crisby and Karistan cultivar.

The total fertilization cost for 1.25 ha in experiment was Lei 1,787.50.

For foliar fertilization, an amount of 5 kg Elite fertilizer was bought, representing the dose per surface unit. Taking into consideration that this fertilizer is commercialized in sacs of 25 kg, the fertilization cost counted for Lei 100/ha, for Lei 62.50 for 0.625 ha cultivated with each watermelon variety and for Lei 125 for 1.25 ha cultivated with the both cultivars.

Therefore, the fertilization cost totalized Lei 1,520/ha, Lei 956.25 per 0.625 ha and Lei 1,912.50 for 1.25 ha cultivated with watermelons in the experiment.

Cost of Weed Control counted for Lei 175/ha, taking into account that 5 litres of Glicos herbicide were purchased at Lei 35/litre. For 0.625 ha, the related cost of weed control was Lei 109.37 and for 1.25 ha cultivated with the two cultivars, it counted for Lei 218.75.

Cost of Fungicide represented Lei 24/ha, taking into consideration that 2 litres of Toxin fungicide was bought at Lei 12/litre. This meant Lei 15 fungicide cost per 0.625 ha cultivated with each watermelon variety and Lei 30 for the total experimental surface, 1.25 ha cultivated with the both cultivars.

Table 3. Production Cost per ha by cost item and watermelon cultivar in 2011 (Lei/ha)

Cost item	V1-Crisby	V2-Karistan	Difference V2-V1
Planting	6,000	6,000	-
Fertilization	1,530	1,530	-
Plant protection	199	199	-
Irrigation	800	1,200	+400
Tillage	950	950	-
Part-time labour	3,000	4,080	+1,080
Electricity	120	200	+80
Supplying cost	80	80	-
VARIABLE COST	12,679	14,239	+1,480
Depreciation	300	300	-
Rent	360	360	-
General cost	50	50	-
FIXED COST	710	710	-
PRODUCTION COST	13,389	14,949	+1,560
GROSS MARGIN	23,321	6,761	-16,560

Cost of Irrigation Water was higher in case of Karistan cultivar due to its longer period of vegetation in comparison with Crisby variety. So, taking into account that Crisby cultivar needed 4 wettings of 250 cubic meters water each, this meant 1,000 cubic meters water consumption/ha. The price per one wetting was Lei 200, meaning Lei 800/ha, Lei 500 for 0.625 ha. In case of Karistan cultivar, the irrigation water counted for Lei 1,200/ha, because it needed 6 wettings. For 0.6,25 ha, the cost of the consumed water was Lei 750.

Therefore, for the whole surface cultivated with the two cultivars, 1.25 ha, the cost of irrigation water was Lei 1,250.

Part-time labour Cost was determined by the labour required both for transplanting the small plants and harvesting of fruits. In case of V1-

Crisby cultivar, a number of 10 part-time workers were used for planting 5,000 stalks/ha. They were paid Lei 50/working day and in addition they received lunch (Lei 10/person/day) for a period of two working days. Therefore, the cost of labour required for planting 1 ha with Crisby cultivar was Lei 1,200, meaning Lei 750 for 0.625 ha.

For harvesting of Crisby watermelon fruits, a number of 6 part-time workers were used for a period of 5 days in order to collect 30 t fruits from 1 ha. They also received Lei 50/day and a lunch costing Lei 10/person/day. Taking into account all these calculations, the harvesting cost for Crisby watermelons was Lei 1,800 /ha and Lei 1,125 for 0.625 ha.

The total cost of part-time labour used for Crisby cultivar counted for Lei 3,000/ha and Lei 1,875 for 0.625 ha.

Table 4. Production Cost by cost item for 0.625 ha cultivated with each watermelon variety in 2011 (Lei)

Cost item	V1-Crisby	V2-Karistan	Difference V2-V1	Total V1+V2
Cultivated area (ha)	0.625	0.625	-	1.25
Planting	3,750	3,750	-	7,500
Fertilization	956.25	956.25	-	1,912.50
Weed Control	109.37	109.37	-	218.75
Fungicide	15	15	-	30
Irrigation	500	750	+250	1,250
Tillage	593.75	593.75	-	1,187.50
Electricity	75	125	+50	200
Part-time labour	1,875	2,550	+675	4,425
Supplying cost	18,75	18,75	-	37,50
VARIABLE COST	15,786.24	8,868.12	-6,918.12	24,654.36
Depreciation	62.50	6250	-	125
Rent	225	225	-	450
General cost	31.25	31.25	-	62.50
FIXED COST	318.75	318.75	-	637.50
PRODUCTION COST	16,104.99	9,186.87	-6,918.12	25,291.81

In case of V2-Karistan cultivar, the cost of part-time labour was similar to the one registered for V1-Crisby cultivar. The only difference is the fact that harvesting required 8 part-time workers for a period of 8 working days for collecting 70 t of watermelons from 1 ha. Under these conditions, the planting cost counted for Lei 2,880/ha and Lei 1,800 for 0.625 ha. The total labour cost related to Karistan cultivar was Lei 4,080/ha by 36 % higher than the one recorded by Crisby variety.

For 0.625 ha, part-time labour cost was Lei 2,550.

Supplying Cost counted for Lei 30/ha, meaning Lei 18.75 for 0.625 ha and Lei 37.50 for 1.25 ha.

Depreciation Cost was Lei 100/ha, Lei 62.50 for 0.625 ha and Lei 125 for 1.25 ha.

Electricity Cost counted for Lei 120 in case of Crisby cultivar and Lei 200 in case of Karistan variety.

Rent Cost counted for Lei 360/ha, that is Lei 225 for 0.625 ha and Lei 450 for 1.25 ha cultivated with the both cultivars.

Total Production Cost. Taking into account all the expenses mentioned above, the total production cost for 1 ha cultivated with V1-Crisby variety counted for Lei 13,389 while in case of V2-Karistan cultivar, it counted for Lei 14,949.

Gross Margin, calculated as a difference between gross product and variable cost, was Lei 23,321 in case of V1-Crisby variety, by Lei 16,560 higher than in case of V2-Karistan cultivar, which registered only Lei 6,761. This was due to the higher gross product (Lei 36,000) registered by Crisby cultivar and lower variable cost (Lei 12,679) in comparison with Karistan cultivar whose gross product was by 50 % lower and variable cost by 12.30 % higher in comparison with the levels registered by Crisby variety.

Economic Efficiency per surface unit.

Yield. In case of V1-Crisby variety, watermelon yield was 30 t/ha, by 40 t lower compared to Karistan cultivar yield.

Production cost/ha was Lei 13,389, by Lei 1,560 lower compared to the one recorded by Karistan variety.

Cost per watermelon kilogram. As a result, a kilogram of Crisby watermelon needed Lei 0.44 in order to be produced, by 1,76 times more in comparison with Lei 0.25 per kg in case of Karistan variety.

Income per ha. Crisby variety assured Lei 36,000, by 71 % more in comparison with Karistan cultivar, which produced only Lei 21,000 income. This was due to the good selling price for the extra-early Crisby variety, Lei 1.2 in comparison with Lei 0.3 /kg for the tardy Karistan variety. The higher price

compensated the low production of the extra-early variety and produced more income.

Profit/ha. Crisby cultivar produced Lei 22,611 profit per ha, by 3.73 times more than Karistan cultivar, whose profit counted just for Lei 6,051/ha.

Profit per watermelon kilogram counted for Lei 0.75 in case of Crisby variety and Lei 0.10 in case of Karistan cultivar.

Table 5. Indicators of Economic Efficiency in Watermelon production per ha by cultivar in 2011

	MU	V1- Crisby	V2- Karistan	V2-V1
Cultivated area	Ha	1	1	-
Watermelon yield	t/ha	30	70	+40
Cost per ha	Lei/ha	13,389	14,949	+1,560
Cost per kg	Lei/kg	0.44	0.25	-0.19
Income per ha	Lei/ha	36,000	21,000	-15,000
Income per kg	Lei/kg	1.2	0.3	0.9
Profit per ha	Lei/ha	22,611	6,051	-16,560
Profit per kg	Lei/kg	0.75	0.10	-0.65
Profit rate	%	68.87	40.47	-28.40
Gross margin	Lei/ha	23,321	6,761	-16,560

Profit rate counted for 68.87 % in case of Crisby variety and 40.47 % in case of Karistan cultivar, showing that the both watermelon varieties are profitable but profitability is higher in case of the extra-early cultivar.

Gross margin was Lei 23,312/ha in case of Crisby, by 3.44 times higher in comparison with the one registered by Karistan cultivar.

Economic Efficiency for 1.25 ha experimental surface.

Table 6. Indicators of Economic Efficiency for 1.25 ha cultivated with Watermelons in 2011

Specification	MU	Value
Cultivated area	ha	1.25
Fruit production	kg	100,000
Income	Lei	47,000
Income per ha	Lei	37,600
Income per kg	Lei/ka	0.47
Production cost	Lei	19,198.74
Production cost per ha	Lei/ha	15,358.99
Production cost per kg	Lei/kg	0.19
Profit	Lei	27,801.26
Profit per ha	Lei/ha	22,241
Profit per kg	Lei/kg	0.28
Profit rate	%	44.80

From the whole surface cultivated with watermelons in this experiment, the farmer obtained 100 tons fruits which were sold in the market at Lei 0.47 average price bringing him Lei 47,000 income. Taking into account that the farmer paid Lei 19,198.74 for producing watermelons from the both cultivars, Crisby and Karistan, on the surface of 1.25 ha, he got Lei 27,801.26 profit, meaning Lei 22,241 per ha and Lei 0.28 per fruit kilogram. The average profit rate was 44.80 % in the year 2011.

CONCLUSIONS

The use of extra-early watermelon cultivars on a sandy soil at SC Casa Pepenilor Verzi SRL Dabuleni, Dolj County has lead to important results concerning the increase of economic efficiency in watermelon growing.

Local producers could obtain a higher production earlier than the traditional season which normally starts at the beginning of August. Producing watermelons in the 1st part of June offers a chance to producers to sell them at the best price in the market.

Crisby cultivar assured 30 t/ha under Lei 13,389 per surface unit production cost and brought Lei 36,000 income to the farmer who finally remained with Lei 22,611 gross profit. Karistan cultivar, which is a tardy variety, assured 70 t fruit/ha under Lei 14,949 production cost and brought only Lei 6,051 profit per surface unit to the farmer.

Therefore, farmers have to pay more attention to the extend of watermelon production along the summer season in order to increase their income and profit.

In this purpose, they have to use a mixture of watermelon cultivars with different maturation length and apply modern technologies.

Crisby cultivar is warmly recommended to be cultivated on larger surfaces in the Southern Romania where soil and climate conditions are suitable to watermelon growing.

In this way, Romanian market requirements could be better covered with watermelons from the domestic production starting from the first half on the month of June.

The use of extra-early cultivars in watermelon growing could lead to a higher profitability in

comparison to the one registered by tardy cultivars.

ACKNOWLEDGEMENTS

This research work was carried out with the support of SC Casa Pepenilor Verzi SRL, Dabuleni, Dolj County, Southern Romania. The author addresses her sincere thanks to Engineer Florea Diaconu, General Manager of this company for all his support in running this experiment and setting up this research work.

REFERENCES

- [1]Fatondji, D., Pasternak, D., Woltering, L., 2008, *Watermelon production on stored rainwater in Sahelian sandy soils*, Agric.J.of Plant Science, Vol.2(12):151-160
- [2]Figueroa, A., Sanchez-Gonzales, M., Wong, A., Arjmandi, B, 2012, *Watermelon extract supplementation reduces ankle blood pressure and carotid augmentation index in obese adults with prehypertension or hypertension*, American J. Of Hypertension:25(6):640-643
- [3]Fish, W, Bruton, B, Russo, V., 2009, *Watermelon juice;a promising feedstock supplement, diluent and nitrogen supplement for ethanol biofuel production*, Biotechnology for Biofuels, 2:18
- [4]Hochmuth, G., Hanlon, E., 2000, *A Summary of NPK Research with Watermelon in Florida*, University of Florida, Institute of Food and Agricultural Sciences, www.edis.ifas.ufl.edu
- [5]Giorgota, M., Toma, V., Chilom, P., Dinu, M., Toma, C., 2004, *Research regarding the improvement of technology to farm watermelon for obtaining the early production on the sandy soils in South Oltenia*
- [6] Nanu, S., Toma, V., Ciuciuc, E., Searpe, D., 2011, *Technology of Watermelon growth on sandy soils*, www.hortitom.ro/tehnologii/pepeni_verzi
- [7]Razavi, S., Milani, E., 2006, *Some physical properties of the watermelon seeds*, African J., of Agric.Research, 1(3):065-069
- [8]Scorei, R., Lascu, N., Giorgota, M., Toma, V., Ploae, M., Croitoru, M., Mitrut, M., 2006, *Establishing the influence for organic compounds of Boron on watermelons*. Scientific Papers, Series X, Horticulture, Genetic Engineering, Timisoara
- [9]Simonne, E., Hutchinson, C., DeValerio, J.,Hochmuth, R., Treadwell, D., Wright, A., Santos, B., Whidden, A., McAvoy, G., Zhao, X., Olczyk, T., Gazula, A., Ozores-Hampton, M., 2010, *Current knowledge, gaps and future needs for keeping water and nutrients in the root zone of vegetable grown in Florida*, Horttechnology, 20(1):143-152
- [10]Toma, V., Ciuciuc, E., Croitoru, M., Ploae, M., 2007, *Watermelon behaviour on sandy soils from South Oltenia*, Scientific Papers, CCDCPN, Dabuleni, Sitech Publishing House, Craiova
- [11]Toma, V., Croitoru, M., Ploae, M., 2007, *Research concerning the efficiency of te Boron natural compounds in the fertilizing watermelons on sandy soils from Southern Oltenia*, Scientific Papers CCDCPN Dabuleni, Vol.I(XVII), Sitech Publishing House, Craiova
- [12]Toma, V., Croitoru, M., Ploae, M., 2007, *Research on fertilization and plant density in watermelon growing on sandy soils*, Scientific Papers CCDCPN Dabuleni, Vol.I(XVII), Sitech Publishing House, Craiova
- [13]Wehner, T., Maynard, D.N., 2003, *Cucumbers, melons and other cucurbits*. In:S.H.Katz.(Ed.), Encyclopedia of Food and Culture. Scribner and Sons, New York, p.2014
- [14] SC Natural Research SRL Craiova, *Testing the efficiency of the application in vegetation of fertistimulations based on organic compounds of Boron in watermelon crop*, www.naturalresearch.ro
- [15]Farm Bookkeeping, SC Casa Pepenilor Verzi SRL Dabuleni, Dolj County, 2011
- [16]www.feminin.netul.ro/dieta
- [17]www.gds.ro/actualitate/25.07.2009
- [18]www.gazetadeagricultura.info/legumicultura
- [19]www.marcoser.ro
- [20]www.moreni.ro

RESEARCH ON ROMANIA’S WATERMELON AND MELON MARKET

Agatha POPESCU¹

¹University of Agricultural Sciences and Veterinary Medicine, Bucharest, 59 Marasti, District 1, Zip code 011464, Bucharest, Romania, Phone: +40 21 318 25 64/232, Fax: + 40 21 318 28 88, E-mail : agatha_popescu@yahoo.com

Corresponding author email: agatha_popescu@yahoo.com

Abstract

The paper aimed to analyze the evolution of watermelon market and melon market in Romania in order to identify the main trends in the period 1990-2009 based on statistical data and using the specific indicators such as: cultivated area, yield and production, consumption, trade and price. Despite that the cultivated area remained relatively constant at about 33.5 thou ha, watermelon and melon yield increased by 73.36 % from 11.2 tons/ha in 1990 to 19.5 tones /ha in 2009. As a result, total production reached 652.8 thou tons in 2009, being by 71.06 % higher than in 1990. The main trends identified in watermelon and melon production and market in Romania are the following ones: a constant cultivated and producing area, mainly in the East, West and South parts Romania, a continuous increase of yield and production, a diversified offer consisting both of local and imported watermelons and melons, appearance of extra and early fruit of Romanian origin even from June contributing to a better cover of consumer demand along the summer season, an increased competition among suppliers and also a higher income and profit for Romanian producers. Romania’s watermelon and melon market is continuously developing grace to an increased demand for a healthy diet including more vegetables and fruit.

Keywords: market, melon, production, Romania, trade, Trends, watermelon

INTRODUCTION

Melons, as a general „term”, are sweet, juicy and tasty fruits being consumed mainly in the hot season.

Two species of melons are known as follows: watermelon, *Citrullus vulgaris L.sin C. Lanatus (Thlumb) Mansf.* and melon, *Cucumis melo L.*, the both species belonging to the *Cucurbitaceae Family* [2, 25].

The both species are drought tolerant crops being cultivated in a wide range of tropical, semitropical and rigid regions of the world [11].

Watermelon is originary from the old times from the Kalahari Desert, South Africa, where it was growing in a wild manner but also from where it was spread in many countries of the world. In China, India and the Arabian countries it was known even from 1,500 B.C. In the 16th century it started to be cultivated in Europe too from where it was brought in America by the colonists [2].

Watermelon has a green shell, various shapes, sizes and weights, flesh coloured in different

colours (red, yellow, orange and white) and its seeds could be black, but also red and green coloured, exiting even seedless varieties.

Watermelon is a fruit extremely appreciated by consumers due to its rich content in water and carbohydrates which make it juicy, hydrating and tasty. It has a fine texture, full of flavour and sweet. It could be consumed in various ways: as such, cut in slices, in fruit salad, as dessert, watermelon juice, as garnish like vegetables, prepared as a stir-fried and stewed meal, pickled watermelon, candied fruit, jellies and jams etc [2, 25].

Depending on the cultivar, watermelon chemical composition consists of 89-94 % water, 7-11 % sugar, 0.2 % fats, 0.5 % protein, vitamins (A, B, C, H, PP) and minerals (2,5 mg Potassium, 0.2 mg Iron, 7 mg Calcium, Zinc). Its energetical value is 26-29 calories/100 g [2, 21].

Due to its chemical composition, nutritive and caloric value, watermelon is considered to be a healthy food.

Watermelon has a high content of sugar, a reason to be appreciated as a high glycemic food [3,4].

Being rich in C and A vitamins, antioxidants carotenes, watermelon plays an important role in neutralizing free radicals in the body.

Watermelon is rich in lycopene like tomatoes, carrots, apricots, papayas, pink grapefruit and guavas. The lycopene is the natural pigment which gives the red colour and it is a strong antioxidant successfully used in the fight against breast, prostate, lung, colorectal and endometrial cancer [8].

For this reason, watermelon, fruit and vegetable consumption in general, are recommended for cancer prevention.

Watermelon is rich in C vitamin with an important role in preventing viral infections and protecting A vitamin from oxidation. It is rich in Beta-carotene which is converted into the body into A vitamin, with an essential role in skin metabolism and prevention of skin diseases and macular degeneration, in reducing the risk of sight loss [8].

The vitamins from B complex play an important role in producing energy in the body and preventing nervous diseases.

The rich water content contributes to blood pressure regulation, kidneys cleaning of salts and weight loss, helping the diet grace to its diuretic effect.

Watermelon is also rich in citrulline, an amino-acid used by the body to create arginine, which is able to decrease blood pressure, eliminate ammonium from our body and stimulate the erectile function [20].

Watermelon is rich in Iron important for creating haemoglobin which transports oxygen from lungs to all the cells of the body and prevent anaemia [18].

Watermelon is rich in Potassium which stimulates heart muscle, regulates blood pressure and increases stress resistance.

Watermelon does not contain fats, only in negligible quantities and has not cholesterol. For this reason is recommended for a healthy diet, for body detoxification, metabolism and blood pressure regulation.

Its benefits on health make it to be recommended in the diet of the ill people of asthma, diabetes, cancer and arthritis [19, 24].

Melon has unknown origins, even thou many researchers considered to come either from

Asia, more precisely India and Iran or in Central and Tropical Africa where was cultivated earlier than 2,000 year B.C. [2]. In Europe it was spread in the 15th century, firstly in Italy, France and Belgium, and then it was brought to America in the 16th century. Melon has small fruits, but tastier compared to watermelon. They are sweet and tasty and are consumed especially in summer season as fruit salad, candied melon, jam, marmalade, juice and ice-cream.

Its chemical composition contains 8-12 % dry matter and 88-92 % water, 4.37-13.8 % sugar depending on variety, 0.5 % protein, 50-60 mg C vitamin/100 g, B1, B2, B6 vitamins, minerals (Calcium, Potassium, Phosphorus, Iron) and carotene 2-3 mg [2].

Melon fruit has a spherical shape in general and the shell colour could be green, olive, yellow or orange. The flesh is dense, floury or juicy, with a special flavour, fineness and sweetness characteristic to each cultivar. The pulp could be coloured in white-green, yellow or orange [2, 5].

Watermelon and melon production have continuously increased at world level, production performance depending of the cultivated varieties, soil and climate conditions, technologies applied from a country to another. Romania has good conditions for watermelon and melon growing mainly in the South, Eastern and Western part where high temperatures are favourable for fruit development [9, 22].

Among the Central and Eastern European countries, Romania is considered the largest producer and exporter of watermelons and melons.

In this context, the paper aimed to analyze Romania's watermelon and melon market in the last 20 years, considering as reference period 1990-2009, using the statistical data supplied by National Institute for Statistics [17] in order to identify the main trends in cultivated surface, average and total production, price, consumption and trade in the context of the development of the international and European market.

MATERIAL AND METHOD

In order to set up this paper, the following system of specific indicators has been used: cultivated surface and its distribution in the territory, yield and production and their distribution in various regions, price, consumption, and trade .

In this purpose, the data have been collected for the period 1990-2009 from the National Institute of Statistics and also from United Nations, FAO Stat, as well as from various reports analyzing vegetable and fruit sectors in Romania and at international level.

RESULTS AND DISCUSSIONS

World Production.

Watermelon is cultivated in the tropical and semitropical areas, being a plant loving warm seasons because it is resistant to drought. The main cultivators at world level are China, Turkey, Iran, Brazil, the USA, Egypt and Mexico [12, 16].

Melons are also cultivated in the hot regions of the world, and the main producing countries are China, Japan, Iran, Mexico at world level and in Europe: Spain, Italy, France, Greece and Portugal [1].

In the period 1970-2009, the world production of watermelons increased 4 times from 18 million tons in 1970 to 88 million tons in 2008 and 97 million tons in 2009, while the world population grew 2 times from 2.5 billion to 6.9 billion people, meaning that in 2009, the average watermelon production per capita was 35.2 kg [26].

In 2005, the world watermelon production was 90.2 million tons of which 71.5 % was produced by China (69.3 million tons), 3.9 % by Turkey (3.8 million tons), 2.2 % by Iran (2.2 million tons), 1.9 % by Brazil (1.9 million tons) and 1.8 % by the USA (1.7 million tons) [27].

In 2009, the world watermelon production reached 100,6 million tons and the main producers, in the decreasing order, were: China, Turkey, Iran, Brazil, the USA, Egypt, Russian Federation, Uzbekistan, Algeria, Mexico, Rep. of Korea, Spain, Syria, Morocco, Mali, Greece,

Thailand, Kazakhstan, Vietnam and Indonesia [16].

