

## AGRICULTURAL COOPERATION AS A FORM OF ORGANIZATION OF RATIONAL LAND USE

**Olha DOROSH<sup>1</sup>, Iosyp DOROSH<sup>2</sup>, Shamil IBATULLIN<sup>2</sup>, Viacheslav FOMENKO<sup>3</sup>,  
Andriy DOROSH<sup>2</sup>**

<sup>1</sup>National University of Life and Environmental Sciences of Ukraine, Land Management Faculty, 17 Vasylykivska Str., Kyiv, 03040, Phone: +38 044 258 05 25; E-mail: dorosholgas@ukr.net

<sup>2</sup>Institute of Land Management, 37 Vasylykivska Str., Kyiv, 03022, Phone: +38 050 311 36 67; E-mails: doroshjosyp@gmail.com, shamilibatullin@gmail.com, doroshandriy1@ukr.net.

<sup>3</sup>Odesa State Agrarian University, Faculty of Engineering and Economics, 13 Panteleimonivska Str., Odesa, 65012, Phone: +38 048 784 57 20; E-mail: ph.d.fomenko@gmail.com.

**Corresponding author:** dorosholgas@ukr.net

### Abstract

*It is established that the monopolization of means of production, in particular agricultural in rural areas, is one of the reasons for the decrease in the population of these regions, and also leads to a decrease in local budget revenues. Accordingly, maintaining one's own infrastructure at the proper level becomes less and less realistic. It was found that most United Territorial Communities (UTC) budgets in Ukraine are subsidized and their average subsidy from the government is about 45%. We found that 13 land users cultivate 68.5% of the agricultural land of the Kolomatska UTC. The community needs to increase its own budget revenues by 6.3% annually in order to compensate 60% of subventions and subsidies during 5 years. It is established that one of the ways to achieve this goal is to change the form of organization of agricultural production in the community from cultivation by single land users of large tracts of land they lease to the formation of agricultural cooperatives by landowners to ensure rational use of local resources and income distribution. Agricultural cooperatives are institutions of collective action that contribute to the rationalization of the use of natural resources. It is estimated that such a transition will double the income of landowners, and local budget revenues will increase by about 25%.*

**Key words:** *agricultural cooperatives, institutions of collective action, local budget, forms of organization of agricultural production, local taxes*

### INTRODUCTION

As part of the process of decentralization of power in Ukraine, which involves the formation of united territorial communities in rural areas, communities are developing strategies and projects for spatial development. On June 12, 2020, the government issued a resolution approving the administrative centers and territories of more than 1,470 communities, which will effectively complete the process of forming the UTCs [16]. It is important to note that the decentralization process involves giving broader powers to local communities to manage financial resources at the local level. However, their responsibilities are also growing significantly, as their task is to develop and maintain local technical and social infrastructure. It is worth noting that although local budgets have grown

significantly in recent years, the expenditures of these budgets are growing very rapidly. Accordingly, a large number of communities, have been subsidized and remains subsidized. Nevertheless, the goal of the reform of decentralization and the formation of UTCs is the formation of self-sufficient communities. It is worth to mention that there are certain obstacles to community development:

-the population of rural areas in Ukraine is rapidly declining, but it should be noted that this is a global trend;

-monopolization of means of production, especially in agriculture, contributes to lower local budget revenues.

These problems make it difficult for communities to maintain and develop their own infrastructure. Aware of this problem, the Cabinet of Ministers of Ukraine determined by Resolution №200 of 16.03.2016 the procedure for providing subventions for UTCs

for infrastructure development [1]. The government also provides medical, educational, and other subventions and grants to communities and funds local projects from the regional development fund. However, this situation has made many communities dependent on government subventions and grants. The share of subsidies and subventions in the budgets of the majority of UTCs in Ukraine is 15-65%, while the average value is about 45%, which is quite significant. According to calculations, most communities in Ukraine need a steady increase in their own budget revenues of 6.9-10% per year to compensate subsidies and subventions with own budget revenues for 5 years [3].

That is why communities need to develop strategies and projects for their own spatial development and create a precondition for their own economic development. One way to prevent the outflow of population and falling local budget revenues is to demonopolize agriculture by creating institutions of collective action, such as agricultural cooperatives.

**The purpose of our study** is to calculate revenues of local budgets and incomes of local residents depending on the organizational form of agricultural production, namely the cultivation of land by individual farmers or enterprises that lease most of the land and cooperatives formed by landowners. It is necessary to establish whether the use of agricultural cooperatives as institutions of collective action will contribute to increasing the welfare of landowners and increase revenues to local budgets.

