STUDIES REGARDING THE DEVELOPMENT OF AGRICULTURAL PRODUCTION IN THE NE REGION OF ROMANIA

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Abstract

The purpose of this paper is to promote the setting up of farms whose size allow the practice of a viable, sustainable agriculture, capable to apply the newest technologies and lead to profit and efficiency, to the economical and organizational consolidation.
The risk is a very important variable in the simulation behaviour farms. this paper aims to build programming models to simulate the behaviour of agricultural farms, that must be calibrate by the culture plan of the year basis or as the average over several years by the agricultural holding. economic rationale behind this requirement is that in this way the model adequately represents the environment in which the decision maker agricultural structure shall base its decision. The paper aims at providing answers to questions such as:

- Which is the percentage covered by agriculture in Romania's gross domestic product?
- Which are the main development criteria in private agricultural exploitations in the NE part of Romania?
- Which is the competitiveness of agricultural exploitations, based on size groups?
- Which is the structure of agricultural exploitations and which are the deviations from the planned level or other norms of reference?
- Which is the degree of specialization of agriculture in the NE part of Romania?
- How can political measures lead to the development of individual agricultural exploitations?
- The paper represents a source of information for the specialists in the field, as well as for the individual agricultural produces who wish to modernize their structure and approach agriculture commercially, with the purpose of an increased economic efficiency.

Key words: agricultural production, competitiveness, specialization, development, commercially

The purpose of the paper is the analysis of the economic and financial results, as well as the optimum sizing at the level of various types of agricultural holdings in the NE region, in the Romanian contemporary agriculture.

The rural area belonging to the NE Region from the administrative point of view gathers the characteristics of not less than 463 parishes and 2445 villages in the counties of Bacau, Botosani, Iasi, Neamt, Suceava and Vaslui, where an approximate of 2,171,838 inhabitants live, representing 56.6% from the population of the region.

After the cadastral situation given by the specialized institution (OCPI), on January 1, 2008, Iasi County was possesses of 547558 hectares, representing 2.3% of the total surface of the country.

Iasi County is ranking on the country classification among the medium sized counties, ranking on 24, with a higher proportion of the private land sector.

In territorial profile, the land fund is reflected in different services structures with characteristics from an area of agricultural productions to another.

In these counties, the large specialized cooperatives appear and coexist with the multi-functional ones. A part of the specialized cooperatives were associated with food companies.

MATERIALS AND METHOD

The methodological system used for this paper for operating with the information gathered, presenting the results and formulating a series of conclusions benefited from methods and procedures based on social and geo-economical studies of the territory, agricultural statistics, economic accounting and experimentation, analysis and synthesis. The research of the technical and economic phenomena, from multiple

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points of view, as well as the actual calculations all imply operating with a series of methods, grouped as follows (2):

- the monographic method;
- methods used to establish the level of the phenomenon, like the comparison method;
- methods of analysis for phenomena characteristic to certain homogenous unit groups: the statistical grouping method.
- specialization of agricultural production

RESULTS AND DISCUSION

Regional development in Romania has become one of the most important development policies, because its actions have an effect upon an entire range of fields, including economic, social and environmental ones.

Within the framework of regional development policies led by the EU, the region represents the fundamental element in all theoretical and practical approaches for fundamenting economic and social development strategies and policies; a failure to involve regional approaches within development programs can and will lead to obstacles in implementing the programs. That is why, in Romania, it was necessary to establish development regions and to actively include them in the elaboration of the programming documents. The way in which our country's territory is structurat according to regions can be seen in Table 1.

Table 1

Territorial distribution of Romania, according to regions

Geographic regions	Counties	Surface (kmp.)	Population (thousands inhabitans.)	Density (inhabitants./kmp.)
1. North-East	Bacău,Vaslui, Neamţ, Iaşi, Suceava, Botoşani	36.850	3.743	101.6
2. South-East	Constanţa, Tulcea,Brăila Buzău,Vrancea, Galaţi	35.762	2.868	80.2
3. South	Teleorman, Giurgiu,Călăraşi, Ialomiţa, Dâmboviţa, Prahova, Argeş	34.453	3.375	98.0
4. South-East	Olt, Dolj, Gorj, Mehedinţi,Vâlcea	29.212	2.341	80.1
5.West	Caraş-Severin, Hunedoara,Timiş, Arad	32.034	1.955	61.0
6. North-West	Galaţi, Sălaj, Bihor, Bistriţa-Năsăud, Maramureş,Satu Mare	34.159	2.766	80.7
7. Centre	Braşov,Covasna, Sibiu,Alba, Harghita,Mureş	34.100	2.547	78.7
8. Bucharest	Bucureşti, Ilfov	1.821	2.210	1213.8