Table 1. World Watermelon Producers, 2010

Country	Watermelon Production Million Metric Tons	Watermelon Production Value USD Million
China	65,002	7,034
Turkey	3,810	303,4
Iran	3,075	350,2
Brazil	2,065	235,2
USA	1,765	188,4
Egypt	1,653	188,3
Russian Federation	1,419	116,0
Uzbekistan	1,071	51,7
Algeria	1,034	117,9
Mexico	1,007	114,7
Rep of Korea	846,9	96,4
Spain	819,1	88,5
Syria	749,4	81,1
Morocco	746,6	631,3
Mali	631,3	71,9
Greece	623,0	68,1
Thailand	580,1	66,1
Kazakhstan	579,1	57,5
Vietnam	526,1	59,9
Indonesia	474,1	54,0

Source: FAOStat, 2012

International trade with Watermelons has been continuously developing. In the period 1970-2009, it increased 10 times from 212,000 tons in 1970 to 2.3 million tones in 2009.

In 2005, the share of the major exporting countries in the world watermelon exported quantity was the following one: Mexico 18.5 %, Spain 15.6 %, the USA 8.8 %, Iran 7.3 %, Vietnam 6.1 % and Greece 5.2 %.

In 2005, the share of the major importing countries in the world imported amount of watermelons was: the USA 15.1 %, China 10 %, Germany 9.6 %, Canada 9.3 %, Poland 5.2 % and France 4.9 %.

In 2005, the total amount of exported watermelons counted for 2,175 thousand tons and the amount of imported watermelons counted for 1,987 thousand tons [27].

The top 20 largest exporters of watermelons in 2009, in the decreasing order, were the following ones: Mexico, Spain, the USA, Kazakhstan, Vietnam, Italy, Greece, the Netherlands, Guatemala, Iran, Panama,

Hungary, China, Turkey, Malaysia, Brazil, Costa Rica, Jordan, Egypt and Germany.

Table 2. The Top 20 Watermelon Exporters in the world in 2009

Country	Watermelon Exported Quantity (Thou tons)	Watermelon Export Value (USD 1000)	Watermelon Export Price (USD/Ton)
Mexico	554,4	287,681	519
Spain	377,2	215,983	572
USA	188,2	97,259	517
Kazakhstan	141,4	34,460	244
Vietnam	135,5	23,014	170
Italy	118,8	45,960	387
Greece	113,2	50,140	443
Netherlands	86,0	65,252	758
Guatemala	85,0	19,345	228
Iran	84,0	10,748	128
Panama	78,0	44,968	576
Hungary	66,2	19,742	298
China	57,8	15,140	262
Turkey	56,3	6,592	117
Malaysia	53,6	13,085	244
Brazil	39,0	15,735	403
Costa Rica	30,2	10,519	348
Jordan	18,4	13,293	722
Egypt	16,1	11,174	691
Germany	10,3	7,890	763

Source: FAOStat, 2012

Taking into account the export value, the order of the largest exporting countries in 2009 was the following one: Mexico, Spain, the USA, the Netherlands, Greece, Italy, Panama, Kazakhstan, Vietnam, Hungary, Guatemala, Brazil, China, Jordan, Malaysia, Egypt, Iran, Costa Rica, Germany and Turkey.

The watermelon export FOB price varied in 2009 between USD 117/Ton in Turkey, the lowest price level and USD 764/Ton in case of Germany, the highest level.

The average world price for watermelons was about USD 420/Ton.

The top 20 importing countries in the world in 2009, based on the amount of imported watermelons, in the decreasing order, were: the USA, China, Germany, Canada, France, Poland, United Arab Emirates, the Netherlands, Czech Republic, Russian Federation, United Kingdom, Italy, China Hong Kong, Austria, Slovakia, Spain, Sweden, Denmark, Switzerland and Norway.

Taking into account the import value, the decreasing order of the main importers of watermelons in the world in 2009 was the following one: the USA, Germany, Canada, the Netherlands, France, United Kingdom, China, Poland, Russian Federation, Czech Republic, Austria, Italy, Norway, Spain, China Hong Kong, United Arab Emirates, Sweden, Denmark, Slovakia and Switzerland.

Table 3. The Top 20 Watermelon Importers in the world in 2009

Country	Watermelon Imported Quantity (Thou tons)	Watermelon Import Value (USD 1000)	Watermelon Import Price (USD/Ton)
USA	454,7	242,202	533
China	269,4	33,3	124
Germany	203,4	117,820	579
Canada	192,5	86,385	449
France	111,1	59,070	531
Poland	100,1	32,877	328
United Arab Emirates	82,5	12,591	153
Netherlands	82,0	61,947	755
Czech Republic	81,6	28,368	348
Russian Federation	76,5	29,592	387
United Kingdom	50,8	36,397	716
Italy	36,7	19,750	537
China Hong Kong	28,2	12,875	456
Austria	27,7	21,517	775
Slovakia	25,3	11,472	453
Spain	21,0	13,773	655
Sweden	20,8	12,399	596
Denmark	18,8	11,902	633
Switzerland	16,1	11,245	695
Norway	15,5	14,574	934

Source: FAOStat, 2012

The import CIF price of watermelons varied between USD 124/Ton in case of China, the lowest level and USD 775/Ton in case of Austria.

The average world import price for watermelons was USD 532/Ton.

The EU Watermelon and Melon Market.

The main EU watermelon producers are: Spain, Greece, Italy but also the CEE countries such as Romania and Hungary.

Among the most important watermelon varieties cultivated for exportation to Europe are the MikeyLee, Crimson and Quetzal.

The main EU exporters are Spain, Italy and Germany and the main EU importers are Germany, France, Poland, Netherlands, Czech Republic, Italy, Austria, Slovakia, Spain, Sweden and Denmark.

Spain is the greatest producer and exporter of watermelons in Europe.

Watermelons comes on the 5th position among the imported tropical fruits in the EU after pineapple, melon, avocados, guavas and mangoes, representing 3 % of imported tropical fruits.

The share of the main suppliers in the Europe’s watermelon imports is the following one: Honduras 31.5 %, Costa Rica 22.8 %, Guatemala 22.5 %, Brazil 6.8 %, Cyprus 3.3 %, Egypt 2 %, Iran 1.5 %, Israel 1 % and other countries 9.6 %.

The main EU watermelons importers are Germany (36 %), Italy (20 %), France (19 %), the Netherlands (8.3 %), United Kingdom (4.7 %), Greece (0.5%), Spain (0.27%), Scandinavian counties (6.39 %) and other countries (7.51 %) [13].

The main EU watermelon exporters are Spain (62 %), Greece (20 %), Italy (11 %), the Netherlands (3.56 %), France 91.92 %), Germany (0.78 %), United Kingdom (0.19 %) [13].

Melon is another important tropical fruit marketed in the EU. It comes on the 2nd position after pineapple.

The main varieties of melon marketed in the EU are Charentais, Honeydew, Galia, Skin of Toad and Canary Yellow.

Melon represents about 22 % of the tropical fruits imported by the EU.

The main melon suppliers for the EU are Brazil (42 %), Costa Rica (22 %), Israel (13.5 %), Morocco (11 %), Honduras (93.6 %), Ecuador (1.4 %), Guatemala (1.2 %) and other countries (6.3 %).

The most important EU melon importers are United Kingdom (28 %), the Netherlands (18 %), France (17.7 %), Germany (17.2 %), Spain (2.4 %), Italy (3.9 %), Greece (0.13 %) and other countries (7.5 %).

The main EU melon exporters are Spain (77%), the Netherlands (10.3 %), France (7.7 %), Italy (2.46 %), Germany 91,31 %) and Greece (0.38 %)[13].

Watermelon and melon consumption in the EU is relatively flat, the highest level being recorded in the Southern Europe followed by the Eastern European countries. The lowest consumption was noticed in the Northern and Western European countries.

In the regional market from the CEE countries, Romania is considered to be the largest producer followed by Hungary, Ukraine and Albania.

The distribution channels are represented by local and regional traders, fruit wholesalers and multiple retailers. Also, in the watermelon and melon chain, an important place is played by importers assuring additional amounts for a better covering of the market demand and exporters responsible to bring more currency in order to balance the trade and payment balance [28].

The main watermelon and melon consumers in Europe are Spain, Greece, Italy, Germany, France and United Kingdom.

Romania’s watermelon and melon market.

Watermelon and melon cultivars.

In Romania, there are many cultivars created or imported but adapted to the local soil and climate conditions. They are different regarding the period of vegetation and maturation moment being classified in extra-early, early, semi-early, semi-tardy and tardy cultivars and varieties. Also, they are different concerning the vigour, stress resistance, the extra-early and early cultivars being more sensitive to stress, diseases and pest attack in comparison with the tardy cultivars. The fruit are also different in shape and weight.

The main watermelon cultivars and hybrids cultivated in Romania, classified according to the moment of maturation are: a)Extra-early cultivars: Crisby F1, Granit F1; b)Early cultivars: Sugar Baby, Timpuriu de Canada, Red Star, Lasy F1, Top Gun F1, Farao F1; c) Sei-early cultivars: Crimson Sweet, Oden, Fabiola F1, Dochita; d)Tardy cultivars: De Dabuleni, Dulce de Dabuleni, De Minis

Paradise F1; e)Tardy cultivars: Clausita, Favorit, Charleston Gray.

The main favourable areas for watermelon production in Romania are the South East part of the country, the South West Oltenia and the South Muntenia [14,15]. Watermelon is mainly cultivated on sandy soils in Galatzi, Dolj, Braila, Olt, Mehedinti, Teleorman, Bihor and Satu Mare counties where the soil and climate conditions are suitable for this crop [7].

The watermelon and melon cultivated surface is 33,500 ha and the average production is about 20 t/ha, but it could be higher reaching 25-40 t/ha depending on the cultivar and variety cultivated in the field and seed production is about 150-200 kg/ha [10].

Melons are cultivated on about 2.500 - 3,000 ha in the field and an increased trend is to be more cultivated as a forced crop in protected areas.

Melon cultivars could be cultivated either in the field, green houses or tunnels.

The cultivars suitable to be cultivated in the field are classified into: a)*Early cultivars* such as: Ica, Roger, Templar F1, Turkestan, Fondant, b)*Semi-Early cultivars* such as: Cantalup, Creso F1, Ogen, Titus and c) *Semi-Tardy cultivars* such as: Comoara Ungariei, Delicios.

The cultivars suitable to be cultivated in greenhouses are classified according to the flesh colour as follows: a)Yellow flesh cultivars such as : Cristal, Cantor, Savor, Odybis, Vedor, Doublon, Galia and b) Green flesh cultivars such as Overgen, Halon and Noy Israel.

Melon average production varies between 20 and 30 t/ha when melons are cultivated in the field, 60-80 t/ha when melons are cultivated in greenhouses and 35-40 t/ha when they are cultivated in the tunnels [2].

Watermelon and melon cultivated area has registered a continuous increase from 33.6 thousand ha in 1990 to the maximum 46.2 thousand ha in the year 2000 but after this year it decreased reaching 33.5 thousand ha in 2009, that is approximately the same level like in 1990,

The share of the cultivated surface area with watermelons and melons in the total cultivated area in the country has increased from 0.36 %

in 1990 to 0.42 % in 2009, in the last analyzed year being by 16 % higher than in the first one.

Taking into account that the cultivated surface with vegetables increased from 250.6 thousand ha in 1990 to 267.1 thousand ha in 2009, the share of watermelon and melon cultivated area in the vegetable cultivated area registered a decline from 13.4 % in 1990 to 12.54 % in 2009

Table 4. Watermelon and melon cultivated area in Romania, 1990-2009 (Thousand ha)

	1990	1995	2000	2005	2009	2009/ 1990 %
Cultivated area Total	9,402	9,225	8,450	8,468	7,884	83.85
Watermelon and melon cultivated area	33.6	45.7	46.2	37.2	33.5	99.70
Share of watermelon and melon in total cultivated area (%)	0.36	0.50	0.55	0.44	0.42	116.66
Vegetable cultivated area	250.6	260.4	281.9	266.7	267.1	106.58
Share of watermelon and melon in vegetable cultivated area (%)	13.40	17.54	16.38	13.94	12.54	93.58

Source: National Institute of Statistics, 2012, Own calculations

The cultivated area in the private sector increased by 91.95 % in the analyzed period from 17.4 thousand ha in 1990 to 33.4 thousand tons in 2009. As a result, the share of private sector in the cultivated area with watermelons and melons to grow from 51.7 % in 1990 to 99.7 % in 2009.

Table 5. Watermelon and melon cultivated area in the private ownership, Romania, 1990-2009 (Thousand ha)

	1990	1995	2000	2005	2009	2009/ 1990 %
Watermelon and melon cultivated area in the private sector	17.4	44.7	45.2	36.6	33.4	191.95
Share of private sector (%)	51.70	97.81	97.83	98.38	99.70	192.84

Source: National Institute of Statistics, 2012, Own calculations

Based on the surface cultivated with vegetables and watermelons and melons, Romania comes on the 5th position in the European market with a share of 6.2 % in the total cultivated surface in Europe after the Russian Federation, Ukraine, Italy and Spain.

The distribution of watermelon and melon cultivated area in the territory in the year 2009 showed that the most significant surface is cultivated in the macro-region M1, 16,639 ha, with a share of 49.68 %. On the 2nd position came the macro-region M4 with 9,536 ha and a share of 28.47 % in the cultivated area with watermelons and melons. On the 3rd position came the macro-region M3 with 6,099 ha, representing 18.21 % and on the 4th position was macro-region M1 with 1,222 ha (3.64 %).

In 2009, the situation by micro-zone was the following one: 40.99 % South-East micro-zone, 23.49 % South West Oltenia, 17.81 % South Muntenia, 8.69 % North East and 4.98 % West.

Table 6. Watermelon and Melon Cultivated Area by Macro and Micro-regions, Romania, 2009

Region	Cultivated area-ha	Share -%
Cultivated area at national level	33,496	100.00
M1	1,222	3.64
-NW	1,060	3.16
-Centre	162	0.48
M2	16,639	49.68
-N-E	2,911	8.69
-S-E	13,728	40.99
M3	6,099	18.21
-S.Muntenia	5,968	17.81
-Bucharest-Ilfov	131	0.40
M4	9,536	28.47
-SW Oltenia	7,870	23.49
-W	1,666	4.98

Source:National Institute for Statistics, 2012, Own calculations.

The hierarchy of the counties based on the cultivated surface with watermelons and melons was the following one: Galatzi 5,760 ha, Dolj 5,133 ha, Ialomitza 3,581 ha, Braila 3,544 ha, Buzau 2,634 ha, Olt 1,552 ha, Mehedintzi 1,170 ha, Teleorman 1m149 ha, Iasi 1,088 ha, Vaslui 1,068 ha, Arad 1,037 ha and Bihor 988 ha. All these 12 counties together totalize 28,704 ha, representing 85.69 % of the

whole watermelon and melon cultivated area in Romania.

Watermelon and melon yield has continuously increased from 11,242 kg/ha in 1990 to 19,490 kg/ha in 2009, meaning 73.36 % growth. This was a consequence of the fact that more and more farmers have been focused on the implementation of modern technologies and the use of high productive cultivars.

In the private sector, the average production increased by 2.11 times from 9,213 kg/ha in 1990 to 19,499 kg/ha in 2009.

Table 7. Watermelon and Melon Yield, Romania, 1990-2009 (kg/ha)

Specification	1990	1995	2000	2005	2009	2009/1990 %
National average	11,242	13,628	11,500	18,602	19,490	173.36
Private sector	9,213	13,778	11,570	18,748	19,499	211.64
Share of private sector in national average	81.95	101.10	100.60	100.78	100.05	122.08

Source:National Institute for Statistics, 2010, Own calculations.

The distribution of watermelon and melon yield in the territory showed that M4 achieved 20,466 kg/ha by 5 % more than the national average; M1 carried out 19,894 kg/ha by 2.07 % more than at national level and M2 obtained 19,894 kg/ha by 2.07 % more. Only M3 has a lower production potential because the yield counted for 16,760 kg/ha by 15 % less than the national average.

Table 8. Watermelon and Melon Yield by Macro and Micro-regions, Romania, 2009

Region	Yield kg/ ha	Share (%)
National Yield	19,940	100.00
M1	20,002	102.62
-NW	20,002	102.62
-Centre	20,000	102.61
M2	19,894	102.07
-N-E	16,345	83.86
-S-E	20,647	105.93
M3	16,760	85.99
-S.Muntenia	16,701	85.69
-Bucharest-Ilfov	19,420	99.64
M4	20,466	105.00
-SW Oltenia	20,324	104.27
-W	21,136	108.44

Source:National Institute for Statistics, 2012, Own calculations.

In 2009, the highest watermelon and melon yield was achieved by the following counties: Dambovitza 28,118 kg/ha, Galatzi 26,888 kg/ha, Arad 24,134 kg/ha, Satu Mare 23,239 kg/ha, Alba 22,500 kg/ha, Dolj 21,696 kg/ha, Bacau 21,340 kg/ha, Teleorman 21,336 kg/ha and Vrancea 20,406 kg/ha.

Watermelon and Melon Production. Based on watermelon and melon production, Romania comes on the 8th position in Europe contributing by 4.2 % to the European production after the Russian Federation, Spain, Ukraine, Poland, France and the Netherlands [6].

Watermelon and melon production increased by 71.06 % from 81.6 thousand tons in 1990 to 652.8 thousand tons in 2009. In the private sector, production grew by 2.34 times from 277.5 thousand tons in 1990 to 652.1 thousand tons in 2009.

Compared to the growth rate of vegetable production, 27.88 %, in the analyzed period, we may notice that the increased rate of 71.06 % for watermelon and melon production is dramatically higher. As a result, the share of watermelon and melon production in vegetable production has increased from 12.50 % in 1990 to 16.73 % in 2009, that is by 33.84 %.

Table 9. Watermelon and Melon Production, Romania, 1990-2009 (thousand tonnes)

Specification	1990	1995	2000	2005	2009	2009/1990 %
Watermelon and melon production	381.6	639.4	531.1	691.8	652.8	171.06
Private sector	277.5	632.2	522.8	685.3	652.1	234.99
Share of private sector in watermelon and melon production (%)	72.72	98.87	98.43	99.06	99.89	137.36
Vegetable Production	3,051	3,869	3,381	3,625	3,902	127.88
Share in vegetable production (%)	12.50	16.52	15.7	19.88	16.73	133.84

Source:National Institute for Statistics, 2012, Own calculations.

The distribution of watermelon production in the territory showed that in 2009 the decreasing order of the macro-regions was the following one: M2-331,033 tons (50.71 %), M4- 195,163

tons (29.90 %), M3- 102,217 tons 915.65 %) and M1 -24,442 tons (3.74 %).

The most important producing counties are the following ones: Galatzi 154,872 tons, Dolj 111,367 tons, Braila 55,640 tons, Ialomitza 55,024 tons, Buzau 47,551 tons, Olt 34,555 tons, Arad 25,027 tons, Teleorman 24,515 tons which together totalize 508,551 tons, contributing by 77.89 % to the total production of watermelon and melons in the country.

Production per inhabitant has increased year by year from 16.44 kg/capita in 1990 to 30.40 kg/capita in 2009 as a result of production increase by 71.06 % but also due to the reduction of Romania’ s population by 7.50 % in the same period of time.

Table 9. Watermelon and Melon Production by Macro and Micro-regions, Romania, 2009

Region	Production Tons	Share (%)
National Production	652,844	100.00
M1	24,442	3.74
-NW	21,202	3.24
-Centre	3,240	0.50
M2	331,022	50.71
-N-E	47,579	6.98
-S-E	283,443	43.73
M3	102,217	15.65
-S.Muntenia	99,673	15.26
-Bucharest-Ilfov	2,544	0.39
M4	195,163	29.90
-SW Oltenia	159,951	24.50
-W	35,212	5.40

Source:National Institute for Statistics, 2012, Own calculations.

Table 10. Watermelon and Melon Production per Inhabitant

Specification	1990	1995	2000	2005	2009	2009/1990 %
Romania’s population (thou people)	23,206	22,681	22,435	21,624	21,470	92.50
Watermelon and melon production (thou tons)	381.6	639.4	531.1	691.8	652.8	171.06
Production per inhabitant (kg/capita)	16.44	28.19	23.67	31.99	30.40	184.91

Source:National Institute for Statistics, 2012, Own calculations.

Watermelon and Melon Consumption.

As well as vegetable production registered an increased trend, vegetable consumption has also increased. For instance in 2011, it was by 11 % higher than in 2010. This was determined by the increased demand of vegetables in the Romanian market.

However, the annual vegetable and fruit consumption in Romania is 70-80 kg/capita in average, by about 20-22 % less than the European average, 90-100 kg/capita.

In the year 2011, the Romanians’ average consumption of vegetable and fruit and products made of vegetables and fruits counted for 174.4 kg, meaning 63.3 kg/capita for fresh fruits in fresh fruit equivalent [23].

Watermelon and Melon Average Sale Price

has increased year by year. In 2004, it was by 2.3 times higher than in the year 2000. In the period 2006-2008, watermelon and melon price increased just a little, but in 2008, the price grew by 47.70 % compared with its level in 2005.

Table 11. Watermelon and Melon Price indices for 2004-2009 (2000=100, 2005=100)

	2004	2005	2006	2007	2008	2009
Total Price Index	230.8	215.8	106.0	128.6	147.7	185.1
Watermelon and melon price indices	94.7	109.9	111.6	100.3	110.2	120.1

Source: National Institute for Statistics, 2012.

Watermelon and Melon Trade is an important source of income for Romania.

Watermelon export increased from 0.8 t and a value of Euro 1,700 in the year 2008 to 2.5 tons with a value of Euro 3,900 in 2009.

The watermelon and melon imports have been higher than the exports, meaning a poor balance and that Romania is a net importer. In 2008, Romania imported 328.2 tons whose value was Euro 386,700. In 2009, the imports decreased to 286 tons with a value of Euro 308,200 [6].

Imports are important to complete domestic production and cover better the consumer’s needs but also they another positive effect on the Romanian producers because local watermelons and melons are more preferred by consumers.

CONCLUSIONS

The world watermelon production is continuously increasing because of the higher market demand. In 2009, it reached 100,6 million tons.

The top producing countries in the world are China, Turkey, Iran, Brazil, the USA, Egypt, Russian Federation, Uzbekistan, Algeria, Mexico, Rep. of Korea and Spain.

In 2009, the top 10 largest exporters of watermelons were Mexico, Spain, the USA, Kazakhstan, Vietnam, Italy, Greece, the Netherlands, Guatemala and Iran.

Based on the imported watermelons and melons in 2009, the top 10 importing countries in the world were the USA, China, Germany, Canada, France, Poland, United Arab Emirates, the Netherlands, Czech Republic and Russian Federation.

Watermelons comes on the 5th position among the imported tropical fruits in the EU after pineapple, melon, avocados, guavas and mangoes, representing 3 % of imported tropical fruits.

Spain is the greatest producer and exporter of watermelons in Europe. Also other important producers are Russian Federation, Ukraine, Poland, France, the Netherlands and Italy.

The main trends in Romania watermelon and melon market are: a) the constant cultivated area at 33.5 thousand ha; b) the main cultivating regions are the East, West and Southern Romania; c) Romania registered a continuous increase of watermelon and melon yield and production; d) the offer in the market is a diversified one consisting of both domestic watermelons and melons and also imported ones mainly from Turkey, Greece and Spain; e) the use of a large range of cultivars and varieties has enlarged the period of consumption starting by 1,5 months earlier than before, more precisely from the beginning of June, instead of the 2nd part of July and beginning of August; f) as a result consumer needs are better covered along the Summer season; g) an increased income and profit is assured to farmers who are able to cultivate extra-early and early cultivars and varieties

because watermelons are sold at the best price in June when offer is still smaller than demand. Romania comes on the 8th position in Europe concerning watermelon and melon production. But in the regional market from the Centre and Eastern Europe, Romania is the main producer and exporter being followed by Hungary, Ukraine and Albania.

