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THE MAIN FEATURES OF ROMANIA'S AGRICULTURE IN THE PERIOD 2007-2012

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Abstract. Romania has a high agricultural potential but it is not enough utilized. Agricultural production increased but not enough, being still huge differences compared to the EU yields and production. The number of 3,859,043 farms is the largest in the EU (32%) and 3.57 ha/farm in average do not allow the application of modern technologies. The low technical endowment in the subzistence and semisubzistence farms is characterized by Euro 540/farm average fixed assets, 5.10 % irrigated land of the available surface, the low amount of fertilizers and huge charge of land per tractor, 54.1 ha. About 30 % of population is employed in agriculture. Rural population is characterized by aging, low training level and income, young generation is moving to cities looking for better paid jobs, the lack of diversified activities does not provide jobs and more revenues. However, important improvements have been noticed regarding agricultural production value, mainly due to the vegetal sector which has been rapidly developed. The contribution of agriculture to GDP increased by 19 % in the period 2007-2012, but its share in Romania's GDP declined to 4.88%.

Key words: agriculture, features, Romania

1. Introduction

Agriculture has a very important role in the economy: it provides food for population and raw materials major industries, it supplies fodder for animal husbandry, employment opportunities and income for the people living in the rural areas, it encourage the development of living standard in the rural space, it gives its contribution to GDP, and has a good play in international trade with agro-food products contributing to a better distribution of food and raw materials at world level, it brings important foreign currency to reduce the unfavorable balance of payments, and also it assures food security. (Stringer, 2001, Meijerink and Roza, 2007).

But the economists are focused on how agriculture could give more contribution to overall development and modernization (Johnston and Mellor (1961).

The traditional approach regarding the role of agriculture is based on the following aspects: to provide raw materials for agro-processing industries, to provide labor for industry sector in the urban areas, to produce food for covering

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population needs, to supply savings for investments in industry, to extend markets for industrial products, to bring earnings from export in order to pay imported goods (Johnston and Mellor, 1961; Timmer, 1992).

FAO initiated in 2001 the Role of Agriculture Project (ROA) as a new approach of the role of agriculture to poverty alleviation and socio-economic development. (FAO, 2001).

However, the development of urbanization and industries has led to a decline of agriculture contribution to GDP and to the reduction of population in the rural space, mainly the young generation being more interested to look for better paid jobs in the cities. The modern technologies applied in agriculture have increased labor productivity and product quality, increased value added per agricultural worker. Climate change has become a restraining factor in agriculture if corresponding measures are not taken to diminish its negative effects on production systems. (Meijerink and Roza, 2007).

After 1990, Romania's agriculture passed to a new era facing important transformation in farm structures, agricultural systems, production performances and its role in the economy. (Zahiu *et al*., 2010, Otiman, 2012).

Romania's accession into the EU structures in 2007 has also changed the agricultural policy paying more attention to fulfill the requirements of the PAC.
In this context, the paper aimed to analyze the statement of agriculture after the year 2007 when Romania has become an E.U. member state and to identify the main features represented by agrarian structure characterized by the number of agricultural holdings and farm size, technical endowment in agriculture characterized by fixed assets, number of tractors and number of tractors per ha, amount of chemical and organic fertilizers, irrigated agricultural land, net investments, cereal production as the main performance in the agricultural production, employment in agriculture and labor productivity, agricultural production value and contribution of agriculture to GDP.

2. Materials and methods

In order to identify the main features of the Romanian agriculture, the following aspects have been approached: number of agricultural holdings and farms size, fixed assets, number of tractors and number of tractors per ha, fertilizers, irrigated land, net investments, employed population in agriculture, labor productivity, cereal production, agricultural production value, agriculture contribution to GDP.

The analysis was carried out for the period 2007-2012 and was based on the data provided by Romania’s Statistical Yearbook, 2013.

3. Results and discussions

Number of agricultural holdings. Romania has the highest number of agricultural holdings in the EU, in 2010, accounting for 3,859,043 units, by 1.84 % less than in the year 2007.(3,931,350 units).

