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COMPARATIVE ANALYSIS OF THE LAND FRAGMENTATION AND ITS IMPACT ON THE FARM MANAGEMENT IN SOME EU COUNTRIES AND MOLDOVA

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Abstract

The paper presents selected problems of farm management in terms of fragmented agriculture. The problem of land fragmentation was exemplified by the three countries of Central and Eastern Europe. The main purpose of the study was to compare the effectiveness of selected indicators of agricultural production in the three selected countries. For the analysis, the data on the concentration indexes was selected: Lorenz concentration coefficient, the Gini index, and territorial concentration coefficient (Gini C and Stuck formula). In selected countries, there is a large number of small and very small farms. They represent the majority of farms managed by private owners. To a large extend, they are called semi-subsistence farms or social farms. Some of them provide a part of their products on the market. Small farms are the part of the so-called European Model of Agriculture – a model that consists of small family farms. It is difficult to indicate correct definition of „small farm", as it may be defined differently depending on the region or country. In the EU, small farms occupy a dominant position, being a constant subject of debates and policy. The authors of the article stressed the need of strengthening of the small farms position, for example by enlarging their acreage or by initiating horizontal or vertical cooperation, however, shall not impair the role of small farms. They are important in biodiversity protection, preserving the rural landscape, as well as by cultivation local tradition, culture and heritage.

Key words**:** *European model of small farms, land fragmentation, concentration index, land productivity, farm management, the role of small farms*

INTRODUCTION

Nearly 14 million farmers manage in the EU and the average farm size is 15 hectares. The biggest agricultural holdings are located in Czech Republic (the average farm size is 90 hectares) and Denmark (60 hectares) and the lowest in Romania (3 hectares), Poland (6 hectares), Bulgaria (6 hectares), Hungary (7 hectares) and Italy (8 hectares) [Eurostat 2014] [5].

Land fragmentation and the system of small farms is known as the European Model of Agriculture (EMA) [Kowalczyk, Sobiecki 2011] [9]. Fragmented agriculture, family farms and, what should be stressed, very diverse, characterize European agriculture. There are many agricultural enterprises and organic farms, nevertheless very small and medium-sized farms have a dominate position [Musiał, Drygas 2013] [13]. European agriculture still represents a fragmented model of agriculture and is in a large part family-managed. Very often, the land is cultivated from generation to generation: when retired owners pass the farm in the hands of their children [Poczta 2010]. The use of direct payments under the Common Agricultural Policy of European Union is for sure an incentive to keep small farms, as well as significantly affect the increase in land prices [Światły, Turnau, Majchrzak 2011] [27]. What`s more, introduced modulation (reduction of direct payments for the largest farms) will cause in splitting the big farms into smaller ones [Zegar 2008] [32].

Although European Model of Agriculture is fragmented and based on family farms, the

concept of "small farm" is not very clear. For the criterion of defining the utilized agricultural area can be taken, as well as economic output, added value, allocation of production, work force, the source of income, etc. [EU Agricultural Economic Briefs: What is a small farm? 2011; The European Model of Agriculture – Challenges Ahead 2006] [5, 28]. Because of the size, the "small farm" may be the farm of 2 hectares in Poland, Romania or Moldova, while in France or Great Britain, we may consider small farm with the area of 30 or 50 hectares.

Over the years, we can observe slow increasing in the average farm size in the EU: between 2003 and 2010, the average farm size increased from 12 to 14 hectares. At the same time, the number of farms reduced between 2003 and 2010 by 20% [Eurostat 2014] [5]. However, small farms still dominate in Europe, and those above 50 hectares are only 5% of all farms. In relation to other countries in the world, e.g. the USA or Australia, these farms are still very small [Tóth 2014] [29].

In this context, the main purpose of the research was to assess the degree of the land fragmentation in three countries in the Central and Eastern Europe (Poland, Romania and Moldova), taking into account its impact on the land productivity and management.

MATERIALS AND METHODS

The rate of land productivity was used defined as the value of agricultural production per 1 hectare of utilized agricultural area (UAA).

To assess the degree of land fragmentation the calculations of Majchrzak [2014] [10]were used: Lorenz concentration coefficient and the Gini index.

The Lorenz coefficient reaches values of <0,1>, where the closer to 0 the lower the concentration is, the closer to 1, the greater the concentration with the respect to a fixed variable is. In the paper, concentration with the respect to farms greater than 50 hectares was taken into account. In turn, the Gini index is a measure of inequality of the random variable. It also ranges from 0 to 1, but the value of zero means complete uniformity and the growth of rate represents the increase of inequality [Statystyczne studium struktury agrarnej w Polsce, 2010] [24]. For Moldova case study, the territorial concentration coefficient (Gini C and Stuck formula) were also used.