The main problems Romania has to solve in order to improve watermelon production and marketing is: the delivery of irrigation water at an accessible price, the building of big conditioned warehouses in order to preserve watermelons and melons for a longer period of time, the organization of a wholesale market where price to be established based on offer/demand ratio, the constant contracts concluded with the hypermarkets and supermarkets in order to assure a continuous supply to consumers and income flow for Romanian producers.

ACKNOWLEDGEMENTS

All the support given by National Institute of Statistics in order to put at the author's disposal the required data for the period 1990-2009 for setting up this paper is gratefully acknowledged. Many thanks to General Manager, SC Casa Pepenilor Verzi SRL Dabuleni for his useful suggestions and comments.

REFERENCES

- [1] Apahidean, A.s., Apahidean, M, 2001, *Special Vegetable Growing*, Academic Press, Cluj-Napoca
- [2] Ciofu, R., Stan, N., Popescu, V., Chilom, P., Apahidean, S., Horgos, A., Berara, V, Laur, K.F., Atanasiu, N., 2004, *Treatise of Vegetable Growing*, Ceres Publishing House, p.835-850
- [3] Davis, A., King, S, 2007, *MSW-28, a full-flavor crisp watermelon line with high lycopene and medium brix*, HortScience, Vol.42(7):1715-1716
- [4] Foster-Powell, K., Holt, S.H., Brnad-Miller, J,C, 2002, *International table of glycemic index and glycemic load values:2002*, Am. J. of Clinical Nutrition, Vol.76(1):5-56
- [5] Maynard, D. F., Elmstrom, G. M., Mc Cuistion, F. T. Jr., 1992, *Periodicity of watermelon fruit set and effect of bee attractant on yield*. Proc. Inter Am. Soc. Tropic. Hort.36:81-87.
- [6] Motofeala, C., Simion, M., Beldescu, A., 2012, *Vegetables and Fruits, Romania, Sectorial Analysis*, Romanian Centre for Foreign Trade and Investment Promotion
- [7] Nanu, S., Toma, V., Ciuciuc, E., Searpe, D., 2011, *Technology of Watermelon Growin on sandy soils*. www.hortitom.ro/tehnologii/pepeni_verzi
- [8] Perkins-Veazie, P., 2002, *Watermelon Packs a Powerful Lycopene Punch*, Agricultural Research Service, USDA, www.ars.usda.gov/is/archive
- [9] Popescu, G., Negrea, L., Cupa, V., 2009, *The Long way of Dabuleni watermelons*, 12.07.2009, www.adevarul.ro/actualitate
- [10] Potlog, A., 1979, *Practical Dictionary of Agronomy*, Scientific and Encyclopedic Press House, Bucharest, pp.225
- [11] Razavi, S., Milani, E., 2006, *Some physical properties of watermelon seeds*, Afric.J. of Agric. Research, Vol.1(3):065-069
- [12] Roberts, W., Motes, J., Damicone, J., Edelson, J., Duthie, J., 2012, *Watermelon Production*, www.pods.dasnr.okstate.edu
- [13] Sanchez, M., 2011, *Offer And demand in the international trade of tropical fruit in the EU*. Georg August University of Gottingen, www.uni-goettingen.de/en
- [14] Scurtu, I., Dumitrecu, M., 1993, *Vegetable Growing – the next future*, Hortus no.1
- [15] Scurtu, I., 2001, *Economy and technology of agricultural crops*, Economic Independence, Publishing House, Braila
- [16] United Nations, FAOStat Agricultural Statistics, 2012, www.FAO.org
- [17] Romania's National Institute for Statistics, 2012, www.insse.ro
- [18] Watermelon - The Iron Fruit, 2006, www.news.softpedia.com/news/watermelon
- [19] *The benefit of watermelon consumption*, www.feminin.netul.ro/diet
- [20] *Watermelon, Benefits on health*, www.eva.ro/diet
- [21] *Nutritional values*, www.doctor.infor.ro
- [22] *Watermelon growing*, www.gazetadeagricultura. Info
- [23] *Vegetable production estimated for 2011 by 11 % higher than in 2010*, www.financiarul.ro
- [24] *Health benefits of watermelon, Nutritional values*, www.knowledgebase-script.com
- [25] *Watermelon*, www.en.wikipedia.org
- [26] *Global consumption of watermelon Report 2012*, www.feshplaza.com
- [27] *Tropical Fruit*, Global Information System, Watermelon-Marketing, www.itfnet.org/gfruit/watermelon.market.info.htm
- [28] *Seedless watermelon market opportunities*, www.keshilluesibujgesor.al/wp

LAND – PRICE DETERMINANTS USING THE SPATIAL ECONOMETRICS MODELING IN THE MOLDAVIAN REAL ESTATE MARKET

Anatol RACUL¹, Dragoş CIMPOIEŞ¹

¹The State Agrarian University of Moldova, 44 Mirceşti, 2049, Chişinău, Republica Moldova,
Phone: 00 373 22 432382, Fax: 00 373 22 312276, E-mail: racul@rambler.ru

Corresponding author email: racul@rambler.ru

Abstract

The purpose of this paper is to determine the factors which influence the land market in Republic of Moldova. The paper aims to discover the determinants for land pricing using the spatial econometrics modeling, as it is widely used when the spatial component is present. The country's agricultural economy combined with the interest of international organizations and limited data availability directed the focus of this empirical study towards land for agricultural purposes. The factors which determine the land market (for agricultural purposes) in Republic of Moldova are mainly related to economic characteristics of land, such as field productivity, the position on the local landscape (characterized by angle and soil quality), proximity to local or national roads (due to storage and transportation reasons), and economic characteristics of owners. Also, another important role in land market price creation is the pressure of urban space to transform land for agricultural use close to cities and villages in spaces for industrial or residential purposes. This is characterized by the financial pressure from the urban centers which has become significant in land transactions.

Keywords: spatial econometrics, land market, spatial autoregressive model, transaction prices, Land Bank

INTRODUCTION

This paper analyses the land market in Republic of Moldova. Since its independence in 1991, the land market has a tendency to be used for agricultural purposes. Also, the country is described an agricultural economy, which is the main reason why the focus of this study is on land prices for agricultural purposes. Another reason is the fact that international organizations such as World Bank and EBRD, seems to show a major interest in this sector due to several reasons: high quality of land compared to global standards, very low land prices and low efficiency levels.

Generally, any market is driven by two fundamental forces: supply and demand. In a market economy, these forces establish the market price, which creates the basis for buy-and-sell transactions. These fundamentals also apply in the land market. Usually the land market can be used in the following activities:

- Industrial
- Construction (residential/commercial)
- Agricultural (farming)

In the market economy, land is considered an economic good which is sold and purchased on

the market of production factors. The well-functioning of the land market implies that there exists a land price which indicates the monetary value necessary to transfer ownership of a piece of land from one individual/legal entity to another individual/legal entity, through the sell-purchase document.

Agricultural real estate seems to draw less interest from developed economies as commercial real estate is considered more profitable. However, for country as Republic of Moldova in a transition period, the question of land market is of primordial interest.

Regarding the land market for agricultural purposes, the fundamentals remain the same. The demand is driven by consumers, which in this case are mainly farmers, but also potential investors such as private individuals, public institutions, joint stock companies, private-public cooperation, corporate farmers, investment funds (which are currently not present in Republic of Moldova). The investors are driven by different motives relative to farmer's production goal: urban spaces absorption from a longer-term perspective, leasing the land, speculative motives, and

change in land usage (for example, from agricultural to residential). On the other side, the supply is constituted by existing landowners and in some cases state ownership.

The market price of land is the result of interaction between supply and demand for land, of the confrontation (negotiation) among sellers and buyers, each of them looking to get the most from the transaction. The factors determining the level and the evolution of land prices can be limited to:

- Supply and demand of land – the natural limitation of the quantity of land available makes the supply rigid, it being not sensitive to price variation. As a consequence, land prices evolve proportionately to the demand, to the number of people willing to invest in agriculture.
- The possibility to use land alternatively: agriculture, forestry, construction, industrial.
- The interest rate – buying a piece of land is an investment. As a consequence, if the interest rate is higher than the efficiency expected from using that piece of land, the investor would rather deposit his money in a bank, thus influencing the demand for agricultural land.
- The increase in the demand for agricultural products determines an increase in the demand for agricultural land, thus increasing their prices.

Given the fundamental market model, when these forces meet, the land market price is created. In developed, well-functioning market economies, this price is also considered the optimal price, which governs an effective buy-and-sell transaction system. This allows for the market value to be usually equal to the investment value ($MV = IV$) and most of the participants to be marginal.

This study aims to discover this optimal land price, and the casual factors which influence this price. But, it is adapted to an economy in a transition period, such as Republic of Moldova. Since it has an under-developed economy, the market mechanism is ill-functioning. This means that the market value is almost never equal to the investment value ($MV \neq IV$), and the majority of participants are described as intra-marginal. As a consequence the system for buy-and-sell transactions is broken and

ineffective. The market is also described by an imperfect competition.

Many Central- and Eastern European countries went through the land privatization processes, or so called land reforms. In most of them, the land reform has created a class of individual, small landowners. Thus, from the former collective state farms were created numerous fragmented smaller scale landowners [4].

During this period, the markets in these countries were characterized by an imperfect competition. At the same time, transaction costs were a major issue, which comprises dealing with inheritance and co-owners, acquiring information on land, bargaining costs, asymmetric information, dealing with regulations. The combination of imperfect competition and transaction costs has a strong influence on land prices. This is also characteristic for Republic of Moldova

In 1998, the National Land Program (NLP) in Republic of Moldova initiated the privatization of "old" collective state ownership of land holdings. As a result, the share of state ownership has decreased from 100% in 1990, to less than 25% in 2005. Each landowner received (due to the NLP program) an average of 1.3 – 1.4 hectares of land. Adding the average household area of 0.3 – 0.4 hectares, the distribution produced fragmented individual landowners of less than 2 hectares. Thus, land fragmentation in Moldova has two specifics: small size of each owner and land ownership of multiple parcels due to the equity-driven process of land privatization [5].

Like for other Eastern European countries, the whole process of LLP in Moldova has created a class of small and fragmented landowners. Less than 50% of them used the land independently, while the other leased it to cooperatives, LLPs, Joint Stock companies (Department of Statistics, 2009).

According to World Bank Study (2005), half of land in Moldova is in parcels smaller than 10 hectares. The corporate farms have as average of 500 – 800 hectares. Almost one million hectares of land was distributed to 600,000 people. Given a population of approximately 4 million, the large number of landowners combined with the small average size proves

the extent of fragmentation as a result of the land reform.

Table 1: Evolution of transactions with land

Year	Number of transactions	Total area (ha)	Average transaction (ha)	Average price/ha (MDL)
2000	9753	1268	0.13	3100
2001	24625	2336	0.09	2928
2002	27759	2682	0.1	3781
2003	49165	3595	0.07	3733
2004	44134	3201	0.07	8001
2005	47382	3250	0.07	9040
2006	51483	3773	0.07	11000
2007	65000	4697	0.07	12104
2008	72000	12911	0.17	10301

Source: Department of Statistics, Cadastral Agency

Land lease market mostly relies on corporate farms which incorporate the land from individual owners.

Land market has been strongly developing in Moldova since 1997, when the law on “Normative price of land and process for purchase and sale” was adopted. The number of transactions and the average price per hectare in table 1 shows this development.

Between 2000 and 2008, the average price (officially registered) increased by 232%. The highest average value was registered in 2007, prior to the crisis, which could be assumed that the global meltdown had also a negative effect on less directly exposed countries. The number of transactions has also surged from 9753 in 2000, to 72000 in 2008, which reflects the development of the land market.

Other important aspect of transactions of the land market regards the lease market (or renting). The land close to urban areas, is almost never leased in nowadays. If more than 15 years ago this land was almost worthless and may or may not have been cultivated, today, it has a ridiculous price in a 20km diameter around the largest cities (for example, the capital). However, when considering other areas where the urban sprawl is more far away, the lease market for agricultural purposes is also very specific. The following table 2,

describes the land leasing transactions by several groups of respondents.

Table 2: Leasing and average size of transactions

	Lease In		Lease Out	
	Percent of respondents	Average size (ha)	Percent of respondents	Average size (ha)
Households	1	0	92	1.8
Individual landowners	4	2.8	33	1.8
Collective owners	75	686	9	44

Source: Academy of Science of Moldova

Basically the individual landowners and head of households lease out land, while collective firms (or so called corporate owners) lease in land. The expectations suggest a different result.

According to local experts, the lease payments in Republic of Moldova are also specific, which consist of: cash, in-kind and mixed. A survey performed by Center for Strategic Studies and Reforms (CISR, 2001) indicates that the main form of payment represents in-kind [3].

MATERIAL AND METHOD

One of the objectives of this study is to investigate the market mechanism which governs individual transactions (buy/sell). The analysis of land markets in Central-European countries indicates specific macroeconomic procedures for land price formation. These procedures employ standardized contiguity (adjacency) matrices (SAM) as the principal component of spatial econometrics method [1]. In order to investigate the spatial nature of variables, several useful regression models have emerged during the last decades, in addition to the conventional Ordinary Least Squares model. The spatial econometrics models employ the spatial characteristics of variables to improve the models. These approaches incorporate the spatial lag into models. However, there is a lack of consensus on how to appropriately evaluate them.

According to Le Gallo, two main issues emerge when sample data has a spatial (locational) component:

- Spatial dependency between observations

• Spatial heterogeneity occurs in the modeled relationships [6].

Traditional econometrics disregards these two issues which violate the traditional Gauss-Markov assumptions used in regression modeling. Thus, alternative estimation procedures are necessary to model this type of variation and make appropriate inferences.

The spatial dependence in a sample data means that one observation associated with a location i , depends on other observations at locations $j \neq i$. The main reason is that spatial dimension of economic characteristics is an important aspect of modeling. Regional science theory integrates this notion through spatial interaction, spatial spillovers and hierarchies of place.

Spatial heterogeneity means the variation in relationships over space. As a result, it might be expected a different relationship for every point in space. It can be formally written as:

$$y_i = X_i \beta_i + \varepsilon_i \quad i = 1, \dots, n$$

Where: X_i – vector of explanatory variables with the set of parameters β_i , y_i – dependent variable at location i ; ε_i – represents a stochastic disturbance. Considering a sample of n observations, it is not possible to estimate a set of n parameters β_i due to degrees of freedom problem. There is simply not enough sample information to calculate estimates for every observation in space.

Calculating location in the model. Prior to analysing spatial dependence and heterogeneity, the first task is to quantify the location of the sample data. Generally, there are two sources of data:

• Geographic information system (GIS) including latitude and longitude. This information allows us to calculate distance from a certain point in space (usually a strategic location), or the distance between observations located in different point space. It is expected that observations that are near each other should exhibit a greater degree of spatial dependence than those more distance from one another.

• The relative position or adjacency (contiguity) of one observation to other. It is based on knowledge of shape and size of observations located in an area. The adjacent units should reflect a higher degree of

dependence than observations with greater distance between them.

Table 3: Variables description of Spatial Autoregressive Model

```

function results = sar(y,x,W,info)

PURPOSE: computes spatial autoregressive
model estimates
y = p*W*y + X*b + e, using sparse matrix
algorithms
-----
% USAGE: results = sar(y,x,W,info)
% where: y = dependent variable vector
% x = explanatory variables matrix, (with
intercept term in first column if used)
% W = standardized contiguity matrix
% info = an (optional) structure variable with
input options:
% info.rmin = (optional) minimum value of rho
to use in search (default = -1)
% info.rmax = (optional) maximum value of rho
to use in search (default = +1)
% info.eig = 0 for default rmin = -1,rmax = +1,
1 for eigenvalue calculation of these
% info.convg = (optional) convergence criterion
(default = 1e-8)
% info.maxit = (optional) maximum # of
iterations (default = 500)
% info.lflag = 0 for full lndet computation
(default = 1, fastest)
% = 1 for MC lndet approximation (fast for very
large problems)
% = 2 for Spline lndet approximation (medium
speed)
% info.order = order to use with info.lflag = 1
option (default = 50)
% info.iter = iterations to use with info.lflag = 1
option (default = 30)
% info.lndet = a matrix returned by sar, sar_g,
sarp_g, etc.
% info.ndraw = 1,000 by default
% info.sflag = 1 if called from SDM, default not
used
% -----
% RETURNS: a structure
% results.meth = 'sar'
% results.beta = bhat (nvar x 1) vector
% results.rho = rho
% results.tstat = asymp t-stat (last entry is rho)
% results.bstd = std of betas (nvar x 1) vector
% results.pstd = std of rho
% results.total = a 3-d matrix (ndraw,p,ntrs)
total x-impacts
% results.direct = a 3-d matrix (ndraw,p,ntrs)
direct x-impacts
% results.indirect = a 3-d matrix (ndraw,p,ntrs)
indirect x-impacts
% ndraw = 2,500 by default, ntrs = 101 default
    
```

Should be mentioned that these two sources of information are not necessarily different, as given the coordinates of an observation, there could be constructed the neighbourhood structure based on a certain distance.

The evaluation of land market in Republic of Moldova can be appropriately performed through spatial econometrics modeling, which as a premise accepts the significant dependency between prices and location of land areas.

The spatial dependency in a data set can be formulated in the following way:

$$y_i = f(y_j) \quad i = 1, 2 \dots n \quad i \neq j;$$

where y_i is the market price of parcel of land i , y_j is the market price of parcel of land j and f defines the functional relationship which includes the neighbourhood of these parcels. The primary data are associated in specific spatial entities which produce a higher economic efficiency. For example, the consolidated land areas (which create a common agricultural field) are more preferable to diffused land lots. The factors which critically influence the offer price of agricultural land are soil quality, location, proximity to roads and agro-technical conditions.

The spatial econometrics modeling used for analysis. The proposed econometric model for the calculation of the optimal land price is Spatial Autoregressive Model (SAR):

$$y = \rho W y + X \beta + \varepsilon$$

$$\varepsilon \subset N(0, \sigma^2 I_n)$$

where:

y – is the equivalent measure of land price

X – set of exogenous variables which determine the economic characteristics of landowner

W – standardized contiguity (adjacency) matrix (SAM)

ρ – spatial autocorrelation coefficient of parcels of land

β – linear regression parameters, geographically weighted

ε – stochastic component, normally distributed with mean equal to zero and variance σ^2

I_n – identity matrix of order n .

It should be mentioned that in case ρ is equal to zero, there cannot be observed spatial dependency between endogenous variable y_i

and the linear regression parameters β can be calculated through Ordinary Least Squares (OLS). This is a special case of the SAR model. This model is performed using MATLAB, including an add-on – Econometrics Toolbox developed by J. LeSage from the Department of Economics, Toledo University, USA [7].

The description of econometric model defines the specific notions of spatial regression analysis. In Table 3 are presented the variables included in the model. According to this table, the initial data of causal factors are included in the variable results.total, while the value of endogenous variables obtained during the survey are included in the variable results.y. After the land price evaluation with the assistance of program SAR, the results are attributed to the structural variable results.yhat. which will be graphically presented as the comparison between the value of this two variables of the resulting factor.

The coefficient of determination R^2 , which defines how well the spatial model reflects the real situation, is attributed to the structural variable results.rsqr. The parameters of regression β_i can be extracted from the variable results.beta, which is a vector of order k (the number of exogenous variables included in the model). The scalar ρ from results.rho reflects the influence of the spatial relationship on the transaction price.

RESULTS AND DISCUSSIONS

For the application of spatial econometrics model is selected data only from a region of Moldova, Calarasi District, commune of Sadova. The number of parcels of land is 199, which represents the number of included observations. Each landowner can have more parcels of land, while the total number of owners is 45. The primary data used regards the economic characteristics of parcels of land and its owners.

The spatial autoregressive model uses 3 main components:

- The spatial (location) component
- The endogenous variable
- The explanatory or exogenous variables

As noted in methodology description, the location is calculated using the Geographic

Information System (GIS), including the coordinates of the parcels of land. The unit of measure is calculated in meters. The spatial adjacent matrix is computed as distance from a strategic point. In this case, the town hall is considered the appropriate choice.

Table 4: Descriptive statistics of exogenous variables

Number of observations	199			
	Surface	Income	Investment	Employees
Mean	0.26	7,020	10,641	4
Standard deviation	0.17	8,890	11,533	3
Median	0.22	5,000	6,000	3
Min	0.03	500	600	1
Max	0.86	50,000	60,000	15

The choice of the endogenous variable is not necessarily the actual price in currency. Generally, in under-developed market economies a more abstract measure of real estate appraisal could be considered (actually it is encouraged). The main reason is that the transaction prices registered at the Cadastral Agency are not the „real” prices, as the participants try to evade payment of taxes or other commissions. In this case, the endogenous variable is chosen an *equivalent measure of value (EMV)* which represents a more abstract notion of value – and is defined by an utility level. It is characterized by a coefficient measure, which can be transformed into the actual market prices by multiplying with another average national (or regional) coefficient. It will be denoted as EMV for this study. Transaction prices registered at the Cadastral Agency are not the „real” prices, as the participants try to evade payment of taxes or other commissions.

In this case, the endogenous variable is chosen an equivalent measure of value (EMV) which represents a more abstract notion of value – and is defined by an utility level. It is characterized by a coefficient measure, which can be transformed into the actual market prices by multiplying with another average national (or regional) coefficient. It will be denoted as EMV for this study.

The next step is description of exogenous variables, which define the causal factors. These variables were collected during same survey in the district. For the purpose of data description, these variables are limited to the ones which indicate significant contribution (higher than 10%) to the coefficient of determination R^2 of the econometric model.

The following exogenous variables are considered:

- I. Surface area – calculated in hectares (ha). One hectare is equivalent to 10000 square meters. This variable is included because it is assumed that the parcel size (in units) affects the land value.
- II. Income – calculated in lei (national currency). It represents level of income of the respondents, the landowners. It seems obvious to include this variable as it seems to directly affect the land price.
- III. Investments – calculated in lei. It represents an important variable because it represents the amount of expenses concerning land maintenance.
- IV. Number of employed personnel – denoted in number of persons, usually including the owner and his family, and seasonal workers. It seems logical to include this variable because of the different productivity levels and specific agricultural production [4].

Data was filtered and processed, and blank observations were removed. Many of respondents did not perceive the questions to be appropriate and left many items uncompleted. There are a total of 199 parcels of land included in the study. Each land owner can manage one or more parcels – there are a total of 45 owners. For each parcel of land are denoted the cadastral code defined by the proprietary form, and the geographic information system (GIS) – longitude and latitude in meters. With the assistance of the program **XY2CONT(xc,yc)** is computed the standardized adjacency (contiguity) matrix **W**.

According to the cadastral data, in Fig. 1 are represented the spatial positioning of all 199 parcels of land. In the graphical representation there can be observed the degree of adjacency of parcels, which means that the parcels of a land owner are either close to one another or at

a small distance. A perfect consolidation would suppose a consistent downward diagonal line from left to right.

There are 2 important points concerning the location of land:

- First, the geographical coordinates are calculated as distance from a certain location. It would be logical to take a strategic location such as the town hall or a production deposit. In this case, the distance from town hall is considered as more appropriate due to the fact that there is no central depositing system.
- Second, this study investigates how the spatial factor influences the real estate appraisal. Thus, the result of the spatial autocorrelation coefficient ρ should describe how distance from the town hall (in this case) affects the land value. Meanwhile, distance from the town hall integrates a broader notion, as usually the center of a town is described by proximity to infrastructure, human resources and roads.

