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# LAND FRAGMENTATION MANAGEMENT-KEY IN RURAL ECONOMY DEVELOPMENT

Empirical study

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## Keywords

Land fragmentation  
Rural economy  
Land property  
Agricultural holding

## JEL Classification

Q15

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## Abstract

*The present paper aims to analyze the current state regarding the property and exploitation of the agricultural land and to formulate solutions concerning the rural economy development with a starting point anchored in the consolidation of the agricultural holdings and the excessive land fragmentation management.*

*A developed rural economy which reduces the poverty of the population living in this environment is based on the proper exploitation of the agricultural land. The faulty law system regarding the agricultural land property has led to its excessive fragmentation, a fact that possesses a problem in achieving efficient land exploitation.*

## **Introduction**

The current situation of the rural areas in Romania is characterized by low development due to an inefficient exploitation of the agricultural land. This situation has major and negative influence on the living standards of the rural population and on creating competitive products which are capable of ensuring the food security and safety of the country. The main reason of this situation is represented by the land fragmentation. This excessive land fragmentation is the result of the huge numbers of agricultural land owners caused by the agrarian reform produced in 1991 by the Land Law No. 18. This affects the exploitation of the land and the productivity and therefore the development of the rural areas. In order to develop the rural area the key of the solution is held by beginning from the basis. In this situation the base is considered the current picture of the exploitation and property land structure. In the economies based on private property, the calculation related to efficiency and economic rationality takes place in the market frame while state property generalization distorts the market signals because it makes practically impossible the competition between the economic agents and by this, decreases the system efficiency (Constantin, 2007).

It is difficult an attempt to develop the Romanian rural space without managing and modifying the agricultural land fragmentation's current situation. Without the holdings consolidation and their resizing in the direction of increasing the economic size in order to make them stronger and capable to resist on the market, the process of rural space development becomes heavy and slow.

## **Main causes of excessive agricultural land fragmentation**

The current situation of excessive agricultural land fragmentation is caused mainly by the modification that interfered in the agrarian policies field practiced during time. Governments intervene in the agricultural sector through policies that both support and shape agricultural production (OECD, 2008). Starting from the consideration that all the agrarian reform regarding the land had the roots in changes at the property level, the Law 18/1991, also known as Land Law which can be applied retrospectively (Romanian Parliament, 2006), can be approached as one of the main justification of agricultural land fragmentation. The explanations on this purpose are found in the issuance of this law without making also clear the modalities and methods of its application.

The main inconveniences caused by this law may be considered:

- the appropriation and allotment of land surfaces in arable equivalent of 0,5 up to 10 hectares per family which determined land parcelling and small sizes underperforming exploitation;
- the incapacity of appropriation and allotment of all ex-owners in the residence area, a fact that determined an extra effort for the farmers in the land exploitation;
- the impossibility of land restitution in the initial areas due to the precarious existing records;
- the migration of agricultural land ex-owners to other localities or to urban areas determined complications regarding the exploitation of the resituated land;
- the death of original agricultural land ex-owners caused difficulties regarding the appropriation and allotment of their descendants;
- the division of appropriated and allotment land in several areas due to the availability;

-the prohibition of land alienation provided by the initial law supported the small sized holdings;

-the release of property titles on the same emplacement caused problems in exploitation of the land.

This cause generated the main agricultural land fragmentation factor which is the big number of agricultural land owners.

Another cause of excessive land fragmentation is considered the aged rural population. This population represents the persons that lived in the communist period, fact that determined a reluctant thinking concerning the cooperation, association or any other form of transferring the property or the utilization of the land they hold. The fear of losing their property becomes higher than the will to progress and develop or even to practice a modern agriculture which is able to allow the obtaining of reasonable incomes that offer them a higher living standard. The key of solving this situation can be found in the simple management criteria definition which can allow decentralized agents to act freely in a manner in which their behaviour can be in accordance with the general interest (Kantorovic, 1963).

The land fragmentation is also justified by the lack of financial funds which determines the farmers to practice an extensive agriculture and reduces the possibility of obtaining incomes that allows the increase of economic size of the holdings.

