

## **CLIMATIC RISK ON ECONOMICAL RESULTS IN A FARMING SOCIETY OF SOUTH MUNTENIA REGION**

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### **Abstract**

The agro-ecosystems present interest by their product useful to society – farming production – agriculture being the branch of economy which satisfies the food needs. As follows of ongoing improvement, the weight of natural ecosystems essential in food supply gradually decreased, in spite of population increasing, reaching to be, currently, insignificant in human food balance. One can ascertain changes into farming exploitations regarding crop structure, with diminutions into floristic variety, influenced by both environmental conditions and economical crisis.

According with the last statistical data, the Region under study was largely cultivated with cereals for grains, followed by oil crops, green forage crops and other categories.

**Key words:** risk, vegetal biodiversity, technology, economical efficiency, farming exploitation

**JEL Classification:** Q12, R12

### ***Introduction***

***Biodiversity guarantees our life!*** In this respect, some ecology scientists consider that its value is huge. And, reasonably speaking, the air is vital, the climate ensures comfortable ambient, water and soil are base to produce food. If, the ecosystems ensure these resources, our duty is to protect them against harmful factors, understanding that any stress could lead to disequilibrium, which sometimes are irreversible, no matter of applied corrections.

Applying the model of natural life mechanisms, the farming technologies have the role to multiply the crops to ensure human food supply. Based on this issue and in keeping with industrialization, some species became resources into agro-ecosystems. The anthropic action of introduction into ecosystem of a new entry (released by breeding) has changed the correlations between abiotic and biotic factors, which, besides species effort for adaptation, led to the structural and functional changes into ecosystem.

The South Muntenia Region, predominantly with meadows and plains, is recognized by cultivation of cereals for grains, sunflower, legumes and fruits. This fact is highlighted by exceeding of average yield on capita/country. There are products with no good enough yield due to natural conditions, lack of irrigation (Vasile, Emilia s.a., 2011) and small properties, as subsistence exploitations.

The exploitation under study with all technologies adequately applied registered profit only for two out of four cultivated species.

### **Materials and methods**

► *Pedolandscape* is, approximately, the biotop equivalent (geotop + pedotop + climatop), respectively, component part of terrestrial ecosystems. Under this framework, the agricultural area of South Muntenia Region is of 2,444 thousands ha (in 2008), representing 70.94% of total area in Region and 10.25% of total area of the country determining, on one hand, the agricultural feature and high potential of area and on the other hand, first position among the 8 Development Regions.

Due to small and middle height relief, the land has a highly economical value of the South Muntenia Region – arable land, which is the main and safest wealth.

► *Agro-ecosystem*. As regards the environmental conditions, they are favorable ones. The winter crops under reveal a good establishment of culture versus temperatures accidentally registered (-26°C) – (-30°C), while the spring crops could be establish, under good conditions, beginning with the end of March.

► *Technological complexity of farming sector*. The optimum functioning of production system in crop cultivation assumes ensuring and manifestation, in the same way, of each its sub-systems (optimum crop structure; fertilization, irrigation, soil tillage; crop management; yield harvesting and transportation), which represent the specific technological links.

By modern practices (conventional farming), humans succeeded “to control” the agricultural ecosystem productivity. So, besides solar energy, he introduced the concentrated energy (cultivar), fossil fuels used directly (mechanical action) or indirectly (chemicals, pesticides). The set of processes and measures adopted to obtain a product represents a specific technology.

► *Diferentiated area utilization*. The silvosteppe area is the most favorable one for crops, wheat and maize being cultivated on about 70% of area; in this situation, the main farmer task is to establish the adequate preceding crops and to avoid monoculture, but to design the crop rotations which include ley plot (alfalfa). In this area, there are optimum conditions for vineyard, fruit trees, legumes; legumes under greenhouse and under irrigation cultivated in metropolitan areas and meadows, contribute to neighbour area supply with fresh legumes during whole

year. All this biodiversity from the South Muntenia Region is placed largely on chernozems. These areas require:

Fertilizer utilization	Chernozems favorably react to manure and nitrogen fertilizer application
	Phosphorus up-taking is generally low, due to neutral or weakly-alkaline reaction of soil, as well as presence of CaCO <sub>3</sub> at surface; phosphorus fertilizer efficiency increases if are applied together with nitrogen ones, under favorable rainfalls
	Potassium fertilizers are not efficiently used by crops because these soils are formed on loess and contain K-reached minerals.
	On cambic clayey-chernozems, the fertilizers are well utilized by majority of crops and especially by those sown in autumn.
Soil tillages	Lack of water limits many crops yield.
	Plowing in autumn is made immediately after preceding crop; Plowing is maintained loosened by harrowing; Plowing is made at depth of 25-30 cm
	Soil preparation tillage for sowing is performed at small depths, to reduce soil water losses by evaporation
Other measures	Early sowing, with deep seed incorporation, to use moisture from 0-10 cm layer;
	Density is chosen depending on soil moisture and fertilization; After sowing, in droughty springs, is necessary crop tillage with roller
	In row-crops, the soil is maintained free of weeds, tillage, with no crust, at surface
	Drought is radically avoided by irrigation

