RESEARCH ON LABOUR PRODUCTIVITY IN ROMANIA'S AGRICULTURE

Agatha POPESCU

University of Agricultural Sciences and Veterinary Medicine, Bucharest, 59 Marasti, District 1, Zip code 011464, Bucharest, Romania, Phone:+40213182564, Fax: +40213182888, Email: agatha_popescu@yahoo.com

Corresponding author: agatha_popescu@yahoo.com

Abstract

The aim of the paper was to analyze Romania's labour productivity in agriculture, forestry and fishery based on the empirical data collected from the National Institute of Statistics for the period 2007-2012. A number of five methods of labour productivity calculation and the chain substitution method to analyze the influence of various factors were used, and finally the trends and solutions to increase labour productivity were identified. For all the productivity indicators there were calculated the statistical parameters: average, standard deviation, variance, standard error and variation coefficient. In the period 2007-2012, the average labour productivity in Romania's agriculture, forestry and fishery accounted for 7.7 persons per one person employed in this field of activity, Lei 23,482.83 agricultural production value per employed person in agriculture, Lei 11,456 gross value added per employed person in agriculture, Lei 11,198 per employed person and Lei 6.42 per hour worked in agriculture as found by NIS. The variation of these indicators was 16 % across the whole analyzed period. Labour productivity in Romania's agriculture is lower than in other sectors of the economy and mainly regarding the EU average and the top productivity in the Netherlands, Denmark, France, United Kingdom and Germany. In the period 2007-2012, Romania registered Euro 4,329/AWU representing 28.92 % of Euro 14,967/AWU average labour productivity in the EU-27. To increase labour productivity, it is needed to assure a modern technical endowment, the knowledge transfer to farmers, the increase of their training level and managerial skills, the intensification of the extension system services, the stimulation of young farmers and women to develop business in agriculture and traditional activities and services, the assurance of funding for investments and modernization, the creation of jobs and new income sources for the agricultural employees and rural population. Only in this way, profitableness and competitiveness could be grown in agriculture.

Key words: agriculture, characteristics, labour productivity, Romania, trends

INTRODUCTION

Labour productivity reflects the efficiency in the economy and its fields of activity. In the EU, about 93 % of surface is represented by rural areas where about 20 % of its population is living.

Despite that just 4.7 % people is working in agriculture, in the EU, labour productivity has deeply increased in the last 20 years due to the increased use of productive factors from other economic sectors, despite of the disparities regarding land/labour ratio, fixed capital per farm, the exodus of people to cities, and the institutional framework involved in agriculture as mentioned by Martin-Retortillo Miguel (2012). [6]

The gap regarding the productivity differences among the CEECs was determined by a variety of factors such as: reform choices and their implementation, and mainly land reform, price liberalization and the subsequent decline of trade, the decrease in output prices, the increase in input prices, reduced agricultural subsidies in agriculture, farm privatization, investments made by processors to support the supply chain, and quality of agricultural products.

The Czech Republic, Slovakia and Estonia implemented radical reforms, which consolidated land in large farming enterprises, stimulated outflow of labour, substantial gains in labour productivity, investments in vertically integrated supply chains, farmers' access to technology, inputs and output markets. Romania, Bulgaria, Lithuania and Poland with a diverse initial farm structure (Poland small family farms, and Lithuania,

Romania and Bulgaria large agricultural holdings) followed a specific pattern of productivity, determined by land restitution to the former owners, the split of land into small plots, the lack of capital, led to small yields and limited gains in output and productivity as presented by Swinnen et al.(2009). [12]

Agriculture is an important sector in Romania's economy, a reason to analyze the dynamics of productivity and identify the factors which could contribute to its development.

Productivity reflects the qualitative relationship between production and the involved production factors, being usually defined as "a relation between the output resulting from the production process and the utilized factors" as affirmed Boghean et al.(2013). [1]

Productivity is determined by production level and the number of employed people, but also by fixed assets existing in the economy and investments in technical endowment which could assure a higher production performance per hour worked or employed person, a higher quality of the products, and an increased efficiency and competitiveness of the economy in general, at macroeconomic level, and at microeconomic level as well.

