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Development of micro-entrepreneurs in agriculture in wartime conditions

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► **Abstract.** Micro-entrepreneurial structures in the field of agricultural production generate employment, have adaptive potential for the formation of stable food systems and survival. **The purpose of this study** was to substantiate the theoretical and methodological foundations and socio-economic problems of micro-entrepreneurial activities in agriculture under martial law. **Research methodology.** The methodological framework of the present study included the provisions of system analysis. To generalize results, the study involved monographic, normative, graphic, abstract-logical methods and approaches. **Study results.** The place of micro-enterprises in the "production – distribution – exchange – consumption" system is determined. They can creatively contribute to the achievement of sustainable development criteria, form sustainable agri-food chains, guarantee self-sufficiency in food products, develop local niche exclusive productions, and ensure self-employment of the rural population. It is established that personal farms that have organized a family farm and registered as individual entrepreneurs also have the opportunity to implement their activities. It was found that the most adapted to the crisis conditions associated with military actions are family farms and household plots. However, the lack of stable sales channels for the products of micro-enterprises, the low level of purchase prices and a considerable increase in prices due to military operations for energy resources, machinery, fertilizers, and plant protection products make production inefficient. One of the priority areas of regional

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policy is still the development of family farming, small and micro businesses in rural areas. **Practical significance.** The results of the study can be considered when developing regional programs for the development of agricultural business entities

► **Keywords:** business entity; micro-entrepreneurial structures; family farm; private household plot; agricultural cooperative; private enterprises

► Introduction

The conditions of martial law have a considerable impact on socio-economic and political instability. Micro-entrepreneurial structures have managed to adapt faster to the extreme conditions of organizing the production, storage, and marketing of agricultural products. Microentrepreneurs are the most motivationally oriented, especially if the owner is the head of the family, the household is family property, and the family takes lessons in building up its capital. The organization and activities of microenterprises are implemented according to the “Economic Code of Ukraine” (Paragraph 2, Item 3). The Code states that the average number of employees in a micro-enterprise should not exceed 10 people during the reporting calendar year. According to the average annual exchange rate of the National Bank of Ukraine, the income of a microenterprise from any activity for the year should not exceed 2 million euros in equivalent (Commercial Code of Ukraine, 2003). Considering the positions reflected in the Law of Ukraine “On Accounting and Financial Reporting in Ukraine”, the following economic features of the development of a microentrepreneur are substantiated as follows: a) up to 10 people – the average number of employees at the enterprise; b) up to 700,000 euros – net income from the sale of products (goods, works, services); c) up to 350,000 euros – the book value of assets (Law of Ukraine No. 996-XIV..., 2018). Microenterprise entities can take a decent position in the market. During the period of martial law (2023), conditions are needed that would ensure the increase in competitiveness of microentrepreneurs in agriculture and their strengthening.

O. Shpykuliak & I. Bilokinna (2019) proved that the rural population can ensure energy independence by selling produced fuel, reducing energy costs, and functioning of established “green” cooperatives. A. Burliai *et al.* (2021) grouped the risks of greening agriculture into four groups: logistics and sales, financial and economic, institutional risks, and industrial risks. Typification of the main risk reduction tools from the implementation of greening at the level of the business entity has been carried out.

Researcher V. Horovyi (2021) investigated the main aspects of the development of Ukrainian agricultural cooperation. J. Lopes & S. Gomes (2022) explored the potential of innovative and sustainable strategic management in the development mechanism of small and medium-sized enterprises to expand the competitive advantages of the enterprise. The processes of survival of the business entity are classified as mechanisms for the realization of social and environmental benefits for the enterprise.

Worthy of attention is the position of V. Kyfyak *et al.* (2022), who substantiated the influence of extreme and socio-economic conditions of activity on the processes of transformation of subjects of agrarian entrepreneurship. It was established that the lack of sources of financing is one of the principal issues of the functioning of agribusiness, and therefore integration and cooperation of agricultural producers will help business entities survive. A. Bitkowska *et al.* (2022) revealed the mechanism of business process management and proved that the implementation of Agile Business Process Management allows the business entity to respond more effectively to market changes and implement radical changes in the business environment. D. Dabrowski (2022) focused on market turbulence and its relationship to commercial enterprise performance, labour productivity, market infrastructure, suppliers, and buyers. It was substantiated that the introduction of innovative products has a dual impact on the commercial efficiency of production.

D. Shyian *et al.* (2021) determined that the quality of the food supply is a fundamental factor in social security according to established standards and scientific norms. However, some issues related to the functioning of microenterprises in wartime conditions are still understudied and require further consideration.

Considering the processes of functioning of microentrepreneurial structures in extreme conditions, most researchers addressed the expediency of their creation; capital formation of individuals-entrepreneurs, family farms, and private household plots, and their economic importance as business entities. Economists’ attention is focused on the problems of infrastructure support for rural areas and the assessment of target parameters of the anti-crisis stability of enterprises. This paper substantiates the features of personnel management, where the owner and manager are one person; marketing development strategy; increasing the investment activity of households, and the impact of armed conflict on the functioning of microentrepreneurial structures.

The published studies on the problems of the development of farms primarily address the essence of the concepts, the need for state support, the assessment of the impact of the external environment, and the criteria for assessing the investment status of subjects. Insufficient attention is paid to the development of microenterprises under martial law. The question of the methodological principles of the assessment also did not find further development. This refers to indicators that ensure the identification

of parameters of the effectiveness of social development processes, considering the specific features of the legal form, which specifically concerns the subjects of microentrepreneurship, which are considered in this paper.