For the calculations statistical data of Eurostat, data from the Central Statistical Office in Warsaw, the data of the Agency for Restructuring and Modernization of Agriculture and Ministry of Agriculture from Moldova Republic, National Bureau of Statistics from Republic of Moldova were used, as well as scientific publications and research results.

The study focused on the analysis of mentioned factors in relation to three selected countries: Poland, Romania and Moldova. The strong similarity can be indicated in the level of development in agriculture, and similar problems faced by these countries. They characterized by a fragmented agrarian structure, low average farm size and a high employment in agriculture [Gospodarstwa rolne w Polsce na tle gospodarstw Unii Europejskiej – wpływ WPR, 2013] [6].

RESULTS AND DISCUSSIONS

Agriculture in Poland is very fragmented: the average farm size in 2014 amounted to less than 11 hectares (but significantly differs in different regions) [www.arimr.gov.pl] [33]. Despite a slight impact on the creation of added value this sector involves a large group of employees – about 12% (3.8 million people working in agriculture). Poland is among the countries with the large number of farms: more than 1.5 million according to Eurostat. Nearly 1.3 million farmers receive direct payments [Rolnictwo w 2014; Agricultural census, Eurostat 2010] [1, 21]. Unfavorable structure of agriculture is the result of many factors, including agrarian overpopulation, agricultural reforms (especially the reform of 1944), social conditions, the results of political transformation, as well as the current EU Common Agricultural Policy [Struktura agrarna – Land structure] [26].

As we can see in Figure 1, small farms dominate: a half of Polish farms had less than 5 hectares of agricultural land. Only 8% of all

farms have more than 20 hectares but they manage almost a half of utilized agricultural area in Poland. Farms with more than 100 hectares covered 22% of agricultural land, but they represent only 1% in the structure of all farms (Fig.1).

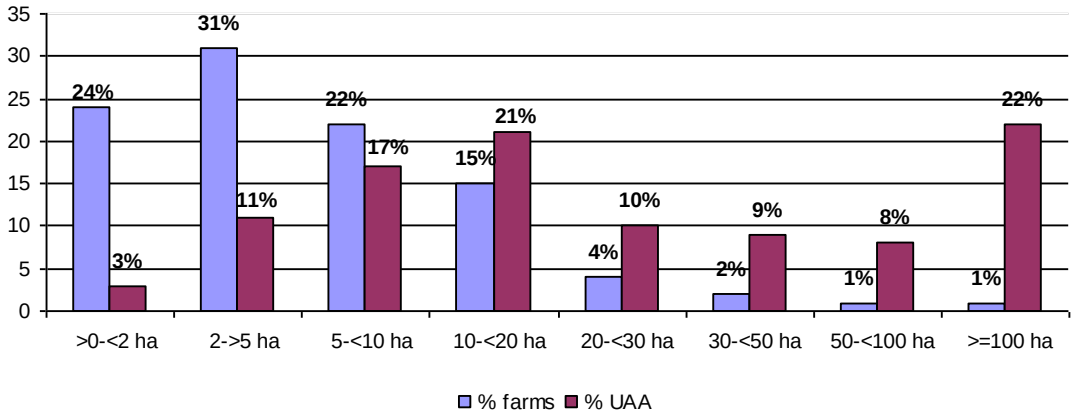

Fig. 1. Distribution of agricultural holdings and UAA in Poland in 2010 (in %)
Source: Agricultural census, Eurostat 2010 [1].

Agriculture is a very important sector in Romanian economy. It covers more than 3.5 million of farms and employs over 28% of the national workforce – the first position in the EU-27, followed by Poland. Family-run and semi-subsistence farms have a dominant position [Popescu, Condei 2015] [19]. The utilized agricultural area is also very large compared to other countries. The huge decrease can be observed in the number of farms (-14% between 2003 and 2010) but still Romania struggles with a very fragmented agriculture [Agricultural census, Eurostat 2010] [1]. Around 90% of all farms manage no more than 5 hectares, which means a huge fragmentation (Fig.2).

