FARMS TYPOLOGIES AND THEIR IMPACT ON THE DEVELOPMENT OF RURAL AREAS IN MOLDOVA

Liliana CIMPOIES¹, Elena SEMIONOVA¹

¹State Agrarian University of Moldova, 44 Mircesti st, 2049, Chisinau, Republic of Moldova

Corresponding author email: l.cimpoies@uasm.md

Abstract

For Moldova’s agriculture are characterized the existence of many small family farms and only a small number of corporate holdings (limited liabilities companies, agricultural production cooperatives etc). Most of individual farms, small by size produce only for own family consumption and cannot find their way to the market place. The accentuated poverty makes rural economy to flow more and more to a natural subsistence economy, isolating itself from the market economy. The goal of this paper is to delimitate different types of farms based on selected indicators and to appreciate their level of development. Differences in farms levels of development are appreciated through cluster analysis. The research includes the analysis of farms survey data. This research was carried as a part of the Academy of Sciences project “Sustainable rural development in Republic of Moldova in the context of EU accession”. In the project were surveyed 938 individual farms from nine districts across the country. As a result, we distinguish three types of farms: natural, family and market household. The cluster analysis allows to characterize the farms level development, to determine the main priority directions, and to elaborate measures for the individual farms further sustainable development.

Keywords: agriculture, cluster analysis, individual sector, rural areas.

INTRODUCTION

Agriculture is of main pillar of the rural space having an important role in all rural development programs. Despite of many changes that appeared in the role and obligations of agriculture, it still remains to be the core of program of rural development. In the meantime, the problem of a new philosophy in agricultural development appeared, conducting to the idea of changing the gravity center from the productivity aspect to its multifunctional aspect (Otiman, 2011).

The term “rural” is understood as a spatial concept, usually defined as “all that is not urban”. “Rural is always analyzed in the context of countryside and agriculture, but also together with traditional culture and geographic peripherality” (Calannan et al., 2006). However, all these definitions usually fail to include all the complexity that is encompassed in rural (Calannan et al., 2006).

Family farms have a central place in the development of agriculture and rural areas. Some researchers affirm that, there is no prove that family farms are more efficient that the corporate ones related to all the farming activities (Gorton et al., 2004). Nevertheless, there is evidence that the most developed family farms can perform as well as the average corporate holdings (Gorton et al., 2004).

According to research, after determining the best type of holding (according to its performance) from the perspective of sustainable rural development, it is necessary to find out how to make it efficient and competitive. An important part has labor market, that requires more qualified and skilled personnel. Assuring the access to proper education, possibilities to improve the qualifications and skills for rural population remains a main task for the government in achieving the objectives of a mature and reflective agricultural policy (Kata et al., 2015; Golas, 2017).

For many countries in transition, an important consequence is migration of rural residents abroad. Subsidies allocated by government to support the sustainable rural development can contribute to out-migration when applied the financial aid directly for measures aimed to farm diversification activities strong related to rural areas (Galluzzo, 2016).
For agriculture, sustainable development represent a continuous process of finding the equilibrium between several targets. These represent the economic, social and environmental aspect. The main actor in the introduction and maintenance of agriculture targeted toward sustainable development is the government together with the institutional system of agriculture (Kata et al., 2015; Koestner, 2003).

For Moldova’s agriculture are characterized the existence of many small family farms and only a small number of corporate holdings (limited liabilities companies, agricultural production cooperatives etc). More than fifteen years after the land reform has been launched, markets have not fully developed yet and market-based middle-sized individual holdings are rare: “average-sized” family farms, the determinant of any market agriculture, virtually do not exist in Moldova. Most of individual farms, small by size produce only for own family consumption and cannot find their way to the market place. The accentuated poverty makes rural economy to flow more and more to a natural subsistence economy, isolating itself from the market economy.

The investigation is aimed to delimitate different types of farms based on selected indicators and to assess their level of development.

MATERIALS AND METHODS

Differences in farms levels of development can be appreciated through cluster analysis. It allows to assess the observed subjects through chosen indicators and offers a clear and understandable interpretation. By using the method of cluster analysis it is possible to distinguish a large number of objects into homogeneous groups. The advantage of this method is that it allows to classify objects according to a whole set of characteristics. Cluster analysis does not impose restrictions on the indicators under consideration, which allows using a large volume of different classification characteristics. As a result of clustering, due to the differences in the units of measurement of the indicators, distortions associated with the disparity of individual variables may appear. To eliminate such a possibility is necessary to standardize the initial data prior to clustering by subtracting the mean and dividing by the standard deviation. As a result, all indicators become equivalent from the position of clarifying the similarity of the objects under consideration. Thus, a procedure for standardizing the initial data was used. To obtain an objective assessment for clustering, the average values of the cluster-forming indicators were used. To obtain reliable and objective differentiation, clustering was carried out using the hierarchical classification method. As the signs for the clusters distribution of districts, the following values of the factors are chosen according to the farms level development:

- income obtained during the analyzed period;
- the costs of the farm (rent paid for land, transport, purchased animals, mineral fertilizers, plant protection products, seeds, fuel, payments for mechanized works, land tax);
- the area of the farm, including personal subsidiary plots;
- labor resources, including employees;
- degree of consumption of agricultural products.