As one can notice observing the figures in Table 1, the most important region, according to developmental criteria, is the North-East, with a surface of cca 36,800 square kilometres, and a population of over 3.7 million inhabitants, encompassing the counties of Bacău, Vaslui, Neamţ, Iaşi, Suceava and Botoşani. This is followed by the South-East, with approx. 35,700 square kilometres and a population of over 2.8 million inhabitants, encompassing the counties of Constanţa, Tulcea, Brăila, Buzău, Vrancea and Galaţi.

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The contribution of agriculture, forestry and pisciculture to the GDP is situated at around 6%, while in the EU member states this value is around 1.7% of the respective national GDPs.

Table 2

The contribution of agriculture, forestry and pisciculture to the Gross Domestic Product

Produsul Intern Brut Gross Domestic Product	2007	2008	2009	2010	2011	2012	2014	
Agriculture, forestry, fishing and pisciculture	23.99 mld. RON	34.12 mld. RON	32.29 mld. RON	29.87 mld. RON	36.34 mld. RON	28.63 mld. RON	35.19 mld. RON	
GDP (total)	416 mld. RON	514 mld. RON	501 mld. RON	523 mld. RON	557 mld. RON	586 mld. RON	628 RON	mld.
% of GDP	5.8	6.6	6.4	5.7	6.5	4.9	5.6	

According to the data supplied by the National Committee for Prognozis "The Projection of the Main Macroeconomic Indicators for the Period 2015 – 2017", May 2015, **the contribution of agriculture, forestry and pisciculture to the GDP in 2015 will be 5.2%.**

The concept of sustainable development starts from the assumption that human civilization is a subsystem of the ecosphere, dependent upon the matter and energy fluxes within it, in direct relation to its stability and capacity of self-adjustment. Public policies elaborated against this background, such as the current National Strategy for Romania's Sustainable Development, aim at reestablishing and maintaining a reasonable long-term balance between economic development and the integrity of the natural environment, in forms understood and accepted by the society.

For Romania, as a member of the European Union, sustainable development is not just one of the possible options, but rather the only reasonable perspective of national evolution.

In EU-27, in 2015, close to 11996400 farms were registered. These farms covered over 171,000,000 ha, the average land of one farm being of 15.3 ha.

On the other hand, as one can notice by looking at Table 3, 335,000 farms in the EU hold a surface of at least 100 ha, representing 50% of the overall surface, at the level of EU-27.

The average size of a farm in the EU-27 is 14.3 ha, while in Romania the value is 3.45, a fact which negatively influences the use or agricultural and rural resources that are available.

The total surface used for agriculture in Romania at the end of 2015 totaled 14.5 million ha, decreasing by 118,400 ha compared to 2014. The total surface used for agriculture in Romania in 2015 totaled 13.3 million ha, decreasing by 625,000 ha compared to 2011 and by 447,000 ha compared to 2014.

Table 3

Comparative situation regarding the number of farms and the land used, according to the size of farms, in EU-27 and Romania, in 2015

	Total	0-2 ha	2-4.9 ha	5-9.9 ha	10-19.9ha	20-29.9 ha	30-49.9 ha	50-99.9ha	≥100 ha
Number of farms according to their respective size, in 2015									
E.U. (number of farms)	11996400	5866560	2407420	1303040	900530	377580	395210	391350	324840
	100%	49%	20%	11%	8%	3%	3%	3%	3%
Romania (number of farms)	3859040 (32.16)	2866440	727390	182440	43610	9730	8210	7480	11730
	100%	74.3%	18.8%	4.7%	1.1%	0.3%	0.2%	0.2%	0.4%
Used land, according to the size of farms, in 2015									
E.U. 27 (ha)	171428450	4177570	7598640	9130130	12633670	9204690	15279510	27435730	85968530
	100%	2%	4%	5%	7%	5%	9%	16%	50%
Romania (ha)	13306130 (7.76%)	1718360	2229930	1210510	571390	233850	315400	518300	6508390
	100%	12.9%	16.7%	9.1%	4.3%	1.7%	2.4%	3.9%	48.9%

Source: Eurostat data (ef_kvage)

The analysis of the work-force

By observing the studies from 2015, one can notice that approximately 25 million people were engaged in agricultural activities, in EU-27, in 2015. The number of the people employed, transformed into A.W.U. (annual work units), shows the fact that the work force directly employed by agricultural farms in EU-27 totaled 9.7 million AWU (Table 4).