Scientific originality. Microentrepreneurial structures have advantages over large enterprises that have suffered large losses as a result of military operations. The present study substantiated the essence of the transformation of household plots into family farms in the conditions of martial law, which proved their effectiveness.

The purpose of this study was, from the standpoint of a systemic approach, to evaluate and substantiate the theoretical, methodical, and practical principles of the economy of microentrepreneurial structures of the agrarian sector of the economy in wartime conditions.

► Materials and Methods

The main provisions of institutional economic theory and system analysis served as the theoretical and methodological platforms of this study. The system method of cognition is based on the historical experience of the development of agricultural microenterprises. Abstract-logical methods were used to determine the essence of the processes of adaptation of microenterprises of the agricultural sector of the Ukrainian economy to functioning in wartime conditions. The monographic method was used to make empirical assessments and identify trends in changes and development of microenterprises. The method of analysis was used to reveal data on the functioning of microentrepreneurs in the agricultural sector of Ukraine. The graphical method was used to display conditional images of statistical data and the process of calculating certain parameters. The generalization method was used to formulate conclusions, research results, and recommendations, and establish cause-and-effect relationships in describing the development of individual groups of microentrepreneurs.

An equation that reflects the change in the average value of one feature (Y) depending on the second feature (X) is called the correlation equation. The rectilinear form of communication is determined by the straight-line equation:

$$y = a_0 + a_1 \times x, \quad (1)$$

where y are the theoretical values of the resulting feature; a_0 is the start of the countdown, provided that $x=0$; a_1 is the regression coefficient; x is the value of the factor factor.

a_0 ; a_1 parameters are found according to the least squares method. The least squares method is reduced to composing and solving a system of normal equations:

$$\begin{cases} a \cdot \sum x^2 + b \cdot \sum x = \sum x \cdot y \\ a \cdot \sum x + b \cdot n = \sum y \end{cases} \quad (2)$$

By solving it, we get the values of the coefficients a_0 ; a_1 and the analytical expression of the dependence: $y = a_0 + a_1 \times x$.

For the established density of the connection between the factor and result features, the Pearson correlation coefficient and determination coefficient were calculated according to the following formulas:

$$\sigma_x = \sqrt{\frac{\sum(x_i - \bar{x})^2}{n}}; \sigma_y = \sqrt{\frac{\sum(y_i - \bar{y})^2}{n}}. \quad (3)$$

$$t_x = \frac{x_i - \bar{x}}{\sigma_x}; t_y = \frac{y_i - \bar{y}}{\sigma_y}. \quad (4)$$

$$r = \frac{\sum(t_{x_i} \times t_{y_i})}{n}. \quad (5)$$

$$d = r^2 \quad (6)$$

where r is the linear correlation coefficient; σ_x is the mean square deviation of the factor feature; σ_y is the mean square deviation of the resulting feature; t_x ; t_y are intermediate indicators for calculating mean square deviations of features. The coefficient of determination (d), i.e., the square of the correlation coefficient, shows what proportion of the total variation of the resulting feature is determined by the factor feature.

The calculations were performed using modern computer technologies (Microsoft 365 for Business; web versions of Word, Excel, and PowerPoint) and analysis techniques. A trend analysis was used to construct a forecast for 2030 of annual changes in agricultural products and net profit realized by the microentrepreneurs. The optimistic scenario of the forecast for the development of microentrepreneurs in 2030 is based on the number of entities according to type of business.

► Results and Discussion

Microentrepreneurial structures, due to their mobile management system and compact production, are more adapted to activities in wartime conditions. Therefore, in the future, it is necessary to promote the development of microentrepreneurial structures, private household plots, and family farms, which are represented by niche products, to ensure the preservation of jobs and environmental protection. In the conditions of martial law, the perspective of the institution of self-sufficiency and the provision of food aid to other citizens increases, and the development of rural social capital also gains priority.

The number of employed employees of microenterprises in 2021 compared to 2016 increased by +6.66%, while individual entrepreneurs decreased by -7.78%. In 2021, agricultural microenterprises employed 129,640 employees. Until 2018, there was a tendency to increase their number. The level of profitability in 2021 was 35.3% (Table 1) (State Statistics Service..., 2023).

In 2021, microenterprises of agriculture ensured the sale of products in the amount of UAH 120,252.924 million with the highest level of profitability of all activities of 35.3% (Table 1).

Table 1. Main indicators of the functioning of the microentrepreneurs of the agricultural economy of Ukraine

Indicators	2016	2017	2018	2019	2020	2021	2021 in % to 2016
Number of active entities, units	36,096	40,943	41,271	40916	40503	38,663	+7.11
Number of employed workers, people	92,765	100,217	99,851	94,537	93,356	129,640	+39.75
share in the total number of microenterprises, %	3.30	3.49	3.29	2.98	3.01	4.14	+0.84
Volume of products sold, mln UAH	53,410.504	63,215.048	71,143.889	76,615.937	89,853.409	120,252.924	+125.15
share in the total number of microenterprises, %	6.58	6.01	5.50	5.35	5.43	5.58	-1
share in the total number of enterprises in the industry, %	c/s	14.13	13.78	c/s	c/s	c/s	c/s
Volume of goods produced, mln UAH	57,918.058	68,749.237	79,988.912	85,842.992	95,156.463	-	+64,29**
share in the total number of microenterprises, %	10.95	9.73	9.13	7.71	7.09	-	-3.86**
share in the total number of enterprises in the industry, %	c/s	13.66	13.53	c/s	c/s	c/s	c/s**
Personnel costs, mln UAH	1,977.0773	2,284.022	3,912.1203	4,120.3941	4,513.6854	4,891.088	+147.39
Labour costs, mln UAH	1,542.6692	1,797.8872	3,072.554	3,241.6429	3,550.2032	3,798.970	+146.26
Net profit, mln UAH	10,084.756	4,026.056	4,881.165	5,807.906	10,678.756	25,099.756	+148.88
Equity at the end of the year, mln UAH	42,248.451	45,280.133	40,822.439	65,751.001	82,042.613	97,282.378	+130.26
Level of profitability of operating activities, %	33.5	24.5	16.5	15.7	18.2	38.2	+4.7
Level of profitability of all activities, %	26.9	7.8	7.9	9.0	15.3	35.3	+8.4