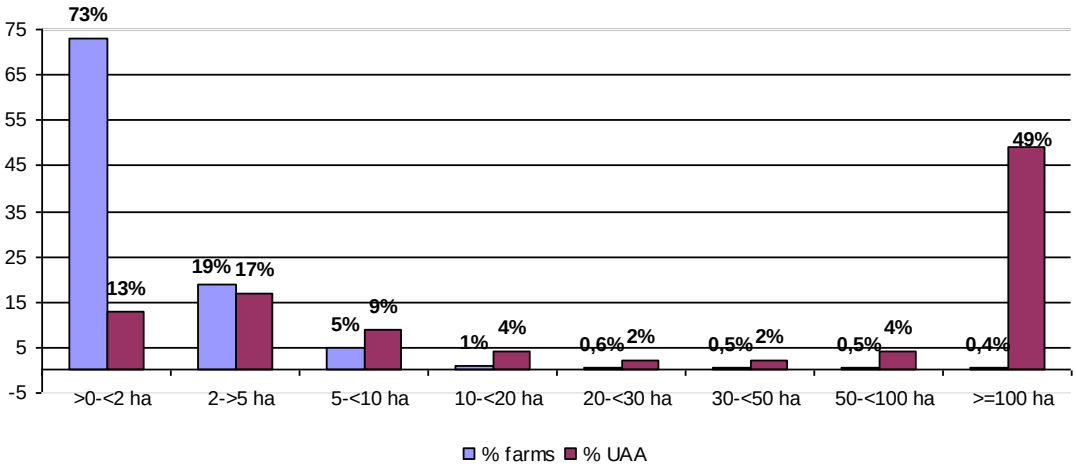

Fig. 2. Distribution of agricultural holdings and UAA in Romania in 2010 (in %)
Source: Agricultural census, Eurostat 2010 [1].

The average farm size is about 3.7 hectares; what's more, farms are fragmented because they consist of many small parcels. The land fragmentation is partially the result of the land restitution from 1990s. According to Popescu [2009] [20]. due to a large fragmentation of agricultural land, there is a need of initiating the processes of land consolidation.

Agriculture in Moldova is also very fragmented. The land reform of 1991 and post-land reform development have resulted in a polarized agricultural structure with an

average land individual farm of 2 hectares, typically distributed in 3-4 parcels. Unfavorable structure of agriculture is the result of many factors, including agricultural reforms (especially the reform of 1990-1992), social conditions and the results of political transformation. In many cases, the fragmentation of land parcels has prevented the land market from developing [www.fao.org.nr] [35]. Now the average private farm size in 2014 amounted to less than 4 hectares (but significantly differs in different regions). Farms with large acreage (more than 100 ha) are usually agricultural holdings (companies or cooperatives), and small farms with the area up to 5 hectares are run privately by farmers. Despite a slight impact on the creation of benefit, this sector in Moldova involves a large group of employees – about 361 thousand people work in agriculture [www.statistica.md] [34].

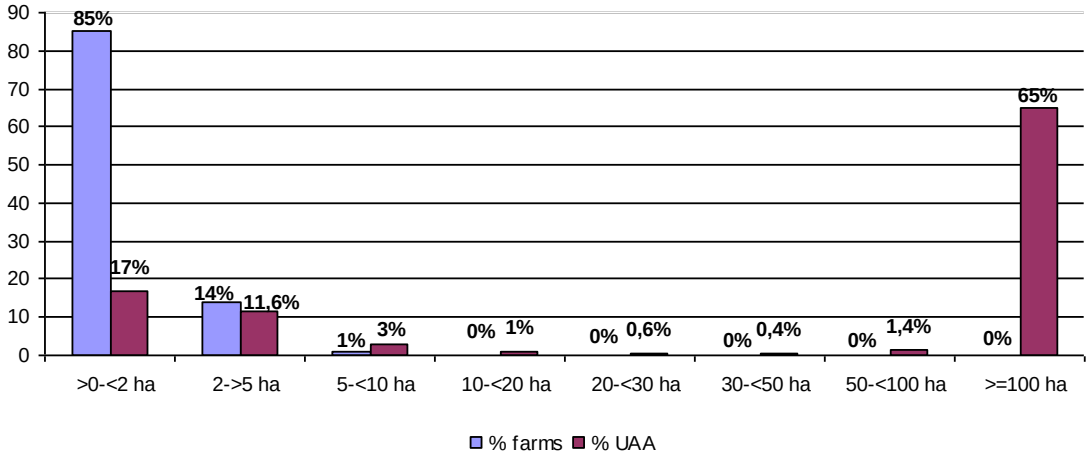

Fig. 3. Distribution of agricultural holdings and UAA in Moldova in 2010 (in %)
Source: Statistical Yearbook of the Republic of Moldova, National Bureau of Statistics 2011[23].

According to Eurostat, in 2010 in the EU were over 12 million farms and almost 30% of them located in Romania [Eurostat 2014] [5]. A significant share in the structure of the EU farms have the Polish farms, with a share of 12.3% (Table 1). Currently, Poland has about 715 thousands farms with an area of 5 hectares, in Romania over 3 million. Moldova has almost 400 thousands of peasant farms (33% of all farms). The remaining part are agricultural cooperatives (232), joint stock companies (161) and limited liability companies (36240) [www.statistica.md] [23]. In the group of Moldovan, family (peasant) farms almost all manage the area of 5 hectares or less.