Work in agriculture has some specific peculiarities compared to other fields of activity, among the most important being: the seasonal agricultural works, the family members involved in the farm activities, the high share of the older population and women, the large variety regarding the applied technologies, the climate influence on production performance, etc, all these aspects leading to difficulties to estimate correctly employment and labour productivity in agriculture, as mentioned by Burja (2014). [2]

For this reason, the EU has established a conventional measure of labour productivity, AWU, meaning annual work unit, which is defined as: "the work performed by one person who is occupied on an agricultural holding on a full-time basis, meaning the minimum hours required by the relevant national provisions governing contracts of employment. If the national provisions do not indicate the number of hours, then 1 800

hours are taken to be the minimum annual working hours: equivalent to 225 working days of eight hours each. As the volume of agricultural labour is calculated on the basis of fulltime equivalent jobs" as mentioned in the EU, European methodology annexed to Regulation (EC) No 138/2004 of the European Parliament and of the Council of 5 December 2003 (with further additions) on the economic accounts for agriculture in the Community and the EU Report 2010, ANNEX A - Glossary of Terms & Definitions. [4, 5]

Romania has 238,391 km^2 surface, being the 12th country in Europe as size and representing 6 % of the EU surface. Of Romania's surface, about 55.8 %, that is 13.3 million ha are agricultural land, and of which 8.3 million ha are utilized arable land. In agriculture, forestry and fishery, the employment rate is 29.6%, very high compared to 4.7% in the EU. The population working in agriculture is aging, about 15% being over 65 years old, and the training level is very low.

The productivity in agriculture is lower than in other economic sectors, compared to the average in the national economy and the EU average as specified in the Document entitled "Socio-economic analysis in the prospect of the Rural Development 2014-2020, issued by Ministry of Agriculture and Rural Development (2013) [11]

Just 7.4 % of the Romanian farmers have a corresponding training in agriculture, compared to 20 % in the EU according to the Study of the National Commission for Forecast on "Agricultural Holdings Consolidation"(2012) [12]

Rural and agricultural population aging, low training level, the lack of financial resources and corresponding endowment, the migration to cities, the low annual income per farmer (just Euro 2,000) much below the EU average are the major features of Romania's agricultural labour with a deep impact on the productivity level as affirmed by Popescu Agatha, (2013 a). [7] The disparities between the EU developed agricultural countries and Romania could be diminished by training, high technologies, infusion of fixed capital

and investments, implementation of associative forms in agriculture as mentioned by Popescu Agatha (2013 b). [8]

In this context, the paper aimed to analyze labour productivity in Romania's agriculture based on the empirical data provided by the National Institute of Statistics for the period 2007-2012 in order to identify the main trends, the influencing factors and the ways how productivity could be developed in this important sector of the economy.

MATERIALS AND METHODS

For setting up this paper, the empirical data were collected from Romania's Yearbooks provided by the National Institute of Statistics for the reference period 2007-2012.

Labour productivity (W) was calculated using the following three formulas:

$$W1 = P/EMa, \qquad (1)$$

where W1= *labour productivity in terms of the number of persons per employed person* in agriculture, forestry and fishery, P=Romania's population, and EMa = employed persons in agriculture, forestry and fishery.

$$W2 = APV/EMa, \qquad (2)$$

where W2= *labour productivity in terms of agricultural production value per employed person* in agriculture, forestry and fishery, APV = agricultural production value, and EMa = employed persons in agriculture, forestry and fishery.

$$W3 = GVAa/EMa, \qquad (3)$$

where W3= *labour productivity in terms of gross value added* in agriculture, forestry and fishery, GVAa= gross value added in agriculture, forestry and fishery, and EMa = employed persons in agriculture, forestry and fishery.

The comparison method and fixed basis index, $I_{FB} = (X_n/X_0)*100$, where n= 1,2,...i, and 2007=100, were used to analyze the values of the indicators in 2012 compared to the reference term recorded in the year 2007.