Note: * – agriculture, hunting, and provision of related services; ** – 2020 in % by 2016; c/s – data are not made public to ensure compliance with the requirements of the Law of Ukraine “On State Statistics” regarding the confidentiality of statistical information (primary and secondary blocking of vulnerable values). It is presented without considering the results of the activities of banks and budgetary institutions, 2016-2021

Source: State Statistics Service of Ukraine (2023)

It has been established that in recent years (2017-2021) there has been an increase in the sale of products by microentrepreneurs. In 2021, compared to 2020, the production of cereals, legumes, and oilseeds in crop production increased by +33.42%. In

animal husbandry, animal breeding increased by +8.73%. In 2021, compared to 2020, the production of cereals, legumes, and oilseeds in crop production increased by +33.42%. In animal husbandry, animal breeding increased by +8.73% (Table 2).

Table 2. Volume of products sold by microenterprises in agriculture, mln UAH, in 2017-2021

Indicators	2017	2018	2019	2020	2021	deviation of 2021 in % to 2017
crop production, cultivation, incl.:						
annual and biennial crops	49,289.6	55,433.0	60,004.6	70,999.8	94,568.3	+91.86
cereals (eXcept rice), legumes and oilseeds, incl.:	48,487.2	54,723.6	59,117.9	69,890.7	93,248.0	+92.31
vegetables and melon crops, roots and tubers	617.5	591.4	669.8	875.4	1,042.3	+68.79
hemp crops	c/s	26.1	11.1	16.2	22.0	-15.71*
other annual and biennial crops	115.9	74.1	120.6	173.3	237.9	+105.26
perennial crops	686.8	736.7	877.2	1,149.7	1,584.5	+130.71
grapes	92.2	95.5	47.8	34.1	105.6	+14.53
seed and stone fruits	348.7	443.1	363.9	546.9	763.5	+118.96
berries, nuts, and other fruit trees	203.1	159.2	399.9	460.5	621.4	+205.96
other perennial crops	19.7	18.3	11.9	25.4	20.2	+2.54
plant reproduction	88.5	134.6	135.1	129.2	242.3	+173.79
animal husbandry, breeding, incl.:	1,580.6	1,775.4	1,589.5	1,886.9	2,051.7	+29.81
Dairy cattle	406.3	582.7	446.6	490.9	558.3	+37.41

Table 2, Continued

Indicators	2017	2018	2019	2020	2021	deviation of 2021 in % to 2017
other cattle and buffaloes	201.2	129.9	104.8	119.9	117.1	-41.80
horses and other animals of the equine family	3.0	5.2	6.9	5.5	22.1	+636.6
sheep and goats	53.9	46.7	72.8	23.1	89.6	+66.23
pigs	358.9	476.7	472.0	544.5	446.1	+24.29
poultry	476.4	436.7	402.7	619.9	648.9	+36.21
other animals	80.7	97.5	83.6	82.9	169.5	+110.0
supporting activities, including in the following areas:	710.8	1,014.8	1,225.5	1,382.5	1,954.8	+175.0
agriculture and post-harvest activities						
crop production	767.4	1,066.6	1,090.5	1,169.3	1,675.5	+118.3
animal husbandry	52.10	42.7	41.9	39.5	50.1	-3.84
post-harvest activities	88.9	76.9	107.3	104.2	137.1	+54.2
mixed agriculture	914.2	752.6	838.0	988.2	1,422.2	+55.56
seed treatment for reproduction	106.4	39.4	56.7	69.5	92.1	-13.44

Source: State Statistics Service of Ukraine (2023)

During the study, a functional dependence was found between the volume of agricultural products sold by active microentrepreneurs and the net profit for 2016-2021 in mln UAH, at constant

prices of 2016 (Table 3). To identify the dependence between agricultural products produced by microenterprises and net profit, we will calculate intermediate indicators (Table 4).

Table 3. Initial data for establishing the relationship between profit and product volume indicators

Indicators	2016	2017	2018	2019	2020	2021
Agricultural products, Xi	53,410.504	63,215.048	71,143.889	76,615.937	89,853.409	120,252.924
Net profit (loss), Yi	10,084.756	4,026.056	4,881.165	5,807.906	10,678.756	25,099.756

Source: State Statistics Service of Ukraine (2023)

Table 4. Calculated values of intermediate indicators for establishing a linear dependence function

	x_i^2	x	y	y^2	$x_i y_i$
2016	2,852,681,937.5	53,410.5	10,084.7	101,702,303.6	547,708,181.1
2017	3,996,142,293.6	63,215.0	4,026.1	16,209,126.9	254,507,323.3
2018	5,061,452,942.0	71,143.9	4,881.2	23,825,771.8	347,265,060.9
2019	5,870,001,802.4	76,615.9	5,807.9	33,731,772.1	444,978,160.2
2020	8,073,635,108.9	89,853.4	10,678.7	114,035,829.7	959,522,630.5
2021	14,460,765,730.5	120,252.9	25,099.8	629,997,751.3	3,018,319,050.7
Σ	40,314,679,814.9	474,491.7	60,578.4	919,502,555.4	5,572,300,406.7

Source: author's development using the Eqs. (1, 2)

The desired equation has the following form:

$$y = 0,2456 \times x - 9120,5 \quad (1)$$

$$a_1 = 0,2456; a_0 = -9120,5 \quad (2)$$

Consequently, with an increase in the volume of agricultural products sold by microentrepreneurs by UAH 1 million, net profit increases by UAH 0.2456 million. The parameter a_0 (in our example -9120.5) as a free member of the equation has only a calculated value and is not interpreted.