A systematic decrease in the number of farms in the EU can be observed, the same in Poland, Romania and Moldova, with the largest reduction in the group of farms with the smallest area [Alexandri, Luca 2012; Poczta, Śledzińska Mrówczyńska-Kamińska 2009] [3, 15].

In the same time, the number of larger farms, over 20-30 hectares, is growing. Despite the positive changes, in those countries there is still a very big group of small farms compared to the other European regions [Poczta 2010] [16].

The share of farms with the area of 5 hectares in the structure of all farms in Poland is 55% and in Romania 92% (Table 1), in Moldova is almost 30%. What`s more almost 40% of farms in Poland and twice as much in Romania allocate a half of agricultural production for family consumption [Agricultural census, Eurostat 2010] [1]. Taking into account the number of farms (private ownership) in Moldova the changes can be seen (Table 1). Over the years, the number of farms is increasing. The effects of consolidation can be seen: the number of larger farms is growing and the number of small farms is reducing. The biggest increase is seen in the group of 5 to 50 hectares. This is the result of systematic enlargement of small farms with the area of 5 hectares. However,

still 98% of family farms in Moldova have less than 5 hectares, and these farms work on 42% of total agricultural land [Ignat, Moroz 2013] [7].

Table 1. Chosen characteristics of agriculture in the EU, Poland, Romania and Moldova

Number of farms [thousand]	EU 27	Poland	Romania	Moldova
2003	15,021	2,172	4,484	1,125
2005	14,482	2,476	4,256	1,113
2007	13,700	2,390	3,931	987
2010	12,248	1,506	3,859	902
Change (2007-2003)	-2,773	-665	-625	-223
Number of farms <5 ha [thousand]	EU 27	Poland	Romania	Moldova
2003	10,959	1,440	4,205	746
2005	10,349	1,750	3,870	427
2007	9,644	1,637	3,530	229
Change (2007-2003)	-1,314	+196	-674	-517
Number of farms 5-<20 ha [thousand]	EU 27	Poland	Romania	Moldova
2003	2,538	619	256	127
2005	2,615	608	355	158
2007	2,553	628	370	187
Change (2007-2003)	+15	+9	+113	+60
Number of farms 20-<50 ha [thousand]	EU 27	Poland	Romania	Moldova
2003	835	90	9	8
2005	825	96	16	7
2007	804	101	16	6
Change (2007-2003)	-30	+11	+6	-2
Number of farms <=50 ha [thousand]	EU 27	Poland	Romania	Moldova
2003	688	17	14	12
2005	691	20	13	9
2007	698	23	14	5
Change (2007-2003)	+9	+5	0	-7
Farm labour force [%]	EU 27	Poland	Romania	Moldova
2010	5.7	13.5	28.7	15.8

Source: Based on Eurostat 2014, BAEL data of Poland and Statistical Yearbook of the Republic of Moldova [5, 23].

The efficiency of agricultural production is largely determinate by the spatial nature of the land factor [Podstawka, Ginter 2006][17]. Efficiency of factor productivity in agriculture depends primarily on the areas of farms [Ryś-Jurek 2009] [22]. According to Nowak [2011] [14], structure of agricultural land is the basic criterion for assessing the way in agricultural land management. The farm size is influenced by many factors, including nature of agricultural production, soil quality, climate, terrain, access to market, land prices, etc. [Majchrzak 2014; Zawadzka, Strzelecka 2012] [10, 30].

Considering the analyzed countries a systematic increase in the average farm size can be observed (Table 2). For the EU, the average farm was almost 15 hectares, in Poland it was 10 hectares. The average size of a farm in Romania is still small and is almost 4 hectares, while in Moldova we can observe increase from 1 to almost 3 hectares (Table 2). Fragmentation of the land resulted in increasing of the costs of transport, it reduces labour productivity and farm income, and limits opportunities of development [Alboiu et al. 2012; Zawadzka, Strzelecka 2012] [2, 30]. Fragmentation of agricultural land can be analyzed using the Lorenz factor and the Gini index. Lorenz coefficient was determined around the farms with the area exceeding 50 hectares. The higher the ratio, the greater concentration of farms of 50 hectares or more is. In Poland and Romania, this figure falls far from the average for the EU 27. For Moldova, this figure also falls far from the EU 27 median (Table 3). In turn, inequality coefficient of random variable (Gini index) for farms shows strong disparities in the structure of farms and their significant

differences (the closer to 1, the greater the inequality is).

