

Marioara RUSU

*Institute of Agricultural Economics, Romanian Academy, Bucharest
mara.r@xnet.ro*

AGRICULTURAL SECTOR SUSTAINABILITY IN THE DANUBE REGION

ABSTRACT

In the recent decades, the subject of sustainable development has gained an important place, both in the academic disciplines and political debates. In many countries, particularly in those economically developed, the national strategies for socio-economic development have included sustainable development in their structure. In recent years, in the Danube Region, rural communities have evolved within the limits imposed by their own history and a hesitant transition. An analysis of the main strengths and weaknesses of the agricultural sector from the Danube Region from the sustainability point of view is initiated in this paper. The conclusions following the analysis could be used by decision-makers in the development strategies of the region.

Key words: sustainable agriculture, post-socialist period, Danube Region, Romania.

JEL Classification: Q00, Q24.

1. INTRODUCTION

Agriculture is an important sector of the Danube Region economy. Although this region has important natural and human resources suitable for the development of this sector, and the governments that succeeded at the country's leadership assumed the sector "national strategic priority", the outcomes from the post-socialist period do not confirm a corresponding effect of that potential (OECD, 2000; MAF, 2004, Otiman, 1997).

2. STATE OF KNOWLEDGE

A relatively new concept, sustainable economic development is a form of development that meets the needs of the present generations without compromising or prejudicing the ability of future generations to meet their own needs (UN, 1992). Under this framework, it was necessary to identify appropriate solutions imposed by the rural

development specificity. Defining sustainable rural development assumes that, in this process, rural communities actively participate with their own resources for the economic and social benefit of the whole community. Sustainable rural development coordinates aim to accommodate the three functions of rural areas: economic, social and environmental.

Sustainable rural development in the economic sector assumes that any activities undertaken in the rural areas must be considered in terms of profitability. Agriculture is the main economic activity of rural areas. Key elements of sustainable agriculture are: i) development of a competitive agriculture, creating an economic surplus needed for their own development and for a positive contribution to overall economic balance; ii) insertion of agriculture in the “general economy” and its operation by the market economy forces; iii) development of ecological agriculture capable to produce clean raw food materials; iv) development of an agriculture that ensure farmers' income parity with other socio-economic groups, and v) improved quality of life for farmers and their contribution to improving the living standard of the entire population (Belli et al.,1995).

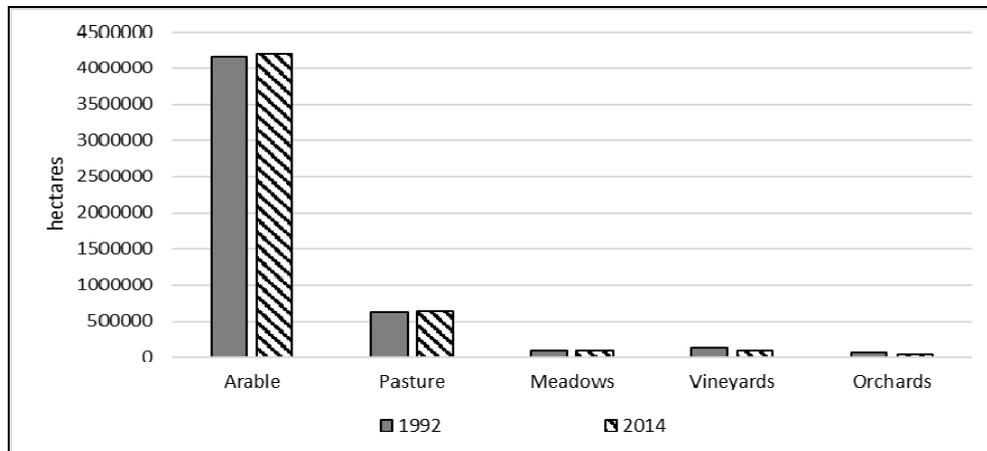
3. MATERIAL AND METHOD

The approach used in this paper is in line with the causal knowledge of economic and social phenomena and processes specific to rural communities, with the stated purpose to identify the existing shortcomings and formulate courses of action to mitigate or correct them. An analysis of the coordinates of sustainable agriculture in the Danube Region in the post-socialist period is initiated in this paper.

4. RESULTS AND DISCUSSIONS

The Danube Region has major land resources that provide significant development opportunities for a diversified agriculture: 5.06 million hectares of agricultural land, out of which 4.19 million hectares of arable land, 0.73 million hectares of natural pastures and hayfields, 0.13 million hectares of land under vineyards and orchards. The analysis of the evolution of land use categories indicates:

Decreasing intensive use of agricultural land. Comparing the 1992 data with the 2014 data, there is a tendency of extensive use of agricultural land resources: the share of the areas under vineyards and orchards decreased along with an increase of areas under pastures and hayfields.