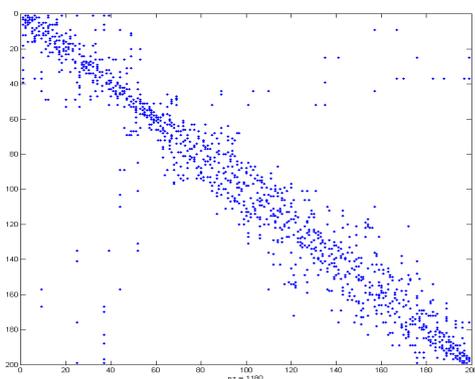


Fig.1: Relative location of parcels of land

As previously noted, the dependent variable EMV was estimated using the mixed autoregressive-regressive mode, with the assistance of the program SAR.

The value of exogenous factors X represents the matrix which contains explanatory variables. The standardized adjacency matrix W is calculated using the program **XY2CONT(xc,yc)**. The spatial component in the EMV estimates is determined by the parameter ρ which can take values ranging from -1 to +1. This range was used for this modeling.

Maximum likelihood estimation of the spatial model is based on a concentrated likelihood function. The following 5 steps are performed

for parameters estimation of the linear spatial model, enumerated in Anselin [2]:

1. Performing OLS for the model:
 $y = X\beta_0 + \varepsilon_0$

2. Performing OLS for the model:
 $W_y = X\beta_L + \varepsilon_L$

3. Compute residuals $e_0 = y - X\hat{\beta}_0$ and $e_L = y - X\hat{\beta}_L$

4. Given e_0 and e_L , calculate ρ that maximizes the concentrated likelihood function:

$$L_C = C - (n/2) \ln(1/n) (e_0 - \rho e_L)' (e_0 - \rho e_L) + \ln |I - \rho W|$$

5. Given $\hat{\rho}$ that maximizes L_C , compute

$$\hat{\beta} = (\hat{\beta}_0 - \rho \hat{\beta}_L)$$

$$\hat{\sigma}_\varepsilon^2 = (1/n) (e_0 - \rho e_L)' (e_0 - \rho e_L)$$

Total number of variables is 5:

X1 – Surface area

X2 – Income

X3 – Investments

X4 – Personnel

Y – EMV

Total number of observations is 199. The results after applying the program SAR are shows that the sum of squared residuals is equal to 0.03, which is sufficiently low and acceptable. The spatial model fits the evaluated initial data well enough, with a coefficient of determination equal to **0.49**. This means that the variables included in the model – explain 49% of total variability. However, not including in explanatory variables other determinants as land quality, distance from household, lack of finance, taxes and other, impose a considerable stochastic ε component. The contribution of several other factors not included in the model is evaluated later through regression analysis.

Most of the explanatory variables are statistically significant and acceptable with a confidence interval of 95%. At the same time, considering the high value of coefficient of partial determination R^2_i , the t-statistic has an acceptable value.

The spatial of land value which is calculated through parameter ρ is equal to **-0.08**, which represents how much the value is influence if the land is situated 1km from the center of the

town (the town hall). This result is significant because it has the following implications: Considering that the average price for 1ha of transacted land (in 2008) is 10301 MDL, the value of land which is located 1km from the town hall is decreasing with 834 MDL. This result is significant and at least interesting. This proves that location is a significant factor in real estate appraisal. Also, using this result might be interpreted for land consolidation. For example, if the parcel of land has a large size, which on average might comprise several parcels, its price is evaluated as a single one. This diminishes the influence of the location component on value.

The next step is to analyse the contribution of explanatory variables in land pricing. The average price of land transacted for 2008 is equal to 10301 MDL (according to reported “real” transactions). This absolute price of land is used to calculate the influence of explanatory variable.

The results regarding the X_i variables in table 3, represent:

- The surface area is a significant factor and has a negative contribution. The estimated coefficient is -0.022037. This means that if the surface area increases by 1 hectare the land value diminishes by approximately 226 MDL. This result is a bit unexpected, and has several implications: it is cheaper to buy a parcel of land with a larger area, as the price paid decreases per hectare. Usually, the value of consolidated land is considered more expensive, which means that this estimate is attributable to less precise data, or different region. A larger sample and more precise data might show different results.
- The income variable, which constitutes the wage from non-land activities, has a positive contribution. This result was expected as landowners with higher incomes do not feel the financial pressure to sell the land cheaply. The estimated coefficient is +0.004, which means that increasing the income by 1000 MDL, the value of land increases by 50 MDL per 1 hectare. The average annual income is 7020 MDL, meaning the land value increases by 350 MDL per hectare.

- The investments (or expenses) have a negative contribution. The estimated coefficient is -0.056, which reflects that increasing the expenses by 1000 lei, the value of land diminishes by 58 lei per hectare. This result is of no surprise.

- Personnel (employees) – has a negative contribution. Thus, increasing the necessary personnel by 1 person, the land value decreases by 517 lei. This result is also expected.

The difference between the actual and estimated data represents the residuals which are included in the variable *results.rezid*. Figure 2 graphically exhibits: the estimated land prices and a comparison with the actual land prices, and also the residuals deviations for the parcels of land.

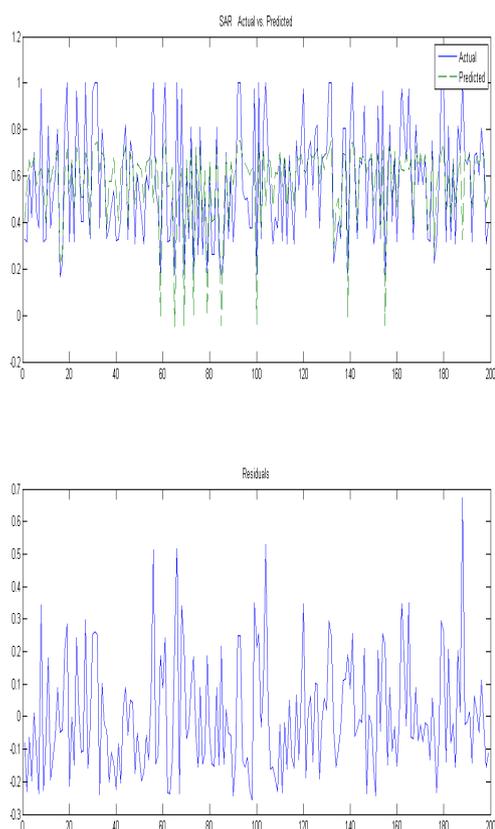


Fig. 2: Actual and estimated values of land and residuals

The leasing transactions are an important part of any land market. The table 6 presents descriptive statistics for variables describing the leasing transactions included in the survey in all

3 communes. The numbers in the table are the average of 3 years, from 2007 to 2009.

The numbers were analysed from the leasing perspective, and factors which might influence the transactions. Thus, the households were classified in 2 categories: lease-in and lease-out participants. Also, the average of the total survey is provided. Out of the total number of respondent, only 24% prefer to lease-out at least a part of owned land, while only 6% prefer to lease-in.

The majority of landowners have between 5 and 6 parcels, which means the market is highly fragmented. It can be observed that the average value for both categories is almost the same, which signifies that the number of parcels owned does not determine the participation in the lease transactions. A more pronounced difference can be examined from the size of owned parcels. Respectively, the smallest landowners prefer to offer their land for rent, while the larger landowners prefer to lease-in more land. The difference is significant – 2.4 ha relative to almost 5 ha.

Table 5. Descriptive statistics for variables describing the leasing market, average for 3 years (2007-2009)

		Total survey	Lease-out	Lease-in
Age of landowner	Years	56	60	52
Age of wife/husband	Years	53	54	44
Family composition	Nr.	3	2	4
Total surface area	ha	2,43	1,98	4,98
Number of parcels	Nr.	5,39	6,00	5,22
Lease payment	MDL/ha	2070	2144	1765
Expenses	MDL	6640	2645	7523
Family income, total	MDL	15138	12328	16721
Number of respondents	Nr.	1617	383	94

Source: Academy of Science survey

Another distinctive feature regards the age, family composition and human resources. The research of these variables reflect that families which lease-in land are on average younger than those than offer land for rent. Thus, the average age of the lessee is 52 years old compared with 60 years old of the lessor. The same conclusion can be reached concerning the his/her wife or husband. The composition of the family also plays a role. The lessee households usually are more numerous than lessor ones. These results confirm the expected ones and also the situation in other countries: younger and more numerous families prefer to own (or cultivate) more land than older families with less working capacity.

Another important indicator of leasing is the payment. The difference in result can be explained by a random insignificant error, with the average payment representing approximately 2000 MDL.

Location plays the primary role in land appraisal due to two main reasons: proximity to favourable or strategic places, and spatial dependence between characteristics of adjacent real estate assets, which should not be ignored. This study uses distance from town hall, which integrates a broader notion of the location component. Usually, it comprises closeness to infrastructure, human resources, storage, household, roads and other. The result of the empirical study shows that the value of land decreases by almost 8% for each kilometre further from the town hall. It is worth noting that this result does not apply for strategic regions, such as the urban sprawl near the capital, where sellers ask for 1 ha of land with agricultural designation as much as 2.4 million MDL (or 155,000 euro) , which is an excessive (ridiculous) price compared to the average “official” transaction price of 10301 MDL (= 665 euro/ha). According to the National Cadastral Agency, the average offer price for 1 ha of land in Moldova was actually 8,000 euro in 2011.

CONCLUSIONS

It is of no surprise that the land market in a transitional economy, as Republic of Moldova, is described by a buy-and-sell transaction

mechanism functioning ineffectively and low land values due to poor efficiency. However, the statistics suggests improving land dynamics. The land development can favour several stakeholders, such as investors, government, citizens. This study is performed mostly from the investor’s perspective and can have two main applications.

Firstly, the model discovers the significant variables which influence land value. It represents a pricing model, which might be used by investment funds or other organizations interested in the land market. For example, investors interested in purchasing cheaper land should look for low-income land owners, low maintenance expenses, larger parcels of land, and further away from the town hall.

Secondly, there exist financial and management tools to improve the land market dynamics. A financial mechanism, like a Land Bank (as in the Netherlands or Romania) could be created to facilitate these transactions. Another option would be attracting land banking investment funds, which would have the goal to improve the buy-and-sell transaction system, develop the financial tools necessary for increasing efficiency, improving the financial structure and others.

There are several ideas that might be studied in future research: replicate this study for land with different designations, change or add other explanatory variables, describe the urban pressure effect in a strategic region.

ACKNOWLEDGEMENTS

This research work was carried out with the support of Academy of Sciences of Moldova and also was financed from Sate Project No. 10.840.08.03A.

REFERENCES

- [1] Anselin, L. 1988, *Spatial Econometrics: Methods and Models*, Dordrecht: Kluwer Academic Publishers, London
- [2] Anselin, L. and Florax, R. 2004, *Advances in Spatial Econometrics. Methodology, Tools and Applications*, Springer-Verlag, Berlin
- [3] Center for Strategic Studies and Reforms Survey, Land Lease in the Republic of Moldova, <http://cisr-md.org/>, 2001

[4] Ciaian, P. and Swinnen, J. 2006, *Land Market Imperfections and Agricultural Policy Impacts in the New EU Member States: A Partial Equilibrium Analysis*, American Journal of Agricultural Economics, vol. 88(4), p. 799-815

[5] Cimpoieș, D. and Lerman Z., 2008, *Land policy and farm efficiency: the lessons of Moldova. Studies on the Agricultural and Food Sector in Central and Eastern Europe*. Leibniz Institut für Agrarentwicklung in Mittel und Osteuropa (IAMO). Halle (Saale): IAMO, 2008, vol. 44, p. 603-614

[6] Le Gallo, J. 2000, *Econometrie Spatiale*, Universite de Bourgogne

[7] LeSage, J. 1998, *Spatial Econometrics*, Department of Economics, University of Toledo

THE REFLECTION OF RURAL POPULATION'S OCCUPATIONAL SITUATION AT ITS REVENUES AND EXPENDITURES LEVEL

Olga SÂRBU¹

¹Agrarian State University of Moldova 42 Mircesti, sector Rascani, MD-4224, Chisinau, Republic of Moldova, Phone: +373 22 432387, E-mail: osarbu@mail.ru

Corresponding author email: osarbu@mail.ru

Abstract

Historically, living conditions in rural communities in Moldova were poorer than those of urban areas. Rural areas have lagged behind urban areas in terms of major indicators of economic welfare, recording lower incomes, higher poverty rates, low employment and lower indicators on health and education. Low productivity of agricultural activities is given by the large number of farms with small surfaces, small-scale use of modern technologies and the over-employment of rural population in agriculture. In these conditions, between employment in agriculture and poverty it is creating a vicious circle from which the rural population can not get out but only through the development of small industries in rural areas and traditional agricultural restructuring.

Keywords: occupational activities, employed population, depopulate rural

INTRODUCTION

During the last twenty years the national economy faced a series of imbalances caused by the transition to the market economy. Although a lot of changes, structural, institutional, legal, behavioural, etc. adjustments and readjustments have been made in this period, the aim of which was to ensure the best possible features of the new economic mechanism based on market relations, competition and efficiency, there were registered a series of failures in relation to the decrease of economic indicators, worsening quality of life, degradation of human capital. Along with these changes in social and economic life, the situation in the labour market is quite poor too. The labour market in its turn, as a secondary market, fully reflects both progress and failures of the national economy. Currently, labour relations occur in the developing labour market. This market includes both the elements and mechanisms inherited from the socialist economy and new elements specific to a modern market economy. There appeared some imbalances that result in increasing unemployment and deterioration of the social protection in the labour market on the one hand and in the inefficient use of labour, accompanied by the decrease in labour

productivity and, consequently, substantial reduction in workers' real wages on the other hand. Thus, the correlation between productivity, competence and the level of workers' wages is rather low and employed people sometimes live in poverty. Sometimes the employed have lower incomes than the unemployed.[2]

The employment situation in rural areas is much more difficult than in urban areas, and imbalances are more visible here. Most of the employed in rural areas are engaged either in agricultural activities, largely informal ones or in the public sector (education, health, culture, social protection), the latter having a modest share in the employment structure. Both agricultural activities that cannot ensure a rapid increase in labour productivity and employment in the public sector where salaries depend on the limited possibilities of the local budget cannot provide the income level necessary for a decent living of both men and women.

Reforms promoted in the agricultural sector, in the implementation of market elements, such as land privatization, land allotment to farmers, disestablishment of collective farms and setting up new farm households, etc. have not improved the situation regarding the improvement of living conditions and increased labour employment in rural areas.

Thus, there appears a need for urgent actions taken by local and central government authorities in order to improve the employment situation in rural areas.

MATERIAL AND METHOD

The studied materials include the analysis of employment in the Republic of Moldova and, in particular in rural areas. We used the following materials during the study: methods of quantitative and qualitative analysis, of the comparative and logic analysis. The research was based on the official data of the National Bureau of Statistics.

RESULTS AND DISCUSSIONS

Living conditions in rural communities in Moldova were historically poorer than those in urban areas. Rural areas have lagged behind

urban areas in terms of major indicators of economic welfare, registering lower incomes, higher poverty rates, low employment and lower health and education indicators.

Basically, rural population that is economically active is made to make a choice between two opportunities. On the one hand, they accept a job with a modest income under unfavourable conditions and increased risk of illness, being consigned to poverty. On the other hand, they immigrate to urban areas to find a more attractive and better paid job or they go abroad searching for a job that will ensure the income necessary to maintain themselves and their family.[2]

Therefore, at present rural areas become increasingly less populated, and the remaining population in villages is largely under 16 years old, i.e. those who still do their studies and the elderly, i.e. retired people.

Table 1. The analysis of Moldova's population flow

Indicators	2002	2003	2004	2005	2006	2007	2008	2009	2010
Population, thousands of people	3627.8	3618.3	3607.4	3600.4	3589.9	3581.1	3572.7	3563.7	3560.4
Rural population, thousands of people	2142.6	2134.2	2129.5	2124.4	2120.1	2103.1	2096.5	2087.0	2078.7
The share of rural population in the total number of people, %	59.1	59.0	59.0	59.0	59.1	58.7	58.6	58.6	58.4

Source: developed by the author on the basis of the NBS data

On January 1, 2011 the number of the stable population of the Republic of Moldova amounted to 3.5604 million people, 3.300 less than on the same date of 2010. More than half of the population is rural inhabitants - 2,078,700 people, or 58.4%. The share of rural population in Moldova is higher than in other countries of the region and it is more than 58%. 1,481,700 people or 41.6% live in urban areas. The population number by sex is as follows: 51.9% (1,848,300 people) women and 48.1% (1,712,100 people) men.[1]

The population structure per residential environment favoured the population in rural areas, although the share of this category has continuously decreased under the intense urbanization process in the period of industrialization. Thus, the census of 1959 showed that 22.3% of the total population lives in urban areas and, consequently, 77.7% of people live in the country. Urbanization

processes of the post-war period have caused significant changes in the population structure in residential areas of the country. Thus, in early 2010 the urban population grew by 41.6% (+21.1 percentage points), decreasing the number of the rural population to 58.4%.

The structure of activity sectors of the active population, consequently grouping active population into the four sectors: agriculture (including forestry, hunting and fishing), industry, construction and services. This distribution is one of the analysis criteria of the level of the economic development of a country. Thus, the comparison of sector structures of the active population in countries with different levels of economic development leads to the conclusion that developed countries are characterized in the position of less developed countries by means of a high percentage of active population in services and a very low share of people in agriculture.

Table 2. Evolution of the employed population by economic activity in rural areas of the Republic of Moldova

Sphere of activity	2006		2007		2008		2009		2010	
	thousands of people	Share, %	thousands of people	Share, %	thousands of people	share,%	thousands of people	Share, %	thousands of people	share,%
The total number of employed population	696.4	100.0	698.6	100.0	696.4	100.0	698.6	100.0	605.0	100.0
of which:										
Agriculture, hunting economy, forestry and fishing	403.2	58.0	381.4	54.6	403.2	58.0	381.4	54.6	295.8	48.9
Industry	57.6	8.0	58.0	8.3	57.6	8.0	58.0	8.3	54.8	9.06
Construction	24.2	3.0	33.5	4.8	24.2	3.0	33.5	4.8	31.8	5.26
Wholesale and retail	49.2	7.0	55.9	8.0	49.2	7.0	55.9	8.0	58.2	9.62
Transport and communications	19.3	3.0	22.4	3.2	19.3	3.0	22.4	3.2	19.3	3.19
Public administration, education, health and social protection	127.5	18.0	126.4	18.1	127.5	18.0	126.4	8.1	126.6	20.9
Other types of activity	18.4	3.0	21.0	3.0	18.4	3.0	21.0	3.0	18.5	3.07

Source: developed by the author on the basis of the NBS data

Unfavourable dynamics of the employed in agriculture and favourable dynamics for other activities in the country during 2000-2010 led to important structural changes in employment. Thus, in 2000 about 76.2% of rural population were engaged in agriculture and about 11.3% of people – in the public sector, in 2010 the share of the population engaged in agriculture was about 48.9% and the employment in public administration, education, health and social care – 18.1%. Therefore, the recession of agricultural activities in the period 2000-2010 has forced a large number of people to move to other activity areas so that the employment reduction in these activities was 22.5 percentage points, while the assimilation of budgetary activities of a part of people from

agriculture, has increased the employment share in these activities by about 6.8 percentage points. [1]

The employment structure of economic activities in rural sector shows the increase in all activities in 2000 if compared with 2006, with the exception of agriculture. However, there is a tendency to standardize the employment spheres in rural areas. The largest structural changes may be found in public administration, health, social protection and education – 8.7 pp, 5.8 pp in trade, 4.4 percentage points in industry and 4.2 pp in construction. Thus, the employment diversity by economic activity can boost the rural economy, which may cause a further increase in the number of the employed in this sector.

Table 3. Distribution of the employed population by age and sex in rural areas, thousands of people

Age groups	2009			2010			2011		
	both sexes	including:		both sexes	including:		both sexes	including:	
		men	women		men	women		men	women
Total	669.6	347.9	321.7	639.6	328.9	310.7	616.7	315.7	315.7
15-24 years old	79.6	46.6	33.0	76.3	44.5	31.8	62.3	37.1	37.1
25-34 years old	115.9	61.5	54.4	129.6	66.2	63.8	125.4	64.4	64.4
35-44 years old	164.7	77.9	86.8	153.1	71.5	81.5	150.6	70.3	70.3
45-54 years old	200.1	98.7	101.4	178.7	87.7	90.2	173.1	80.8	80.8
55-64 years old	89.3	51.6	37.7	87.6	50.4	37.2	88.5	53.2	53.2
over 65 years old	20.1	11.7	8.4	14.4	8.6	5.8	16.9	9.9	9.9

Source: developed by the author on the basis of the NBS data

Population systematization in large age groups allows the formation of three population segments: young, adult and elderly people. This conventional grouping will make it possible to determine the share of population in each age group and characterize the degree of demographic aging and influence of the people groups who are unable to work on the population able to work.

Rural population has always been a demographic basis of the country. Nowadays, however, one may observe economic and reproductive incapacity in the country, even though more than 2 million live there. Every fourth man in the central region and every third man from the north region is retired. It feels as there is a great deficit of labour force too. It should be mentioned that this situation will not be

changed in the next 20 years because the population aging has overcome acceptable limits within which the situation can be reversed. Moreover, population aging emphasizes feminization of the rural population. Women have a higher expectancy of life (five-seven years more) and die at the extreme level of poverty and loneliness. Retirement allowance of the rural female population is 30-40% lower than the men's one.

The analysis of the age group distribution in rural areas shows that the share of young people (15-24 years old) decreased from 11.88% in 2009 to 10.1% in 2011. At the same time the proportion of adults (25-54 years) increased from 71.79% in 2009 to 72.82% in 2011.

The population structure by age groups is characterized as follows: 17.8% of the population under the working age, 66.7% of the population of the working age and 15.5% of the population over the working age. The aging coefficient (the number of people at the age of over 60 years per 100 inhabitants) is 14.4. Nearly 15.2% of the rural population is over 60 years old, the share of elderly women in the rural female population is 18.1%.

Although women predominate in number in relation to the men in Moldova, certain circumstances, particularly social ones, have resulted in their less modest presence in the labour market of the country. In 2009, the differentiation of the employed by sex was insignificant: 49.5% of women and respectively 50.5% of men out of the total population of the republic. The minor difference is maintained at the level of the two residential areas. Thus, in 2009 the population structure by sex included 51.2% of men and 48.8% of women in the rural areas. So, one registers the employment aging

of the rural population. The predominance of middle-aged employed people in rural areas shows a lack of attractive jobs, due to low salaries, employment opportunities, lack of professional development perspective, etc. Depopulation of rural areas is determined by the fact that most young people who have left their homes in order to study in urban areas, do not want to come back after graduation and continue their working career at home. We can expect worsening of the situation with the demographic aging in the future because of the continuous decrease of the young people share and increase of the adult population share.[3]

The value of the aging rural population is greater than that of the urban population. Although the rural sector has a lower potential of labour resources formation nowadays (the share of population at the working age), it has a larger reserve of labour resources formation in the future. Therefore, the differentiation of the rural population by age is more balanced, if it does not become a major supplier of labour force for urban areas. To maintain this balance we need to develop some important policies to preserve the rural population.

The unattractiveness of rural areas is determined by several factors. One of the factors is a small number of activities and professions required in rural areas. Consequently, a large part of young people who study at secondary specialized schools and universities in towns can not and do not want to come back to their village because they can not find a job by their occupation.

An overview of the distribution of economically active rural population, by sex and educational level, shows a similarity with the structure of the rural population at working age.