To these causes it can also be added the high number of subsistence and semi-subsistence holdings existing in the rural areas. This type of holdings are not viable and do not encourage the agriculture development due to the reduced performance they have and also due to the fact that the products obtained reach the market in small part or not at all. The land

exploited like this rarely makes the object of sell or even lease because in many cases they represent the only family source of living. It has to be considered that the rent, as a price of the land lease, should equally gratify the interest of those two marketer partners, land owner and leaseholder (Popescu, 2007).

### **The current situation of exploitation the agricultural land**

The exploitation of agricultural land in Romania is inefficient due to the existing of big differences both at physical and economic level of the holdings sizes. There are found on the one hand agricultural holdings of small size with an extremely low performance and big size and independent holdings with straight on the Romanian market but uncompetitive on the European market on the other hand.

### **Average physical size on a holding analysis**

Concerning the average physical size of a holding, at the EU27 level in the year 2007, as shown in Figure 1 - Average physical size per agricultural holding, it had a value of 12.6 hectares per holding. At the Member States level the highest value of this indicator was reached in Czech Republic and was 89.3 hectares per holding. With more than 50 hectares per holding are distinguished the states: Denmark (59,7 hectares per holding), France (52,1 hectares per holding) and United Kingdom (53,8 hectares per holding) and the value of this indicator in Germany reached 45,7 hectares per holding. At the other pole there are the states: Malta with 0,7 hectares per holding, Romania with 3,5 hectares per holding, Ireland with 4,7 hectares per holding, Bulgaria with 6,2 hectares per holding, Poland and Slovenia with 6,5 hectares per holding each. This situation highlights the differences and the major deviation from the

EU27 average of this indicator. The main explanations of this situation are found in the total surface of agricultural land, the model and manner of agricultural land exploitation and the number of holdings. This situation has a great influence on the development degree of the agriculture in every Member State and even of the rural areas. The causes that led to this situation are found both in agrarian and agricultural policies developed in these states and are highly connected to the historical evolution of each Member State and the type of economy that functioned during time in these countries.

The small sized holdings are incapable to support themselves and they not dispose of financial funds that allow them a productive exploitation and a future development and consolidation. This fact explains the situation concerning the rural area development of Member States and the discrepancies between them.

### **The number of holdings according to the physical size**

Regarding the number of holdings according to the physical size, the data are presented in Table 1 - Total number of the agricultural holdings and the share of the different size class in total, the highest number of holdings is owned by Romania with 3931350 agricultural holdings of which 89,8% are represented by holdings with physical size under 5 hectares. At the EU 27 level in 2007 there were 13700400 agricultural holdings of which 70.4% were agricultural holdings with a physical size smaller than 5 hectares, 24.5% were holdings with the physical size between 5 and 50 hectares. The analysis of this indicator reflects the degree and the form of exploitation of agricultural land. Thereby also this indicator demonstrates a polarization in terms of agricultural holdings according to their physical size by allocating

them according to the number of hectares exploited per farm. Consequently the states can be classified as follows: states with the highest percentage of holdings whose physical dimension is less than 5 hectares (most of the states: Bulgaria, Czech Republic, Greece, Spain, Italy, Cyprus, Lithuania, Hungary, Malta, Poland, Portugal, Romania, Slovenia and Slovakia), states with the highest percentage of holdings whose physical dimension is between 5 and 50 hectares (the case of Belgium, Denmark, Germany, Estonia, Ireland, Latvia, Holland, Austria and Sweden), states with the highest percentage of holdings whose physical dimension exceeds 50 hectares (the case of Luxembourg) and states whose distribution of holdings according to physical size maintains a balance (the case of France and United Kingdom). This classification justifies the major influence of the agriculture development degree of the rural areas in general. Is worth mentioning that although the first category, namely holdings with physical size smaller than 5 hectares, owns an important percentage in some Member States it should not be overlooked the fact that these holdings may have surfaces close to 5 hectares but also may have much more less than 5 hectares. This situation is majorly influenced by the manner of exploitation of those surfaces and also by the results obtained. An efficient exploitation of those surfaces allows the obtaining of financial results that can be utilized in the purpose of increasing and developing the holding.