Also, the statistical parameters: average, standard deviation and variation coefficients were calculated, according to the formulas:

Average of the variable, $\overline{X}$, using the well known formula:

$$\overline{X} = \frac{X_1 + X_2 + ...X_n}{n} \qquad (4)$$

Standard Deviation, S, based on the formula:

$$S = \left(\sqrt{\frac{\sum\limits_{i=1}^{n}(X_i - \overline{X})^2}{n-1}} \right) \qquad (5)$$

Variation Coefficient, $V_\%$, using the formula:

$$V_\% = \frac{S}{\overline{X}} \times 100 \qquad (6)$$

The chain substitution analysis of the influence factors was used in order to identify the influence of GVA on the change of labour productivity, as follows:

The change of labour productivity, $\Delta W =$

$$\frac{GVA_1}{EM_1} - \frac{GVA_0}{EM_0}$$

The influence of GVA, $\Delta W(GVA)$, on the change of labour productivity, ΔW:

$$\Delta W(GVA) = \frac{GVA_1}{EM_0} - \frac{GVA_0}{EM_0}$$

$$\Delta W(GVA)\% = (\Delta W(GVA)/ \Delta W) *100$$

The influence of EM_a, $\Delta W(EM_a)$, on the change of labour productivity, ΔW:

$$\Delta W(EM_a) = \frac{GVA_1}{EM_1} - \frac{GVA_1}{EM_0}$$

$$\Delta W(EM_a)\% = (\Delta W(EM_a)/ \Delta W) *100$$

To check if the calculations were correctly done, the sum of the influence of GVA and EM_a should be equal to ΔW, according to the formula:

$$\Delta W = \Delta W(GVA) + \Delta W(EM_a)$$

In a similar way, it was used the same method to determine the influence of agricultural production value, APV, on the change of labour productivity in 2012 versus 2007, replacing GVA with APV in the formulas presented above.

The obtained results were tabled and graphically illustrated and then interpreted.

The specific indicators taken into consideration in this research, there were: total population of Romania, rural population, employed persons in agriculture, forestry and fishery, agriculture production value, gross

value added created in agriculture, forestry and fishery, and also the labour productivity in terms of Lei/employed person and per hour worked as provided by the National Institute of Statistics for the reference period 2007-2012.

For each indicator taken into consideration, there were calculated the statistical parameters: average, standard deviation and the coefficient of variation.

RESULTS AND DISCUSSIONS

Labour productivity in terms of number of persons per one person employed in agriculture, forestry and fishery varied between 7.28 persons, the minimum value registered in the year 2010 and 7.71 persons, the maximum level recorded in the year 2011. The general trend was a descending one from 7.57 persons in 2007 to 7.49 persons in 2012. (Table 1).

Table 1. Labor productivity in terms of Number of persons per employed people in agriculture, forestry and fishery, Romania, 2007-2012

	MU	2007	2008	2009	2010	2011	2012	2012/2007 %
Labor productivity	No. of persons/ One person employed in agriculture, forestry and fishery	7.57	7.63	7.57	7.28	7.71	7.49	98.94

Source: Own calculation based on NIS, 2013, Romania's Statistical Yearbook, 2008-2013 [10]

In the last year of the analysis, the figure was by 42 % smaller compared to the average of 12.9 persons found by Tofan (2005) in Romania, and much smaller compared to the one recorded in other EU countries: 49.3 persons in the EU-15, 165.6 persons in Belgium-Luxembourg, 104 persons in the Netherlands, 76.3 persons in France, 74.2 persons in Denmark, 60.6 persons in Germany, 57.3 persons in United Kingdom as mentioned by Tofan (2005). [14]
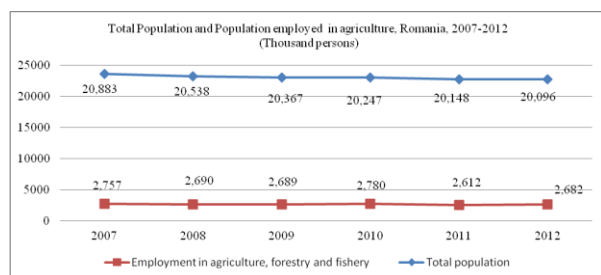

Fig. 1. Dynamics of the total population and population employed in agriculture, forestry and fishery in Romania, 2007-2012
Source: NIS, 2013, Romania's Statistical Yearbook. [10] Own design.

The reduction of this indicator is explained by the decline by 3.77 % of the total population in Romania and also by the decline by 2.73 % of the employed persons in agriculture, forestry and fishery in the analyzed period. It reflects that less people could be fed by people working as employees in the agricultural sector. (Fig.1.)