Examining the existing experience, we **reviewed the literature** on planning strategies and projects for rural development, as well as institutions of collective action and analyzed the factors that contribute to sustainable development of territories.

Malik M. and Pulim V. (2009) examined rural development issues and concluded that local entrepreneurship and local self-government are key players in a local development strategy [10].

Elinor Ostrom (1990) examining the problems of common resources use, concludes that the institutions of collective action are the most

effective in managing shared natural resources. According to her paper the state or individuals are less effective [12].

## MATERIALS AND METHODS

Carrying out this research, we used the data of state statistical agency, materials of scientific works, provisions of laws and regulations. In particular, we have processed statistical data on revenues to local budgets published by the Ministry of Finance of Ukraine [11].

We also studied the simplified system of taxation of legal entities and individual entrepreneurs, as well as the sources of filling the local budget on the basis of the Tax Code of Ukraine [15].

The processed materials became the basis for our calculations, in which we determined the revenues to local budgets and earnings of landowners in various forms of organization of agricultural production.

It is first necessary to determine whether the concentration of agricultural land is a problem in the community, and whether the community depends on subsidies, in order to understand whether there is a need to change the form of organization of agricultural production.

The concentration of land in the community can be determined by the following formula:

$$C_{CI} = \frac{\sum_{i=1} \{S_i \mid S_i > CI\}}{S_t} * 100\%$$

where:

C – concentration of agricultural land in individual land holdings;

CI – concentration indicator, the area relative to which the concentration is calculated;

$S_i$  – land use area;

$S_t$  – total area of agricultural land on the territory of the united territorial community [9].

Determining the dependence of the community on subventions and subsidies is determined by the share of subventions and subsidies in the total budget revenues of the community. If this share exceeds 20%, it is already a threat to the long-term budget stability of the community. Accordingly, there

is a need to compensate these funds with their own budget revenues. The required annual growth of own revenues to the local budget can be determined by the following formula:

$$i = \sqrt[n]{\frac{B'}{B}} - 1$$

where:

$i$  - average annual growth of own budget revenues;

$B'$  – desired amount of own revenues to the budget at the end of the period;

$B$  – existing amount of budget revenues;

$n$  – number of years [3].

As a next step, budget revenues and incomes of landowners and land users are calculated. Whether it is farmers, agricultural enterprises or cooperatives, they pay 5% of their annual income to the local budget [13]. To determine this amount, it is necessary to determine the typical crop rotation for the region on the basis of statistics to determine the cost per hectare per year for growing crops, then based on statistics that reflect the profitability of growing crops, determine the income of a farmer, enterprise or cooperative and deduct 5%, which to be paid as taxes.

Then the calculations are differentiated, because if it is a farmer or an enterprise, they lease land from landowners who receive rent and pay taxes.

Local tax paid by landowners can be calculated by the formula:

$$T_L = R \times S \times 0.18 \times 0.6$$

де:

$T_L$  – local tax;

$R$  – rent payment;

$S$  – area.

Personal income tax in Ukraine is 18% [15], of which 60% is paid to the local budget [8]. In this case, the profit of a farmer or enterprise will be taxed income minus the cost of field cultivation and rent, and the income of landowners will be rent minus personal income tax and military tax, which is 1.5% [15].

In the case of a cooperative, its profits are distributed among its members, i.e. taxed

income minus field cultivation costs will be paid to its members, who will pay 1.5% of the military tax and 18% of PIT, 60% of which will go to the local budget.

## RESULTS AND DISCUSSIONS

Our study is performed on the territory of Kolomatska UTC of Kharkivska area. A total of 13 land users cultivate more than 200 hectares of land each. In total, they cultivate 15,094.4 ha [7], which is 68.5% of all agricultural land in the community. Accordingly, the concentration of agricultural land in the community is present, but not critical.

Analyzing the sources of revenues to the budget of Kolomatska UTC, we conclude that the community has a fairly significant level of dependence on subsidies and subventions, as they amount to 37.28 mln UAH (~€1.15 mln) or 43.80% of total budget revenues (Fig. 1), which is approximately the average value for Ukraine.