The following average values of agricultural products and net profit (loss) were established: $\bar{x} = 79081,9$; $\bar{y} = 10096,4$.

To find the density of the connection between the factor and result features, we will calculate

the coefficient of correlation and determination (Table 5).

Calculation results using Eq. (3):

$$\sigma_x = \sqrt{\frac{2790948746,8}{6}} = 21567,52.$$

$$\sigma_y = \sqrt{\frac{307879307,1}{6}} = 7163,32.$$

The results of calculations using Eq. (5):

$$r = \frac{5}{6} = 0,8333.$$

The results of calculations using Eq. (6):

$$d = r^2 = 0,6944.$$

Table 5. Calculated values of intermediate indicators for determining Pearson's correlation coefficients and determination

	$x_i - \bar{x}$	$y_i - \bar{y}$	$(x_i - \bar{x})^2$	$(y_i - \bar{y})^2$	t_x	t_y	$t_x t_y$
2016	-25,671.4	-11.7	659,020,777.9	136.9	-1.19	-0	0
2017	-15,866.9	-6,070.3	251,758,515.6	36,848,542.1	-0.73	-0.85	0.62
2018	-7,938	-5,215.2	63,011,844	27,198,311.0	-0.37	-0.73	0.27
2019	-2,466	-4,288.5	6,081,156	18,391,232.2	-0.11	-0.60	0.07
2020	10,771.5	582.3	116,025,212.3	339,073.2	0.50	0.08	0.04
2021	41,171	15,003.4	1,695,051,241	225,102,011.5	1.91	2.09	4
Σ			2,790,948,746.8	307,879,307.1			5

Source: author's development based on Eqs. (3,5,6)

Given that the value of the correlation index approaches 1, we can conclude that the influence of other factors in 2016-2021 on the analysed population is not very significant. In 2016-2021, among

existing individual entrepreneurs: their number decreased by only -19.53%; the volume of products sold (goods, services) increased by +119.89%; the number of employees also increased by +27.25% (Table 6).

Table 6. Some key indicators of the functioning of existing individuals-entrepreneurs in microenterprises in agriculture

Indicators	2016	2017	2018	2019	2020	2021	2021 in % to 2016
<i>Number of active entities, units</i>	23,460	21,205	20,927	20,339	19,357	18,879	-19.53
<i>Number of workers employed by individuals-entrepreneurs, people</i>	31,351	30,070	c/s	30,436	29,046	28,913	-7.78
share in the total number of individuals-entrepreneurs, %	1.44	1.39	c/s	1.27	1.22	1.23	-0.21
share in the total number of individuals-entrepreneurs in micro enterprises of the industry, %	96.8	96.1	93.8	93.8	93.9	94.9	-1.9
<i>Volume of products sold, mln UAH</i>	8,380,886.2	9,640,485.3	11,057,041.0	11,875,273	13,317,137.6	18,429,211.1	+119.89
share in the total number of individuals-entrepreneurs, %	1.86	1.74	1.60	1.45	1.41	1.43	-0.43
share in the total number of individuals-entrepreneurs in micro enterprises of the industry, %	97.3	96.3	94.8	94.9	94.1	95.9	-1.4

Source: State Statistics Service of Ukraine (2023)

The largest financial losses were experienced by micro, small, and medium-sized business entities that are focused on the production of niche products. Almost half of the products are produced by private

household plots (PHPs), micro and small producers. In 2020, retail and wholesale markets, public catering establishments that are the main sales channels for products, especially fruits and vegetables, greens,

and meat and dairy products, were shut down. Two components decreased – the gross accumulation of fixed capital and the change in stocks of tangible working capital. Due to the massive shutdown of markets, farmers suffered considerable losses.

The principal role in the preservation and development of local markets and food supply chains is played by farmers and private household plots. Private household plots function for the existence of the producer itself, and not just for profit and rent. The development of farmers and private farms will

contribute to ensuring the adaptation of the agricultural structure of Ukraine to the EU (National Academy..., 2022).

In 2021, there were 3,921.5 thousand PHPs in Ukraine, using 6,120.0 thousand hectares of land, producing a significant share of gross agricultural production (32.0%). The largest share in the production of certain types of products is occupied by the production of potatoes (97.7%), vegetables (85.9%), fruit (79.2%), milk (68.2%), raising livestock (29.4%) (Table 7) (State Statistics Service..., 2023).