Source: Author's processing of data from the National Institute of Statistics (NIS), 2016, Tempo-Online Database

Figure 1. Evolution of agricultural land area in the Danube Region.

The significant decrease of the area under vineyards and orchards is the result of massive cuttings after the agricultural land restitution to former owners.

Private land property became prevalent. The transition from the socialist economy to market economy resulted in significant structural changes not only for agriculture but also in the land ownership structures in particular. Individual private property is the most important segment of the rural economic and social activity. While in the early 1990s the share of agricultural land into private ownership was quite low, after the first application of land laws the private land share greatly increased: 69.87% in 1996 and 92.21% in 2014.

Significant share of the population employed in agriculture. After 1989, the changes produced in the national economy structure have strongly marked the employed population structure by sectors. Throughout the transition period, agriculture represented the economic branch with the largest number of employed persons (around 30%). Among the main causes of this situation, we could refer to the urban industrial sector restructuring, which resulted in the migration of the laid off staff to the rural areas. Although down from 718300 people in 2008 to 692800 people in 2014, the percentage of people employed in agriculture still remains very high and it has influenced the farming type (Table 1). The best part of the farming population is working on their own household farms: household heads and unpaid family members. Self-employed workers are mostly elderly people, more than two-thirds over the age of 50 years and one third of them are older than 65 years. An extremely small number of farms are run by young people. The large share of households headed by elderly people has greatly hindered the restructuring of the agricultural sector.

Table 1
Evolution of agricultural employment in the Danube Region

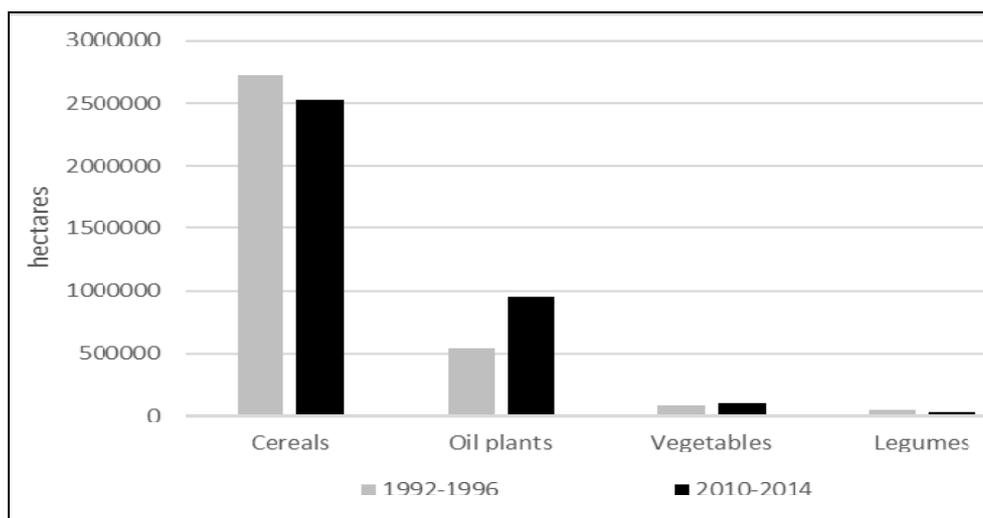
	2008			2014			2014vs 2008 %
	Total	Women		Total	Women		
	number	numbers	%	number	numbers	%	
Romania	2407.40	1267.40	52.65	2304.10	1223.80	53.11	95.71
Danube Region	718.30	375.70	52.30	692.80	366.20	52.86	96.45

Source: Author's processing of NIS data, 2016, Tempo-Online Database

Employment in agriculture features slight feminization, a situation similar to that at national level.

The crop structure has a strong extensive pattern. The areas under grains held the largest share throughout the post-socialist period (Fig. 1).

The remaining areas were mainly cultivated with oil crops, vegetables and legumes. The horticultural sector is under strong transformation process: vegetables are provided for the period of the season, but out of season there is a scarcity of vegetables, and imports are required.



Source: Author's processing of NIS data, 2016, Tempo-Online Database

Figure 2. Evolution of the cultivated area in the Danube Region.

Low yields in most crops. In the period 1992–2014, the average yields for most crops had low and oscillating values, in relation to the existing natural potential (Table 2). This was mainly the result of the strong agricultural land fragmentation, of underinvestment in agriculture, of low use of inputs etc. However, in 2014, an improvement was noticed compared to the earlier years of the post-socialist period.