► As research method, the statistical observation, represented by primary data and local information was used. The aim of the observation is subordinated to overall aim of research and is important to define the researched colectivity, observation unit. The principle, direct and indirect observation was targeted towards both socio-economical and social frame (regional and local) and activity of farming exploitation located in Giurgiu county. One can ascertain that the observation was partially, by the fact that the subject was selected.

### Results and discussion

**Case study.** *Eco-economical analysis into farming society – Giurgiu County (Călugăreni locality)*

The exploitation was founded in accordance with the stipulations of the Law no 36/1991. It utilizes the land to achieve farming products resulted from field crops conventionally exploited.

## 1. Owned area and its utilization:

Specification	Surface	
	hectares	%
Wheat	120.00	<p>A pie chart illustrating the distribution of land use. The largest portion is wheat at 58%, followed by sunflower at 21%, rape at 19%, and maize at 2%.</p>
Maize	4.00	
Rape	40.00	
Sunflower	44.00	

## 2. Endowment level/existing fixed assets

No.	Specification	Quantity, pieces
1.	universal tractor 65 cp	1
2.	agricultural plow	2
3.	grapa (roller and fangs)	2
4.	agricultural grower	1
5.	agricultural seed drills: SUP, SPC	2
6.	trailer for transport	2

The situation reveals a low endowment level.

## 3. Labor force structure:

Specification	Nr.	Sex	
		F	M
Total employees	4	1	3
of which: graduated with diploma	1	-	1
Employees over age limit	4		

## 4. Materials suppliers:

No.	Vendor	Product
1.	S.C. AGROSEM S.A.	seed for sowing
2.	S.C. ROM STAR SRL	fertilizers and pesticides

## 5. Investments level

Year	The sum, lei
2007	30000
2008	5000
2009	-
2010	-

## 6. Other information/questionnaire:

No.	Questionnaire	Response
1.	Are you part of an association or cooperative?	NO! There is no initiative!
2.	Area has cooperatives or units having as activity the inputs supply?	NO!
3.	Area has cooperatives or units having as activity the agro-products collecting – gross type?	YES!
4.	Do you receive aids (/ha; /product)!?	YES! Governmental + European
5.	Discussions/ shortcomings?	NO!

## 7. Farming activity

7.1. *Crop rotation into exploitation.* As a result of exploitation presentation, the farmer structured the land for four crops, which could be included in four-year crop rotation and depending on his technological endowment and which could be (scheme 1).

The plot no.	Year of production					
	I	II	III	IV	V	VI
1	wheat	rape	wheat	sunflower	wheat	rape
				maize	sunflower	wheat
		rape		maize	sunflower	
		sunflower		wheat		
2		sunflower		wheat	rape	wheat
3		maize		sunflower	wheat	
	sunflower	wheat	maize	wheat	sunflower	
4			rape		wheat	sunflower
	maize		sunflower			rape
5					rape	wheat
	rape					

Scheme 1. Crop rotation

7.2. *Yielding and economical results.* The farmer uses conventional technology (tables 1 and 2). In all situations, he exceeded the annual average per county (2521 kg/ha wheat; 3822 kg/ha maize; 1661 kg/ha sunflower. Source: National Institute of Statistics - 2010).

**Table 1. Economical efficiency of farming society/area unit, agricultural year 2009-2010**

No.	Indicators	UM	Wheat	Maize	Rape	Sunflower
1	Average production	kg/ha	3500	5000	2200	2000
2	Total expenditure	lei/ha	2000	1800	2095	1900
3	Revenue	lei/ha	1750	2500	2640	1400
4	Gross profit	lei/ha	- 250	700	545	- 600
5	Profit rate	%	-	38.88	26.01	-

**Table 2. Economical efficiency – module 208 ha**

No.	Indicators	UM	Wheat	Maize	Rape	Sunflower
1	Surface	ha	120	4	40	44
2	The total production	t	420	20	88	88
3	Total expenditure	lei	240000	7200	83800	83600
4	Revenue	lei	210000	10000	105600	61600
5	Total profit	lei	-	2800	21800	-
6	Profit rate	%	-	38.88	26.01	-

The unit registered losses to wheat and sunflower, which occupied 79 % of the exploited area. This situation could be explained only in the case of natural risks or high market tender.