### **Average economic size of the holdings analysis**

The relation between land property and agricultural exploitation has represented a permanent concern in history (Popescu, 2001). The economic size reflects a similar situation regarding the agricultural holdings

according to Figure 2 – Average economic farm size. Therefore the agricultural holdings are divided into agricultural holdings with less than 2 ESU, agricultural holdings from 2 to 100 ESU and agricultural holdings with over 100 ESU.

Average economic size of agricultural holdings in the EU-27 is 11.3 ESU. This average is constructed by average economic size of each state and the main feature is defined by states with high values of this indicator and states with very low values of this indicator. States with high values of this indicator are represented by Netherlands with 111.3 ESU, Denmark with 80.2 ESU, Belgium with 70.3 ESU, France with 53.6 ESU, Luxembourg with 51.7 ESU and Germany with 59.5 ESU. At the other pole are situated Romania with 1 ESU, Bulgaria with 2.2 ESU, Lithuania with 2.5 ESU, Latvia with 3.1 ESU, Hungary with 3.2 ESU and Poland with 3.6 ESU. It can be observed that the states with a reduced physical size of the holding also have a reduced economic size and the ones with large physical size also have large economic size. This fact is explained by the farmers' power of exploitation. Because on a smaller surface of land the product costs are higher due to fixed costs, the products are not competitive enough on the market; therefore economic size cannot be larger. If we analyze the case of states with small physical size, as in the case of Romania, can be added that excessive fragmentation land does not allow the development of autonomous holdings and blocks further the agriculture in the sphere of subsistence and semi-subsistence. Lower efficiencies per hectares caused by the financial inability of farmers to invest in physical resizing of holdings and also the reluctance concerning the land alienation, association and cooperation in agriculture prevent the holdings development and consequently limit the rural development.

### **The effects of excessive agricultural land fragmentation**

The excessive agricultural land fragmentation has effects which are felt at the level of land exploitation and further in the obtained results, yields and share of agriculture in the GDP.

### **The yields analysis**

The yields for wheat, maize and sunflower are presented in Table 2 – Yields for wheat, maize and sunflower. From the analysis of yields for maize, sunflower and wheat it can be observed that Romania and Bulgaria are situated very low under the European Union averages in some cases the differences are up to half, Poland is approaching the averages and France and Germany exceed the averages. Analyzing the evolution in time, it can be noticed that there are oscillations especially in the case of Romania and Bulgaria. These oscillations can be justified by the manner of exploitation of the agricultural land and by the degree of agriculture intensivity in the Member States. Regarding the intensivity, this kind of agricultural land use is characterized by a massive infusion of inputs (Popescu and Constantin, 2004). Likewise, an explanation in this regard can also be formulated through the capital goods and the resources of the farmers, which are not constant, and are required sometimes, by the agriculture specificity, as unpredicted resources in order to cover the risks.

### **Share of agriculture in the GDP**

Regarding the share of agriculture in the GDP it can be observed that the states with small size holdings both economic and physical have high shares according to data presented in Figure 3 – Share of agriculture to the GDP. This fact is explained by the underdevelopment of the other economic branches, especially the industry. Also the high share of the agriculture in the GDP

reflects the degree of development of the rural areas. It can be observed that in the states with performing agriculture the share of the agriculture in the GDP is reduced; this indicates the involvement of rural population in activities with non-agricultural nature. EU27 average in 2007 was 1.2%, while at Member States level in Sweden and in the UK the contribution of agriculture to GDP was 0.4 each and 0.6% in Germany. Romania has a value of 5 times higher of this indicator; it records a contribution of agriculture to GDP of 5.1%. This situation supports the idea that the physical size of agricultural holdings has indirect influence on economic development in the rural area or making a contribution in terms of overall economic development.

### **Land fragmentation management**

The effects that agricultural land fragmentation has on rural development are materialized in:

- practicing an underperforming agriculture incapable to sustain the population necessities and to generate competitive products on the market;

- slowing the process of orientating the farmers towards non-agricultural activities by the absence of attractiveness of alienating the land that they have in possession;

- reduced incomes for farmers due to exploiting preponderantly the small size both economic and physical holdings;

- maintaining the living standard of rural area population at a low level, inferior to the one in urban;

- preventing the reduction of territorial disparities and social economic cohesion.