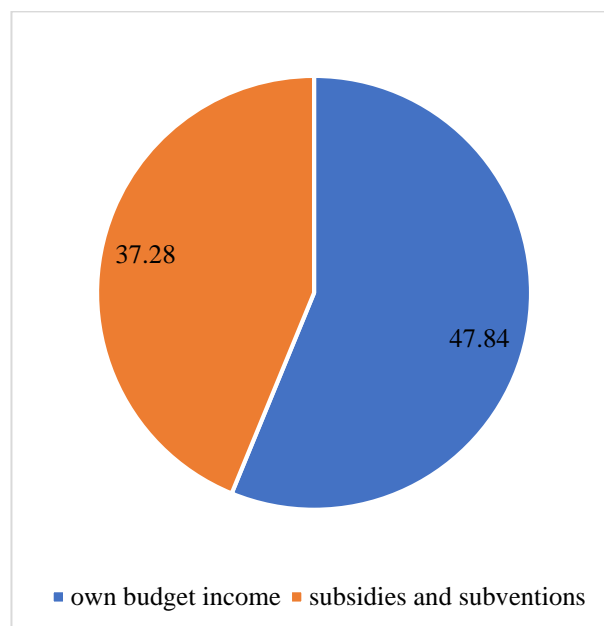


Fig.1. Sources of local budget income 2019, mln UAH  
 Source: Ministry of finance of Ukraine (stand 10.08.2020).

The next step is to determine the necessary growth of the local budget over five years in order to compensate subventions and subsidies with own revenues. However, it should be noted that not all subsidies and subventions will be reduced, some, such as

education and healthcare subventions, will remain stable, so about 60% of subventions and subsidies should be compensated. Accordingly, we have calculated the required level of growth of own revenues to the budget to compensate 60, 80 and 100% of subventions and subsidies. At the same time, for calculation of the required growth of own budget revenues, the share of subventions and subsidies that shouldn't being compensated is added to own budget revenues for the calculations (Table 1).

According to our results, to fully replace subventions and subsidies with their own budget revenues, the community needs to increase them by 12.2% per year, which is a very difficult task, but setting a more rational goal to replace 60% of subventions and subsidies is achievable. To reach this goal an increase of 6.3% is needed, which is possible to realize through planning the strategy of spatial development and changing the organization form of agricultural production.

Table 1. Calculation of the required annual own budget revenues growth for Kolomatska UTC,%

Share of subventions and subsidies to be replaced,%	Community budget, mln UAH.	Community budget per capita, thousand UAH	Subventions and subsidies needed to be replaced		Own revenues and the share of subventions and grants that will not be replaced		Budget without subsidies and subventions per capita, thousand UAH	Desirable annual growth of own budget revenues
			mln UAH	%	mln UAH	%		
60	85.12	12.33	22.37	26.28	62.75	73.72	6.93	6.3
80			29.82	35.03	55.3	64.97		9.0
100			37.28	43.80	47.84	56.20		12.2

Source: Ministry of finance of Ukraine (stand 10.08.2020) and calculations of authors.

The next step is to estimate the income of the farmer, enterprise or cooperative, the income of landowners and revenues to local budgets. An important difference is that an individual farmer or enterprise accumulates profits exclusively for itself and rents the land it cultivates, while a cooperative, as an institution of collective action, accumulates income for its founders, who are also landowners. We also differentiate production into organic and inorganic, because according to Ukrainian statistics, organic production is 20% more profitable than inorganic [5].

As for the parameters of the economy, we chose a land area of about 1,000 hectares in the northern part of the community. The average size of land plot in this part of the community is about 8 hectares. Accordingly, the study area includes about 125 land plots [14]. Growing of 9-year crop rotation typical for the natural zone of the Forest-Steppe is planned on the study area. The next crop rotation was chosen, which we have already designed for other farms and which has a deficit-free balance of humus. The order of crops in this crop rotation is as follows: Corn

for the grain; Barley; Winter wheat; Perennial herbs; Sunflower; Perennial herbs; Winter wheat; Corn for silage; Soy [2].

Growing costs is approximately 12 mln UAH (~€0.37 mln) per year for sowing crops, field care, harvesting, wages and depreciation of production means (Table 2). The annual cost of growing our selected crops is from 9,000 UAH (~€280) to 15,000 UAH (~€460) per hectare, the average cost of growing all the selected crops is 12,000 UAH (~ €370). Accordingly, for a land area of 1,000 hectares, the costs will amount to 12 mln UAH (~€0.37 mln) per year. The average profitability of all crops of this crop rotation will be about 45%, and for organic production the profitability will be 65% [6].