In the agricultural year 2010-2011, when the air humidity was favorable to requirements of all species (land preparation and sowing under optimum conditions; rainfall during the most important vegetation stage – maturation), the achieved yields were higher with 28.75 % in wheat, 6% in maize, 13.63% in rape for seeds and 15% in sunflower. The managerial effort being similar in the two years of exploitation, the result was influenced only by the favorable climatic conditions. Under these conditions, the tender increased too. But the unit obtained benefit at all cultivated crops.

## 8. SWOT analysis

Strengths	Weaks
<ul style="list-style-type: none"> <li>- exploitation has 208 hectare, arable land, which allows farming production activity;</li> <li>- owner management training is based on specialty knowledge applied to develop the exploitation.</li> </ul>	<ul style="list-style-type: none"> <li>- low return degree which affect the financial exploitation status;</li> <li>- has no initiative to join in an association or cooperative.</li> </ul>

Opportunities	Threats
<ul style="list-style-type: none"> <li>- elaboration of a structure which has as aim a larger market;</li> <li>- improvement of endowment, especially related to irrigation and harvesting;</li> <li>- accessing EU and structural funds for investment → setting up of associations and producer groups;</li> <li>- accessing structural funds to purchase technical equipments;</li> <li>- legislative frame to set up and develop farming exploitations;</li> <li>- support of County Consulting Office regarding EU accessing funds;</li> <li>- high eco-friendly farming development potential.</li> </ul>	<ul style="list-style-type: none"> <li>- expenses increasing of production factors;</li> <li>- competition between similar activity exploitations;</li> <li>- low price of crop selling;</li> <li>- import of similar products with lower prices;</li> <li>- annual yield variations due to climatic changes;</li> <li>- lack of legislative frame to protect internal production;</li> <li>- low level of farmer information related to EU legislations;</li> <li>- currency exchange instability;</li> <li>- credit supply difficult to obtain (with high warranties), and high interest rates;</li> <li>- low weight of active labor force and aging of existing one.</li> </ul>

**Conclusions**

The vegetal yield is predominant into Romanian farming and highlights a certain expanding compared to EU countries. The farming activity is performed into exploitations. They decide as regards the crop structure taking into account some factors: ecological conditions of the area, market requirements, exploitation capitalization, ensuring of qualified labor force, agricultural policy to support some production branches, avoidance of some effects of risks and uncertainty.

In the plain areas, the crop structure is characterized by high weight of cereals (especially wheat and maize – cereals occupy 65% of arable land in the South Muntenia Region) followed by industrial and forage crops and legumes.

The production system is represented by the way in which the farmer/manager combines the products, factors and various technical and economical measures in order to achieve an optimum crop structure with expected economical results.

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#### ACKNOWLEDGEMENT

*This work was cofinanced from the European Social Fund through Sectoral Operational Programme Human Resources Development 2007-2013, project number POSDRU/89/1.5/S/63258 "Postdoctoral school for zootechnical biodiversity and food biotechnology based on the eco-economy and the bio-economy required by eco-san-genesis".*

#### Bibliografie

1. Bran, Mariana (2012), *Cercetări privind Dimensiunea eco-economică a biodiversității vegetale din Regiunea de dezvoltare Sud Muntenia, în condițiile schimbărilor climatice și de ecotehnică, în concordanță cu dezvoltarea durabilă*, Lucrare de cercetare științifică pentru finalizarea programului postdoctoral, Academia Română – INCE, București
2. Bran, Mariana (2007), *Tehnologii agricole comparate – culturi de toamnă*, București, Ed. Printech
3. Dobre, Iuliana (2011), *Modeling the process to diversifying of production in agricultural exploitations*, Proceedings of the 7th International Conference on Management of Technological Changes, book 2, september 2<sup>st</sup>-3<sup>rd</sup>, Alexandroupolis, Greece
4. Istudor, N. (2006), *Dezvoltarea rurală și regională a României în perspectiva integrării în Uniunea Europeană*, Ed. ASE.
5. Vasile, Emilia, Bălan, Mariana, Mitran, Daniela, Croitoru, Ion (2011), *The restructuring of Romanian agriculture*, in Romanian agricultural research, no. 28
6. Voicu, R., Bran, Mariana, Dobre, Iuliana (2008), *Ritmul lent al mersului agriculturii către modernizare și creștere economică*, Revista Agricultorul Român, nr.3
7. Voicu Radu, Bran, Mariana, Dobre, Iuliana, Ștefan, Marcela (2008), *The agriculture development in accordance with the environment*, Conferința internațională Performanța ecologică într-o economie competitivă, ASE, București
8. Zaman, Gh. (2011), *Gândirea și economia progresului tehnologic*, Note de curs, POSDRU
9. \* \* \*, Anuarul Statistic al României (2011)
10. \* \* \*, Documente exploatație agricolă