Table 2. Utilised agricultural area (UAA) and the average farm area in the EU, Poland, Romania and Moldova

Specification	Utilised agricultural area, UAA [thousand hectares]	Average area of farm [hectares]				
	2013	2003	2005	2007	2010	2012
EU 27	184,202.0	11.8	12.1	12.9	14.4	14.7
Poland	14,409.0	6.7	6.0	6.5	9.6	10.4
Romania	13,055.0	3.2	3.4	3.6	3.8	4.1
Moldova	378,418.8	1.9	2.2	2.5	2.6	2.9

Source: based on the data of Eurostat 2014, ARiMR Poland 2014 and National Bureau of Statistics of the Republic of Moldova 2014[5, 23, 33].

Table 3. Lorenz concentration coefficient and the Gini index for agricultural land in the EU, Poland, Romania and Moldova

Specification	Lorenz concentration coefficient around farms up to 50 hectares	Gini index of concentration of agricultural land			
	2007	2003	2005	2007	2010
EU 27	0.78	0.82	0.81	0.81	0.82
Poland	0.63	0.67	0.69	0.67	0.62
Romania	0.59	0.73	0.70	0.70	0.77
Moldova	0.48	0.57	0.65	0.66	0.67

Source: Majchrzak 2014, and own calculations based on Statistical Yearbook of the Republic of Moldova 2014 [10, 23].

Based on Gini indexes for each year, small changes can be noticed. According to Majchrzak [2014] [10] we can observe slight deconcentration processes in Poland, which means creation of the larger and medium-sized farms, and elimination of the smallest at the same time. In Romania, however, these processes occur slowly, the trend is visible even further concentration of agricultural land around the farms of small and very small size. On the other hand, in Moldova exists much more farms (holdings) with the surface over the 50 hectares [www.statistica.md] [34], and persists, as in Poland, the process of slight deconcentration, creation of the larger and medium-sized farms, with the tendency for small size farms cooperation.

Land fragmentation hinders development; it makes achieving competitiveness impossible, as well as has a significant impact on the level of agricultural income. Table 4 shows the changes in land productivity per 1 hectare of UAA in analyzed countries and the EU 27.

Table 4. Changes in the land productivity in the EU, Poland, Romania and Moldova in 2000-2008

Specification	Land productivity per 1 hectare of UAA [euro]						
	2000	2003	2004	2005	2006	2007	2008
EU 27	1,848.9	1,904.0	1,897.7	1,907.0	1,768.2	2,084.6	2,134.0
Poland	864.6	815.5	874.0	1,020.0	1,011.0	1,288.3	1,399.2
Romania	579.1	772.5	955.2	924.2	1,017.6	1,039.9	1,326.2
Moldova	225.2	315.7	435.2	412.0	552.6	509.3	771.5

Source: Eurostat 2014, General Agricultural Census in the Republic of Moldova [1, 5]

The average land productivity in the EU is not very high, reaches values oscillating around 2 thousands euro per 1 hectare. Land productivity in Poland and Romania is much lower than the average of the EU 27, as well as in Moldova (Table 4). Over the years 2000-

2008, a significant increase can be seen in this rate (especially in Romania). According to Eurostat [2014] in almost all countries, the rate of land productivity is increasing year-on-year, with the highest values in the Netherlands, Malta, Cyprus and Belgium. Nowak [2011] [14], on the basis of the analyzes, concluded that the highest productivity growth occurred in the new member states (e.g. Romania), which according to the author, is a result of direct payments absorption and other aid programms for farmers.

The farm size versus economic efficiency: the case of Moldova

Below the results of analyze carried out in the North Moldova districts were shown (Table 5). The study involved the analyze of agricultural land and the value of agricultural production. Next, these data were used to calculate the concentration of the variables.

Table 5. Chosen agricultural characteristics of the North of Moldova districts

Districts	In the period of 2008-2012			
	Utilized agricultural land		The value of agricultural production in the comparable prices [euro]	
	[thousand hectares]	[%]	[thousand]	[%]
Mun. Balti	836	5.0	19.9	1.0
Briceni	1,720	10.0	631.3	29.2
Dondușeni	1,123	6.8	118.8	5.5
Edineț	190	1.2	27.3	1.2
Fălești	1,322	8.0	147.1	6.8
Florești	1,002	6.0	107.6	5.2
Ocnița	3,998	24	361.2	16.7
Râșcani	444	2.6	52.0	2.4
Sângerei	2,520	15.0	367.5	17.0
Soroca	3,546	21.4	324.5	15.0
Total	16,701	100.0	2157.5	100.0

Source: Own calculations based on data specialized form T 6.1. and 9.64 in territorial T., National Bureau of Statistics of the Republic of Moldova 2014 [23]

The research shows that farms of the North of Moldova are very diverse in terms of agricultural land and global production. The Balti farms occupies only 5% by area and the volume of production and less than 1%. Briceni, occupying 10% of the surface, has the global production share at 29.2%. Farms in Edinet region occupies 1.2% of all utilized agricultural area, and in the Soroca - 21.4% (Table 5).