In the year 2010, of the total number of agricultural holdings, about 99.06 %, that is the largest number, was represented by individual agricultural holdings, working about 65 % of the total utilized agricultural land. The remaining of 30,698 units with juridical personality accounted for 0.94% of the total number of agricultural holdings and were working about 35 % of the utilized agricultural (Table 1).

Table 1. The statement of the agricultural holdings in Romania in 2007 and 2010

Specification	2007	2010	2010/2007
Total agricultural holdings, of which:	3,931,350	3,859,043	98.16
-Individual agricultural holdings	3,913,651	3,823,130	97.68
-Units with juridical personality	17,699	30,698	173.44

Source: Statistical Yearbook, 2013,Own calculations

The Romanian agricultural hodings represent the largest number of farms in the EU, accounting for about 32 % of the total number of farms in the community. Romania is followed by Italy with about 13.5 %, Poland with 12.5 %, Spain with about 8.2 %. All these 4 countries have 66.2 % of the whole number of farms in the EU (Alecu IoanNicolae, 2013, Popescu Agatha, 2014).

Average farm size. In the year 2010, the average agricultural land per farm accounted for 3.57 ha by 2 % more than in the year 2007, when the farm size was 3.5 ha in average. The individual farms recorded 2.02 ha in average compared to 190.78 ha/farm in case of the commercial holdings. The main trend is a decreasing one in the both cases because in the year 2010 the farm size was smaller by 12.18 % in case of individual farms and by 29.45 % in case of the units with juridical personality (Table 2).

Table 2.Average farm size in Romania in 2007 and 2010 (ha/farm)

Specification	2007	2010	2010/2007
Average farm size at country level	3.5	3.57	102.00
Average size of individual farms	2.3	2.02	87.82
Average size of commercial farms	270.4	190.78	70.55

Source: Statistical Yearbook, 2013,Own calculations

Farm size in Romania is very small reflecting a low efficiency and production performance. Even in the EU, the average of farm size is small, only about 14 ha, but much higher than in Romania. Only Cyprus has a similar farm size, about 3 ha/farm. In Greece and Slovenia, farms have about 6 ha. The countries with an average farms size between 55-65 ha are: France, Germany, Luxembourg and Denmark, where agriculture is highly developed. Also, we can not compared Romania's average farm size with the one from United Kingdom, 79 ha, and from Czech Republic, 152 ha, the highest in the EU. (Eurostat, Farm structure statistics, 2000-2010 and Popescu Agatha, 2014).

The small farm size requires association between various agricultural producers, the setting up of producers' groups and new commercial companies according to the legilslation in force in order to join the capital and be able to cultivated land in a more efficient way, applying modern technologies in order to increase agricultural prpduction and its quality, labor productivity and farm competitiveness.

Fixed assets. Technical endowment with fixed assets in agriculture is very important. In the year 2012, the value of fixed assets existing in agriculture of Romania accounted for Lei million 32,926.7, being 2.15 times higher than in the year 2007. However, in the period 2007-2012, the share of fixed assets belonging to agriculture in the value of fixed assets existing in the national economy varied from a year to another. The highest weight was recorded in the year 2012, 2.33 % while the lowest share was registered in the year 2011, only 1.44 %. (Table 3).

Table 3. Fixed assets in Romania's agriculture, 2007-2012 (Lei million, current prices)

Specification	2007	2008	2009	2010	2011	2012	2012/ 2007
Fixed assets in agriculture, forestry and fishing	15,267.4	25,770.0	33,704.4	28,779.0	40,039.0	32,926.7	215.66
Share in national economy(%)	1.66	1.91	2.27	1.84	1.44	2.33	140.36

Source: Statistical Yearbook, 2013,Own calculations

The level of fixed assets in the Romanian agriculture is still very low compared to other E.U. countries. In Romania, there are allotted only Euro 540 fixed assets per agriculturist, 16-17 times less than in the EU, where an agriculturist has at his disposal about Euro 9,000-9,200 (Otiman, 2012). This has a deep impact on the technological and performance level registered in Romania. Therefore, the lack of fixed assets at a corresponding level is a restraining factor for the Romanian agriculture.