An efficient management of agricultural land fragmentation can be realized by applying coherent agrarian policies in concordance with the agricultural policies. The modifications that lead to

increasing the average size of agricultural holdings influenced the rural area development by the correction of the agricultural land fragmentation effects. Solving the problems related to cadastre and land register represent the starting point in managing this situation of land fragmentation.

### **Conclusions**

Between the agricultural holdings size and the development of rural economy there is a tight connection. The excessive agricultural land fragmentation represents an impediment in terms of developing by the difficulties that this problem creates at the level of practicing the agriculture and performing non-agricultural activities in the rural areas.

The productive potential with special referring to the large surface of agricultural land that Romania has and that is inefficiently exploited leads to practicing an underperforming agriculture and consequently to a low living standard level of the rural areas population. The efficient management of the fragmentation solves the problems concerning the aligning of Romania to the others Member States regarding the rural areas. The consolidation of Romanian agricultural holdings and the resizing of the subsistence and semi-subsistence holdings into autonomous and independent agricultural holdings determine a decrease of rural population and of population occupied in agriculture and consequently, the efficient management of agricultural land fragmentation supports the rural economy development.

### **References**

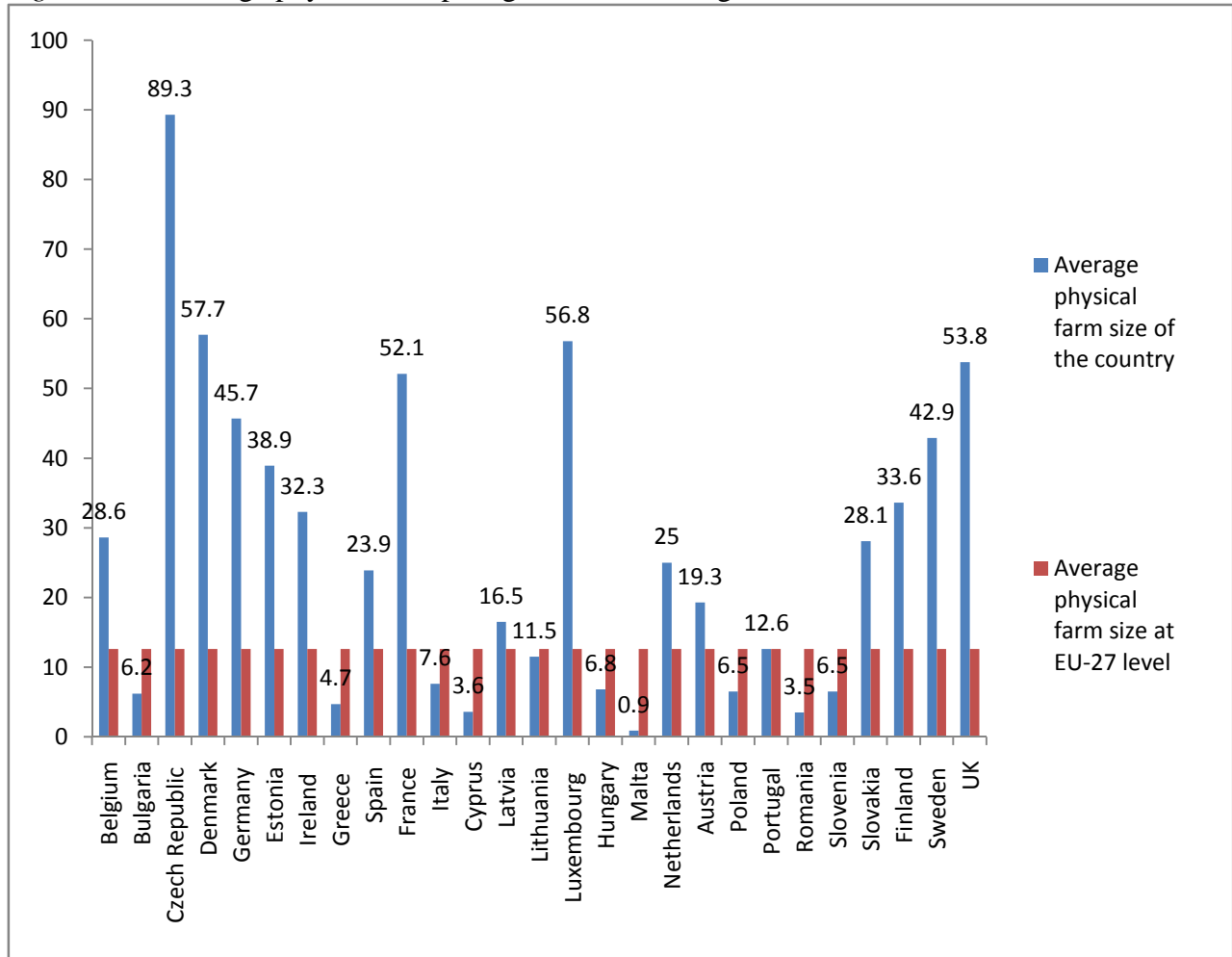
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Appendix A