Table 2
Evolution of average yields per hectare in the main crops in the Danube Region
(1992–1996 and 2010–2014 averages)

	Wheat	Maize	Sunflower	Potatoes	Melons	Grapes
1992-1996 (kg/ha)	2.232	2.642	1.172	9.715	13.515	4.589
2010-2014 (kg/ha)	3.179	4.106	1.743	12.940	17.392	4.079
Differences 2010-2014 vs. 1992-1996	+497	+1464	+571	+3225	+3877	-510

Source: Author's processing of NIS data, 2016, Tempo-Online Database

Underdevelopment accentuation in the livestock sector. It is well-known that in developed countries, animal husbandry has a prevailing place in agriculture, providing a higher conversion of plant resources. The agricultural policies in the transition period determined the decrease of the livestock sector share in total agricultural production: in 2014 the livestock sector accounted for only 25.41% of total agricultural production.

Table 3
Evolution of crop and animal production in the Danube Region

	2001			2014		
	Crop production	Animal production	Services	Crop production	Animal production	Services
Romania	62.79	36.08	1.13	65.83	32.85	1.32
The Danube Region	65.83	31.89	2.29	72.23	25.41	2.36

Source: Author's processing of NIS data, 2016, Tempo-Online Database

The underdeveloped animal production was mainly revealed by the significant diminution of livestock herds. These trends seem unnatural, but they have not been produced on a random basis. A combination of factors led to this situation: maintaining the state-owned companies for a long period of time, which generated economic inefficiency; underdeveloped product markets; lack of an institutional structure to protect the interests of livestock farmers for a long period of time etc.

Sharp drop in the use of agricultural inputs. The restitution of agricultural land to private owners has severely affected the irrigation and land reclamation systems in the Danube Region. Although the agricultural area equipped with irrigation facilities totalled about 2.6 million hectares (86.51% of total agricultural area equipped with irrigation facilities in Romania), the effectively irrigated area recorded extremely low levels (e.g. 5.30% in 2014).

In the transition period, two main trends in the endowment of agriculture with tractors and machinery could be noticed. On one hand, the number of less complex machinery for the mechanization of agriculture increased: the number of tractors was up by 1930 in the year 2014 compared to 1992. On the other hand, in

the same period, the mechanization of complex works was limited: for instance, the number of fertilizer spreaders and combines decreased (Popescu, 2001).

Among the production factors involved in obtaining high yields, the chemical and organic fertilizers are a priority for maintaining and enhancing soil fertility and increasing crop yields. In the Danube Region, the application of chemical fertilizers is close to the national average, but the manure applied per hectare accounts for only 67%.

Table 4
Evolution of chemical and organic fertilizers use in the Danube Region

	Chemical fertilizers			Organic fertilizers		
	Area (ha)	Quantity (kg)	kg/ha	Area (ha)	Quantity (kg)	kg/ha
1992	1530920	190103	124.17	78403	2127948	27142
2014	3153935	217443	68.94	88825	1216996	13701

Source: Author's processing of NIS data, 2016, Tempo-Online Database

In the post-socialist period, the fertilized areas increased, while the applied fertilizer amounts decreased. It is known that the development of modern agriculture implies a significant amount of investments and knowledge, together with the application of scientific research results.

5. CONCLUSIONS

The conclusions arising from the statistical analysis could serve as a basis for decision-makers, who, depending on the specific issues identified, can develop strategies for medium and long-term development at regional level. Agriculture became a predominantly private sector in the region and it is the main economic activity of rural areas in the Danube Region. Therefore, it continues to decisively influence any rural development activity. Although efforts have been made, this sector has largely remained a subsistence sector, characterized by low efficiency and productivity levels. A major obstacle to accelerate the development and modernization of agriculture and the whole agri-food system in Danube Region was the lack of a correlated approach as regards the new land ownership legislation and the farm structure and organization. The measures that targeted the sector were dominated by land ownership reform issues based on the principle of equity, which inevitably led to economic issues (land fragmentation, high percentage of elderly owners, soil production potential degradation, insecurity of property rights etc.).

The main reason for this situation is the extremely low production resource utilization. Production is mainly extensive and it is characterized by large areas cultivated with cereals. Average yields, both in crop production and animal

husbandry are extremely low, in obvious disagreement with the agricultural potential of the Danube Region. Low productivity obviously leads to low incomes. In turn, these are the main causes of production and investment decreasing. In this context, it is appropriate to adopt specific measures to support agriculture sustainable development. Considering the characteristics of the region (the existence of the Danube Plain), these should be exploited under an ameliorative agricultural system, which primarily involves potentiation solutions for the protection, conservation and environmental management, with elements of economic and social rehabilitation in the region (Botzan et al., 1991).

6. ACKNOWLEDGEMENT

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