Number of tractors. The Romanian agriculture has still a reduced number of tractors which has a negative impact regarding the quality of agricultural works and the moment when they are carried out. In the analyzed period, the number of tractors increased by 6 % from 174,003 pieces in the year 2007 to 184,446 pieces in the year 2012, which is a positive aspect.

Taking into account the land surface worked by a tractor, one may notice that it is still very high compared to other EU countries. Compared to the year 2007, when a tractor worked 54.1 ha arable land, in the year 2012 the surface allotted per tractor accounted for 50.23 ha, being by 7.16 % lower than in 2007, which is a positive trend.(Table 4).

Table 4. Number of tractors in Romania's agriculture and arable land per tractor, 2007-2012

Specification	2007	2008	2009	2010	2011	2012	2012/2007
Number of tractors (pieces)	174,003	174,790	176,841	180,433	183,064	184,446	106.00
Arable land per tractor (ha/tractor)	54.1	53.7	53.1	52.11	51.23	50.23	92.84

Source: Statistical Yearbook, 2013,Own calculations

Fertilizers. The amount of chemical fertilizers used in the Romanian agriculture is still very small compared to the one applied in other EU countries. However, in the year 2012, it was applied an amount of 438 thousand tones, by 13.17 % more than in the year 2007. Also, important amounts of organic fertilizers are available for agriculture, its level being closely related to the number of livestock. In 2012, the amount of organic fertilizers accounted for 123,293 thousand tones, being by 1.52 % lower than in the year 2007 (Table 5).

Table 5. Fertilizers in Romania's agriculture, 2007-2012 (Thousand tones)

Specification	2007	2008	2009	2010	2011	2012	2012/2007
Chemical fertilizers, active substance	387	398	426.2	481	487	438	113.17
Organic fertilizers	13,498	11,748	13,748.3	15,232	14,510	13,293	98.48

Source: Statistical Yearbook, 2013,Own calculations

Irrigations. Irrigations are a very important factor for production growth in agriculture.

Table 6. Irrigated land in Romania's agriculture, 2007-2012 (Thousand ha)

Specification	2007	2008	2009	2010	2011	2012	2012/2007
Irrigated land	320.2	225.0	296.7	79.21	103.3	161.3	50.37
Land prepared to be irrigated	3,155.3	3,157.1	3,157.04	3,157	3,157	3,157	100.05
% of prepared land	10.0	7.1	9.6	2.51	3.27	5.10	51 %

Source: Statistical Yearbook, 2013,Own calculations

The climate change and global warming have become more and more visible in Romania bringing droughts every year, affecting agricultural production. Despite that the surface prepared for irrigation accounts for 3,157 thousand ha, only 5.10 % was irrigated in the year 2012, representing a half of the irrigated land in 2007.

Therefore, the Romanian agriculture is less irrigated than it needs and much below its potential. (Table 6).

Net investments. Agriculture is an attractive field for investments. The value of net investments increased by 53.38 % from Lei million 2,192.2 in the year 2007 to Lei million 3,362.4 in the year 2012. The share of the net investments in agriculture represented 2.62 % in 2007 and 3.74 % in the value of net investments at national level (Table 7).

Table 7. Net investments in Romania's agriculture, 2007-2012 (Lei million, current prices)

Specification	2007	2008	2009	2010	2011	2012	2012/ 2007
Net investments in agriculture, forestry and fishing	2,192.2	3,393.3	2,919.5	2,659.5	3,285.1	3,362.4	153.38
Share in national economy(%)	2.62	3.40	3.89	3.67	3.74	3.74	142.74

Source: Statistical Yearbook, 2013,Own calculations

However, investments in the Romanian agriculture are still pale. The borrowings taken from banks by the Romanian farmers are very small, in average Euro 110/ha, while in other EU countries they account for about Euro 1,700-2,000 per ha (Otiman, 2012).