To perform hierarchical clustering the Ward method was used. According to it, in the process of unification such clusters are clustered that give a minimal increase in the intragroup sum of squared deviations. In the general case, the grouping of objects by a hierarchical method can be carried out by means of various distance functions.

The proposed research considers survey data of family farms in Moldova. This research was made as a part of the Academy of Sciences project “Sustainable rural development in Republic of Moldova in the context of EU accession”. During the project were surveyed 938 individual farms from nine districts across the country. Cluster analysis was based on the data of 706 farms.

RESULTS AND DISCUSSIONS

During the analysis we classify the farms into the following types:

- Natural farm - produce products for own consumption, and sale can only be in case of urgent need for money;
- Family farm - produce products for own consumption and sale of surpluses;
- Market farm - production is directed to sales and partly for own consumption. The indicators used in the analysis and their average values for selected clusters are presented in Table 1.

Table 1. Cluster results for surveyed individual farms

<table>
<thead>
<tr>
<th>Cluster component</th>
<th>Natural farm</th>
<th>Family farm</th>
<th>Market farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income, MDL</td>
<td>44,432</td>
<td>43,812</td>
<td>254,191</td>
</tr>
<tr>
<td>Costs, MDL</td>
<td>2,928</td>
<td>5,216</td>
<td>76,724</td>
</tr>
<tr>
<td>Area, hectares</td>
<td>1.07</td>
<td>1.78</td>
<td>6.96</td>
</tr>
<tr>
<td>Labour resources, persons</td>
<td>2.35</td>
<td>3.20</td>
<td>12.05</td>
</tr>
<tr>
<td>Consumption level, %</td>
<td>86</td>
<td>38</td>
<td>19</td>
</tr>
</tbody>
</table>

Source: Authors calculations based on farm surveys

The first cluster includes only 2.97% of farms, the lowest value in the total. A particular characteristic of the first cluster is the small area that includes also low amount of costs and the use of a fewer labor resources that family and market farms. In the same time, for natural farm a large consumption level is characteristic (86%). With an average area of only 1.07 hectares almost 3 thousand MDL are spent. The income of the first cluster is greater than the income of the second cluster that includes costs with 65% higher.

The second cluster includes 52.55% of the analyzed farms. The family farm cluster is the largest cluster, that characterize significantly the level of development of most individual farm sector in Moldova. Consumption level in "family farms" includes 38% of the total production, lower than for "natural" type of farms. About 62% are allocated for the sale of products, which brings an income of 43 thousands lei. The area of family farms is 0.71 hectares higher than natural farms type, but with 5.18 hectares less than market type. Many of the "family" farm indicators are ten times worse than the third cluster ("market" farms).

The third cluster characterizing "market" type of farms has a share of 44.48% in the analyzed sample. The average number of farms in this cluster is lower than in the second, but has the largest area in the sample (6.96 ha). Market farms production is mostly oriented to sale (81%) and only 19% is used for own consumption. For this cluster is characteristic the largest use of labor resources and high production costs (76 thousands MDL). The costs of this type of farms is higher by 73 thousands MDL compared to the first cluster and by 71 thousand MDL with the second cluster. However, the increase in costs has also determined to an increase in farms incomes. So on the incomes of "market farms" have the largest share in the analyzed sample of 74% (254 thousand MDL).

Wages are the main source of income for rural population. Nevertheless, in rural areas its share in the total income is low or completely missing. Individual farms in rural areas receive up to 86% of their gross income in kind. In table 2 are reflected different sources of incomes of surveyed rural population. In recent years, money transfers from family or friends working abroad (remittances) has increased and became a more common and significant source of income for the rural population.

On average, according to the obtained results, in Moldova the disposable income per person is 1956.6 MDL. The wages represent 27.8% in the total income amount of rural families, while the income from individual agricultural activities represent only 17.5%. Remittances remain a significant source of income for the rural family budget. Thus, in the structure of incomes of rural residents, transfers from abroad have a share of 23.4% (Table 2).