Based on the data in Table 5, the territorial concentration coefficient (territorial distribution) was determined using the square root of the sum of squares ratio (n) administrative (territorial) units reflecting the total amount of northern districts by formula Gini C (CG) and the ratio of the concentration Struck (Gs):

$$C_G = \sqrt{\sum g_i^2} \Rightarrow \sqrt{\frac{1}{n}} \le C_G \le 1$$

where: $g_i -$ the share of agricultural land.

The second concentration ratio is calculated as:

$$C_S = \sqrt{\frac{n\sum g_i^2 - 1}{n-1}} \Rightarrow 0 \le C_s \le 1$$

From calculations, the average of 2004-2006, the following results of the coefficients were obtained and shown in Table 6.

The calculations resulted in low Gini index, which indicated low uniformity of agricultural land distribution in the studied districts, and the agricultural production is even lower.

$$C_{G_{(S)}} = \sqrt{g_i^2} = \sqrt{0.14} = 0.374$$

$$C_{G(VPG)} = \sqrt{0.17} = 0.412$$

Table 6. Gini index, Struck farmland and overall output (in comparable prices of the 2005) in farms of 50 hectares and more of UAA, in the North of Moldova, average 2008-2012

Indicator	Type of coefficient	
	C ^{G}	C_S
Utilized agricultural land [hectares] *(S)*	0.374	0.209
The value of global production (in comparable prices 2005) thousand *(VPG)*	0.412	0.277

Source: own calculations based on data specialized form T 6.1. and 9.64 in territorial T., National Bureau of Statistics of the Republic of Moldova 2014 [23]

Struck coefficient confirms this conclusion:

$$C_{S_{(S)}} = \sqrt{\frac{10 \cdot 0.14 - 1}{10 - 1}} = \sqrt{\frac{1.4 - 1}{9}} = \sqrt{\frac{0{,}4}{9}} = \sqrt{0.044} = 0.209$$

$$C_{S(VPG)} = \sqrt{\frac{10 \cdot 0.17 - 1}{10 - 1}} = \sqrt{\frac{1.7 - 1}{9}} = \sqrt{\frac{0.7}{9}} = \sqrt{0.077} = 0.277$$

The study allows concluding that the concentration of agricultural production is very low. The concentration of agricultural production of farms can be achieved by grouping the factors of production (consolidation of farms of the same profile) branches and units of various sizes, growth providing technical agricultural and professional qualification to act positively towards the concentration of production, to increase the weighted branches and crops in regions of fragmented agriculture.

Fragmented agriculture: new model of small farm

According to Dacko and Dacko [2014] [4], area structure reflects the state of a country's agricultural system and can change due to the impact of the components of this system, as well as external factors. Therefore, a system consists of many interacting elements. Despite the obstacles posed by fragmented system of agriculture, there are many voices supporting small, family-run farms in Europe. Small farms should have a permanent place in European agriculture [Musiał 2010; Zegar 2012] [12, 31]. The argument supporting small farms is primarily the fact that they have a social character, they are very often environmentally friendly, they help to preserve rural landscape, contribute to biodiversity, tradition and culture [Kiełbasa 2015] [8]. The system of agriculture in Europe should be changed, but it cannot be based on the elimination of small, family farms. The need to create a network of processing enterprises in rural areas is the cornerstone of sustainable development of the rural areas. The new form of small farm management should include for example cooperation between producers and processors of raw materials (Fig.1).

According to Fig.1, we can observe two directions of farm cooperation: vertical and horizontal. Vertical cooperation includes processing - supplies - transport agricultural production; while horizontal cooperation involves inter - from farming means sharing basis, applying marketing activity, providing information, with service credit, insurance and other levers of economic mechanism.

Land consolidation process is a very long operation. In Western Europe countries, it lasts for hundreds of years. This process gained momentum in EU countries in the early 50 and is continuing until today. Strengthening small and medium-sized farms provides a real opportunity to increase the effectiveness of using agricultural land on the principles of regional and erosion control, organize and implement complex necessary measures to protect the soil - the main natural wealth of the country, implementation of actual performance of agriculture and the creation of the sustainable development [Popescu 2009] [20]. Achieving this goal will

be possible by land consolidation and owners cooperation in producing a good quality and competitive production [Popa, Timofti 2009] [18].