Cereal production. As a main indicator of agriculture development, cereal production is important to be analyzed. In the period 2007-2012, the land cultivated with cereals increased by 4.40 % from 5,129 thousand ha in 2007 to 5,440.3 thousand ha in 2012. Cereal production recorded an important growth from 7,814.8 thousand tons in 2007 to

12,824 thousand tons in the year 2012, when it was by 64 % higher than in the first year of the analysis. As production increased more rapidly than cultivated land with cereals, this means that average production was the key factor which determined this performance. (Ministry of Agriculture and Rural Development, November 2010)

However, cereal production registered various performances in the analyzed period. The maximum cereal production was recorded in the year 2011 because it was a favorable year for agriculture, while in the year 2007 the production level was the lowest one due to the terrible drought registered in Romania. Therefore, Romania has a high potential for producing cereals, except the dry years (Table 8).

Table 8. Cultivated land with cereals and cereal production in Romania, 2007-2012

Specification	2007	2008	2009	2010	2011	2012	2012/ 2007
Cultivated land with cereals (Thousand ha)	5,129.2	5,210.7	5,282.4	5,066.4	5,224.7	5,440.3	106.06
Cereal production (Thousand tons)	7,814.8	16,826.4	14,873	16,713	20,842	12,824	164.09

Source: Statistical Yearbook, 2013,Own calculations

Even thou cereal production increased, its level is still very low compared to the one registered by other EU countries. Low technological endowment, and lack of capital caused as the cereal production in Romania to be by 40-45 % smaller than in the EU.(Otiman, 2012).

Employed population in agriculture. Compared to other EU countries, in the Romanian agriculture are employed many persons, as about 30 % of Romania's population is living in the rural areas. In 2011, a number of 2,723.5 thousand persons were employed in the field of agriculture, forestry and fishing, by 4 % less than in the year 2004, which could be considered a positive aspect. In 2011, the employed population in agriculture represented 29.98 % of employed population at national level compared to 30.29 % in the year 20007.(Table 9).

Table 9. Employed population in Romania's agriculture, forestry and fishing, 2007-2012 (Thousand persons)

Specification	2007	2008	2009	2010	2011	2012	2011/ 2007 %
Employed persons in agriculture	2,836.7	2,767.8	2,764.2	2,896.2	2,723.5	-	96.00
% of employment at national level	30.29	29.55	30.10	31.63	29.98	-	98.97

Source: Statistical Yearbook, 2013,Own calculations

Romania is on the top position inthe EU with the highest number of employed persons in agriculture (35 %), being followed by Poland (14%), Greece (12%), Portugal (11 %) and Spain (10%). (Eurostat FSS, Agricultural Census, 2012, Popescu Agatha, 2013, Popescu Marin, 2009).

Beside the fact that the percentage of population employed in agriculture is very high compared to other EU countries, it is important to mention that in the rural areas, population is facing with aging, a low training level and the movement of young people to cities looking for better paid jobs. Just a few number of the Romanian farmers have a corresponding knowledge level and managerial skills. Most of the farmers own subzistence and semisubzistence farms, lacked of capital and modern technologies.

Labor productivity. In the Romanian agriculture, labor productivity increased by 66.13 % from Lei 8,032 per employed person in the year 2007 to Lei 13,343.7 per employed person in the year 2011. The share of employed people in agriculture, forestry and fishing in the employment at national level increased from 20.41 % in 2007 to 24.84 % in 2012. (Table 10).

Table 10. Labor productivity in Romania's agriculture, forestry and fishing, 2007-2012 (Lei/Employed person)

Specification	2007	2008	2009	2010	2011	2012	2011/ 2007 %
Labor productivity in agriculture	8,032	12,329 .8	11,684 .3	10,315 .0	13,343 .7	-	166.13
% in labor productivity in the national economy	20.41	25.18	23.78	20.24	24.84	-	121.70

Source: Statistical Yearbook, 2013,Own calculations

Even thou the statistical figures reflect an improved situation of labor productivity in agriculture, in term of Lei per employed person, these figures cover the real situation, which should be analyzed by the amount of products resulting per working hour.