Table 2. Incomes of surveyed rural population, MDL

<table>
<thead>
<tr>
<th>Types of income</th>
<th>Average income, MDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wage</td>
<td>29,584</td>
</tr>
<tr>
<td>Income from agricultural activities</td>
<td>22,568</td>
</tr>
<tr>
<td>Income from non-agricultural activities</td>
<td>25,176</td>
</tr>
<tr>
<td>Pensions</td>
<td>17,043</td>
</tr>
<tr>
<td>Incomes from work in other farms</td>
<td>14,922</td>
</tr>
<tr>
<td>Money transfers from abroad</td>
<td>33,815</td>
</tr>
</tbody>
</table>

Source: Authors calculations based on farm surveys.

A major source of income for the rural population are wages. The average amount of this type of is 29,584 MDL or 32% in the total share of income. Also a significant share belongs to income from agricultural activities and money transfers, which account about 20%. On the next step is situated the income...
from pensions with a share of 17% (17,043 MDL). The smallest share in the income of rural families belong to non-agricultural activities (4%) and incomes from working activities in other farms (5%)

According to the level of income distribution the surveyed farms are divided into three clusters. The distribution into three clusters of the rural families’ main income sources are represented in Figure 1.

Figure 1. Clusters distribution according to the surveyed rural families’ main source of income, %

Source: own calculations based on farm surveys

The financial situation of rural families is very different. Thus, the average annual income in the natural farms is twice lower than the income of the family and market. The average annual income for the family in total is 48,024 MDL. For the first cluster (natural farm), the largest share of income belongs to wages (45%). At the same time, there is an increase in the share of incomes for retired persons in rural areas (pensions), which is 4% higher than for family farms (second cluster). The share of other benefits from the government in the aggregate income represents 4% for both family and market farms. Other sources of income are also represented in the total incomes and have a share of 15%. Thus, the main type of income among the surveyed farms are wages. An important contribution to the formation of aggregate income is also made by: scholarships, remittances, social payments, as well as income from individual non-agricultural activities, while incomes from agricultural activities remains low (8%). Thus, this type of farms requires governmental support to enhance and stimulate the agricultural production.

For the second cluster (family farms), the largest contribution to the total incomes also belongs to wage earnings (40%). Nevertheless, both the income from the sale of agricultural activities and pensions have a share of 19%. Individual non-agricultural activities, social payments, including scholarships, money transfers have a low share.

In the incomes distribution of the third cluster (market farms), the maximum share of 67% belongs to the income from agricultural activities. Shares of 5 to 10% from income is attributed to individual non-agricultural activities and other sources. Such types of income as pensions, scholarships, income from the delivery of land and other rented properties, remittances are not available in the analyzed cluster.

For rural development an important role plays the education level. Lately, positive trend in education and literacy of the Moldavian population were observed. In rural areas, the number of people with higher and general (secondary and compulsory) level of education was 81.7%. The increase in the population’s general level of education influenced the decrease in the number of illiterates with 3.9 points (Figure 2).

In the first cluster, the number of people with higher education is by 7% and by 12% more than family and market farms. The higher education level for family farms is 5% and for market farms 12%. A significant influence on the changes in the dynamics of the education level has the decrease in the number of youth among rural population. From the surveyed data, 65 farm managers have incomplete higher education, 11% of which belong to the second cluster and 8% to the third. The highest part of individuals is characterized by secondary education, with a share not less than 30% in all clusters. Is observed that in the educational
level of rural population, secondary vocational education prevails. This level of education is present in each cluster and the leader are family farms (30%) (Figure 2).

Figure 2. Clusters distribution according to the level of education of farm managers

Source: own calculations based on farm surveys

The most significant decrease in the number of people with incomplete secondary education is observed in the first cluster (5%). For family and market farms there are some positive changes in the level of this educational type as the its value is 5 times greater than in the case of natural farms cluster. The low level of education of the younger generation can become an obstacle to the development of rural areas in the future. Within the framework of clusters, through education, mutually beneficial cooperation between farms can arise, which makes it possible to increase the efficiency of farms activities. The conducted cluster analysis allows to characterize the farms level development, to determine the main priority directions, and to elaborate measures for the individual farms further sustainable development.

ACKNOWLEDGEMENTS

This research work was carried out with the support of Academy of Sciences of Moldova and was financed from Institutional Project 15.817.05.31A.

REFERENCES


Golas, J., 2017, Professional and social activation of rural population in Poland – structural aspects and frameworks. Scientific Papers. Series "Management,
Economic Engineering in Agriculture and rural development", Vol. 17 Issue 3.