From the data presented in Table 4, we draw the conclusion that, out of the total work volume used in the agricultural farms in EU-27, Romania holds 1.6 million AWU, which situates our country among the first two countries in EU-27, being only second to Poland as far as this indicator is concerned. The policy measures applied beginning with 2015 must allow the retirement of the elderly from agricultural activities, as well as improving efficiency of this sector through increasing the size of the exploitations in order to allow the assimilation of technological progress.

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As far as the time needed for the activities is concerned, at the level of EU-27, in 2015, the share of family work force, expressed in AWU, was 75%, while the work force brought from outside of the families, used on a regular basis, held 17% - with the one not used on a regular basis representing 8%.

Table 4

Key-Indicators at the farm level, in EU countries (2015)

Member state	Number of agricultural exploitations (1000)	Surface used (1000)	Work force (1000)	Number of animals (1000)	Value of production (mil.euro)
U.E.-27	11966.4	171428.5	9736.1	133992.9	269899.3
PL	1506.6	14447.3	1897.2	10377.2	18987.1
BG	370.5	4475.5	406.5	1149.5	2536.7
CZ	22.9	3483.5	108	1722.5	3852.2
HU	576.8	4686.3	423.5	2483.8	5241.0
RO	3859.0	13306.1	1610.3	5444.2	10420.3
DE	299.1	16704	545.5	17792.6	41494.1
DK	42.1	2646.9	52.3	4919.4	8430.8
ES	989.8	23752.7	889	14830.9	34173.1
FR	516.1	27837.3	779.7	22674.2	50733.2
IT	1620.9	12856.1	953.8	9911.5	18930
NL	72.3	1872.4	161.7	6711.5	18930
AT	150.2	2878.2	114.3	2517.2	5879.3
UK	186.7	15686.4	266.3	13227.0	-

Source: Eurostat (ef_kvftaa)

For three agricultural products with a significant share in the production of private businesses, wheat, corn and potatoes, we have estimated Cobb-Douglas production functions, in which the quantity of product obtained depends on the cultivated surface, the quantity of work, agricultural raw materials and mechanical services utilized. The quantity of work sums up the number of days-per-person actually worked by the members of the farms and the day-labourers. The quantity of raw materials comprises the value of seeds, fertilizers and pesticides used. Plus, the equations include two binary variables which signal the use or lack thereof of certified seeds, or using surfaces smaller or equal to half of ha.

Table 5

Cobb-Douglas production functions for small private business in agriculture, the NE of Romania

Specification	Wheat		Corn		Potatoes	
	Coef.	t-stat	Coef.	t-stat	Coef.	P(t-stat)
Work force	-0.032	0.017	0.016	0.010	0.037	0.028
Land	0.980	0.041	0.952	0.021	0.711	0.045
Input and mechanical services bought	0.037	0.033	0.032	0.016	0.134	0.034
R2		0.706		0.819		0.559
Scale turnover	Constant		Constant		Decreasing	
Impact of fragmenting surfaces	grey		-		+	
Impact of using selected seeds	+		+		grey	

Source: Our estimates based on the Project of Costs and Yields, CNS & ASAS-IEA 2015 Note: Grey parts indicate coefficients which do no differ significantly from zero, for a signification threshold of 5%

The same equation was used to test whether the scale turnover for wheat, corn and potatoes are constant, increasing or decreasing, as well as for estimating the impact of the fragmenting the agricultural fields on the production. For wheat and corn we obtained a constant yield. For the potatoes cultivated using traditional technology, the turnover seems to decrease when the production scale is increased. The fragmentation of agricultural surfaces has a significant negative effect on corn exploitations, and a positive one for the ones with potatoes. Finally we wanted to see if using selected seeds has a positive impact on production. Empirical tests demonstrate that for corn as well as for wheat using selected seeds increases the production.

The recent reforms in the field of research and that of agriculture counselling, aiming at offering these two sectors a new direction for the benefit of small private businesses, represent one of the important results of this change in attitude and approach.

In order to provide the adequate quantities of food for the population, according to our calculations, in the NE region, the surfaces cultivated with cereals should comprise approx.

980,000 ha. From this surface, the crops can reach up to 850 – 1000 kilos per capita (in the United States individual consumption represents aprox. 850 kilos of cereals, while the bread consumption is 90 kilos). The surfaces cultivated with cereals can or cannot be enlarged, based on the increase of the population and the productivity. The rational surface of the main cultures in Romania is illustrated in Table 8.