Labour productivity in terms of agricultural production value per employed person in agriculture, forestry and fishery increased by 38.48 % from Lei 17,301/employed person in 2007 to Lei 23,959 per employed person in 2012. This was due to the increase of the agricultural production value by 34.71 % in the analyzed period, which had a positive influence and also due to the decline of the number of persons employed in agriculture, forestry and fishery by 2.73 %, which had a positive effect as well (Fig.2., Table 2).
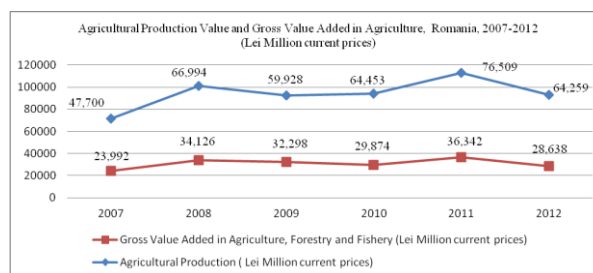

Fig. 2. Agricultural Production Value and Gross Value Added in agriculture, forestry and fishery, Romania, 2007-2012 (Lei Million current prices)
Source: NIS, 2013, Romania's Statistical Yearbook. [10]Own design.

In Euro, this means that in 2012, labour productivity accounted for Euro 5,324, being by 3.56% smaller than Euro 5,520/person employed in agriculture determined by Tofan (2005) in Romania and the figure is also much lower compared to Euro 36,804, the EU-15

average, Euro 89,836 in Belgium, Euro 78,668 in the Netherlands, Euro 71,128 in France, Euro 45,430 in United Kingdom and Euro 42,337 in Germany as affirmed Tofan (2005).[14]

Table 2. Labour productivity in terms of Agricultural Production Value per employed people in agriculture, forestry and fishery, Romania, 2007-2012

	MU	2007	2008	2009	2010	2011	2012	2012/2007 %
Labour productivity	Lei Employed person in agriculture, forestry and fishery	17,301	24,905	22,256	23,185	29,291	23,959	138.48

Source: Own calculation based on INSSE Data base, 2008-2013. [10]

To analyze the influence of the two factors of influence, APV and EM_a, on the change of labour productivity, ΔW, in the year 2012 compared to the year 2007, the following calculations were done:

The change of labour productivity,

$$\Delta W = \frac{APV_{2012}}{EM_{2012}} - \frac{APV_{2007}}{EM_{2007}} = \frac{64,259}{2,682} - \frac{47,700}{2,757} =$$

Lei 6,657.94/ employed person in agricultural sector.

The influence of APV, $\Delta W(APV)$, on the change of labour productivity, ΔW:

$$\Delta W(APV) = \frac{APV_{2012}}{EM_{2007}} - \frac{APV_{2007}}{EM_{2007}} =$$

$$\frac{64,259}{2,757} - \frac{47,700}{2,757} = \text{Lei } 6,006.17/\text{employed}$$
person.

$\Delta W(APV)\% = (\Delta W(APV)/\Delta W) *100 = (6,006.17/6,657.94)*100 = 90.21 \%$.

The influence of EM_a, $\Delta W(EM_a)$, on the change of labour productivity, ΔW:

$$\Delta W(EM_a) = \frac{APV_{2012}}{EM_{2012}} - \frac{APV_{2012}}{EM_{2007}} =$$

$$\frac{64,259}{2,682} - \frac{64,259}{2,757} = \text{Lei } 651.77/\text{employed}$$
person.

$\Delta W(EM_a)\% = (\Delta W(EM_a)/\Delta W) *100 = (651.77/6,657.94)*100 = 9.79 \%$.

The calculations were correctly done, because the sum of the influence of APV and EM_a were equal to ΔW, as follows:

$\Delta W = \Delta W(APV) + \Delta W(EM_a) = 6,657.94 = 6,006.17 + 651.77$.

