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Methodological Aspects of the Military-Economic Significance of Agriculture and Modern Problems of Military Food Resources in Ukraine

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Abstract. Today, the study of the military-economic significance of agriculture is given considerable attention by both the leadership of the Armed Forces of Ukraine and the state as a whole, so the main purpose of the article is to determine some methodological aspects of the military-economic significance of agriculture to strengthen the military-economic potential of the state and reveal the problems of using food resources for military purposes. In the article, the authors analyse statistical data on the dynamics of the main indicators that characterise the military-economic significance of the agro-industrial complex in the general system of national security of the state, as well as the dynamics of their growth over the years, with further research of correlations between these indicators and defence expenditures of Ukraine in order to develop recommendations for assessing the importance of indicators for the development of the agricultural sector in ensuring a sufficient level of military-economic potential of the state. Through the analysis, the economic capabilities of the state to provide Armed Forces were established, the views on determining the share of GDP in the protection of national interests in order to strengthen the country's MEP were formed, the main priorities for further development of the country as a whole were formulated. Also in the article, using the method of an expert survey based on pairwise comparisons, the indicators of the contribution of the main components to the overall indicator of sufficiency of the level of military and economic potential of the state are evaluated in order to determine the importance of the agricultural sector in the development of this potential. Based on the results, it was determined that the basis of any MEP of the state is the stability of the functioning of industry and the agricultural sector, since this is the basis for ensuring the country's defence capability as a whole. The collected statistical data and practical results obtained can be useful for specialists in the defence and agricultural sectors of the state, as well as scientists for conducting further research in the area defined in the article

Keywords: armed forces, army, national security of the state, war, food products



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INTRODUCTION

The national interests of Ukraine today require the immediate development and implementation of a set of measures to ensure the effective use of available resources for economic progress, increasing and strengthening the defence potential (DP) and military-economic potential (MEP) of the state. The study of the issues of assessment and balanced development of the state's MEP is one of the main components of the problems of further development of Ukraine as a whole [1-5].

Ukraine now has a significant potential for the availability of human, labour, natural, material, energy, technical, intellectual, scientific, production resources [6-10], which, if used correctly, can contribute to the acceleration of economic, social, and military development of the state by creating a competitive economy [1-4]. The national interests of Ukraine require the immediate development and implementation of a set of measures to ensure the effective use of available resources for the purpose of economic progress, increasing and strengthening the defence and military-economic potential of the state [11-13].

The study of the issues of assessment and balanced development of the state's MEP is one of the main

components of the problems of further development of Ukraine as a whole. The concept of MEP characterises the objectively existing maximum opportunities in the state to meet military needs in the event of its involvement in the war. In each specific case, the degree of practical use of these opportunities, the level of their transformation into real military-economic power are determined by many reasons: military-political, economic and military-technical, and so on.

There is also an opinion that the MEP of the state can be considered part of the economic potential (EP) [7], which reflects the military and economic capabilities of the state, which can be aimed at meeting material needs and completing the Armed Forces for warfare:

$$MEP = K_u \cdot EP \quad (1)$$

where MEP – military-economic potential, %; K_u – economic potential utilisation ratio ($0 < K_u < 1$); EP – economic potential, %.

That is, with this approach, the MEP is a set of economic resources of the state (Fig. 1), which can be allocated and used to build up the economic foundations of the military power of the state.