The income received on the study area doesn't depend on the form of organization, but depends on the cultivation of organic or inorganic products by the farm. The income of inorganic farms/cooperatives will amount to 17.4 mln UAH (~€0.54 mln), and of organic farms/cooperatives – 19.8 mln UAH (~€0.61 mln). The local tax, which is 5% of the farm's/cooperative's income, will be 870

thousand UAH (~€26,900) or 990 thousand UAH (~€30,600), respectively. As for profits, here the differentiation also takes place according to the forms of organization of production, because cooperatives generate all profit for their members who own land cultivated by the cooperatives, and the farmer or enterprise is forced to lease land, the cost of

leased land is deducted from farm income. The profit of a farm or enterprise growing inorganic products will amount to 1,012 mln UAH (~€31,300), and organic – 3,292 mln UAH (~€101,700). In the case of cooperatives, their profit will be 4.53 mln UAH (~€0.14 mln) and 6.81 mln UAH (~€0.21 mln), respectively.

Table 2. Calculation of incomes of farmer/cooperative and revenues to the budget of Kolomatska UTC for various forms of organization of agricultural production, thousand UAH

Form of organization of agricultural production	Costs	Earnings						Own revenues of the local budget		
		of cooperative/farmer			of landowners			Direct, from the payment of local taxes	Indirect, from spendings on local goods /services	Total
		Revenue	Local tax	Profit	Revenue (per land owner)	Local tax (per land owner)	Profit (per land owner)			
Cooperative	12,000	17,400	870	4,530	4,530 (36.2)	489.0 (3.9)	3,646.6 (29.1)	1,359.0	229.4	<b>1,588.4</b>
Cooperative (organic)	12,000	19,800	990	6,810	6,810 (54.5)	735.0 (5.9)	5,482.0 (43.9)	1,725.0	284.5	<b>2,009.5</b>
Farmer/ enterprise	12,000	17,400	870	1,012	3,518 (28.1)	380.0 (3.0)	2,832.0 (22.6)	1,250.0	210.0	<b>1,460.0</b>
Farmer/ enterprise (organic)	12,000	19,800	990	3,292	3,518 (28.1)	380.0 (3.0)	2,832.0 (22.6)	1,370.0	221.4	<b>1,591.4</b>

Source: Tax Code of Ukraine (Stand 12.08.2020), Agravery (Stand 12.08.2020) and calculations of authors.

If we talk about landowners, then in the case of land lease, the income of landowners will be the cost of leasing these plots provided to the farmer or enterprise for rent. The average cost of renting a land plot in Kharkivska oblast in 2019 was 3,518 UAH/ha (~€110) [4]. Accordingly, the total income of landowners will be 3,518 thousand UAH (~€110,000), which after paying taxes will be 2,832 thousand UAH (~€87,500). At the same time, revenues to the local budget will amount to 380 thousand UAH (~€11,800). If each plot has a different owner, the profit of each landowner will be 22.6 thousand UAH (~€700) per year.

Instead, in the case of a cooperative, their income will be equal to the cooperative's profit, the local tax paid by them will be 60% of 18% of their income and will amount to UAH 489 thousand UAH (~€15,100) for inorganic production and 735,000 thousand UAH (~€22,700) for organic. The profit will be 3,646.6 thousand UAH (~€112,700) and 5,482.0 thousand UAH (~€169,400), respectively. If each plot has a different owner, the profit of each landowner will be 29.1 thousand UAH (~€900) for inorganic production and 43.9 thousand UAH (~€1,400) for organic per year.

Our calculations reflect the lowest possible income of landowners, because we assume that all landowners are members of the cooperative and the cooperative is engaged in growing crops. Income will be higher if you grow fruits or berries. Also, it is very likely that some of the land plots cultivated by the cooperative will be leased and the total number of members will be lower, although the total profit of the cooperative will decrease due to the need to pay rent for the use of leased land plots, but each individual member of the cooperative will earn more.

Summarizing the revenues of the local budget from the payment of local tax, it should be noted that for different forms of organization of agricultural production these revenues will be different, inorganic agricultural cooperative will bring about 1,359 thousand UAH (~€42,000) per year, and organic – 1,725 thousand UAH (~€53,300). In this case, the farm or agricultural enterprise will bring

1,250 thousand UAH (~€38,600) or 1,370 thousand UAH (~€42,300), respectively.