Figure No.1 Average physical size per agricultural holding, 2007



Source: European Commission Reports 2012,  
[http://ec.europa.eu/agriculture/statistics/agricultural/index\\_en.htm](http://ec.europa.eu/agriculture/statistics/agricultural/index_en.htm)



Appendix B

Table No. 1

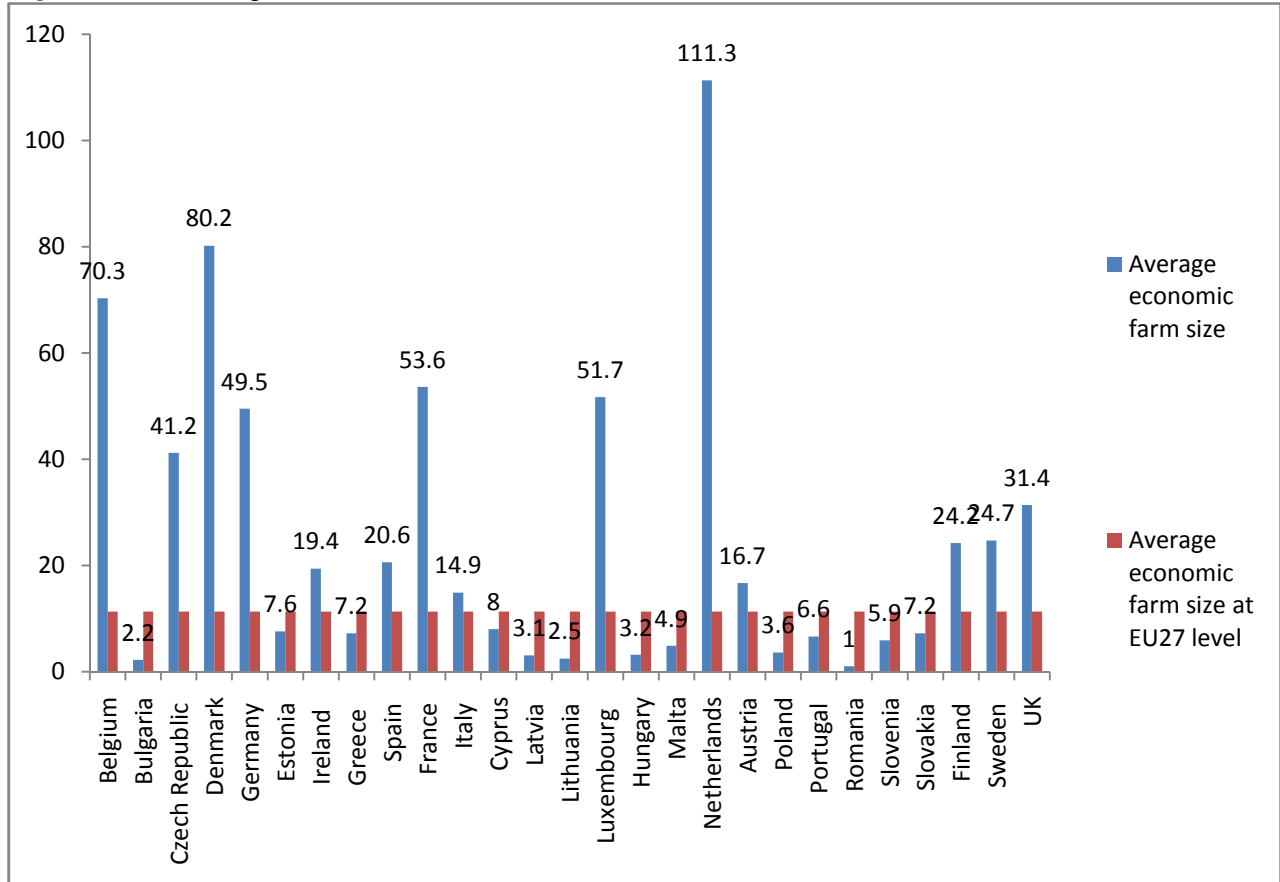
Total number of the agricultural holdings and the share of the different size class to total, 2007