Therefore, the change of labour productivity Lei 6,657.94/person employed in agriculture in the year 2012 compared to 2007 was determined 90.21 % by agricultural production value, APV, and 9.79 % by employment in agriculture, EM_a.
The influence of APV and EM_a on the change of labour productivity is presented in Table 4.
Labour productivity in terms of Gross Value Added created in agriculture, forestry and fishery per employed person in agriculture, forestry and fishery increased by 23.74 % from Lei 8,702 in the year 2007 to Lei 10,678 in the year 2012.
This growth was positively influenced by the increase of Gross Value Added in agriculture, forestry and fishery by 19.36 % and also by the decline by 2.73 % of the employed persons in the agricultural sector (Table 3, Fig.2.).
Transformed into Euro, at an exchange rate (Euro 1 = Lei 4.50), this means that in 2012, in Romania's agriculture, labour productivity accounted for Euro 2,373 gross value added per employed person. This level is by 20 % lower than the average calculated by Tofan (2005) who found Euro 2,949 GVA/employed person in the agricultural sector.
This figure was also lower compared to Euro 19,314 the EU-15 average and the level recorded by other EU countries: Euro 35,437 in the Netherlands, Euro 35,511 in France, Euro 34,091 in Belgium, Euro 32,685 in Luxembourg, Euro 31,902 in Denmark.

Table 3. Labour productivity in terms of Gross Value Added per employed people in agriculture, forestry and fishery, Romania, 2007-2012

	MU	2007	2008	2009	2010	2011	2012	2012/2007 %
Labour productivity	Lei Employed person in agriculture, forestry and fishery	8,702	12,686	12,011	10,746	13,913	10,678	123.74

Source: Own calculation based on INSSE Data base, 2008-2013. [10]

To analyze the influence of the two factors of influence, GVA and EM_a, on the change of labour productivity, ΔW, in the year 2012 compared to the year 2007, the following calculations were done:

The change of labour productivity, ΔW:

$$\frac{GVA_1}{EM_1} - \frac{GVA_0}{EM_0} = \frac{28,638}{2,682} - \frac{23,992}{2,757} = \text{Lei}$$

1,975/employed person in agricultural sector.

The influence of GVA, $\Delta W(GVA)$, on the change of labour productivity, ΔW:

$$\Delta W(GVA) = \frac{GVA_{2012}}{EM_{2007}} - \frac{GVA_{2007}}{EM_{2007}} =$$

$$\frac{28,638}{2,757} - \frac{23,992}{2,757} = \text{Lei 1,685/employed}$$

person.

$\Delta W(GVA)\% = (\Delta W(GVA)/\Delta W) *100 = (1,685/1,975)*100 = 85.31$ %.

The influence of EM_a, $\Delta W(EM_a)$, on the change of labour productivity, ΔW:

$$\Delta W(EM_a) = \frac{GVA_{2012}}{EM_{2012}} - \frac{GVA_{2012}}{EM_{2007}} =$$

$$\frac{28,638}{2,682} - \frac{28,638}{2,757} = \text{Lei 290/employed person.}$$

$\Delta W(EM_a)\% = (\Delta W(EM_a)/\Delta W)*100 = (290/1,975)*100 = 15$ %.

The calculations were correctly done, because the sum of the influence of GVA and EM_a were equal to ΔW, as follows:

$\Delta W = \Delta W(GVA) + \Delta W(EM_a) = 1,975 = 1,685 + 290$.

Therefore, the change of Lei 1,975/person employed in agriculture in the year 2012 compared to 2007 was determined 85.31 % by gross value added obtained in agriculture, GVA, and 15 % by employment in agriculture, EM_a.
A similar results was found by Boghean et al,(2013) who analyzed the change of labour productivity in the year 2011 against 2010 and found that GVA had a higher influence, 62.39 % while EM_a had o lower influence of 37.61 %. [1]
The influence of GVA and EM_a on the change of labour productivity is presented in Table 4.

Table 4. The influence of APV, GVA and EM_a on the change of labour productivity in agriculture, forestry and fishery in 2012 versus 2007

Change of Labour productivity due to APV and EM_a					Change of Labour productivity due to GVA and EM_a				
ΔW	$\Delta W(GVA)$		$\Delta W(EM_a)$		ΔW	$\Delta W(GVA)$		$\Delta W(EM_a)$	
Lei	Lei	%	Lei	%	Lei	Lei	%	Lei	%
1,975	1,675	85.31	290	15	6,657.94	6,006.17	90.21	651.77	9.79

Source: Own calculations.