Agricultural production value increased by 34.71 % from Lei million 47,699.9 in the year 2007 to Lei million 64,259.4 in the year 2012 which is a positive aspect. The vegetal production is well represented registering the highest growth in the analyzed period, 39.84 %. On the second position came animal production with 28.77 % and on the last one agricultural services which recorded a deep decline.(Table 11).

The contribution of various sectors to agricultural production value was the following one: in the year 2007: 60.21 % vegetal production, 38.34 % animal production and 1.45 % agricultural services; in the year 2012: 62.51 % vegetal production, 36.65 % animal production and 0.84% agricultural services. The weight of the three sectors varied from a year to another. The highest share of 70.81 % in agricultural production value was

performed by vegetal production in the year 2011. However, animal production should be better represented and also the percentage of agricultural services is still very low.

Table 11. Agricultural production value in Romania, 2007-2012 (Lei million, current prices)

Specification	2007	2008	2009	2010	2011	2012	2011/ 2007 %
Agricultural production value, of which:	47,699.9	66,993.9	59,928.4	64,452.5	76,508.8	64,259.4	134.71
-Vegetal production	28,723.4	45,742.2	35,735.5	43,488.4	54,179.8	40,169.1	139.84
-Animal production	18,291.6	20,535.7	23,441.6	20,406.8	21,784.1	23,555.3	128.77
-Agricultural services	684.8	716.0	751.6	557.2	544.7	535.0	78.12
Share of vegetal production (%)	60.21	68.27	59.63	67.47	70.81	62.51	-
Share of animal production (%)	38.34	30.65	39.11	31.66	28.47	36.65	-
Share of services (%)	1.45	1.08	1.26	0.87	0.72	0.84	-

Source: Statistical Yearbook, 2013,Own calculations

The agricultural production value is still very low compared to the one registered in other EU countries because of the performances per surface unit. In 2012, the value of primary agricultural production accounted for Euro 800-900/ha in Romania compared to Euro 1,800-2,000 in the EU (Otiman, 2012).

Agriculture contribution. The GDP created in agriculture, forestry and fishing increased by 19.49 % from Lei million 23,966.3 in the year 2007 to Lei million 28,638.1 in the year 2012. As a result, the contribution of agriculture to GDP was different from a year to another, and in 20122 accounted for 4.88 % compared to 5.75 % in the year 2007.(Table 12).

Table 12. Agriculture contribution to Romania's GDP (Lei million, current prices)

Specification	2007	2008	2009	2010	2011	2012	2011/ 2007 %
Agriculture contribution to GDP	23,966 .3	34,403 .9	32,297 .8	29,874 .2	36,341 .6	28,638 .1	119.49
% of GDP	5.75	6.68	6.44	5.70	6.52	4.88	84.86

Source: Statistical Yearbook, 2013,Own calculations

Agriculture contribution to GDP reflect how important is this economic branch in Romania's economy (Zahiu Letitia et al, 2010).

Conclusions

1. Romania has a high agricultural potential which is not yet entirely utilized. Agricultural production is still low compared to other EU countries due to the large number of small farms, their low technical endowment, and farmers' lack of capital, training and managerial skills.

2. Even thou the number of agricultural holdings is decreasing, with 3,859,043 farms in 2010, Romania keeps 32% of the whole number of the EU agricultural units.

3. The average farm size, 3.57 ha/farm in 2012, is very small compared to 14 ha/farm the EU average, reflecting a low efficiency and production performance.

4. The value of fixed assets accounted for Lei million 32,926.7 in 2012, being 2.15 times higher than in the year 2007, which is a positive aspect. But a Romanian farmer has still only Euro 540 fixed assets compared to Euro 9,000-9,200 in the EU.