Country	Total number of agricultural holdings	<5ha	>=5-<=50 ha	>=100 ha
Belgium	48010	25,4	56,3	18,3
Bulgaria	493130	94,9	3,9	1,3
Czech Republic	39400	50,4	33	16,7
Denmark	44620	3,7	62	34,2
Germany	370480	22,6	54,4	23
Estonia	23340	36,1	52,8	11,1
Ireland	128240	6,5	75,7	17,7
Greece	860150	76,2	23	0,8
Spain	1043910	52,8	37,5	9,7
France	527350	24,7	37,9	37,4
Italy	1679440	73,3	24,3	2,4
Cyprus	40120	86,5	12,6	1
Latvia	107750	40,9	54,4	4,7
Lithuania	230270	60,5	36,5	3
Luxembourg	2300	17,9	34	48
Hungary	626320	89,4	8,6	1,9
Malta	11020	97,4	2,6	0
Netherlands	76740	28	57,5	14,5
Austria	165420	33,5	59,7	6,8
Poland	2390960	68,5	30,5	1
Portugal	275080	72,6	23,9	3,6
Romania	3931350	89,8	9,8	0,4
Slovenia	75340	59	40,4	0,5
Slovakia	68990	87,2	8,6	4,2
Finland	68230	9,7	69,6	20,7
Sweden	72610	15	60,3	24,7
United Kingdom	299830	39,8	35,5	24,7
EU-27	13700400	70,4	24,5	5,1

Source: European Commission Annual Reports 2012,  
[http://ec.europa.eu/agriculture/statistics/agricultural/index\\_en.htm](http://ec.europa.eu/agriculture/statistics/agricultural/index_en.htm)

Appendix C

Figure No.2 Average economic farm size, 2007, ESU/farm.



Source: European Commission Annual Reports 2012,  
[http://ec.europa.eu/agriculture/statistics/agricultural/index\\_en.htm](http://ec.europa.eu/agriculture/statistics/agricultural/index_en.htm)