The labour productivity is the combined result of various factors, but mainly of the labour market trends and market failure the change of production performance and the variation of gross value added produced in agriculture, forestry and fishery.
For instance, in 1990, 29 % employed people in agriculture created 22 % of the GVA in Romania's economy, in 2000, 41.7 % employed persons in agriculture produced 12.5 % GVA in the economy, and in 2012 about 29 % population employed in agriculture contributed by just 6.5 % to the national GVA as mentioned Ciutacu

et.al.(2014). [3]

Labour productivity in agriculture, forestry and fishery in Lei per employed person in the agricultural sector as determined by the National Institute of Statistics ranged between Lei 8,448.7/person in 2007 and Lei 13,343.7/person in 2011, when the level was by 57.93 % higher than in the 1st year of the analyzed period.

The evolution of labour productivity in agriculture was more dynamic compared to the labour productivity in Romania's economy, whose growth was 36.52 % in the same period. As a result, the weight of the labour productivity achieved in the agricultural sector in the labour productivity recorded in the national economy increased from 21.47 % in 2007 to 24.84 % in the year 2011.(Table 5)

Table 5. Labour productivity in the national economy and in agriculture, forestry and fishery, Romania, 2007-2011 (Lei/employed person)

	2007	2008	2009	2010	2011	2011/2007 %
Labour productivity in the national economy	39,334.1	48,958	49,120.9	50,938.4	53,702.1	136.52
Labour productivity in the agricultural sector	8,448.7	12,198.2	11,684.3	10,315	13,343.7	157.93
Share of agriculture (%)	21.47	24.91	23.78	20.24	24.84	-

Source: NIS, 2013, Romania's Statistical Yearbook. [10]Own calculation.

Compared to the national average labour productivity, which accounted for Lei 53,702.1/employed person in agriculture in 2011, the productivity level was 4.02 times lower, reflecting a better situation than 4.65 times less in the year 2007.

The low productivity level in the agricultural sector was determined by a series of factors such as: the low quality biological material used in the vegetal and animal sector, the low technical endowment, the reduced number of farmers with professional qualification, the high proportion of land per agricultural worker, the numerous holdings (3.8 million) with an average size of 3.4 ha, the highest number of people dealing with agriculture, the low production performance, all these aspects reflect that Romania's agriculture could not meet the performance achieved in the developed countries of the EU as mentioned Trasca Daniela (2015). [15]

Labour productivity in agriculture, forestry and fishery in Lei per hour worked in the agricultural sector as determined by the National Institute of Statistics increased by 57.14 % from Lei 4.9/hour in 2007 to Lei 7.7./hour in 2011. (Table 6).

Table 6. Labour productivity in the national economy and in agriculture, forestry and fishery, Romania, 2007-2011 (Lei/hour worked)

	2007	2008	2009	2010	2011	2011/2007 %
Labour productivity in the national economy	20.9	26.1	26.3	27.4	28.4	135.88
Labour productivity in the agricultural sector	4.9	7.0	6.6	5.9	7.7	157.14
Share of agriculture (%)	23.44	26.81	25.09	21.53	27.11	-

Source: NIS, 2013, Romania's Statistical Yearbook. [10]Own calculation.

However, the labour productivity in the agricultural sector is very small compared to the average in the national economy. In 2011, it was 3.68 times lower than at the national level compared to 4.26 times lower in the year 2007.

The gap recorded a slight reduction, which is a positive aspect.

The statistical parameters of Labour productivity in agriculture, forestry and fishery in the period 2007-2012, determined in 5 manners is presented in Table 7.

Table 7. Statistical parameters of Labour productivity in agriculture, forestry and fishery in the period 2007-2012 in Romania

Statistical parameter/ Labour productivity type	MU	Average	Standard deviation	Standard error	Sample variance	Variation coefficient(%)
W1	-	7.536	0.1642	0.0734	0.0269	2.17
W2	Lei/employed person	23,482.83	3,893.4041	1,589.4756	15,158,596.17	16.57
W3	Lei/employed person	11,456	1,819.4325	742.7802	3,310,334.80	15.88
W4	Lei/employed person	11,198	1,882.6979	841.9679	3,544,550.50	16.81
W5	Lei/Hour worked	6.42	1.0709	0.4789	1.147	16.68

Source: Own calculations.