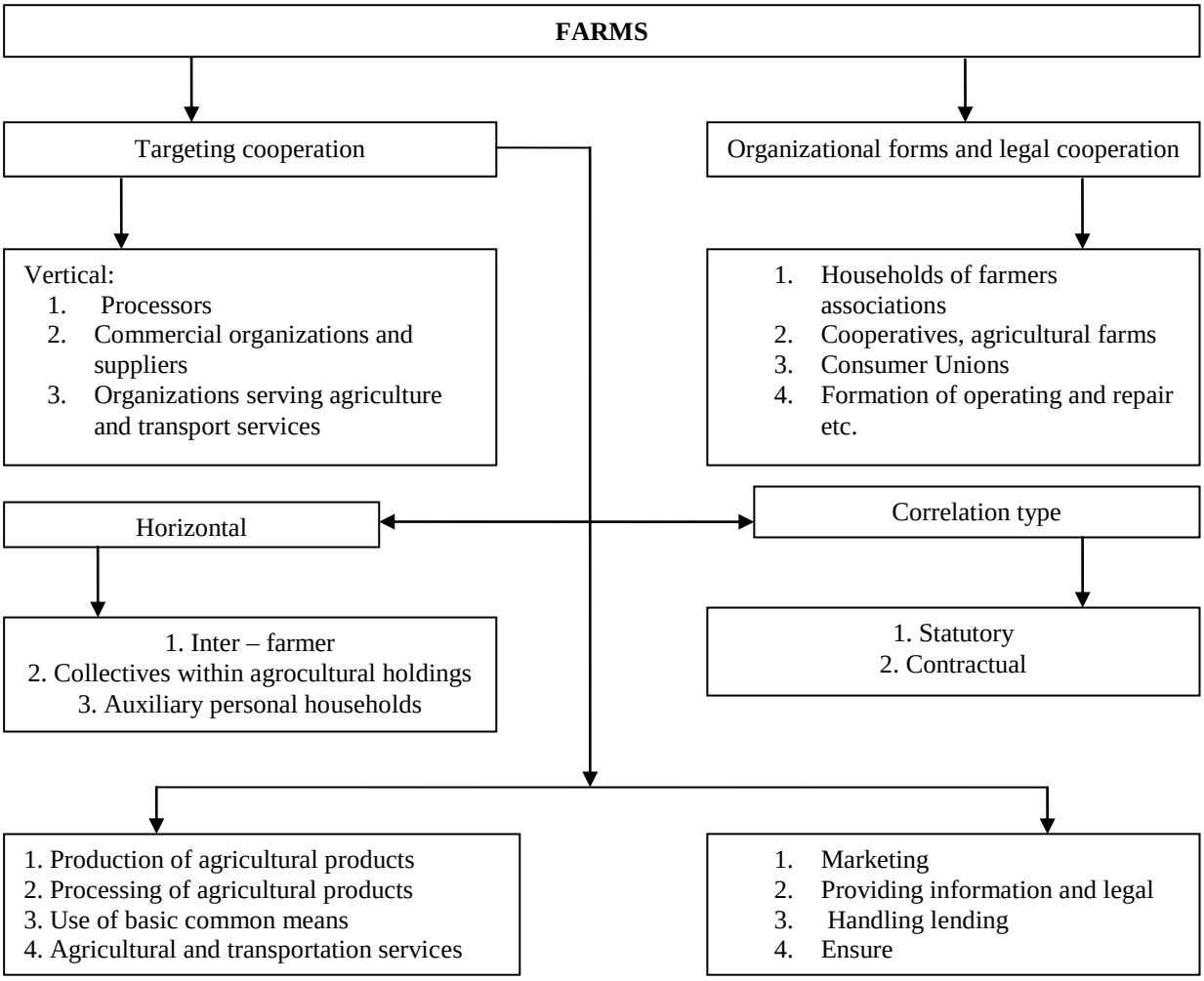

Fig.1. The forms of farms cooperation
Source: prepared by the authors based on their scientific researches

To address the situation in agriculture a complex of economic, legal and organizational set must be developed. These strategy envisages sustainable development of agriculture by implementing advanced technologies of cultivation, processing, packaging and marketing, etc., which ensure the country`s food security and increase of farmers' income [Strategies of development of the agrofood sector in Moldova in the period 2006-2015] [25]. Therefore, the fundamental subject of farm development should contribute to economic efficiency and consolidation (Fig.2).

Achieving these basic policies would serve a solid foundation for the development of private initiative, a favorable environment for the activity of all categories of farmers to resist competition. At the same time promoting the development of rural areas as the natural, social and cultural regeneration of the economy will help rural communities in which they operate. The process of consolidation are inevitable - not only the purchase and sale, but in exchanging or leasing term, as well as by associations or unions landowners. It is building the future shape of a more rational and efficient use of land. The good example is the government programme of land consolidation in Moldova. Moldovan Ministry of Agriculture and Food Industry proposed to create the so-called

"consolidation centers" [Land Consolidation Program, Moldova] [36].