Table 4. Analysis of the population of over 15 years old by the level of education and gender in rural areas, thousands of people

Age groups	2009			2010			2011		
	both sexes	including:		both sexes	including:		both sexes	including:	
		men	women		men	women		men	women
Total	669.6	347.9	321.7	639.6	328.9	310.7	616.7	315.7	315.7
15-24 years old	79.6	46.6	33.0	76.3	44.5	31.8	62.3	37.1	37.1
25-34 years old	115.9	61.5	54.4	129.6	66.2	63.8	125.4	64.4	64.4
35-44 years old	164.7	77.9	86.8	153.1	71.5	81.5	150.6	70.3	70.3
45-54 years old	200.1	98.7	101.4	178.7	87.7	90.2	173.1	80.8	80.8
55-64 years old	89.3	51.6	37.7	87.6	50.4	37.2	88.5	53.2	53.2
over 65 years old	20.1	11.7	8.4	14.4	8.6	5.8	16.9	9.9	9.9

Source: developed by the author on the basis of the NBS data

Only a quarter of the economically active population with the higher education lives in the countryside. However, about 60% of people with the secondary and general school education and 12.4% of the 15.1% of the economically active people who have graduated from the gymnasium may be found in rural areas. Small proportions of economically active population with higher education and big proportions of the economically active population with poorer education may be the cause of the poorer economic activity in the country. The study allows us to conclude that the active population with the secondary specialized education predominates in rural areas and is about 29%. If we analyse the situation from the point of view of sex, one should state that the secondary special education prevails by men and the general and secondary education - by women. This trend is also specific for the active population employed in rural areas.

The employment system of a state is formed under a variety of factors. Their analysis will imply both quantitative and qualitative approaches with a complex set of indicators, able to highlight the current employment situation as well as its dynamics, therefore isolating evolution laws over time and the factors established under those laws.[2]

The performed economic reforms have resulted in a substantial change in the occupational

structure based on ownership. Actually, in all fields of activity from rural area, with the exception of budgetary, social, transport and telecommunications sectors, most employed people work in the private sphere. Thus, in the analysed period there is a fact of the absolute dominance of the private sector over the public one. The share of persons employed in the private sector was about 65%, in public companies - about 32%, other categories of property dividing the remaining 3%. Large shares of employment in the private sector can be determined in agriculture, about 98.6%, in construction, about 97.6%, in commerce, about 88.2%, and industry, about 71.5% of employment in these spheres. Also, private agricultural sector has more than two thirds of rural employment (67.8%), followed by employment in public sector –public administration, education, health and social assistance—with about 81%. Men in rural areas are engaged mainly in the private sector with a share of 81.3%, compared to 16.3% - in the public sector. The increased female employment in the public sector makes them record lower rates of employment in private enterprises. In 2010 women accounted for about 44.05% of employment in the private sector and about 55.95% of those employed in public enterprises.

Table 5. Dynamics of employment by unit's ownership, gender and area in Moldova, thousands

Gender and areas	2008				2009				2010			
	totally	including			totally	including			totally	including		
		private	public	other		private	public	other		private	public	other
Employed population, totally	1251,0	872,5	330,3	48,3	1184,4	793,1	329,3	62,0	1143,4	745,8	324,5	73,1
including:												
by area:												
- urban	559,2	351,6	174,7	32,9	548,3	330,8	173,9	43,5	538,3	315,5	174,8	48,0
- rural	691,8	520,9	155,6	15,4	636,1	462,3	155,4	18,5	605,0	430,3	149,7	25,1
by gender:												
- men	628,8	483,8	122,2	228	597,7	445,3	121,3	31,2	573,3	417,3	121,5	34,5
- women	622,3	388,7	208,2	25,4	586,7	347,8	208,0	30,8	570,1	328,5	203,0	38,6

Source: developed by the author on the basis of the NBS data

The situation of women employment in the public sector may be treated as a positive one. The activity in this sector is more protected, providing social guarantees secured by effect of law. Public sector employee status allows regulation of labor relations under an

employment contract. Thus, about 85% of rural workers are employed on the basis of a work contract (about 39% men and about 46% women). Hiring contract employees, considered as an additional opportunity for the rights of workers, manifests itself differently on the

types of activities. Almost all employees in public administration, education, health and social assistance are employed on the basis of an employment contract, while in transport sector about 92% of employees have signed labour contracts, in the industry - about 90%. The lowest proportion of employees with employment contracts can be observed in agriculture (about 70%).

The shortage of labour market opportunities in rural areas, its inefficient regulation, the exhausting bureaucracy and the inability of public administration, the pressing tax system, the lack of confidence shown to the state, and the advanced level of poverty have influenced the socio-economic evolutions of recent decades. The mentioned difficulties caused the occurrence on the labour market of some typical behaviours for underdeveloped economies, including: hiring without a labour contract; not recording of employees by employers; not declaring or incomplete declaration of income; tax avoidance; subsistence activities.[4]

These and many other factors have led to some forms of employment, as is the informal one.

An important moment that conditioned the assertion of the informal sector in the rural economy was the dissolution of large farms and agricultural land division between rural residents. The employment in rural areas of our country is characterized by a fairly large share of informal activities. In 2010 the rural economy was represented by 605000 of employed people, of which 330000 (about 54.5%) were formally working and 275000 people (about 45.5%) - informally. It will be important to note that the informal employment in rural areas is much higher than in urban areas. In 2010 it accounted for more than three quarters (about 77.8%) of the engaged population in informal activities in our country. Features of the rural employment are determined by the following factors: unskilled, less paid jobs (usually agricultural activities) are of the highest demand; agricultural activity is characterized by a very low level of industrialization and implementation of advanced technologies and a small share of qualified specialists, with the negative influence on the productivity.

Table 6. Analysis of the rural population by its engagement in economic activity

Indicators	2006	2007	2008	2009	2010
Active population, total, thousands of people	739.4	724.5	710.9	69.6	639.6
of which:					
Employed	696.4	698.6	691.8	636.1	605.0
unemployed (ILO)	43.1	25.9	19.1	33.5	34.6
Activity rate, %	43.7	43.1	42.2	39.3	37.5
Employment rate, %	41.2	41.6	41.0	37.4	35.4
Unemployment rate, %	5.8	3.6	2.7	5.0	5.4

Source: developed by the author on the basis of the NBS data

The dynamics of the main indicators of labour force participation in economic activity in rural areas shows continuous decrease in recent years. Thus, from 2006 to 2010 the economically active population has dropped from 739,400 to 639,600 people (minus 99,800), while there has been reported a reduction of the employed from 696.4 to 605.0 thousand people. Seasonal fluctuations in employment that occur during the year are quite alarming too; they arise in particular because of the agricultural character of the economy. For example, the number of employees in rural areas in the first quarter of 2011 was about 30.8% lower than in the second quarter. Generally speaking, quarterly employment fluctuations for the period 2000-2010 are

characterized by a higher average in the third and the second quarters (830,000 people and 833,000 people respectively), and a lower average in the fourth and the first quarters (735,000 people and 701,000 people respectively).[1]

However, according to ILO, the number of the unemployed has been reduced from 43.7 thousand in 2006 to 34.6 thousand people in 2010 in the period under analysis. But if we compare 2010 and 2009, there is an increase of unemployment by 1.1 thousand people. Weaker consolidation of labour market relations that are still in the developing stage, in rural areas on the one hand and lack of employment opportunities in this environment on the other hand, result in reduced flexibility of the market

and therefore, an increasing number of the unemployed.

From 2006 until 2010 the activity rate is continuously reduced in rural areas. So if this indicator was 43.7% in 2006, in 2010 it dropped to 37.5%. This fact contributed to the reduction of the employment rate from 41.2% to 35.4% in the period.

The unemployment rate decreased from 5.8% in 2006 to 2.7% in 2008 in rural areas. However, in recent years this indicator increased to 5.4% in 2010 which is only 0.4 percentage points less than in 2006.

The difficulties the labour market had faced in rural areas led to a faster reduction of the employment intensity in rural areas. Thus, the employment difference in the two areas of the country becomes more pronounced and the gap is likely to deepen.

Demands and different socio-economic offers launched by the two residential environments, have led to the appearance of traditionalized activities and a social division of labour that separates urban activities profile from the rural one. Thus, areas of activity in two residential areas register significant differences in terms of population and employment structure. Trade is

the activity in which the majority of urban population is involved, farming predominates in rural areas.

Rural employment typology negatively influenced the income. Rather, it can be said that there is quite a close interdependence between the income level and structure and employment types in rural areas. Wages received by people involved in rural activities are less than the national average figure. Taking into consideration the fact that a big share of people is employed in agriculture, education, health and social protection one can conclude that the majority of the population employed in villages gets much lower wages than people in urban areas.

Available incomes of the population represent all the money and payments in kind earned from the employment activity and one's own account, commercialization of the agricultural production from auxiliary households, property income, pensions and other social benefits as well as other current transfers (including payments in kind and sums of money received from outside the household). Cash and payments in kind are the two types of available incomes.

Table 7. Evolution of available incomes of Moldova's population by the activity type, lei

Sources of the available income	2009			2010		
	Total	including the following areas:		Total	including the following areas:	
		urban	rural		urban	rural
Available incomes - Total	1166.1	1477.1	939.2	1273.7	1574.7	1054.7
including in % by the source						
The employment	45.3	58.1	30.6	42.6	55.2	28.9
Individual agricultural activity	8.9	0.9	18.0	9.8	1.3	19.1
Incomes from non-agricultural individual activities	6.5	7.2	5.7	6.8	8.4	5.0
Property income	0.2	0.3	0.0	0.1	0.2	0.1
Social benefits	17.5	14.8	20.6	18.7	16.4	21.2
Other incomes	21.7	18.7	25.1	22.0	18.6	25.7
From which remittances	17.0	12.6	22.0	16.8	11.3	22.8
The share of available incomes in the form of payments in kind, %	10.7	3.2	19.4	11.8	4.4	19.8

Source: developed by the author on the basis of the NBS data

According to the data of the Household Budget Survey, the population's average available incomes amounted to 1273.7 lei per month per person in 2010, it is 8.45% more compared to 2009.

Salary payments are the most important source of income, 42.6% of the total available income, their contribution decreased by 2.7 percentage points in comparison with 2009, but it increased if compared with the period 2006-

2008. Social benefits are the second important source of income, they contributed to the formation of the population's income in proportion of 18.7% or 1.2 percentage points more than in the previous year, in 2006 – 2010 there was an increase of about 5.5 percentage points.[2]

Revenues from individual agricultural activities accounted to 9.8% and those from individual non-agricultural activities - 6.8%. Money

transfers from abroad (remittances) remain an important source of household income, their contribution was 16.8% or 0.2 percentage points less in 2010 compared with 2009, but 3 percentage points more than in 2006.

Incomes in the form of cash are predominant in the structure of available incomes, their share amounted to 88.2% in 2010, and the share of incomes in kind was 11.8% of available incomes. In absolute terms, the average amount of income in cash was 1123.3 lei per month per person and 150.5 lei - income in kind. Compared with 2009, the share of incomes in cash decreased by 1.1 percentage points.

Thus, it was stated that the average income of the urban population was 520 lei or 49.3% higher than that of the rural population. Salary payments are the main source of income in urban areas, which ensured the share of the population income of 55.2% (58.1% in 2009) and social benefits - 16.4% (14.8% in 2009).

Salary payments are also the most important source of income in rural areas (28.9%), but its

contribution is almost 2 times lower than in urban areas. However, incomes from individual agricultural activities have provided 19.1% of the total available income.

The rural population compared to the urban one greater depends on the transfers from abroad, their share in revenues is 22.8% compared with 11.3% for urban population. Moreover, the rural population is characterized by a higher share of social benefits, their contribution is 21.2% compared with 16.4% in urban areas.[2]

Incomes in the form of cash are predominant in the structure of available incomes, their share amounted to 88.2% in 2010, and the share of incomes in kind was 11.8% of available incomes. In absolute terms, the average amount of income in cash was 1123.3 lei per month per person and 150.5 lei - income in kind. Incomes in cash are 95.6% of the urban population income, their contribution is 80.2% in rural areas.

Table 8. Evolution of available revenues and expenditures of Moldova's population, lei

Years	Available income (average monthly figure per person), lei			Consumer expenditures (average monthly figure per person), lei		
	Total	Urban	Rural	Total	Urban	Rural
2006	839.6	1000.6	723.8	953.3	1100.7	847.2
2007	1018.7	1210.0	878.9	1119.1	1304.7	983.4
2008	1188.6	1463.3	987.0	1227.5	1475.2	1045.8
2009	1166.1	1477.1	939.2	1217.4	1512.5	1002.5
2010	1273.7	1574.7	1054.7	1371.7	1712.4	1123.8

Source: National Bureau of Statistics of the Republic of Moldova

The study reveals an increase of both revenues and consumer expenditures of the Moldavian population. Thus, in 2006 the average monthly available income was 839.6 lei per person, in 2010 it increased to 1273.7 lei or by 434.1 lei. This tendency is specific for both the urban and rural population. However, the growth rate of an average monthly available income per person in towns exceeds the income from the rural areas. In 2010 compared to 2006 the average monthly available income per person in towns increased by 57.3 percentage points while it amounted to only 45.7 pp. in rural areas. People with general secondary and specialized education receive lower incomes, they increased from 825 lei in 2006 to 1257 lei in 2010 in the analysed dynamics. People with basic studies and primary or no education

receive the lowest income which reached 960 lei in 2010.[2]

According to the data, obtained during our study, average monthly consumer expenditures per person exceed the level of the average monthly available income. Consumer expenditures increase together with the available income from 953.3 lei in 2006 to 1371.7 lei in 2010. Their growth rate also varies depending on the residential environment. Thus, average monthly consumer expenditures per person in urban areas in 2010 compared to 2006 increased by 55.6 percentage points, in rural areas – only by 32.6 pp.

In 2011 the average monthly consumer expenditures of the population per person were 1534.1 lei (the average monthly income – 1444.7 lei), having increased by 11.8% in comparison with the previous year. In real

terms (adjusted to the consumer price index), the population spent on average 3.9% more compared with 2010.

The necessity for food consumption traditionally remains the biggest part of expenditures - 42.5%. An average person spent 18.1% (+ 0.3 pp) of the total consumer expenditures for household needs and 10.4% (- 0.4 pp) - for clothing and footwear. Other expenditures were as follows: health care - 5.4% vs. 6.4% in 2010, transport - 5.2% vs.

5.0% in 2010, communications - 4.4% vs. 4.6%, household facilities - 3.6% vs. 3.9%, education - 1.1% vs. 1.3%, etc. The average consumer expenditures of the urban population amounted to 1869.4 lei per person per month, consequently 584.2 lei or 1.5 times more than in rural areas.

It is interesting to analyse the structure of the average consumer expenditures in the Republic of Moldova and to evaluate the population's welfare at the same.

Table 9. Analysis of the structure of the average consumer expenditures in Moldova

	2008			2009			2010		
	Total	from which on average:		Total	from which on average:		Total	from which on average:	
		rural areas	urban areas		rural areas	urban areas		rural areas	urban areas
Average monthly consumer expenditures per person, lei	1227.5	1475.2	1045.8	1217.4	1512.5	1002.8	1371.7	1123.8	1712.4
including in %:									
Food	40.2	42.7	37.8	40.8	43.8	38.1	40.8	44.1	37.8
alcoholic beverages, tobacco	1.9	2.4	1.3	1.8	2.2	1.5	1.8	2.3	1.4
clothing, footwear	12.7	13.7	11.7	12.2	13.0	11.6	10.8	11.7	9.9
household needs	16.3	17.1	15.5	16.2	16.8	15.6	17.8	17.3	18.3
household facilities	4.8	5.5	4.1	3.9	4.3	3.6	3.9	4.5	3.5
health care	5.6	5.3	5.8	6.2	6.1	6.3	6.4	6.8	6.0
Transport	4.9	3.7	6.0	4.7	3.9	5.4	5.0	3.9	5.9
communications	4.9	4.4	5.4	5.0	4.4	5.5	4.6	4.1	5.1
Entertainment	2.1	2.2	3.0	2.0	1.0	3.0	1.7	1.0	2.3
Education	0.4	0.2	0.7	0.5	0.3	0.7	1.3	0.8	1.7
hotels, restaurants, cafes, etc.	2.3	0.8	3.7	2.5	1.1	3.7	2.2	0.6	3.6
Various	3.9	2.9	4.9	4.1	3.2	4.9	3.8	3.0	4.5

Source: developed by the author on the basis of the NBS data

The average monthly consumer expenditure of the population per person was 1371.7 lei in 2010, having increased by 12.7% in comparison with the previous year (see Appendix, Table 4). In real terms (adjusted to the consumer price index), the population spent on average 4.9% more than in 2009. The necessity for food consumption traditionally remains the biggest part of expenditures - 40.8%. People on average spent 17.8% (+ 1.6 pp) of the total consumer expenditures on household needs, 10.8% (- 1.4 pp) – on clothing and footwear. Other expenditures were as follows: 6.4% vs. 6.2% in 2009 on health care, 5.0% vs. 4.7% on transport, 4.6% vs. 5.0% on communications, 3.9% on household facilities, 1.3% vs. 0.5% on education, etc.[2]

At average total consumer expenditures of the urban population amounted to 1712.4 lei per person per month, respectively 588.6 lei or 1.5 times more than in rural areas.

The population spent 37.8% of monthly consumer expenditures (38.1% in 2009) on

food in urban areas and 44.1% (43.8%) - in rural areas. People in urban areas spend more on household needs (18.3% vs. 17.3% in rural areas), communication services (5.1% vs. 4.1%), recreational services (2.3% vs. 1.0%) and hotels, cafes and restaurants (3.6% vs. 0.6%).

Money expenditures dominate over expenditures in kind in the structure of total consumer expenditures - 89.1% and 10.9% respectively (see Appendix Table 4-6). Expenditures in kind in urban households (4.0%) are most often represented by the consumption of free food received outside the household (relatives, social benefits, etc.). 18.5% of expenditures in rural areas is the consumption of products produced as a result of individual agricultural activity.

CONCLUSIONS

Poor social and economic conditions of rural areas, resulting in the forms related to the

transition to a market economy, caused a decrease in the population number and natural population growth and an increase of the final immigration, which have a negative impact on employment indicators.

Rural areas continue to be unattractive for employment. This fact is determined by several factors. One of the key factors is the narrow range of occupations and professions required. Therefore, many of the young people who study at institutions of secondary specialized and higher education in towns can not and do not want to return to their native villages, because they can not find a job by occupation there and their education turns into unjustified investment in human capital.[4]

Taking into consideration the specific nature of economic activities in rural areas, seasonality has a crucial influence on employment indicators. Thus, the activity of the labour market is manifested in the second and the third quarter of the year, i.e. in the periods of the year when agricultural work can be done - the main activity in rural areas.

One may also observe a decrease in the share of people employed in agriculture against the background of the employment level decrease in rural areas. However, the share of people employed in agriculture is impressive so far - 50% in 2009. Nevertheless, the share of people employed in agriculture in rural areas is steadily decreasing.[2]

Traditionally, rural unemployment is at a lower level than in urban areas. This fact is, firstly, determined by the specific employment character in rural areas, where the majority of the population is self-employed, including private auxiliary households for own consumption or sale, or it is not present in the labour market at all. However, in recent years one can observe a steady increase in unemployment against the background of the decrease of both economically active population and the employed in rural areas.

Unemployment in rural areas, like other occupational indicators, is strongly influenced by seasonality. One can note that the number of the unemployed grows mostly during the cold season, when agricultural work, the main activity in rural areas, can not be done.

Incomes of the urban population are higher than those of the rural population. Salary payments and social benefits are the main source of income in urban areas. People who live in rural areas are to a larger extent dependent on money transfers from abroad than the urban population.

To restore the situation one needs to diversify the occupational structure in rural areas in order to ensure a better use of human potential in rural areas, diminishing the role of agricultural activities in the rural areas economy and reducing the brain drain intensity.

REFERENCES

- [1] *Anuarul statistic ale Republicii Moldova 2011*, Chisinau, Statistica, 2011, 564 p.
- [2] Bărcă, A., Vaculovschi, D. *Situația forței de muncă în mediul rural din Republica Moldova*, ASEM, 2008, 171 p.
- [3] Haupt, A., Kane, T.T. *Populația, definiții și indicatori*, Chișinău, Vite-Jesc, 2008.
- [4] *Proгноза pieței muncii 2012*, ANOFM, Chișinău, 2012, 24 p.

THE IMPACT OF THE EU INSTRUMENT FOR PRE-ACCESSION FOR RURAL DEVELOPMENT (IPARD) TO TURKEY

Coskun SEREFOGLU¹, Tecer ATSAN²

¹Ankara Development Agency, 1322. Cad., No: 11 Ovecler, Cankaya-Ankara-TURKEY,

²Ataturk University, Faculty of Agriculture-Agricultural Economics Department,
tatsan@atauni.edu.tr

Corresponding author email: cserefoglu@gmail.com

Abstract

Turkey has acquired a valuable experience on rural development with five-year-development plans that were launched in 1960's. A number of rural development projects, which have been financed by the United Nations and the World Bank, have been carried out in the underdeveloped regions of Turkey. With the EU Helsinki Council that recognizes Turkey as an EU candidate country in 1999, Though Turkey did not utilize pre-accession assistance programs like PHARE, SAPARD, CARDS, ISPA that Central Eastern European Countries (CEEC's) took advantage, but she benefited tremendously from the EU pre-accession assistance program under the instrument of IPA rural Development. Following the National Rural Development Strategy, which was prepared by the Ministry of Development in collaboration with the Ministry of Food, Agriculture and Livestock (MoFAL) of Turkey in 2005, Turkish side, provided technical assistance by the EU, worked out IPARD program with the hard negotiations held with the EU Commission concerning the priorities, the number of cities and the number of sub-measures and sectors to be funded under Rural development program. MoFAL decided to implement the IPARD Program in two phases between the periods 2007-2010 and 2011-2013. In the first phase, 20 provinces out of 42 have been funded. The EU allocated 873,89 million Euro for seven-year-period. The setting up an IPARD Paying Agency in Headquarter and its divisions in provincial level took a lot of hard works to get accreditation by the EU. So, the completion of all 20 provinces' accreditation was concluded as late as in the last quarter of 2011. Nowadays, the IPARD Paying Agency has announced six-call for proposals nowadays. As a result of the first two call for proposals made in 2011, only 15.974.636,95 € of the allocated funds by the EU has been used. This study discusses the process that is made by the EU on rural development program in Turkey and analyse the challenges which is made for benefiting from the EU funds. From the first implementation year of IPARD Program, it seems that Turkey won't be able to use all funds allocated by the EU.

Key words: Agriculture, EU Funds, IPARD Program, Rural Development, Turkish Agriculture

INTRODUCTION

Atsan (1998) states that rural development as endeavours made for eliminating inequality in income distribution, providing a better life style for those who practice in Agriculture and live in rural areas. Rural development projects have aimed to improve infrastructure in rural areas and increase welfare level of the rural population. Furthermore, five-year-development plans have played a complementary role with rural development projects implemented in the underdeveloped regions since 1960's in Turkey. These programs consisted land and agricultural reforms, community development programs and strengthening of cooperatives.

The Ministry of Food, Agriculture and Livestock (MoFAL) released some documents such as II. Agricultural Council, National Rural

Development Strategy, National Rural Development Plan in the last decade. The harmonization with the EU CAP policies took into account in all these documents.

The EU has implemented the EU pre-accession assistance program to Turkey. The aim of the rural development component is to prepare the candidate countries to implement the EU Common Agricultural Policy upon accession by helping them to align their agricultural sectors to the Community standards that will be applicable to them after accession and assisting them to develop a policy for the agricultural sector and rural areas (EC, 2012).