W1=Labour productivity in terms of No. persons/EM_a ; W2= Labour productivity in terms of APV/EM_a;
W3== Labour productivity in terms of GVA/EM_a; W4= Labour productivity in terms of Lei/employed person in agriculture, as determined by INSSE, 2013; W5= Labour productivity in terms of Lei/Hour worked in agriculture, as determined by INSSE, 2013.

Labour productivity in Romania compared to other EU countries in terms of GVA, at basic price in Euro/AWU.
Romania is situated on the penultimate position in the EU, being followed by Bulgaria, which is placed on the last position. Romania is still far away from the EU average productivity and of the top productivity registered by the Netherlands, Denmark, Belgium, France, United Kingdom and Germany as affirmed Popescu Marian (2011). [9]
The EU-27 average labour productivity for the period 2007-2012 was Euro 14,967/AWU. Romania registered Euro 4,329/AWU, representing 28.92 % of the EU average productivity in agriculture. Germany recorded Euro 20,259/AWU, that is an almost double productivity in agriculture compared to the EU average and 6.75 times more than Romania. Poland achieved Euro 4,054/AWU by 73 % less than the EU average and by 6.36 % less than Romania. Hungary achieved Euro 5,717/AWU, that is 38.19 % of the EU average and by 32.06 % more than Romania. Bulgaria recorded the lowest labour productivity in agriculture, accounting for Euro 3,826/AWU, being by 75 % lower than the EU average and by 11.62 % lower than the one recorded in Romania as presented by Burja (2014). [2]
A recent study proved that in Romania, farm structure is a major problem with a negative impact on labour productivity. The farms over 100 ha UAA exceed the EU-27 averages with regard to the indicators assessing economic performance. The farmers owning less than 10 ha achieve lower performance in agriculture below the EU-27 average: by 93% less in standard output value, by 91%
less hectares of UAA and 90% less in LSU per holding. They produce by 85 % agricultural output, and manage fewer hectares per full-time equivalent worker (80%).The farms whose size varies between 10 and 100 ha represent just 2 % of the total number of holdings and utilize 12.3% of total UAA. This farm sized model is closer to the EU average performance: 63% of the SO value/holding, 63% more hectares of UAA and 8% less in LSU per holding. However, the economic output per full-time equivalent worker is lower than the EU-27 average, as is the number of hectares managed per AWU. But, this farm model should be supported to develop and improve farm structure in Romania and contribute to the increase of labour productivity, production and product quality, competitiveness and efficiency in this economic sector as affirmed Tudor Monica Mihaela (2014). [16]
The main causes of the low labour productivity in Romania's agriculture are the following ones:

(i)The low technical endowment in agriculture and low investment in fixed assets;'

(ii)the high number of persons employed in agriculture or dealing with agricultural works to compensate the lack of modern machinery, equipments;

(iii)the low production performance determined by the extensive technologies used and low inputs (fertilizers, herbicides, pesticides) and also the use of low potential biological material;

(iv)the non corresponding farm structure, dominated by subsistence and semi-subsistence farms lacked of modern fixed and financial capital;

(v)the low training level of the farmers, most of them practicing traditional agriculture; only 1 % agricultural holdings are market oriented commercial companies, managed by high qualified managers, able to carry out high productions and high quality agricultural products and assure the profitability and competitiveness of their agricultural holdings;

(vi)the rural population aging and the high share of women working in agriculture, many of them having a low training level and weak managerial skills;

(vii) a few number of farmers' organization forms (co-operatives or producers' associations) to enable them to use their fixed, financial and human capital in a more efficient manner, to assure inputs at a lower price and sell much better their agricultural products on various markets to get a higher price;

(viii)the lack of attraction of agriculture for the young generation who prefer to migrate to cities looking for better paid jobs as long as work motivation in agriculture is weak, as income coming from full time agriculture is very small compared to other economic sectors or in the EU agriculture.

(ix)the climate conditions and mainly the climate change which have a stronger and stronger influence on the agricultural production.