Table 7. General characteristics of private farms, 2017-2021

Indicators	2017	2018	2019	2020	2021	2021 in % to 2017
Number of households in rural areas, thous. units	4,900.1	4,873.6	4,844.2	4,782.1	4,734.1	-3.39
Number of PHPs, thous. units	4,031.7	3,996.5	3,975.1	3,954.8	3,921.5	-2.73
Land area owned by PHPs, thous. ha, incl.:						
for construction and maintenance of residential buildings, outbuildings and structures, thous. ha	793.3	791.0	788.3	787.0	777.1	-2.04
for private household farming, thous. ha	2,551.3	2,513.4	2,512.6	2,517.7	2,544.2	-0.28
for commercial agricultural production, thous. ha, of which:	2,799.3	2,777.1	2,781.8	2,772.6	2,735.3	-2.29
leased, thous. ha	338.5	345.0	348.2	350.9	367.1	+8.45
The average size of the land area of the household, ha	1.23	1.20	1.19	1.18	1.24	+0.81
The average land area of the PHP, ha	1.532	1.534	1.543	1.549	1.561	+0.03
Gross agricultural production, billion UAH	279.393	314.904	311.302	326.604	437.539	+56.60
The share of households in gross agricultural production, %	39.5	37.2	36.9	36.6	32.0	

Source: Socio-demographic characteristics... (2023)

Therewith, the main objective prerequisite for the dynamics of rural households is the demographic crisis in rural areas, which is expressed in a tendency to reduce the size of the rural population and its economically active part. Thus, from 2017 to 2021, the number of economically active people aged 15-70 years decreased from 5,602.2 thousand people to 5,414.9 thousand people (by -3.34%). During 2016-2021, the area of land used in terms of 1 PHP was 1.5387 ha. Analysis of PHP dynamics allows making a trend forecast for 2024-2030. According to the

forecast, the number of PHPs in 2030 maybe 3,753.4 units (Fig. 1) (State Statistics Service..., 2023).

Considering the positions of local self-government, it is important to form a balanced socio-economic activity of rural communities, which is ensured if there is an optimal number of business entities in terms of types of business in agriculture. Therewith, it is important to have a different scale with priority support for farms and subsidiary farms, various forms of cooperation as integration structures for organizing joint activities (Table 8).

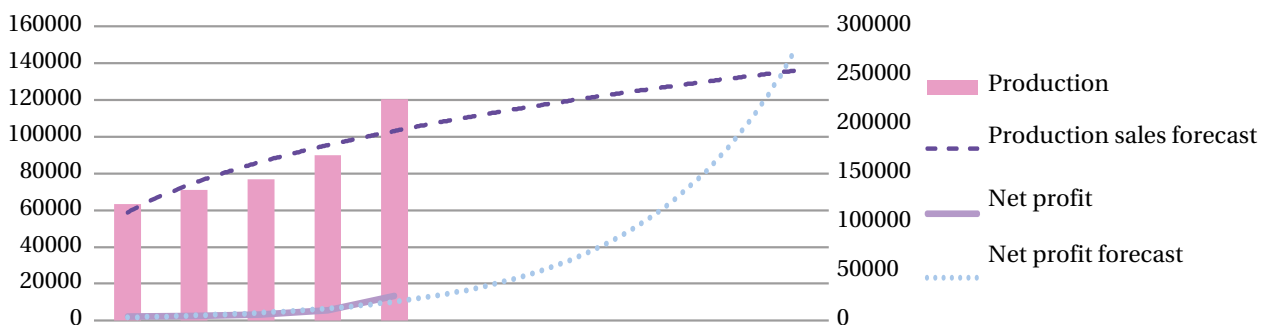


Figure 1. Forecast of changes in agricultural products sold by microentrepreneurs and net profit in 2030 (mln UAH; in constant prices of 2016)

Table 8. Dynamics of the number of entrepreneurs according to forms of management in agriculture for 2027, thous. units

Entrepreneurs	2016	2017	2018	2019	2020	2021	2030 forecast	2021 in % to 2016
Number of agricultural enterprises, as of 01.11 of the corresponding year, incl.:	47,697	45,558	49,208	48,504	47,523	45,661	44,628	-4.27
Family farms	-	-	-	64	48	151	953	
Household plots	4,075.2	4,031.7	3,996.5	3,975.1	3,954.8	3,921.5	3,753.4	-3.77
Individuals-entrepreneurs	23,458	21,201	20,922	20,337	19,354	18,876	24,236	+3.59

Source: State Statistics Service of Ukraine (2023)

As a result of the military operations, 1.5 million citizens need aid in resuming their activities in agriculture. The Food and Agricultural Organization of the United Nations (FAO) in 2023, to resume work in agriculture, plans to help restore its activities and directs USD 205 million for this. In 2022, 40,000 households in rural areas have already received the aid, but USD 100 million is still planned to be directed in 2023 to support households (FAO will allocate..., 2023; Small agricultural producers..., 2022).

As of January 2023, the Entrepreneurship Development Fund has already concluded cooperation agreements with banks regarding the implementation of the State Program "Affordable Loans 5-7-9%" (During the period..., 2023). Microentrepreneurs can receive a loan for investment purposes for the restoration of production facilities (destroyed or stolen partially or completely due to extreme operating conditions) in the amount of up to UAH 60 million (at 7% with the possibility of a reduction for investment loans to 5%); for a term up to five years; state subsidy; technical support loan from state donors; targeted credit. In 2022, according to the State Program, "5-7-9% Affordable Loans", by Resolution of the CMU No. 916 of July 29, loans to business entities for seed companies (at 0%) in the amount of 95.5 billion were extended to 12 months UAH, with UAH 24.722 billion received under state guarantees (80%) (The government has..., 2022). In March 2023, according to the state program, banks (about two-thirds of them were state-owned) issued 511 preferential loans for a total amount of UAH 1.9 billion. The total number of loans issued since the beginning of large-scale military operations on the territory of Ukraine under the program exceeded 23 thousand, and their volume amounted to almost 92 billion UAH (The government has..., 2023).