The assistance is provided by an IPARD Rural Development Program for the period 2007-2013 which has been drafted by the Turkish authorities after hard negotiations done with the EC experts in 2007 and approved by the

European Commission on 25th of February 2008 (Şerefoğlu, 2008). One of the most strenuous decisions during the negotiations was the selection of the eligible provinces for IPARD Program.

The EU was not keen on funding whole Turkey on the contrary to Balkan countries. They just wanted to fund the regions of which GDP per capita was below 75% of the national average. But MoFAL insisted on including some provinces of which GDP per capita is above national average because the capacity of the sector was set up in these provinces. In consequence of the negotiations made with the EC, It was agreed that the IPARD program will be implemented in 42 provinces in Turkey within the period 2007-2013. These provinces were selected with regard to their existing potential, problems, GDP per capita and net internal migration (MoFAL, 2008). 22 out of 42 provinces will be carried out in the second phase which is foreseen to launch in 2011.

Yet, the accreditation procedures for setting up twenty provincial agencies in the first phase took much time. Therefore, the first call for proposal was made in 1st July of 2011 in seventeen provinces that achieved the EC accreditation. In total around 873,89 million Euros is allocated by the EU for Turkish Rural development program (Ministry of EU Affairs, 2012).

Turkey has continued to adapt her policies to the EU CAP policy since negotiations started. The EU-financed IPARD program in Turkey introduces new measures for the Turkish agriculture and rural areas such as Leader, rural tourism and agri-environment.

The main difference from Turkish rural development projects implemented so far is to focus economic viability and diversification of economic activities as well as it harmonizes the EU acqui rather than social policies in agriculture through the national assistance.

It is not unexpected that Turkey will not be able to use the EU funds allocated for Turkey as the program started late and the EU procedures is quite hard for the beneficiaries who are willing to benefit from the EU funds.

MATERIAL AND METHOD

In this study, the rural development endeavours were analysed under the EU membership process. The rural development concept of the EU with the IPARD program was reflected in comparison with the Turkish policies on the basis of rural development programs funded by international organizations and implemented in the last four decades. While analysing the past and current situation of rural development in Turkey, some theoretical and practical knowledge on site was given.

RESULTS AND DISCUSSIONS

The rate of the rural population of Turkey in 1970 was 71,3 %. This decreased 25% in 2010's in forty years. As clearly seen from this figure, there was a fasting migration from rural areas to urban areas in Turkey. Rural development has been an important instrument for Turkey. Turkey, in order to prevent the migration from rural areas, has implemented many regional and rural development projects since 1970's. Most of which have been carried out in underdeveloped regions in east and south east part of Turkey. Efficient use of resources in rural areas, improving of rural infrastructure, creating of new job opportunities, raising awareness about the agricultural practices and cooperation among the people were the main targets of these projects.

Although some progress has been monitored in developing the rural areas and raising the living standards of rural population using the implementation of policies to reduce development disparities in Turkey, the objectives have not been fully achieved and the development disparities have continued (Ministry of Development, 2006). It is also clearly seen that lack of participatory approach, lack of women participation, lack of capacity of Non-Governmental Organizations and top-down approach instead of bottom-up approach made unfavourable effect sustainability of the projects.

It is stated in the National Program of Turkey released in 2001 that "per capita income in rural areas is low in comparison with other regions. Moreover, a general high rate of

unemployment in rural areas impels immigration into urban areas, which in turn, creates a social problem and aggravates the unemployment situation in urban centres. In rural areas the education level is by and large low and social life is limited.

Educated young people in particular, prefer not to live in rural areas. As a result, the number of people in rural areas working in agriculture is decreasing. Moreover, problems associated with the progressively declining contribution of agriculture to the national income despite its high share in the total employment, and small-scaled production units scattered throughout the country providing an inefficient but substantial portion of total agricultural production in Turkey, need to be dealt within formulating a comprehensive policy with regard to rural development. Such policies should be directed towards benefiting agriculture and the agricultural population in the rural areas and should contribute to the elimination of the basic problems of Turkish agriculture" (Ministry for EU Affairs, 2001).

According to the accession partnership document issued by the EU, The priorities in the Accession Partnership are divided into two groups- short and medium term. Those under the short term were selected on the basis that it is realistic to expect that Turkey can fulfil them in 2003/2004 while those under medium term priorities are expected to take more than one year (EC, 2003).

In this framework, preparing a strategy for the introduction of the Community rural development policy and the forestry strategy in short term because there was no specific legislation related to the rural development policy in Turkey though many rural development projects were on-going in the field. As for the medium term target, setting up the administrative structures required for the implementation of EC rural development policy and the forestry strategy would be needed.

The Ministry of Food, Agriculture and Livestock (MoFAL) organized the second Agricultural council in 2004 in Ankara. All the parties which were related with Agriculture gathered together. The existing situation of the sector was discussed in detail. Also in the

process to EU membership, the strategies, policies and implementations that could facilitate the development of the agricultural sector were identified (MoFAL, 2004).

Before benefiting from the EU pre-accession funds for rural development, the requested strategy document by the EU for rural development with the accession partnership document was prepared. According to the National rural development strategy, reducing rural unemployment, improving income situation, improving Agriculture efficiency and services, devoting greater resources to training and preparation for employment are targeted for rural development in Turkey (Ministry of Development, 2006).

On the basis of the National rural development strategy, the IPARD Program, with the technical assistance given by the EU, was prepared in 2007 and sent to the EC for approval. The EC approved Turkish IPARD Program with the other two programs of Macedonia and Croatia in February 2008. Turkish IPARD Programme was modified twice in October 2008 and 2009. Under pre-accession funds for Turkey, IPA rural development instrument would be implemented according to the Extended Decentralised Implementation System (EDIS) which was different from the other four instruments of IPA which constituted of DIS system when it was negotiated.

The EU implemented 16 measures for CEEC's. But these measures were reduced to 9 measures under three priority axis for Turkey and other candidate countries with the Council regulation 817/2007 by the EU after they saw the implementation of the regulation 1698/2005 in the CEEC's. For instance, rural infrastructure which covered almost $\frac{1}{4}$ of funds in SAPARD Program (Gülçubuk, 2006) and the first purchasing livestock and tractors were not eligible under the regulation of 718/2007/EC which was amended with the regulation 80/2010/EC (EC, 2007) in spite of the fact that they were eligible investment types for the CEEC's. The negotiation that was made with Turkey was notably different from other two candidate countries and Central Eastern European countries as the population of Turkey

overreaching 70 million with larger rural areas. The EU asked from Turkish authorities to fund the areas which less than 75 % of GDP while the MoFAL would fund the other areas of which GDP is more than 75 %. Finally it was decided to fund 42 out of 81 provinces in total. The 20 provinces out of 42 provinces are under support in the first phase 2007-2010 and 22 will be in the second phase 2011-2013.

The EU allocated 873,89 million Euro for those years to Turkey. For the 2007-2011, 70,7 % of the funds shall be used for Axis 1 (improving market efficiency and implementing Community standards), 4,3 % for preparatory actions for the implementation for the agri-environmental measures and Leader, 23 % for development of rural economy and 2 % for technical assistance (MoFAL, 2008).

Under investment for Agricultural holdings, meat and milk sectors, for processing and marketing of Agricultural products, milk, meat, fruit and vegetable and fishery sectors are under support. In addition to these sectors, diversification of rural economic activities, Leader measure and Agro-environment will be supported in the program. After the IPARD program was approved by the EC, a 19-month-project, funded by the EU, on the setting up of the IPARD agency was started in 2007 with the establishment law of IPARD Agency entered into force on 18th May 2007. The twinning project was implemented by the consortium which was consisted of experts from Austria, Hungary and Germany. The accreditation of 20 provinces was not so easy for Turkey if considered the difficult EC procedures. The EC would ask from the MoFAL to launch the IPARD program with fewer provinces and fewer sub-measures due to the procedures. Yet the MoFAL had the wish to start the IPARD Program in 20 provinces with all sub-measures as was negotiated with the EC. Because of that, Turkey, In August 2011, eventually achieved conferral of management of EU funds for three measures across 17 provinces. Compliance with the EU accreditation criteria is being verified for three remaining provinces included in the first phase of the IPARD implementation. In parallel, the Managing Authority has developed its capacity to operate agri-environmental

measures and those relating to bottom-up local rural strategies and to the setting up of producer groups, included in the second stage of IPARD implementation (EC, 2011). Therefore, the IPARD program finally started in last quarter of 2011 due to the expected delay.

Fortunately, Turkey gained favour from n+ 3 rules that is eligible for candidate countries (Adriatic IPA, 2011). According to this rule, the year that the rural development program of a country is approved by the EC is accepted as a base year and the allocated money for the candidate countries can be used in the following three years. Because of that rule, 20 million € allocated for Turkey in 2007 would be able to be used in 2011. The IPARD Agency employed around 1000 experts for 20 provinces and completed all the procedures requested by the EU.

On receiving national accreditation, MoFAL called for conditional proposal without wasting time by waiting conferral of management by the EU in 20 provinces. The budget of the conditional call for proposal was around 96,3 million € out of which 73,7 million € allocated by the EU (Agriculture and Rural Development Support Institute, 2010).

The first call for proposal was only made on 1st July of 2011 in seventeen provinces. The Agency right after made three more calls for proposals before entering 2012. The IPARD Agency nowadays called for 6th proposal in 20 provinces while the preparations for the 22 provinces that would be supported in the second phase of the program are not completed yet. The program as a general rule grants 50% of the total eligible costs of the projects but a few exceptions. If the farmer under 40 years of age the grant would be up to 55% and if the project is implemented in mountainous areas this would be up to 60% and if agricultural holding located in mountainous areas and made by young farmers under 40 years of age the amount of support would be up to 65 % (EC, 2007). The EU has allocated 363 million € for years 2007-2011. 15.974.636,95 € allocated by the EU has been used for 62 approved projects at 1st and 2nd call for proposals in the first two quarters of 2011 while the spent budget of third and fourth call for proposals in the last two

quarters of 2011 have not been announced yet. As seen, Turkey has not been able to use all the allocated funds by the EU so far. Though Turkey is not threatened by losing the funds thanks to n+ 3 rules, she is not supposed to use all the funds and the money allocated for Turkish rural development instrument would likely be de-committed and extend until 2016. It seems that Turkey will lag behind the EU rural development program for 2014-2020.

Unlike Turkish rural development policy, one of the main gains of the IPARD to Turkish agricultural sector is that the EU would want to assist to the farms that have economic viability not the ones which are subsidy and semi-subsidy farms. This significant difference will do away with the micro-sized farms while it increases the competitiveness of the small and medium farms. Also, other significant issues under IPARD Program are the definitions of mountainous and rural areas.

Turkey developed definition of the mountainous areas in order to benefit from the EU funds. In this framework, in the IPARD Program the definition of the mountainous areas to be used is defined as the areas having altitude higher than 1000 meters or areas having altitudes between 500-1000 meters and slope more than 17% (MoFAL, 2008). According to the definition, the selected eligible provinces in the IPARD Program mostly benefit from this definition due to the geographic condition of the Anatolia. Another important issue is the definition of the rural areas. The MoFAL with the support from Holland and Letonia implemented a seven-month project for rural areas' definition as well as Natura 2000, less favoured areas and agri-environment zones. The rural area definition in Turkey is defined by Village Law no. 442, which identifies that those settlements with a population below 2.000 and 20.000 are towns and those above 20.000 are called cities. The rural area definitions in the National Rural Development Strategy determinate that rural areas are areas outside urban settlement with a population of 20.000 or more (Official Journal, 1924; Ministry of Development, 2006). However, the definitions of Natura 2000, Less

favoured areas and Agri-environment zones remain missing.

The most important problem that farmers encounter in rural area is to reach credit. Credit provision to micro and small agro-business is not sufficiently developed in Turkey (Anonymous, 2009). There was only one State bank called The Turkish Agricultural Bank and the Agricultural Credit Cooperation giving loans for agricultural sector for many years until more commercial banks are focusing on agri-finance.

The MoFAL with technical assistance from Radobank in Netherlands in collaboration with Letonia carried out a project funded by the Ministry of Economic Affairs in Netherlands for establishment credit schemes for Rural investment (Anonymous, 2009). Lately, the MoFAL signed memorandum of understanding with 13 national banks and Central Union of the Agricultural Credit Cooperation in order to facilitate credit mechanism for beneficiaries. According to this agreement, those who want to get loan from banks for their projects under IPARD program can receive easily a letter of intent from the banks which already have an agreement with the MoFAL. This would be too beneficial in particular for small farmers.

The IPARD Program has brought mobility for Turkish food sector as well. For instance, all the food companies and slaughterhouses have been registered and checked if they were able to reach the EU standards in short run and long run. If the veterinaries or control engineers decide that the companies cannot be modernized, they cannot benefit from the EU funds. So, they are seen not eligible for IPARD program.

Rural tourism, which had not been actively implemented country-wide in the past, is one of the measures IPARD program introduces. It is obviously seen from rural development program in CEEC's that rural tourism played a crucial role to develop diversification of economic activities in rural areas. It is not out of the question to continue the same argument for the rural areas of a country like Turkey having rich nature and noticeably rural population with large rural areas. If considered the micro-sized enterprises who are not able to

reach competitiveness in the markets can easily directed to economic diversification through rural tourism and recreation areas offering rural areas new opportunities to realize the value of their assets.

Lastly, Agri-environment measure and Leader approach is new approaches which will be implemented in the second phase of the Program as well as rural tourism for rural development in Turkey. The MoFAL carried out a twinning project with consortium that consists of Holland, Estonia and Spain on Agri-environment measure and a twinning project with France for Leader approach. Corum and Urfa provinces of Turkey were selected for pilot projects. Local action groups were created in these provinces. The setting up of the local action groups will be extended to other eligible provinces.

CONCLUSIONS

In this study, we have provided an overview of the IPARD Program in Turkey. The IPARD Program made a lot of contribution to reshaping of Turkish rural development policy. enterprises has become so important in order to benefit from the IPARD funds regarding as economic viability of the farms. Rural areas, as in the EU, are treated as viable entities incorporating social, economic, and cultural and natural resources, rather than simply areas solely focusing on agriculture where the agricultural population live. In fact, it is clear that a policy encompassing just agriculture and the agricultural infrastructure alone will not be sufficient for rural development and cannot solve the problems currently experienced in the rural areas. Therefore, the rural development policy of the EU today focuses on eliminating income disparities between developed and under developed regions so that social and political cohesion can be preserved.

The rural development policies of Turkey, aiming at the political integration with the EU, should be integrated with social and regional policies establishing social and economic balances and preserving cultural diversity. Such policies should be directed towards benefiting agriculture and the agricultural population in

the rural areas and should contribute to the elimination of the basic problems of Turkish agriculture. Reaching credit for farmers is still difficult in particular for those who are not able to be competitive in the markets. Therefore, a rural credit and guarantee system should be developed in Turkey. As analysed the countries that benefited from SAPARD Program, in the beginning of the implementation of the program, the number of the submitted projects for co-financing was small and the contribution of the rural society was limited. As long as the Turkish authorities develop credit mechanisms for agro-finance, the transmission of the knowledge to beneficiaries has a vital role on the way to success if considered the fact that most countries benefited from SAPARD Program set up training and advisory services for farmers.

The IPARD Program has brought new approaches such as Leader, rural tourism and agri-environment to the agenda. Though rural tourism is under support for the first phase, Agri-environment and Leader measures shall be launched in the second phase. Rural tourism was one of the most successful measures in CEEC's. The same result would be expected for Turkey which is a great potential for the valorisation of untapped natural and cultural resources in rural areas, for which there is a growing demand in the last decade for national and international tourists who are fed up with mass tourism.

The IPARD Program also took into account environmental friendly production in farms. For instance, the manure storage is a compulsory investment type for medium-sized farms in IPARD Programme. Şerefoğlu (2008) stated that around 75 % of the fattening farms in eligible provinces have no manure storage in their farms.

As for the EU acqui, all food companies that wish to benefit from IPARD funds have to be registered and checked whether or not they could meet EU acqui in short and medium term. This helped a lot for registering and knowing the real conditions of food companies and their needs.

Consequently, the IPARD Program will alter the existing structure of Turkish agricultural

policy. The professional farms will replace the ones who are subsistence or semi-subsistence farms in Turkey. Agro-industry will be modernized with the harmonization to the EU. The institutional capacity of the producer groups is set up on the basis of product focused. The rural areas will be transformed into more liveable areas. Behind all these positive impacts, the implementation of the program shall not be easy, in particular, in the east and southeast part of Turkey because of the lack of capacity of the sectors to be backed up. Also, what the micro-sized farms that have to give up farming in rural areas do at the end of the program which is consciously implemented through this program is not clear yet.

REFERENCES

- [1] Adriatic IPA, 2011. *IPA Adriatic Cross-Border Cooperation Programme 2007-2013*, http://www.adriaticpacbc.org/download/Programme_Management_and_Control_Manual.pdf (accessed 5 July 2012)
- [2] Agriculture and Rural Development Support Institute, 2010. *E-bulletin*, Year:3, Number: 12, July 2010, Ankara, Turkey.
- [3] Anonymous, 2009. *Establishment Credit Schemes for Rural Investments*, Final report of the G2G Project financed by the Ministry of Economic Affairs in The Netherlands, Turkey.
- [4] Atsan, T., 1998. *A Research on Planning of Technical Staff and Training of Farmers in Yozgat Rural Development Project*. Ph.D. Thesis, Erzurum, Turkey.
- [5] EC, 2003. *Council decision on the principles, priorities, intermediate objectives and conditions contained in the Accession Partnership with Turkey*, Brussels.
- [6] EC, 2007. *Commission regulation (EC) No: 718/2007*, Brussels.
- [7] EC, 2011. *Turkey progress report*, 12.10.2011 SEC (2011) 1201 final, Brussels.
- [8] EC, 2012. *Turkey-Financial Assistance*, http://ec.europa.eu/enlargement/candidate-countries/turkey/financial-assistance/index_en.htm?id=vid#library (accessed 5 June 2012).
- [9] Gülçubuk, B., 2006. *Agriculture in Turkey*, Rural Development Section, pp. 8, the Ministry of Food, Agriculture and Livestock, Ankara, Turkey.
- [10] MoFAL, 2004. *The report of II. Agricultural Council*, the Ministry of Food, Agriculture and Livestock, 29 November-01 December 2004, Ankara.
- [11] The Ministry of Development, 2006. *National rural development strategy*, Ankara, Turkey.
- [12] The Ministry for EU Affairs, 2001. *National Program of Turkey*, Ankara, Turkey.
- [13] Ministry of EU Affairs, 2012. *TR-EU Financial Co-operation*, <http://www.abgs.gov.tr/index.php?p=5&l=2> (accessed 7 July 2012).
- [14] MoFAL, 2008. *IPARD Program, the Ministry of Food, Agriculture and Livestock*, Ankara, Turkey.
- [15] Official Journal, 1924. *Village Law numbered 442*, Ankara, Turkey.
- [16] Şerefoğlu, C., 2008. *Analysis of SAPARD-IPARD Program-A Research on Fattening Farms Taken Part In IPARD Program*, Ph.D. Thesis, University of Ataturk, Erzurum, Turkey.

FACTORS AFFECTING THE VEGETABLE FARMING EFFICIENCY IN BULGARIA

Teodora STOEVA¹

¹Agricultural University - Plovdiv

Corresponding author email: teodorastoeva@gmail.com

Abstract

The efficiency is the major economic category, which measures the final result and the expenses related to the production and provides value expression. The article aims to analyze the prospects and conditions for the development of field vegetable production in Bulgaria. Field vegetable farming is a traditional and fast developing sector of the Bulgarian agriculture. Its condition and development is determined by the various natural and geographic conditions in the country and the experience in cultivating and farming vegetable crops, which are traditional for the Bulgarian population. The vegetable farming is organized in individual private agricultural farms and agricultural farming cooperatives and is performed in small areas. The crisis in the vegetable farming raised a lot of questions that need to be answered. It is necessary to overcome the decrease in vegetable production. This can happen by establishing efficiently operating organizational companies. The most important reasons for the reported decrease are the result of the improperly conducted reforms in the agriculture industry as a result of which the economic condition of the sector is declining. A serious flaw is that the farmers are selecting certain crop production without conducting any preliminary marketing and without any signed contracts for produce realization.

Key words: *development, efficiency, factors, vegetable production*

INTRODUCTION

Efficiency is a major economic category, which defines the value expression of the relation between the final results and resources used in the production process.

The aim of this article is to examine the efficiency as an economic category which defines the degree of utilization of production resources and the main factors affecting the development of vegetable farming in Bulgaria. In this article are indicated the specific features of field vegetable farming and the most important factors affecting its effectiveness.

The study of the efficiency is important as it enables us to establish the vegetable farming development trend, and to improve its competitiveness and market orientation.

MATERIAL AND METHOD

Bulgaria is a country with traditionally good opportunities to develop vegetable farming, determined by the variety of natural and geographical conditions of the country and the experience of growing and farming vegetable crops, which are traditional for Bulgaria.

Field vegetable farming is a dynamically developing subsector of Bulgarian agriculture. Traditional vegetable crops as tomatoes, cucumbers and peppers are essential for the vegetable farming in Bulgaria. The production of fresh vegetables is of great economic importance for the agricultural sector.

Although after 1990 Bulgaria has lost its good positions as traditional producer and exporter of vegetables, vegetable farming remains an important subsector in agriculture due to its economic and social importance.

The production of vegetables is associated with high costs, which determines the higher cost of production and presents an obstacle for its realization. In 2010 are reported higher average yields for most of the major vegetable crops compared with the 2009.

An important condition for all vegetable producers is the most effective way to use production resources – land, equipment, labor and capital.

The level of efficiency in the field vegetable farming is a result of the needs and limited resources with which they have to be satisfied. In modern conditions, characterized by extreme shortage of resources, the increase of efficiency

level contributes to greater competitiveness of the production.

Negative impact on the efficiency of vegetable farming, besides the high dependence on climate conditions, have a number of factors that form the economic conditions in the subsector: an unfavorable demographic trend in the population structure, high concentration of population in the cities, high average age of the workforce, relatively low degree of mechanization and low labor productivity, high fragmentation of arable land, lack of planning characteristic for the large farms (National Strategy for sustainable operational programs of the organizations and producers of fruits and vegetables in the Republic of Bulgaria for the period 2009 – 2013).

Vegetable farming is concentrated in the South Central and North Eastern areas where over 62% of the total quantity of fresh vegetables is produced. In South Central are concentrated 44% of the vegetables.

Regionalization of production is one of the strengths of the sector affecting the efficiency. (National Strategy for sustainable operational programs of the organizations and producers of fruits and vegetables in Republic of Bulgaria for the period 2009 – 2013).

Higher average yields per hectare are observed for potatoes with almost 10%, tomatoes with about 18%, head cabbage and onion 22% and 65%, respectively. Higher yields for these vegetable crops are result of better farming practices of cultivation and use of high yield, and diseases and pests resistant varieties (Annual Report on Agriculture State and Development by Ministry of Agriculture and Food – 2011).

RESULTS AND DISCUSSIONS

The change in volume of production of major vegetable crops in Bulgaria is under the influence of factors such as arable area and average yield for the period 2001 – 2010.