It should be noted that the activities of either a farmer or an enterprise or cooperative will also lead to indirect revenues to the local budget, because in both cases we need employees who receive wages and pay taxes, and most importantly, landowners who receive income will spend money on local goods and services. These revenues are difficult to calculate clearly, we believe that they will amount to about 200-300 thousand UAH (~€6,200-9,300) per year. In the case of the formation of a cooperative, these indirect revenues will be higher, because landowners will receive more income and, accordingly, will be able to spend more on local goods and services.

In summary, we compare the earnings of the farmer/enterprise, landowners and revenues to the local budget for both forms of organization of agricultural production with organic agricultural products (Fig. 2).

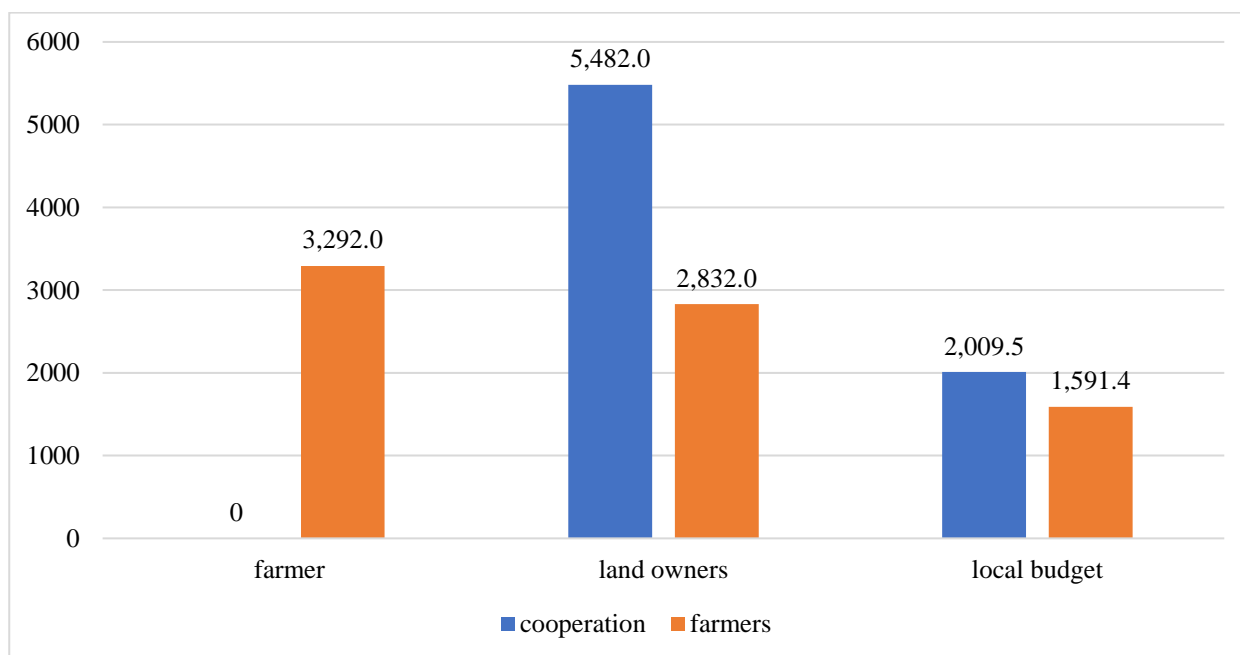


Fig.2. Distribution of income between different stakeholders, thousand UAH  
 Source: authors own calculations.

In the case of the formation of a cooperative, the cooperative will earn money for its members, respectively, it will not receive a profit. In the case of a farmer or enterprise, their profit will be 3,292 thousand UAH (~€101,700). So, an individual farmer or several farmers accumulate more profit than

the owners of land they cultivate, because the profit of landowners will be UAH 2,832 thousand UAH (~€87,500). In the case of the organization of the cooperative, their profit will be almost twice as much and will amount to 5,482 thousand UAH (~€169,400).

As for receipts into the local budget, in case of a farm/enterprise they will be 1,591.4 thousand UAH (~€49,200), while the cooperative and its members will bring 2,009.5 thousand UAH (~€62,100) to the local budget.

## CONCLUSIONS

As a result of our research, we have calculated the economic effect of various forms of organization of agricultural production and believe that institutions of collective action, in particular agricultural cooperatives are a more effective form of organization of agricultural production for both landowners and local budget revenues. In the case of transfer from land cultivation by individual farmers or enterprises to the formation of agricultural cooperatives, the income of landowners who form a cooperative will at least double, and revenues to the local budget will increase by approximately 25%. Further growth of landowners' wealth will promote the development of other local businesses.

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