There are no funds to support the development of entrepreneurs in agriculture in the country's budget for 2023. However, the state can provide compensation, grants, or loans if necessary. For instance, in August 2022, Switzerland allocated almost UAH 100 million for the affected 296 milk-producing farms in the Kharkiv, Sumy, Chernihiv, and Kyiv regions (FAO will allocate..., 2023).

To develop microentrepreneurship, among the existing grant programs from international donor organizations, the following should be noted.

1. Training in social entrepreneurship (the possibility of attracting a grant to scale the business).

2. Competition for female entrepreneurs "Created by women – 2023" (the possibility of attracting 100 000 UAH for the development of their business).

3. Science&Business – GIST Pitch Days (an opportunity for entrepreneurs to receive support for innovation development; 24 winning projects will receive assistance from GIST in the amount of USD 5,000).

4. Competitive advice from KSE Graduate Business School on adapting to war conditions for at least 100 entrepreneurs.

5. Express online incubator for the creation and development of social enterprises from SILab Ukraine and the Ukrainian social venture fund.

6. Compensation from the German MSME Government up to 30% of the investment value (in general, an initial amount of EUR 1.3 million is available for grants; the total program budget is EUR 2.4 million).

7. Leverist.de – a digital platform for finding business partners in EU countries (Grants for business..., 2022).

8. "Make your own – 2023" – a grant competition for microentrepreneurs, within the framework of which projects were financed for a total amount of UAH 6.2 million (The year of indomitability..., 2023).

9. "Own business – 2023" – support of 7,000 micro-businesses (1.8 billion UAH). The grant amount is from 50 to 250 thousand UAH for the purchase or leasing of equipment, purchase of raw materials, rental of premises (Grants for business..., 2022).

Within the framework of the "e-Robota" grant program, it is planned to create new jobs (632 permanent, 9,000 seasonal) in the development of greenhouses and gardens in 2023. The decision on the procedure for providing grants for the creation or development of viticulture, horticulture, and berry growing and the procedure for providing grants for the creation (development) of greenhouse farming is prescribed by Resolution of the CMU No. 39 of January 17, 2023 (IOM grant program..., 2023). The issue regarding the transfer of funds to recipients from the general fund of the state budget has been resolved.

The program of USAID-agro (US Agency for International Development) on agrarian and rural development is calculated until 2024. The implementation of the program allows supporting 3 thousand

producers from the regions of the country that suffered from the Russian-Ukrainian war.

The total cost of the program is USD 35 million. In addition, the Agriculture Resilience Initiative (AGRI) project "Agricultural Resilience Initiative in Ukraine" is being prepared for implementation. Its total cost is USD 100 million. It was established that the purpose of implementing this project is to strengthen the mechanisms for exporting agricultural products. Furthermore, in 2023, it is planned to implement the USAID-agro project "Increasing the capacity of demonstration farms to ensure food security in Ukraine". The overall purpose of the project is to attract subgrants for the development of production for post-harvest preparation, processing of vegetables, fruits, and berries, meat, dairy products, poultry (except chicken), or aquaculture products (Agriculture Resilience Initiative – Ukraine, 2023).

The amount of the grant "Development of small and medium-sized enterprises: economic integration of internally displaced persons and business recovery" for micro-enterprises from the Government of Germany is up to EUR 20,000. Within the framework of this project, the amount of one-time grants is up to EUR 4,500. May 2022 was the first competition for microenterprises in the Zakarpattia, Lviv, Kyiv, Chernihiv, and Sumy regions. Support was provided to 62 microenterprises. October 2022 - second contest. Support was implemented for 188 microenterprises in these regions and from Ivano-Frankivsk, Ternopil, and Poltava regions. The third competition is to be held in spring 2023 (IOM grant program..., 2023).

Non-refundable grants for the creation of greenhouses and gardens. The total budget of the program is UAH 7 billion. In 2023, the Ministry of Agrarian Policy signed 98 orders on the allocation of grants for the development of gardens and greenhouses, totalling UAH 472.3 million. 86 grants were approved for UAH 388.4 million in gardens and 12 grants for UAH 83.9 million in greenhouses. Support for viticulture and berry growing is also provided. For the horticulture grant, the conditions for obtaining funds are the official and transparent purchase of seedlings, equipment, irrigation systems, fertilizers, etc.; garden area – from 1 to 25 ha; own land or land in use for at least 25 years. For the greenhouse grant, the maximum grant amounts are as follows: 1.6-2.4 ha – UAH 7 million; 0.8-1.2 ha – UAH 3.5 million; 0.4-0.6 ha – UAH 2 million (The Ministry of Agrarian..., 2023). The Keep Going project is a platform for helping micro and small businesses. Impulse monetary and informational support for micro-business owners is also planned. (National platform of small..., 2023).

It is also possible to receive non-refundable aid for microentrepreneurs registered in the State Agrarian Register in the amount of UAH 5,300 for each cow owned by the recipient (but not more than UAH 530,000); UAH 3,100 per hectare of cultivated agricultural land (but no more than UAH 372,000). The total amount of funding by the European Union is over UAH 2.5 billion (EUR 50 million) (Ukrinform, 2023).

The study of theoretical, methodological, and practical principles of adaptation of microenterprises of the agricultural sector of the economy to functioning in wartime conditions is a common issue. These issues are discussed in different interpretations in scientific publications.

It has been established that the imperfection of forms of social capital prevents the involvement of microenterprises in agriculture in integration processes (Yatsiv and Solovei, 2019). M. Odnorog *et al.* (2019) proved that business entities are most adapted to extreme operating conditions, and the functioning of inefficient institutions in the state reduces the standard of living of the villager and the protection of property rights.