Table 1

CROPS	PERIODS						TOTAL DEVIATION Thousand t	Incl. on account of	
	2001 – 2005 BASE			2006 – 2010 INDEX					
	AREA Thousand dca	YIELD Kg/dca	PRODUCTION Thousand/t	AREA Thousand dca	YIELD Kg/dca	PRODUCTION Thousand/t		AREA	YIELD
TOMATOES	127.1	2 061.4	262.0	45.8	2 028.4	92.9	- 169.1	- 167.6	- 1.5
CUCUMBERS	33.7	2 092.0	70.5	7.7	2 001.0	15.4	- 55.1	- 54.4	- 0.7
GREEN PEPPER	110.4	1 303.4	143.9	56.9	1 623.1	92.3	- 51.6	- 69.8	+ 18.2
ONION	40.4	866.3	35.0	14.8	932.4	13.8	- 21.2	- 22.2	+ 1.0
HEAD CABBAGE	51.0	2 244.8	116.5	21.9	2 589.0	56.7	- 57.8	- 65.3	+ 7.5
POTATOES	369.5	1 421.6	525.3	206.5	1 537.0	317.4	- 207.9	- 231.7	+ 23.8
WATERMELONS AND MELONS	106.4	1 515.0	161.2	62.5	1 942.0	121.4	- 39.8	- 66.5	+ 26.7

1, 2 – Area and production do not include family gardens

By 1999 the total area of vegetables is about 158 – 168 thousand decares and after this period it is within 900 – 1 100 thousand decacres, i.e. a reduction by 30-40%, which is clearly a negative trend. Compared with the base period 2001 – 2005, during the 2006 – 2010 period the areas with major vegetable crops decreased. Most notable is the reduction of the harvested areas with cucumbers – 4.37 times, tomatoes – 2.77 times, onions – 2.73 times, cabbage – 2.33 times, green pepper – 1.94 times, potatoes – 1.79 times, and watermelons and melons – 1.70 times.

The second major factor determining the volume of produce is the level of average yields, which is negligible decreased for tomatoes – by 1.61% and for cucumbers – by 4.35%. For other vegetable crops there is a favorable trend which is reflected in the increase of values of this indicator for melons and watermelons with 28.18%, for the green pepper with 24.50%, for head cabbage with 15.33%, for potatoes – 8.12%, and onions with 7.63%.

The level of the average yield is low and is not consistent with the potential capabilities of the varieties used. Furthermore, there are many gaps in application of used technology.

The combination of the two main factors – area and average yield, leads to reducing the production of vegetables, potatoes, melons and watermelons, as the negative impact of the first factor is determining – the amount of produce from area unit. For the period 2006 – 2010, compared with base period, the decrease in vegetable production is with 354.8 thousand t, potatoes 207.9 thousand t, of melons and watermelons with 39.8 thousand t.

This illustrates the unsatisfactory condition of the vegetable farming is in this moment.

From the data presented in Table 1 it is obvious that the total deviation of production of all vegetable crops during the 2006 – 2010 period compared to the 2001-2005 period, accepted as base, is with a negative sign. Most notable is the reduction for tomatoes with 167.6 thousand t, followed by green pepper with 69.8 thousand t, head cabbage by 65.3 thousand t, cucumbers by 54,4 thousand t, and onions with 22.2. For potatoes, melons and watermelons the decrease

is 231.7 and 66.5% thousand t, respectively. For all crops the negative influence of the area size factor is determining the decrease in production.

CONCLUSIONS

The main problems in vegetable farming are the lack of good organization of vegetable growing, the reluctance of producers to associate in vegetable farming organizations, the lack of commercial arrangements between the producers and dealers for sale of the finished produce, low vegetables purchase prices and poor quality, lack of workforce in the production and use of unqualified workers.

The above problems affect the efficiency of vegetable farming and are one of the main reasons for the reduction of areas used for vegetable farming in recent years. To improve efficiency in the sector it would be better for vegetable farmers to focus their efforts on a certain production after thorough research of the situation, trends and competitiveness on the market.

Vegetable cultivation is traditional farming activity in Bulgaria and improving the vegetables farming efficiency should be a priority in the Bulgarian agriculture strategy.

REFERENCES

- [1] *National Strategy for sustainable operational programs of the organizations and producers of fruits and vegetables in the Republic of Bulgaria for the period 2009 – 2013.*
- [2] *Annual Report on Agriculture State and Development by Ministry of Agriculture and Food – 2011.*

INTENSIVE AND EFFICIENT AGRICULTURE AND THE NEED FOR ITS SUSTAINABLE DEVELOPMENT

Elena TIMOFTI¹

¹The State Agricultural University of Moldova, Chisinau, 44 Mircesti, Phone: +373 22 312258, Fax: + 373 22 312276, E-mail: e.timofti@uasm.md

Corresponding author email: e.timofti@uasm.md

Abstract

The intensification of agriculture is subject to special concerns of agricultural economists. The degree of intensity of development region or national economy depends on its micro and macroeconomic levels. Economic efficiency of agricultural production depends largely on the intensity. Sustainable development requires a balance between economic growth and environmental protection, and on this basis, satisfying not only present but also future development of human society.

Key words: agricultural intensification, intensity, efficiency, ecology, sustainable.

INTRODUCTION

As defined in the approach of economic substance from intensifying agricultural production emerges three terms: intensity, efficiency and results. These notions, in one form or another, are found in the core concept to intensify the agricultural production, with its corresponding branch features.

Intensification and efficiency are interrelated as cause and effect, but also through indirect links. Development of agriculture in an intensive system causes the efficiency which, in turn, will be caused on a wider scale the intensification of agricultural production. Thus, intensive agriculture is an important way of enhancing economic efficiency of agricultural production. Therefore, farmers in the Republic of Moldova should choose an agricultural system based on sustainable intensification, which requires compliance appropriate agro-technology for each crop, and the selection and management of chemical fertilizers should be an element well-controlled, managed and combined with organic fertilization of soil.

MATERIAL AND METHOD

In research we used data from the Statistical Yearbook, the specialized forms of agricultural farms.

As research methods were used: monographic method, method comparison table method, average and relative size etc.

RESULTS AND DISCUSSIONS

The divergences in essence increasing the process led to development of various methodological approaches in determining the level of intensity and increasing the economic efficiency of crop production.

Economic efficiency of agricultural production depends largely on its level of intensity. Currently there is still no widely accepted system of indicators that can characterize the level of intensity of agricultural production.

In recent years there has been a descendant trend of increasing production in crops, while value indicators showed a significant increase. Increasing the value indicators of the level of intensity is explained by long-term tangible asset revaluation used in agricultural production, increasing prices for materials and other inputs, increased payroll related consumption. In these circumstances, the intensity of the agricultural production only on value indicators can be assessed objectively, but is indicated to compare the level of intensity of production in various economic entities.

To study the intensity's dynamics of the vegetable production is more reasonable to

analyze a specific set of physical indicators for the agriculture industry:

- consumption of labor per 1 hectare of agricultural land, man-hours;
- provide energetic resources (calculating on horsepower to 100 hectares of arable land) etc.;
- the amount of incorporated organic and mineral fertilizers (tons/kg active substance per 1 ha); the amount of chemical means for plant protection (kg per 1 ha of arable land) etc.

Note that some indicators of this system is problematic to determine due to the fact that specialized forms of agricultural entities in the initial data are missing.

The transition to intensive development is mainly considered a prerequisite to maintain stability and high rates of growth of the industry.

Intensification reflects the actual process of development of extended reproduction, indicating the occurrence degree of crop production insurance with land resources, material, financial and labor resources.

The output intensity can be determined by the ratio between qualitative and quantitative indicators of resource use. Production potential of agricultural enterprises includes land, capital goods for agricultural production, current assets, financial resources and labor force. All these factors work together and determine the production capability. Factors are to be correlated. Violation of certain proportions leads to weakening and partial use of production potential. Thus, the change in production potential size of agricultural enterprises in Moldova largely depends on the influence of different trends of change in each resource separately. First of all, depends on reduction of the labor resources and agricultural land, secondly, the changes in quantity and quality of fixed assets and current production, working capital etc.

In the agricultural enterprises (Table 1) the value of indicators characterizing the level of intensity have been increasing. Although in the dynamics value of fertilizers applied to 1 ha is increased by 70-80%, but values are low and in the last seven years are about 298 lei/ha. This increase is largely conditioned not from their

volume growth in kind, but the account purchase price increase of 1 ton.

Table 1. Dynamics of the intensity of gross agricultural production in the agricultural enterprises of the Republic of Moldova during the period 2005-2011

Year	Per 1 ha of arable land, lei			Per 1 ha of arable land and perennial plantations	
	Average value of agricultural fixed assets	Material costs	Retribution of labor	Fertilizers, lei	Potential energy, H.P.
2005	4345	2129,0	804,0	214	2,48
2006	4875	2412,7	782,9	231	2,31
2007	4936	2803,0	794,2	250	2,24
2008	5327	3998,3	972,0	314	2,12
2009	6140	3211,9	885,5	235	2,16
2010	6616	4115,8	869,3	311,2	2,08
2011	7844	4964,7	961,7	529,6	1,99

Source: author's calculations based on specialized forms of agricultural enterprises in Moldova

Note that the potential energy insurance in the years 2005-2011, despite the fact they are at a low level and that are longer downward trend, the main cause is lack of financial resources to equip businesses with the potential energy.

Production potential is the total production capacity of producing materials and enterprises to produce a unit of time (typically, during) a certain amount of production quality, structure and appropriate range in terms of the rational point of the interests of society. This totality is determined both by the potential production resources available material production, as well as weather and economic conditions.

Manufacturing resources are distinctive elements of the production potential. Research resources production efficiency allows performing a deeper analysis and differential inputs of various reserves disclosure in order to accelerate economic development. Resource potential of the company serves as a criterion in determining production possibilities. Rational use of land resources, including agricultural land, is of great importance for the business economy. The earth appears as the object of labor, when man acts on the top layer of soil and create conditions for crop growth and development. Thus, the land becomes a means of labor, the cultivation of plants are used when mechanical properties, physical and biological soil for growing agricultural.

The technical and material development in agriculture is determined largely by the degree of insurance of production assets.

The degree of assurance and their use depends on rationality and the production rate of agricultural production and its economic efficiency.

Intensifying the process is not only providing resources, but "the intensity of their use in order to increase production." This involves the practice of sustainable farming systems and technologies, to improve land productivity.

To characterize the economic efficiency of production intensification of agricultural production are indicators of value, which shows the means and resources from which production was obtained and which is the level of recovery of used means in the process of intensification.

Table 2. The dynamics of enhancing economic efficiency of gross agricultural output in agricultural enterprises of the Republic of Moldova during 2005-2011

Indicators	Year						
	2005	2006	2007	2008	2009	2010	2011
The gross agricultural output obtained, lei:							
• 1 leu per production fixed assets	0,76	0,63	0,44	0,94	0,63	0,70	0,64
• 1 leu per material costs	0,95	0,88	0,58	1,25	1,19	1,13	1,0
• 1 average worker per year	27817	30170	24836	65766	53288	70545	84577
Per 1 ha of arable land, lei:							
• Gross agricultural output(in comparative prices in 2005)	3307	3081	2156	5023	3842	4641	4994
• income obtained from selling the agricultural production	560,1	536,1	565,8	1043	324,5	1739	2173
Profitability level of agricultural production, %	17,9	17,5	18,9	26,1	8,5	38,4	39,1

Source: author's calculations based on specialized forms of agricultural enterprises in Moldova

Research results allow us to state the following: Indicators of economic efficiency increased in the analyzed period, and the higher results were registered in 2008. Resource potential in enterprises of Moldova is not used to a high level of efficiency. Agricultural lands yield consistently low, labor is used inefficiently, and labor productivity occurs on account of labor reduction, consumption of recovered materials is low.

As well, had increased the costs compared to selling prices of agricultural products, subsidies are at lower level due to lack of funds in the budget, which cannot positively influence the increase of production, there is implemented enough technical progress, advanced technologies, irrigation facilities, fertilizers, etc. Research and findings presented demonstrates that agricultural enterprises in the Republic of Moldova are characterized by low agricultural intensification efficiency, being not prepared for the transition to new market conditions and that in the agricultural sector there is a diffusion

process in increasing the economic efficiency of intensification.

From the time of appearing the global problem of food security is seeking some solutions on how to handle it. Despite contrary opinions, it is choosing between two ways to develop agriculture: extensive and intensive way.

For the extensive agricultural development is characteristic extension of the areas of agricultural land, without significant changes in production technologies, technical, personnel, improvement work etc., without enhanced quality of inputs. Extensive development path of agriculture is limited, given that land, the main means of production, is limited in extent. In addition, extensive mode of development does not ensure increased productivity of land. In turn, development of intensive agriculture makes continuous increase crop yields. This way allows more efficient use of available resources. These goals can be achieved by using scientific and technological progress, efficient use of land, material and labor.

All countries have tried to promote the development of intensive agricultural industry funded research in these areas, which allowed the accelerated growth of production, contributing to society in general. Reverse step was not to be awaited. In the World, as well as in Moldova stands out negative trends of practicing intensive agriculture. Agriculture is a key generator degradation and is also a victim of degradation caused by itself.

The first signs appeared negative due to excessive use of fertilizers to increase production by giving concomitant administration of manure and other organic fertilizers. As a result, the soil start to lose its ability to maintain yields at the same level applied increasingly more chemical fertilizers.

Increased agricultural production was made possible by combining the use of high quantities of fertilizers adaptation of new crop varieties and hybrids with superior technical and economic characteristics. Unfortunately, the agricultural system was effective for half a century, but now does not work, because the soil is exhausted and increasingly polluted and chemical fertilizers, pesticides, and fungicides are harmful to the environment and health human.

Criticism of intensive agricultural system refers to: toxicity caused by chemical fertilizers and plant protection means (pesticides, fungicides, etc.) Damage for both the environment and human health as well, promoting soil erosion, increasing number of diseases and pests by practicing monoculture and decreased natural resistance of plants by the abundant use of chemicals; descent groundwater level (for drainage) or if the rise of excessive irrigation, restricting the area of biodiversity as a result of expansion of cultivated crop species, diminishing productivity of land and destruction of soil structure, is a outbreak of ill health through food, is an energy-intensive system, etc.

It is no secret that agriculture based on energy-intensive technologies and agricultural technological mistakes are major causes of environmental degradation. Their impact is manifested in negative impacts on various

environmental resources: land, water, air, flora and fauna.

The most polluting aspect of production is chemical treatment intensification (fertilizers, pesticides, fungicides, items motivating retardation (inhibitors)). This means, to some extent have an impact not only on crop yield, but also the environment, and not always positive. In some cases, negative results from the use of chemicals, neutralize the positive effects. Residues of pesticides and chemical fertilizers, heavy metals and other pollutants in soil, water, food chain, leading to deterioration of the natural environment, endangering the existence of humanity. Because of it, the spraying crops are polluting the atmosphere.

In some European countries like Belgium, Netherlands, Germany, Switzerland, with advisory centers, farmers are directed to a new strategy of using different types of fertilizers, the severe reduction in the quantities used in the coming years, but while maintaining balance of various nutrients in the soil [3, page 36].

Intensive agriculture (also called conventional) is considered one of the important causes of global climate change.

Protecting the environment requires the need to practice sustainable farming systems. Global economic crises of the 60s, 70s brought to the fore issues of environmental damage. When the company realized the seriousness of these issues and called for the development of environmental programs, environment protection was born the concept of sustainable development. This concept is not new, it expresses the meaning of current behavior met earlier in ancient Greek philosophy, and human relations harmonize with the environment, as well as current responsibilities to future generations. One caveat, the current formulation of the concept it is not known until the middle of the twentieth century.

In 1951, the International Union for Environmental Protection (IUCN), founded in 1948, published a report on environmental protection in the world (The State of Protection for Nature in the World, 1950) [1]. This report was the first of its kind to address the issue of

reconciliation of economic and ecological phenomena.

Since Conference on Environment in Stockholm in 1972, people began to recognize that environmental degradation is dependent on human welfare and economic growth in general. In this respect, was established the World Commission on Environment and Development of the next United Nations (UN).

According to the Brundtland Report presented at the International Commission on Environment and Development (UCED) in 1987, sustainable development "that meets the requirements of the present without compromising the ability of future generations to meet their own needs" [5, pag.88]. This development includes, therefore, criteria to protect ecosystems, soil, air and water and the conservation of biological diversity, taking into account the needs of future generations.

Recently, we identified numerous definitions and approaches of sustainable development. But, most of these definitions are the fact that sustainable development requires, in harmony, the three essential dimensions: economic, social and environmental.

Minimum requirements for achieving sustainable development include the following [5, pag.89-90]:

- Resizing growth, given a most efficient and use resources more evenly so that to obtain quality products with minimum waste and toxic;
- enhance people's lives in conditions meet basic needs and reducing uncontrolled population growth;
- conservation of environment and natural resources, etc.

We believe that sustainable development requires a balance between economic growth and environmental protection, and on this basis, satisfying not only present but also future development of human society.

Over time, the concept of sustainable development entered in agriculture too. The concept of sustainable agriculture was the main subject of discussion at the twenty-first century Forum of the International Association of Agrarian Economists in Tokyo in 1991, is defined by its president, the Australian John W.

Langworth as involving three components: a) economic growth (capital), b) distribution (market), c) the environment (environmental component) [3, pag.38].

Sustainable agriculture is a system of technologies and practices designed not only to ensure satisfactory production, but also to achieving the objectives. This is evident considering that sustainable agriculture has its scientific substantiation Bio-economic concept, developed the first time by the American economist of Romanian origin N. Georgescu Roegen, a concept that summarizes the relationship between nature and humans.

In Moldova, sustainable agriculture has become a focus of programs and strategies of economic development and agriculture which is found whereas a number of strategies and action programs.

The main objectives to be met by sustainable agriculture are:

- Food security (human needs of food and fiber);
- conservation of environment and natural resources which agriculture depends;
- more efficient use of renewable resources and non-renewal;
- support the viability of farming and the quality of life of farmers and members of society as a whole;
- broad participation, with a decision power by the public.

Despite the fact that agricultural science already has a large number of technologies that meet the requirements of organic farming, sustainable agriculture in Moldova implementation still requires extensive research. Sustainable development of agricultural production must be achieved not only by organizational and economic measures, but also by the level of scientific argumentation farming systems. Currently, the recommended, in many cases, does not provide a rational use of the climatic resources nor the means to enhance effective implementation of agriculture, soil fertility reproduction, and ecological balance.

In Moldova there is great potential in terms of scientific development by intensive and sustainable system of plant culture. We

mentioned that are made available to farmers and fundamental work, and practical recommendations how to efficiently use land, how to preserve fertility for future generations. Main factors in this sector are increasing varieties, hybrids, seeds, seed quality [4, p.3]. In some cultures are dozens of varieties and hybrids, in the State Register with over 900 [6]. One of the main directions of biotechnology innovation systems are creating new cultivation technologies, hybrids and varieties of crops with new economic and technical features potentially high strength at low temperatures, high, etc.

Agriculture is apparently a branch less exposed to product innovations, nature cannot be changed from one day to another, as happens with a number of industrial products. However, technical innovations in the industry, biotechnology, and other kinds penetrate more rapidly, affecting the competitiveness of farmers' work [2, page 36]. Harmonization of agricultural development and environment can be achieved only through a systematic approach of political, environmental, economic and social, in which scientific research must contribute through innovations in biotechnology and technologies for increasing soil fertility.

CONCLUSIONS

To achieve the objectives of sustainable agriculture, it is necessary that budget resources be concentrated on modest development of scientific and technological solutions for sustainable intensification of production branch.

It is important to develop an efficient cooperation between science, staff training and production, to ensure the transfer of scientific, technical, biotechnological and their effective application in production.

REFERENCES

- [1] Caracota, D., Caracota, C. *Dimensiuni contemporane ale dezvoltării durabile și competitive*. <http://www.contabilizat.ro> (citat 20.16.2011)
[2] Chivu, L. *Competitivitatea în agricultură – analize și comparații europene*, București: ed. EXPERT, 2003. 236 p.

[3] Cotigă, C. *Ecologie și protecția mediului*. Manual universitar. Craiova, 2010. 77 p.

[4] Micu, V. *Probleme și posibile soluții în dezvoltarea durabilă a complexului agroindustrial*. În: *Agricultura Moldovei*. nr. 9, 2007, pag. 1-6.

[5] Otîman, Păun. *Dezvoltarea rurală durabilă în România*. București: Editura Academiei Române, 2005, 410 p.

[6] *Registrul soiurilor de plante al Republicii Moldova pentru anul 2007*. Ediție oficială a Ministerului Agriculturii și Industriei Alimentare, Chișinău, 2007, 107 p.

PROSPECTS FOR AGRICULTURAL COOPERATIVES IN ROMANIA IN THE CONTEXT OF CAP REFORM 2014-2020

Maria Magdalena TUREK RAHOVEANU¹, Adrian TUREK RAHOVEANU², Luiza CRISTEA³

¹University Dunarea de Jos Galati; Scientific researcher II – Research Institute for Agriculture Economy and Rural Development, E-mail: mturek2003@yahoo.com

²University of Agronomic Sciences and Veterinary Medicine of Bucharest; Scientific researcher II – Research Institute for Agriculture Economy and Rural Development, E-mail: aditurek@yahoo.com

³Pact Foundation, Bucharest, E-mail: luiza@fundatiapact.ro

Corresponding author email: mturek2003@yahoo.com

Abstract

European and global cooperative sector is a powerful economic and social actors within these societies, with significant results can be summarized as market share both in their work and contribution to GDP and the number of members and the welfare of citizens offered through job creation. Global cooperative activity operates on cooperative principles cooperative companies regularly reviewed by members of the International Cooperative Alliance (ICA). This cooperative movement world wide organization founded in 1889, is composed of 226 active cooperatives in all sectors of the economy that brings together more than 800 million members in 89 countries. This work is part of the CAP reform in Europe after 2013, by which Romania will have to undergo a series of transformations including: promoting and encouraging cooperation and association in agriculture; stimulate the development of alternative economic activities such as organic farming, ecotourism, development and promotion of local products labeled specialized human capital development and collaboration and sharing of best practices with experts from other EU Member States. Macroeconomic paper wants to answer a series of questions: Is a viable alternative for Agricultural Cooperative Farm? What is the economic and social impact of cooperatives in the next stage? Through agricultural cooperatives can better penetrate market closer to the consumer? What is the specific model of cooperation forward Romanian society?

Key words: agricultural cooperative, association in agriculture

INTRODUCTION

Associative life in Romania is well known in the communist period, but decreased more than in rural areas.

Romania has some of the most favorable assumptions productive agricultural associations, but it is not capitalized enough to become a true pillar in support of the local economy. In the EU27 from a total of 13.7 million 3.9 million farms are located in Romania, represented 28.7%. If the EU27 average size of a farm is 12.6 hectares, in Romania it is only 3.5 hectares, about four times smaller. The differences are even greater when considering farm size: EU27 average is 11.3 ESU ESU and only one in Romania. (Table 1).

Table 1. Size and the size of farms in Romania and EU27 in 2011

Specification	Romania	EU 27
Number of farms (millions)	3.9	13.7
UAA(Thousand ha)	13753	172485
Average farm size (ha)	3.5	12.6
Average size of farm (ESU)	1.0	11.3

Source: www.ier.ro, Sudi SPOS - Reform of the Common Agricultural Policy post-2013 context of budgetary perspective

Table 2. Share of farms by size class in Romania and EU27 (%)

Specification	Romania	EU27
<5ha	89.9	70.4
5-50 ha	9.8	24.5
> 50 ha	0.4	5.1

Source: www.ier.ro, Sudi SPOS - Reform of the Common Agricultural Policy post-2013 context of budgetary perspective

Table 3. Share of farms by size classes in Romania and EU27

Specification	Romania	EU27
<2 ESU	94.0	60.8
2-100 ESU	6.0	36.9
> 100 ESU	0.0	2.2

Source: www.ier.ro, Sudi SPOS - Reform of the Common Agricultural Policy post-2013 context of budgetary perspective

From the table above it can be seen in Romania associative potential represented by very large share of small farms (<5 ha) and sizes (<2 ESU) compared to EU27. Subsistence farming is the category of farms where farming is rather in an individual manner in which every family work primarily home practically such individuals are employees of their families. Moreover, old and inadequate technology, lack of knowledge and lack of education community agriculture for small farmers has led to exploitation fractional land for their own use.