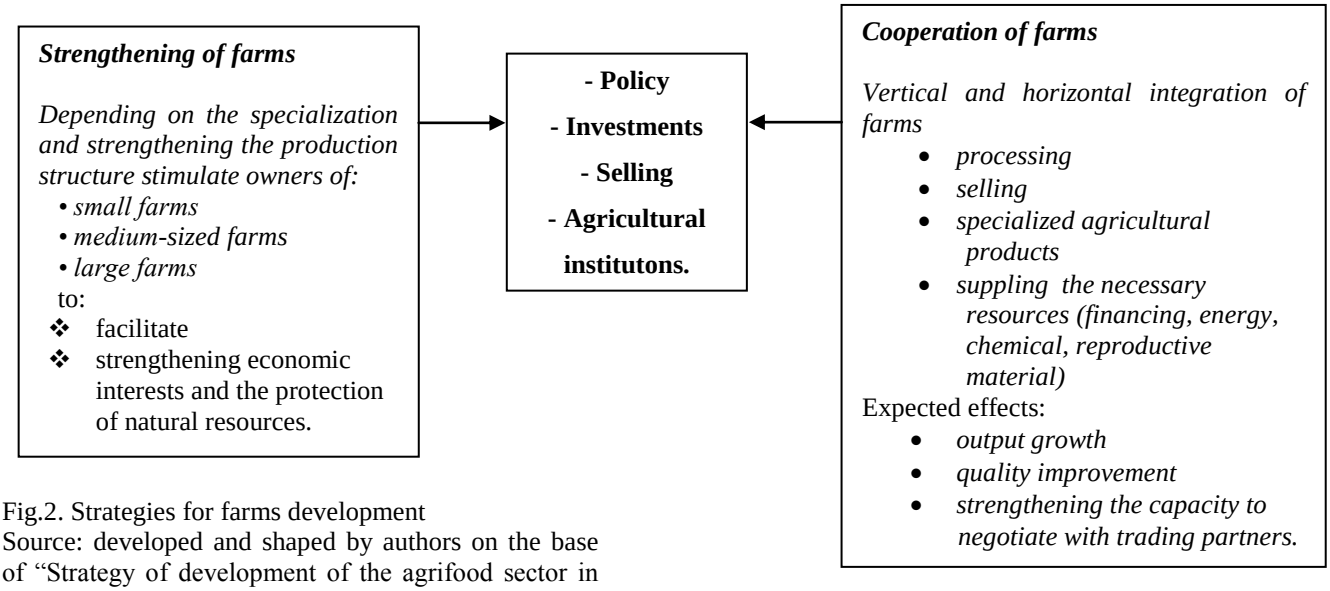

Fig.2. Strategies for farms development
Source: developed and shaped by authors on the base of "Strategy of development of the agrifood sector in Moldova in the period 2006-2015" [25]

CONCLUSIONS

The problem of fragmented agriculture concerns Europe for many years, especially in its Eastern parts. Analyzed three European countries: Poland, Moldova and Romania, struggle with similar problems in development of their agriculture and competitiveness. When it comes to small family farms, it can be noticed that in these countries they are very fragmented and achieve poor economic results.

The following conclusions were indicated on the basis of the analysis and discussions:

-In these countries enlargement processes can be seen. The number of small farms is reducing, and larger is increasing. There is also an increase in the average size of a farm (in Poland currently it is 10 hectares, in Romania 4 hectares and in Moldova 3 hectares). However, these processes are slow and face number of barriers (natural conditions, tradition model of farm management, the luck of funds for investments, etc.).

-Large fragmentation of the agrarian structure adversely affects the economic results and land productivity. Fragmentation contributes to a significant reduction in the small farms competitiveness.

-Indexes of land concentration indicate processes of deconcentration of a small farms and creating a greater number of larger farms in Poland. In Romania, these processes occur slowly due to the large number of very small family farms. Slightly better are indicators for Moldova, because this country has a large number of agricultural companies, however, the problem of small farms still exists.

-The case of the North of Moldova shows a large distribution of indicators within one country. The authors indicate the possibility of farms consolidation of the same profile in certain regions, which goal would be the improvement of small farm competitiveness and providing the source of income.

-The structure of farms and land structure points to a system of agriculture in Europe. This system consists of many different elements, mutually dependent and influencing each other. Increasing of the small farm effectiveness requires the cooperation of small holders, for example through cooperation between producers and processors of raw materials.

-To improve the competitiveness of small farms the processes of land consolidation are essential. However, is should be remembered that these are a long-term processes, so the effects can be seen in several years.

-The role of small farms should be emphasized especially for the environmental protection and sustainable development. Their social role is also very important: they manage small plots, which, to some extend, provide food for farmer 'families. Usually products are not sold on the market, and most consumed on the farm (semi-subsistence farm). Therefore, the European model of agriculture should not exclude small family farms.

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