It was found that the general strengthening of the material and technical condition, optimization of the size of land use, use of modern production technologies, increasing the capitalization of private household plots, and the activation of their transformation into family farms are one of the main areas of the development of microentrepreneurship. The approach of T. Ivanyuk *et al.* (2020) is noteworthy, who argued that the start-specialization mechanism should be implemented during the cooperation of farmers' associations as an opportunity for supplementary financing of development, considering the characteristics of resources and the territorial system of functioning.

V. Hrosul *et al.* (2021) developed the concept of the economic core of the development of a business entity; identified strategic components of the development of entrepreneurship; proved that the component of resource potential provides the size of the resources required for the subject; found that the component of the business model most increases the efficiency of the functioning of the subject of agricultural entrepreneurship. O. Semenenko *et al.* (2021) identified the basics of the military-economic importance of agriculture for the use of food resources for military purposes and developed recommendations regarding the importance of agricultural development indicators in the formation of the military-economic potential of the state. Semenenko analysed the impact of the armed conflict on the development of business entities and changes in the average prices of agricultural products; determined the relationship between the change in the sale price of products and financial costs for defence needs; established a connection between the change in the volume of military expenditures, the gross collection of grain and leguminous crops, the harvested and threshed area, and their productivity levels.

I. Vinichenko *et al.* (2021) revealed the criteria for evaluating the components of the efficiency of using the resource potential of business entities in agriculture; determined the integral indicator of efficiency (quantitative and qualitative characteristics of the involved resources, productivity, and efficiency) of the principal types of activity of business entities on agricultural land. E. Kharashvili and M. Suknishvili (2021) identified and substantiated

the factors restraining the development of business entities in agriculture. They also emphasized that farms that are not united in cooperatives have a lower level of adaptation to extreme survival conditions. V. Roshylo (2023) proved that sustainable household functioning expands the socio-economic potential for developing a country's economic security.

As for food security, J. Junaidi *et al.* (2022) found that its level in households growing food crops is high compared to households growing plantations. Half of such households are classified as food secure, while only about 20% of plantation crop households fall into this category.

O. Kyrylenko *et al.* (2022) identified certain approaches of Ukrainian scientists, the methodology of the State Statistics Service of Ukraine for estimating and determining household expenses. The Engel coefficient was chosen as an indicator for estimating the financial condition of a household with calculated values.

S. Maryam *et al.* (2022) proved that microenterprises in agriculture are the main platform for the country's national sustainable development. H. Molnar (2021) and Yu. Lupenko *et al.* (2022) revealed the priority areas of development of business entities in agriculture; which justified the need to increase Ukraine's investment potential. Subjects of agricultural entrepreneurship are quite sensitive to extreme states of the economic system, transformational shocks, and wartime states. When observing the main aspects of the market environment, the model of behaviour chosen by the business entity in the environment of functioning in wartime conditions is of great importance. For an individual business entity in the agricultural sector of the economy, adaptation processes are revealed at the level of response to external changes (Kravchenko *et al.* 2022).

When a business entity in the agricultural sector of the economy is faced with a new type of instability, its staff implements the process of adaptive change management. Under certain socio-economic and political circumstances, the problem of survival of a business entity is the loss of its market niche capacity. An adaptive approach to management in the languages of wartime is associated with the development and application of strategies for reflecting the effects of the consequences of the war by the business entity and its structures, the optimal management strategy options are chosen in the management decision-making system (Malik *et al.* 2022).

V. Rudenko *et al.* (2022) covered the impact of the fiscal mechanism on household investment activity. The tax burden on individual entrepreneurs was calculated and the need to improve the fiscal mechanism of their functioning was established. R. Skrynkovskyy *et al.* (2022), and S. Ierokhin *et al.* (2022) substantiated that to optimize the information and financial flows of the business entity, it is necessary to use the quality function. A multiplicative criterion of management effectiveness (about risk management, specifically innovation) for the

task of maximizing the profit of a business entity is proposed, which contains methods for determining the level of quality of development of a business entity and managing the development of a business entity. It was determined that the level of quality of development of a business entity depends on the level of satisfaction of consumers' needs with finished products; defect-free production; and the level of rhythmicity.

M. Ilchuk *et al.* (2023) were the first to propose a mechanism of environmental taxation for agricultural enterprises that violate the scientifically sound structure of acreage, to suspend the adverse processes of soil degradation and stabilize the agroecological situation in the country. Proposals have been developed to introduce a tax on the consumption of energy resources by creating a model of the mechanism for taxation of carbon taxes on fossil fuels.

D. Nemish (2022) found that to solve the problems of regulating the Ukrainian agricultural sector, it is necessary to consider the main aspects of the development of small agricultural entrepreneurship during its implementation. V. Antoshchenkova *et al.* (2023) developed an economic-mathematical model that allows determining the optimal raw material zone of the procurement entity of the enterprise based on the criterion of the minimum transport expenses for the delivery of raw materials. The optimal structure of production is also determined according to the criterion of minimum technological costs for processing raw materials in the production of various types of products, considering the volume of consumer demand. The rational distance of producers from the business entity was determined at a distance of 46-56 km in the region. L. Kucher *et al.* (2023) were the first to assess the readiness of business entities to implement and manage innovative projects. The current state and industry features of readiness to implement innovative projects in general and in the context of large, medium, small, and microenterprises were identified. It was found that in crop production, small business entities were distinguished by a relatively high level of readiness for the implementation of innovative projects. It was proved that in general, in the industry and animal husbandry, large business entities have a higher integral indicator of readiness to implement innovative projects than medium and small enterprises. H. Sanikidze (2021) clarified the theoretical and legal aspects of the development of agricultural cooperatives, factoring in the introduction of new principles of their activity.