Appendix D

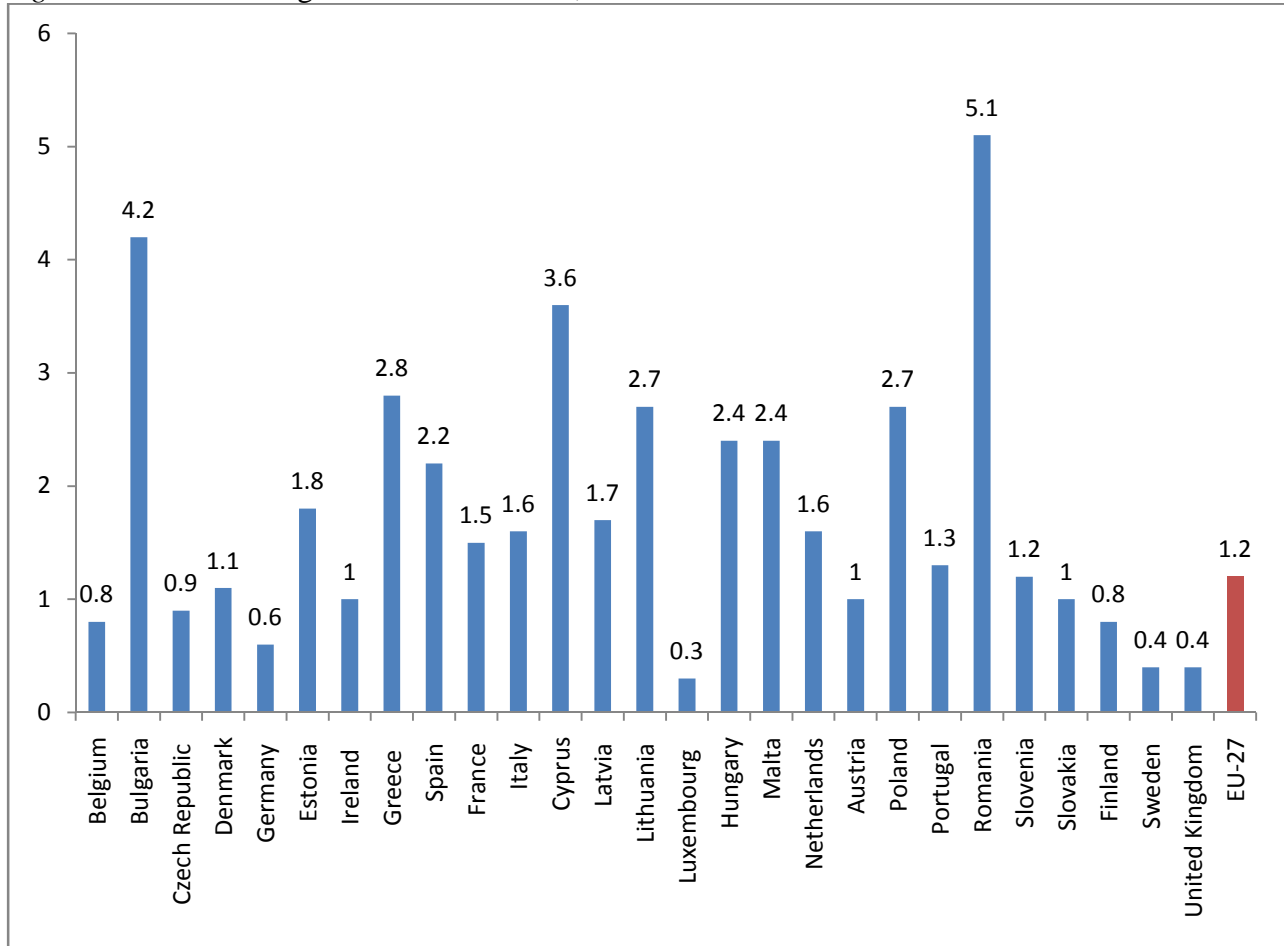
Table No. 2  
*Yields for maize, sunflower and wheat(kg/ha)*

	<b>item</b>	<b>2007</b>	<b>2010</b>	<b>2012</b>
Bulgaria	Maize	1459,5	6251,6	3679,9
	Sunflower seed	937	2104,9	1777,5
	Wheat	2197,3	3599,2	3759,6
France	Maize	9672,7	8831,3	9085,4
	Sunflower seed	2524,1	2362,7	2313,3
	Wheat	6254,2	6441,9	7599,2
Germany	Maize	9447,5	8785,4	9786,3
	Sunflower seed	2654,5	1891,6	2378,8
	Wheat	6961,1	7310,2	7328,3
Poland	Maize	6574 ,3	5745,6	7348,1
	Sunflower seed	1745,9	1505,3	1761,3
	Wheat	3938,1	3943,2	4143,8
Romania	Maize	1703,0	4317,6	2187,0
	Sunflower seed	730,6	1606,7	1313,2
	Wheat	1610,0	2700,0	2659,3
UE 27	Maize	6048,3	7193,0	6055,7
	Sunflower seed	1481,1	1855,2	1637,5
	Wheat	4842,2	5157,6	5336,9

Source : faostat.org

Appendix E

Figure No.3 Share of agriculture to the GDP, 2007



Source: European Commission Reports 2012,  
[http://ec.europa.eu/agriculture/statistics/agricultural/index\\_en.htm](http://ec.europa.eu/agriculture/statistics/agricultural/index_en.htm)