5. The reduced number of tractors, fertilizers, irrigated agricultural land and investments continue to maintain a low productivity, product quality and competitiveness of the Romanian farms.

6 The high number of employed people in agriculture, the lack of diversified activities, aging, low training level and movement of young generation to cities for getting a job reflect the main social aspects the rural space is facing at present and also the low productivity and value added created in agriculture, even thou during the last years it was noticed an improvement, but the growth process is still very slow.

7. Agricultural production value increased, but mainly due to the growth of vegetal production, and animal and services sectors are not yet enough developed.

8. The contribution of agriculture to GDP increased by 19%, but is recorded a low decline keeping 4.88 % in Romania's GDP.

9. As a final conclusion, policy makers have to pay more attention to the role of agriculture in the economy to provide high quality food and cover the domestic market demand, to earn income from agro-food products export mainly in the EU countries, to create jobs by diversifying activities in the rural areas and encouraging producers' association to better use their fixed and financial capital and implement modern technologies, to produce more primary materials for processing industries, to create savings for investments for its own development.

10. Agriculture has to be more involved in providing indirect non-commodity contributions such as environmental services regarding water, biodiversity preservation, carbon sequestration, food security, poverty reduction and social viability in the rural space.

References

1. Alecu, I.N., 2013, Situation of agriculture and agricultural holdings in the EU member states, Ceres Press House
2. Eurostat, Farm structure statistics, http://epp.eurostat.ec.europa.eu/statistics_explained/images/5/5a/ Agricultural_holdings%2C_2000-2010.png
3. Eurostat FSS, Agricultural Census, 2012
4. FAO, 2001, Roles of agriculture (ROA) Project, Socio-economic analysis and the roles of agriculture in developing countries.
5. Hazell, P. and X. Diao. 2005. "The Role of Agriculture and Small Farms in Economic Development". Proceedings of a Research Workshop, Wye, UK, June 26–29, 2005. IFPRI Washington, DC.
6. Johnston, B.F., and J.W. Mellor. (1961). "The Role of Agriculture in Economic Development." Amer. Econ. Rev. 51, September, pp. 566-93.
7. Meijerink Gerdien, Roza Pim, 2007, The role of agriculture in economic development, Markets, Chains and Sustainable Development Strategy & Policy paper 4, Wageningen, http://edepot.wur.nl/690
8. Otiman I.P., 2012, Romania's current agrarian structure - a great and unsolved social and economic problem of the country, Romanian Review of Sociology, A new series, Year XXIII, No.5-6/2012, pP.339-359
9. Popescu Agatha, 2013a, Considerations on utilized agricultural land and farm structure in the European Union, Scientific Papers Series Management, Economic engineering in Agriculture and Rural Development, Vol.13(4):221-226
10. Popescu Agatha, 2013b, Considerations on the main features of the agricultural population in the European Union, Vol.13(4):213-220
11. Popescu Marin, 2010, Physical dimension of the agricultural holdings in Romania. Gaps from the EU. Review of Agrarian Economy and Rural development, Year VII, No.1, pp.41-60
12. Popescu Marin, 2009, Labour employment in Romania's agriculture and labour productivity increase. Gaps between Romania and the EU., Agricultural Economics and Rural Development, New Series, Year VI, no.2,p.181-197
13. Romania's agriculture in figures, Ministry of Agriculture and Rural Development, November 2010
14. Statistical Yearbook, Romania, 2013, www.insse.ro
15. Stringer Randy, 2001, How important are the 'non-traditional' economic roles of agriculture in development? Discussion Paper 0018, Centre for International Economic Studies, School of Economics, Adelaide University, Australia
16. Timmer, C.P., (1992). 'Agriculture and Economic Development Revisited', *Agricultural Systems*, 40:21-58.
17. Zahiu Letitia, Toma Elena, Dachin Anca, Alexandru Cecilia, 2010, Agriculture in Romania's economy- between expectations and realities, Ceres Publishing House, Bucharest.