The conducted research showed that the transformation of the agricultural sector, the functioning of rural areas, as well as the lengthy period of their adaptation to market conditions, generally contributed to the development of cost-effective forms of entrepreneurial activity. Non-agricultural business entities have also become widespread in rural areas.

The effective development of entrepreneurship as the main driving force in the development of the country's economy depends on the state of

the entrepreneurial environment. The conditions of martial law have a considerable impact on socio-economic and political instability. Such conditions of activity of business entities set new requirements for the development of an effective system of adaptation of the organizational and economic mechanism of management to the conditions of martial law. The practice of economic structures in wartime conditions has shown certain advantages of the functioning of small and medium-sized business structures in comparison with larger ones, such as agricultural holdings. Microentrepreneurial structures have managed to adapt faster to the extreme conditions of organizing the production, storage, and marketing of agricultural products.

Substantial obstacles to the development of microentrepreneurial structures in the countryside are still the orientation of most state programs in the field of agriculture and rural development towards the support of large producers; certain risks associated with starting a business, a low level of identification and liquidity of property objects, which practically exhausts their value with the costs of compulsory charges; the inadequate level of development of systems of informational and advisory support for entrepreneurship in rural areas. Agricultural advisory services do not receive sufficient state support.

► Conclusions

The conducted assessments of trends in the development of microentrepreneurial structures confirmed their special socio-economic importance as quickly responding to changes in the business environment under martial law. The effectiveness of their economic activities was covered. The implementation of the marketing strategy of microenterprises in the face of the complexity of logistics components caused by military operations, along with financial support, is the key element of management of microenterprises.

The study results indicate that the activity of microentrepreneurial structures in wartime conditions ensures the performance of their functions. Microentrepreneurial structures, due to their mobile management system and compact production, are more adapted to activities in wartime conditions. In the system of ensuring food security, the importance of niche products is growing, the activation of production of which requires inclusion in the priority areas of regional and national policy.

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It was established that the purpose of the strategy for the development of private farms and family farms in the post-war period is to increase the efficiency of management that can ensure income growth. It was substantiated that the development of private farms and family farms provides a substantial increase in added value through the processing of agricultural raw materials, innovative renewal of production, and infrastructure. In further research, there is a need to clarify the strategic areas and principles of microenterprise development. Furthermore, they require support to accelerate the integration of the Ukrainian agricultural sector into the global economy. Such research may include the development of content and terms for enhancing the involvement of microentrepreneurial structures in the restoration and acceleration of the post-war development of the Ukrainian economy. Attention should be paid to the increased involvement of local self-government bodies in the processes of supporting the activities of private farms and family farms. For this, it is necessary to develop state and regional programs for the development of private household plots and family farms for the period up to 2030, under the determination of the priority vectors of their development in Ukraine.

The reasons that hinder the development of microenterprises are the low level of technical and technological support; insufficient awareness of the population about the opportunities and benefits of creating family farms. Furthermore, there is an insufficient level of opportunities to attract financial resources and investments for the functioning and development of microentrepreneurs. The lack of a holistic and consistent policy aimed at the integrated development of rural areas, which is based on the needs of territorial communities of the village and settlement, and the support of microenterprises, has a negative impact.

A key factor in the further development of microentrepreneurs is national support for starting one's own business, protecting property rights, and employment, spreading financial literacy, and increasing export potential.

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► Conflict of Interest

None.

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Розвиток суб'єктів мікропідприємництва у сільському господарстві в умовах воєнного часу

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- **Анотація.** Мікропідприємницькі структури в сфері виробництва сільськогосподарської продукції створюють нові робочі місця, володіють адаптивним потенціалом для формування стабільних продовольчих систем та виживання. **Мета статті** – обґрунтувати теоретико-методологічні засади та соціально-економічні проблеми діяльності суб'єктів мікропідприємництва у сільському господарстві в умовах воєнного стану. **Методика дослідження.** За методологічну основу дослідження слугували положення системного аналізу. Використано монографічний, нормативний, графічний, абстрактно-логічні методи та підходи узагальнення результатів. **Результати дослідження.** Визначено місце мікропідприємств у системі “виробництво – розподіл – обмін – споживання”. Вони здатні креативно сприяти досягненню критеріїв сталого розвитку, формувати сталі агропродовольчі ланцюги, гарантувати самозабезпечення харчовими продуктами, розвивати локальні нішеві ексклюзивні виробництва, забезпечити самозайнятність сільського населення. Встановлено, що мають можливість реалізувати свою діяльність і особисті селянські господарства, які організували сімейне фермерське господарство і зареєструвалися як фізичні особи-підприємці. Виявлено, що найбільш адаптованими до кризових умов, пов'язаними з воєнними діями, є сімейні фермерські і особисті селянські господарства. Проте відсутність стабільних каналів збуту продукції мікропідприємств, низький рівень закупівельних цін та значне підвищення цін в зв'язку з воєнними діями на енергоресурси, техніку, добрива, засоби захисту рослин робить виробництво малоефективним. Одним з пріоритетних напрямів регіональної політики залишається розвиток сімейного фермерства, малого та мікробізнесу на селі. **Практична значущість.** Результати дослідження можуть бути враховані при розробленні регіональних програм розвитку суб'єктів аграрного підприємництва
- **Ключові слова:** суб'єкт підприємництва; мікропідприємницькі структури; сімейне фермерське господарство; особисте селянське господарство; сільськогосподарський кооператив; приватні підприємства