In Europe a competitive market, the lack of an organized collection, transport, storage and marketing systems brings significant crop losses and constitute a barrier to market supply and inability to radiate intermediaries speculators. Without an efficient route to market, low value agricultural resources and, therefore, efficiency / profitability and competitiveness in agriculture are declining.

However, associative initiatives can provide development value chain of production-processing-marketing, so necessary for a competitive agriculture.

MATERIALS AND METHODS

This study aims to provide arguments for specific processes, community development as the basis for public policies for rural areas, with emphasis on the participation of citizens and increase their ability to be active citizens of their communities. All these aspects are presented for rural communities in Romania for sustainable development.

RESULTS AND DISCUSSION

Rural areas in Romania covering 87.1% of the land area and are home to 45% of the

population, or about 9.6 million Romanian. In 2012 a survey of farmers' associations, forest owners, collective composesoratele Romania, shows that 75% of rural residents live in poverty. Also over 1,000,000 Romanian living in rural areas are unpaid family workers, people who do not receive a salary and live in their own household. Residents of rural communities belong to the poorest groups in Romania, with poor access to services, reduced employment opportunities, and also a low level of civic education.

However employment in rural areas show a slight increase, even under severe crisis over Romania during 2009-2010. As an apparent paradox, the employment rate showed an upward trend from 5.4% in 2009, the worst year of the economic crisis in Romania, 0.5% more than in 2007.

At the same time, long-term unemployment in rural areas showed an average decrease of 2%, even among young people - who are most affected by unemployment category. This could be a warning regarding poor rural communities in Romania ability to respond to crises. In Romanian rural employment opportunities are close to zero, and access to services (poor quality) is very difficult. These are the reasons that cause as well migration from rural to urban areas, especially among young people, with 8.3 per thousand in 2010, compared to 6.8 in 2007 and 6 in 2009, which stress aging rural population.

However, rural areas of Romania have great potential, which is well worth the recovery and exploitation in a sustainable manner to increase the quality of life for residents.

RDP funds will end eventually and rural communities are at risk of passive state remains the same, waiting for external resources. when instead the program should provide an opportunity for rural communities to develop from the inside out first.

Authorities as part of the social economy should play a role in mobilization, the active participation of rural community life, to encourage new associations, the provision of information, consultation necessarily lead to influence the direction and execution of the project development.

In recent years, the concept of social economy recently entered the public debate and academic though its constituent forms have a history more or less extended both in Romania and in other countries in Europe.

Future associative structures in Romania are considered key elements in the new social economy which lists three specific organizational forms, namely: cooperatives, associations and foundations and mutual societies.

These are the main institutional components of the social economy, sometimes known as the social economy organizations and enterprises.

In Romania, in 2009, out of a total of 70,000 social economy organizations, only 2278 (or 3%) are specific to agriculture and fishing activities represented by cooperative agricultural associations (Table 4).

Cooperatives are associations of persons (natural and / or legal), autonomous and voluntary, democratically run and aimed at common goals of economic, social and cultural domains as diverse as agriculture, trade, craft, housing, utilities and more recently, social services etc..

Table 4. Distribution of agricultural associations by region, 2009

Region	Agricultural associations -Number-	Crafts Cooperative %	Consumer cooperatives -% -
NorthEast	186	27.0	17.7
West	271	9.0	19.9
Southeast	339	16.0	12.5
Center	612	11.5	16.6
Northeast	363	13.5	17.1
Southwest	245	8.1	8.6
South	229	9.4	12.5
Bucharest Ilfov	33	6.0	3.1
Total	2,278	100.0	100.0
% Of Rural	71.7		

Source: www.ies.ro Atlas SE, 2011

Another form cooperative refers to credit unions, constituted as autonomous associations of persons whose activity takes place mainly on the principle of mutual aid cooperative members, they are established and operating

under the Emergency Ordinance. 99 of 2006. In Romania, the number of credit cooperatives / cooperative banks decreased significantly in favor CAR - employees, ie from 191 in 2000 to 65 in 2009.

In Romania, cooperatives are established and operating pursuant to Law no. 1 of 2005, the most popular forms to the general public as craft and consumer cooperatives. Cooperatives in Romania recorded a marked involution especially during 1990-2000. Handicraft cooperatives are an organizational form only while urban consumer cooperatives are mainly rural, 74% of the total working in rural areas. Both forms cooperative has a relatively uniform regional distribution, higher percentages being found in areas with lower development level (North-East, South-Muntenia). In Romania were in 2009, 788 and 894 craft cooperative consumer cooperatives.

At the current stage, the associative structures to become future lead actor for socio-economic development of the Romanian rural areas, where all citizens and other stakeholders should become active with the opportunity to develop, inform, and critically analyze the social, economic and political and develop their skills into action.

This is why the community needs identification, analysis and prioritization, followed by planning and implementing the solution must be performed by or at least with people directly or indirectly affected by the problem to be solved. We believe that the direct involvement of beneficiaries is a prerequisite for sustainable rural development projects and the use of local resources (human, material, financial, etc., natural) with maximum efficiency to ensure further success of each project.

The key is that the emphasis should be on how to solve it - participatory and involves also civic education, developing community spirit, human and social capital altogether.

The challenges are that the process is slower, often need more resources to encourage, support and sustain participation, and sometimes requires changes in the balance of power at the local level.

In general, the benefits of participatory approaches directly and genuinely involve local

citizens (which may turn also the risk of loss otherwise) are:

- Efficient use of existing resources in a responsible way (in fact, an opportunity for local authorities, not citizen involvement from the initial project phase high risk that the community will not take the responsibility of project results, development projects are more probably perceived to belong to their originators - mostly local public administration - which represents a loss of opportunity for the local authority to transfer responsibility to the community);
- Effectiveness in the sense of legitimacy (lack of legitimacy the difficulties in implementation, community members likely will not support projects that are not real solutions for their needs as they perceive them, even if they will support the phase implementation, they probably will not support them in the use phase results);
- Using local resources helps to avoid dependence on external solutions (community should not depend on the outside, but instead of being able to identify solutions based on local resources, office support depends on community members who are responsible for their own solutions to the needs them);
- Human resource development (human capital is itself a community development engine before any other factors, capital of a community is the capital of trust and reciprocity, which is the main resource of rural communities)
- Balancing power relations between different sections of the community (otherwise deepens inequity between different socio-economic category);
- Control the process of local development, empowerment, ownership, continuity and sustainability.

CONCLUSIONS

- Direct support measures are needed to form associations of farmers enabling them to develop a professional management, strategic planning and business appropriate specialized training in managing associative and cooperative forms.

- A community needs assessment provides assurance that development strategies chosen by a particular group will respond to community needs also reflect the priorities of the initiative group and ability. Practical experience and learning will lead to the development group as a combination of capacity building for those involved and organizational capacity building.
- Local authorities to develop participatory processes, programs and projects in order to help local communities obtain the best financing opportunities available locally and regionally.
- The economic development of a community is a process by which communities can initiate and generate their own solutions to general economic problems. A community in this process contributes to long-term community capacity building and promoting an integrated approach aims of economic, social and environmental.
- Community economic development based on the principle that people have the ability and responsibility to implement economic community initiatives and community initiatives for the benefit of all community members.
- A process of economic development in a community may begin when community members think they can make their contribution to changing living conditions in their community.
- The economic development of a community based on organized collective action, which is a group process and economic development strategy of a community is prepared following a decision by the group. Although leadership is essential in this process (the role played by a single person), community initiatives require cooperation and collaboration.

REFERENCES

- [1] www.ies.ro
- [2] www.fundatiapact.ro
- [3] www.ier.ro
- [4] www.rndr.ro
- [5] www.madr.ro
- [6] www.insse.ro

THE ROMANIAN EXTERNAL TRADE IN LIVE ANIMALS AND ANIMAL PRODUCTS

Ionela Mițuko VLAD¹, Silviu BECIU¹, Paula STOICEA¹, George PATRASCU²

¹University of Agronomic Sciences and Veterinary Medicine – Bucharest

59, Blvd. Marasti, cod 011464, Bucharest, Romania, + (40) 727.215.909; bmitsouko@yahoo.fr

²Ministry of Agriculture and Rural Development, 2-4 Carol I Blvd, District 3, 020921, Bucharest, Romania, Phone: +4021 307 23 00, Fax: +4021 307 85 54

E-mail: george.patrascu@madr.ro

Corresponding author email: bmitsouko@yahoo.fr

Abstract

In terms of foreign trade, in Romania there were some major changes over the past 20 years. In this paper we have focused on the Romanian external trade. The products which have been taken into account were live animals and animal products. Thus, we have made an analyse on the Romanian imports and exports at the global level and at the European level. Focused on the animal products, on the global level, there were registered major differences during the first seven years in the analysed period. Breaking by branches, we have pointed out huge distinctions between imports and exports, where the balance of trade was completely negative. Meanwhile, to have a good view on the international trade there were made links, based on some indexes between imports, exports, GDP and investments.

Key words: live animals, trade, salary, exchange rate

INTRODUCTION

International trade is one of the most important activities of the national economy. In the past 20 years, in Romania have been generated a series of economic measures for trade orientation, which determinate major changes in structure and weight of economic sectors. But, however, Romania has remained until now a net importer of food and agriculture. This was caused by poor economic restructuring and the specific products sold. Thus, Romania exports mainly low-processed products, which have incorporate a small amount of labor and import processed products, so they incorporated in the price a greater amount of labor used to produce these products. With this article we do an analysis for the dynamic of the Romania's international trade and livestock industry, for a period of 20 years. The purpose of this study was to determine the main orientation in foreign trade and to make recommendations for policies and measures that lead to improved trade performance of Romania. In the '80s and '90s, countries with socialist economy could be compared, in terms of goods exports, with developing countries (Krugman and Obstfeld,

1997). Disappearance of the communist regime and the CMEA agreement (Council of Mutual Economic Assistance) caused a major decline in exports, mainly due to characteristics of Romanian products exported (less processed products, poor quality and delivered under conditions that did not fit to new destinations, especially, that were produced based on low efficiency criteria). However, the imports and exports, showed an increasing trend during the analyzed period. International trade liberalization in the '90s and sudden orientation to countries with market economies, allowed a rapid increase in foreign trade volume of these economies in transition, their degree of openness and diversification is today close to the level existing in Western Europe (Havrylyshyn and Al-Atrash, 1998). Thus, it was found that in some studies, the evolution of international trade during the transition was characterized by two general trends, namely: a reorientation of trade towards Western countries' markets, mainly the European Union, was a continuous increase balance of payments deficit, (Zaman C., 1999), a phenomenon particularly evident in the years after 2000. However, the last five years have shown that

the trade share of EU markets in transition countries is already comparable with that of Western European countries like Greece or Spain (Brenton, 1999). For these reasons, it was tried different methods of recovery and to encourage exports, on different branches. Still, other authors (Kaminski, Wang and Winters, 1996) argue that alone trade liberalization does not improve overall performance of the economy, even if it is accompanied by significant changes in the national currency. Therefore, it is estimated that improving trade conditions depend on: i) price liberalization (bringing the price of the products analyzed in this document has been felt since 2006, especially in import prices for the "live animals" and the export prices for the same period, have shrunk since 2008, but in 2010, reappeared largest differences between prices in the categories mentioned), ii) reducing inflation and iii) the reduction of state control over economy thus encouraging private initiative (Zaman C., 1999).

MATERIAL AND METHOD

Regarding the methods used in this paper, we mention the analysis of the dynamics of Romania's total imports and exports, but also with EU countries and their balances that these exchanges are present (a strongly negative balance was recorded since 2005 and reaches a maximum in 2008). Also it was made an analysis of imports by country breaking down by origins and destinations of their exports and gross domestic product (GDP). At the same time, were calculated and analyzed a series of index that make considerations in trade. Here we mentioned, the average rate of growth for imports, exports and some investment categories, and also we have shown the degree of dependence between these items. There were calculated and interpreted indices such as the index of openness of the economy in Romania, which allowed us to do analysis of the permissiveness of the Romanian economy to foreign trade. Then other indices were taken into account, such as specialization index (I_s) for "Live animals" category, which is calculated as a ratio between share of country's

product categories (X_{ij}) in total exports of the country (total X_{ij}) and the share of this specific category (X_j EU) in total EU exports (X_j EU total). Also, it was calculated and analyzed the index of the geographical reorientation for the EU regions and four other trading partners. For trade analysis, we used indicators reflecting the extent to which Romania's foreign trade experienced a geographical realignment, expressing the cumulative changes in the quantities imported / exported between two consecutive periods in relation to total imports / exports corresponding to the previous period. These changes are expressed in absolute terms in order to reflect the cumulative effect of moving from one market to another (C. Zaman, 1999). Geographical reorientation of international trade of a country corresponds to a low level of the index. This reorientation is done when the transition shows stability after a number of periods during of which the quantitative exchanges were significant. Thus, more the index value decreases faster, more the geographical stabilization is faster. (Socol M. and C. Dinu, 2006)

RESULTS AND DISCUSSIONS

From the analysis made in this paper, some statements have been emphasised. First, we will present the dynamic of the trade and the balance registered in the last 20 years, with a specific regards on the private sector.

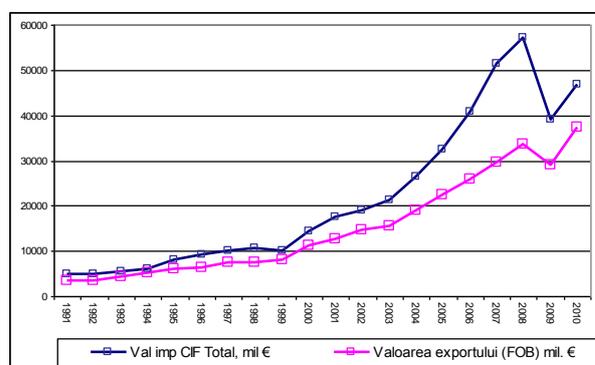


Fig.1: Dynamic of foreign trade of Romania, 1991-2010

Source: Romanian Statistical Yearbooks

By adding the Gross Domestic Product in the data series, it was drawn in the figure below the picture of these elements.

Concerning the balance of the international trade in Romania, on the Live animals, we put in the picture below data which shown the positive balance in this branch.

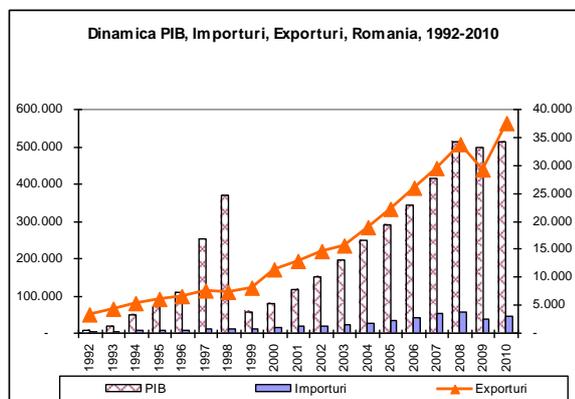


Fig. 2: GDP, Imports, Exports, Romania, 1992-2010
 Source: Romanian Statistical Yearbooks

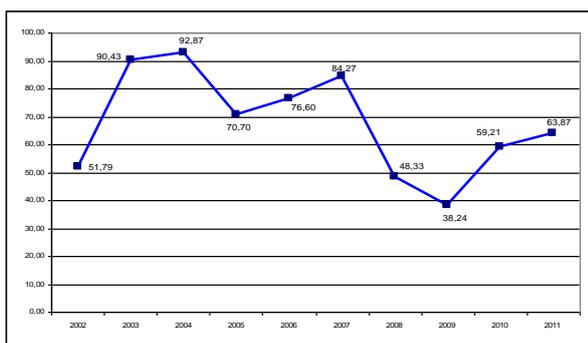


Fig. 3: Romania's foreign trade balance, Live Animals, 2002-2011
 Source: Romanian Statistical Yearbooks

So, we conclude that for these products, during the whole period, exports have exceeded the imports.

In the trade sector, investments are also very important, in order to do explanations on the support for the imports and exports. More information was drawn in the figure below.

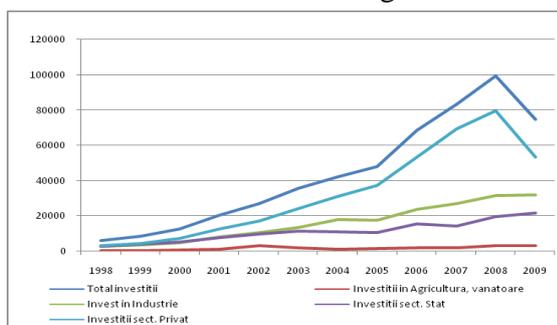


Fig.4: The dynamics of investment in Romania, 1998-2009
 Source: Romanian Statistical Yearbooks, 2010

To be continued the idea, we did analysis, and presented the results below, for the European trade from Romania, breaking down by destination. Thus, we have identified the main destination partners for the Romanian exportations. The first three destinations were Italy (with 421.991 \$mil) and Greece (with 397.120 \$mil), then Bulgaria (with 205.443 \$mil). In term of importations, the countries from where the goods arrived were (period 2002 – 2011) Hungary (with 288.932 \$mil), Holland (with 172.069 \$mil) and Germany (with 45.748 \$mil).

Also, it was calculated the index of average growth in order to find out increase for imports and exports. Thus, imports were up in average with 77,36 % each year during the analysed period; meanwhile, the exports were increased faster, with 80,89% each year.

The next three indexes are described here below and concern the capacity of the trade to opening and orienting itself by using the trade capacity to exchange information.

a. The index of opening degree

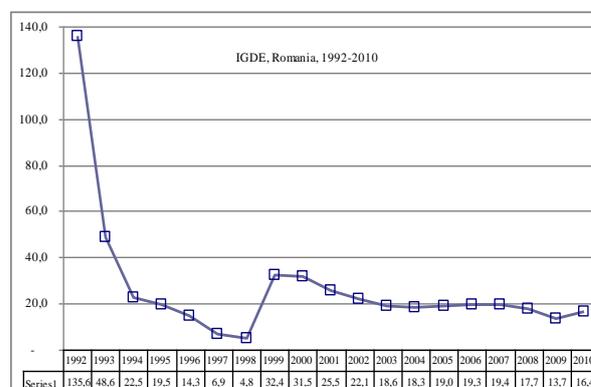


Fig. 5: The index of opening degree of the economy, Romania, 1992-2010
 Source: MADR, 2012

b. The index of specialisation

Over the period analyzed, the index of specialization for the "Live animals", in the analyzed period (2002-2011) was subunit, which means that Romania exports relatively less in this category, compared to the whole European Union and thus cannot assessing that our country is specialized in exporting the category.

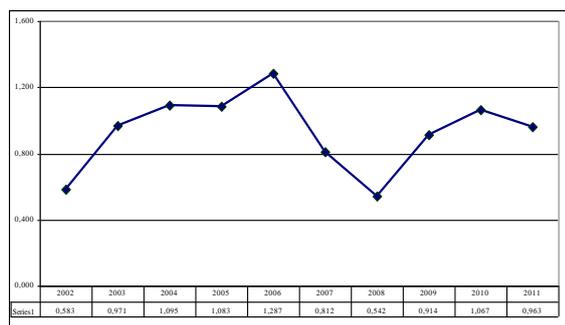


Fig. 6: Index of specialization, live animals, Romania, 2002-2011
 Source: MADR, 2012

c. The index of the geographical orientation

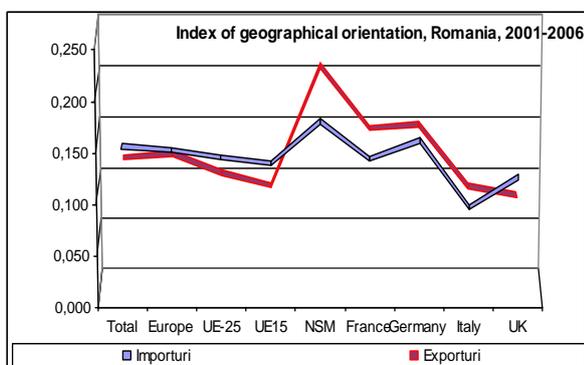


Fig.7: Index of geographical orientation, Romania, 2001-2006
 Source: MADR, 2012

The Fig. 8 has been shown the trend of prices in Romania and the European Union, for the live animals category, during the 2002-2011 period.

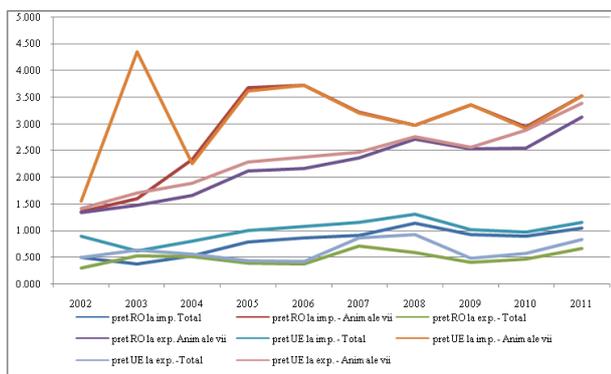


Fig. 8: Price developments in Romania and the EU total and live Animals Romania, 2002-2011

CONCLUSIONS

It was registered major correlation between the total imports and live animals imports and the

total investments and the investments in agriculture. On the opposite there were registered very low connections between on one hand imports of the live animals and the investments in agriculture sector and the other hand total exports and total investments.

The index of opening degree registers a relatively constant trend during the last 5 years. Concerning specialization index (Is) for "Live animals" category, if it is higher than one, it shows that the country exports relatively more for this specific category, compared with the EU. Therefore, it is considered that country is specialized in the mentioned export category. If the index is subunit it shows the reverse situation. Share of exports of that country is lower than the EU as a whole.

REFERENCES

- [1]Balassa B., 1965. *Trade liberalization and revealed comparative advantage, the Manchester school of economic and social studies*
- [2]Brenton, P., 1999. *Trade & investment in Europe. The impact of the next enlargement.* Ceps, Brussels
- [3]Havrylyshyn, O., Hassan A., 1998. *Opening up and geographic diversification of trade in transition economies.* Imf working paper no. 98/22
- [4]Kaminski, B., Zhen Khun W., Winters A., 1996. *Export performance in transition economies.* Economic policy
- [5]Krugman, P., Maurice O., 1997. *International economics.* Theory and policy. Ed. Addison-Wesley
- [6]Linneman, H., 1966. *An econometric study of international trade flows North-Holland, Amsterdam*
- [7]Maliszewska Maryla, 1999. *Romanian trade: recent developments and simulations for 1998.* Case working paper, Varsovia
- [8]Stern R.M., Deardoff A.V., 2006. *Globalization's bystanders: does trade liberalization hurt countries that do not participate?* World development, no 34
- [9]Tanasoiu O., Iacob Andreea, 2012. *Econometrie studii de caz,* ASE, Bucuresti
- [10]Zaman C., 1999. *Ajustari structurale ale comerțului internațional al României,* Sofreco Paris & Case Varsovia
- [11] *Romanian Statistical Yearbooks,* INS, Bucharest
- [12] www.biblioteca-digitala.ase.ro/biblioteca
- [13] www.eurostat.eu
- [14] www.insse. Ro
- [15] www.madr.ro