CONCLUSIONS

Labour productivity in Romania's agriculture reflects a low work efficiency in this sector of the economy where many efforts are done and many times the results do not meet the expectations.

Labour productivity in agriculture, forestry and fishery is lower than in industry, constructions, trade etc and also compared to the EU average and with the one recorded in almost all the EU-28 member states.

From this point of view, Romania comes on the penultimate position in the EU-28, being followed only by Bulgaria.

To increase labour productivity, it is necessary an important financial support for farmers to develop the endowment and modernized their farms, to apply the modern technologies, increase production and product quality and profitableness.

Knowledge transfer should be assured by a deeper involvement of the agricultural consultancy system in farmers training, the delivery of good practices and farm models and the development of technical and managerial skills.

Young farmers should be stimulated, supported and encouraged to set up their business in agriculture and be aware that agriculture is a profitable sector in the economy.

Also, traditional industries and services should be developed in the rural areas for assuring jobs and increasing income and the living standard of the rural population and the economic viability of the rural households.

According to the Horizon 2014-2020 Programme launched by the EU to strengthen the agriculture and rural development by an important financial support allocated for knowledge transfer, modernization of the small and semi-subsistence farms, young and women farmers training, increase of profitableness and competitiveness, and assure the sustainable development of the rural areas.

REFERENCES

[1]Boghean Carmen, State Mihaela, 2013, Analysis of the factors affecting the average labour productivioty variation in agriculture, forestry and fishing in Romania, the University of Suceava Annals of Economics and Public Administration, vol,13,2(18):35-42

[2]Burja Vasile, 2014, Some aspects of employment in Romania's agriculture on the European context, Annales Universitatis Apulensis Series Oeconomica, 16(1), 2014, 41-51

[3]Ciutacu C., Chivu, L., Andrei, J.V., 2014, Similarities and dissimilarities between the EU agricultural and rural development model and Romanian agriculture. Challenges and perspectives, Land Use Policy, Volume 44, March 2015, 169–176

[4]EU, European methodology annexed to Regulation (EC) No 138/2004 of the European Parliament and of the Council of 5 December 2003 (with further additions) on the economic accounts for agriculture in the Community

[5]EU Report 2010, ANNEX A - Glossary of Terms & Definitions,http://ec.europa.eu/agriculture/agrista/rurde v2010/RD_Report_2010_Annexe-A.pdf

[6]Martin-Retortillo Miguel, Pinillia Vicente, 2012, Why did agricultural labour productivity not converge in Europe from 1950 to 2005?, EHES Working Papers in Economic History, No.25, Oct.2012

[7]Popescu Agatha, 2013a, Considerations on the Rural Population as a Resource of Labor Force in Romania, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.13(3):229-236

[8]Popescu Agatha, 2013b, Considerations on the main features of the agricultural population in the European Union, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.13(4):213-220

[9]Popescu Marin, 2009, Labour employment in Romania's agriculture and labour productivity increase. Gaps between Romania and European Union, Agricultural Economics and Rural Development, New Series, Year VI(2):181–197 ftp://www.ipe.ro/RePEc/iag/iag_pdf/AERD0902_181-198.pdf;

[10] Romania's Statistical Yearbooks, 2008-2013. National Institute for Statistics, ww.insse.ro

[11]Socio-economic analysis in the prospect of the rural development 2014-2020, MARD, Authority of Management for NPRD, http://www.madr.ro/docs/dezvoltare-rurala/Descrierea_generala_a_situatiei_economice_actu ale_4_11_2013.pdf

[12] Study of the National Commission of Forecast on "Agricultural Holdings Consolidation", 2012

[13]Swinnen Johan F.M., Van Herck Kristine, 2009, Vranken Liesbet, Agricultural Productivity in Transition Economies, Choices, 4th Quarter 2009, 24(4)

[14]Tofan, A.,2005, Labor Productivity in Agriculture, Scientific Annals of Alexandru Ioan Cuza University, Iasi, 441-447

[15]Trasca Daniela, 2015, Challenges of agricultural companies from the perspective of labour productivity and funding access, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.11(1):533-537

[16]Tudor Monica Mihaela, 2011, Performance of the farm management in Romania after 20 years of transformations, Scientific Papers Agricultural Management, Series I, Vol.XVI(2):17-25