Table 8

Main cultures (rational program)

	Surface (thousands ha)	Crop (thousands tons)	(kg/inhabitant)
Cereals	4857	18445−21700	850−1000
Sunflower	455.5	911	42
Tobacco	146	292	13.5
Vegetables	244.6	3689	170
Grapevine	737.8	3689	170
Orchards	1002.4	5012	231
Sugarbeet	252.5	6293−7595	290−350

The authors' own calculations, based on the MADR site

Table 9

Surfaces cultivated with the main cultures

	Surface (thousands ha)	Deviations		Rational program
Cereals	6265	−1408		4857
Sunflower	1007	−551.5		455.5
Tobacco	5.9	141.1		146
Vegetables	241.9	2.7		244.6
Grapevine	191.8	564		737.8
Orchards	192.9	809.5		1002.4
Sugarbeet	18.8	233.7		252.5

The authors' own calculations, based on the MADR site

In order to calculate crops and rational surfaces we started from the individual rational crop, the population in the NE region and respectively Romania, and an average crop per ha of 4132 kg for cereals, 2000 kg for sunflower, 2000 kg for tobacco, 15000 kg for vegetables, 5000 kg for grapevine, 5000 kg for orchards, 27500 kg for sugarbeet. The rational structure for the cultivated surfaces in Romania is illustrated in Tables 8 and 9.

In order to provide the necessary quantities of foods for the population of Romania, according to our estimations, the surfaces cultivated with cereals should reach approx. 4,856,000 ha. From this surface one can harvest approx. 20000 tons of cereals, a quantity which would suffice for rational consumption.

CONCLUSIONS

The paper aimed at all these issues due to the social and economic role played by private agriculture, and all the surfaces it owns. Agriculture plays an extremely important role as a source of food safety, a fact demonstrated by the major proportion of self-consumption in the overall food consumption, and also as a means of earning one's living for most of the population in the countryside. Still, this important branch is facing great problems, which makes it largely inefficient, particularly in the case of private exploitations with small surfaces at hand.

The possibility of actually selling products is relatively low because of the reduced surfaces allocated and the low average production per ha. A small part of the crop can be sold immediately after harvest, only if there is an urgent need for money, or in the case of a lack of storage space. The owners do not yet possess adequate spaces for storage, well equipped, which would allow for keeping the qualities of the products intact for a longer period, which consequently leads to a depreciation of the products at the later moment when they are sold.

Low economic performance and productivity manage, however, to hold on through minimalizing self-consumption in the case of most individual exploitation. The main source of structuring the food consumption of the individual

exploitation is represented by its own production, which reflects a focus on self-consumption and a state of subsistence. The lack of specialized production and diversified activities of the small exploitations determine gaining small quantities of various products, of different quality, which makes things difficult when it comes to selling them. Most of the income of the farm/ household is brought in through marketing various quantities of animal products. Such a diversification of the structure of production creates an economic environment where applying intensive, highly productive technologies becomes impossible.

Most of the producers try to combine cultivating plants with breeding animals, but the numbers of animals are rather small since the surface at hand is reduced. The existence of communal pastures and the cultivation of plants used for feeding the livestock are two factors that enable small farmers to raise animals, especially cattle, that stand as their only asset. As far as the breeds of farm animals are concerned, the average individual exploitation owns breeds with medium productivity.

The structure of production in agricultural exploitation must be thought over, against the new background created by privatisation , taking into account the needs of the rational consumption of the population and focusing on adding new dimensions to, and stabilizing the cereal production, as well as improving production in animal farming and the branches which do not provide enough for the necessary consumption.

Yet another important effort that Romania has to make lies in the organization and improving the functionality of production in the agrofoods sector. In other words, the connection between agricultural production and marketing the products through functional distribution channels has to be strengthened. Setting up networks of distribution, based on the various products, must find a foundation in a production structure which corresponds to internal consumption, as well as processing industries and export.

It is necessary for all the components in the network to be privatised, beginning with the organization of commercial agricultural exploitations, trading and crediting cooperatives and installing a modern system for managing the agricultural market and its branches. The creation of inter-professional entities intended to defend, without bias, the interests of all operators in the agricultural market and its functioning on principles similar to their correspondents in the European Union states is a compulsory step to ensure a level of competitiveness which would bring us closer to the demands of a single, common market.

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