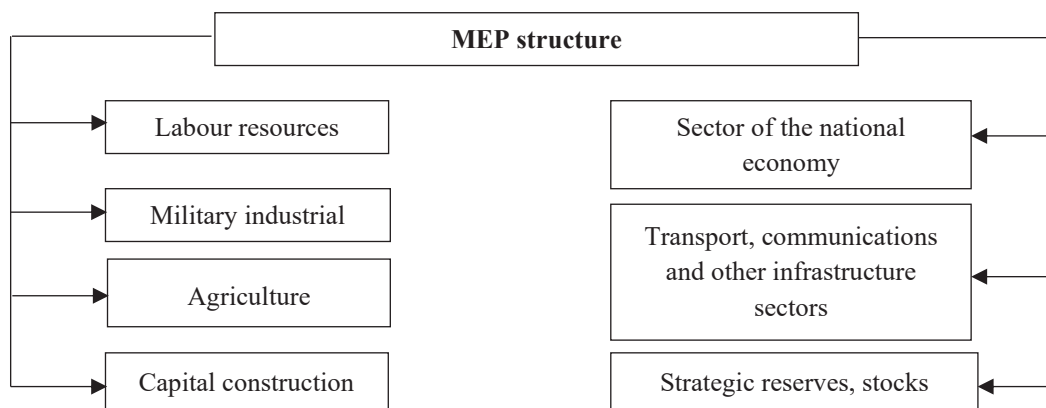


Figure 1. MEP structure

The issue of ensuring a sufficient state of the MEP of the country becomes particularly important in the conditions of combat use of units and subunits of the Armed Forces of Ukraine in the performance of tasks for their intended purpose, as well as significant differences between the needs for the development of the military component of the state and the resources available to meet these needs, which are actually allocated to maintain the military potential (MP) of the state today [1]. The lack of resources significantly depends on the ideas formed in society, including theoretical ones, about the role and place of the military organisation (Armed Forces of Ukraine) in the national security system of the country, about the objective needs and the final effectiveness of its activities in the actual geostrategic, cultural-historical and economic-technological conditions [3; 4; 14; 15].

One of the most important conditions for the material support of the state population, the stability of

the national economy, and the sufficiency of the Armed Forces of Ukraine is the sustainable production of food and agricultural raw materials in peacetime and wartime. Agriculture is one of the important elements of the economic potential of Ukraine, so its role in ensuring a sufficient level of MEP in order to increase the protection of the national interests of the state is quite significant, so the study of the military-economic significance of agriculture is given considerable attention by both the leadership of the Armed Forces of Ukraine and the state as a whole. For the defence of the state, a combat-ready army, a strong rear are necessary, and for any army that performs tasks for their intended purpose, it is necessary to provide sufficient food for military personnel in their places of deployment [5-6; 14; 15].

In the modern conditions of development of Ukraine, the problem of rational use of sources of meeting the needs of all sectors of the national economy is

quite acute. It is important today to have the necessary supplies of food and raw materials and their rational placement, maintenance and storage. Many new influences are exerted by the modern hybrid war on the territory of Ukraine on the solution of issues of mobilisation of sources of food supply for the army, organisation of agricultural production and distribution of products.

Analysis of recent research and publications shows [15-20] that in the current conditions of development of the Armed Forces of Ukraine and the state as a whole, taking into account the factors of the presence of armed conflict on the territory of Ukraine and the occupation of part of the territory, the requirements for providing the needs of the armed forces of Ukraine with food are sharply increasing, which in turn affects the growth of requirements for agriculture of Ukraine in conditions complicated by the loss of about 4% of acreage. Today, during the ongoing armed conflict, a number of urgent problems arise for the agricultural sector. One of the main problems is to meet the ever-growing needs of the population and the Armed Forces in food products, and industry in agricultural raw materials. This problem is very strongly connected with the socio-economic development of the country and the nature of the modern war. Its successful solution provides for further improvement of agricultural production and ensuring the stability of its functioning during combat operations [1; 6].

Therefore, the *purpose of the study* is to reveal the main methodological aspects of the military-economic significance of agriculture and modern problems of military food resources in Ukraine today.

MATERIALS AND METHODS

During the research, the methods of statistical analysis were used to collect and process the collected statistical data on the dynamics of the main indicators that characterise the development of the agro-industrial complex of Ukraine over the years. Regression and correlation analysis methods were also partially used to study the relationships between the studied indicators of the development of the agro-industrial complex and defence expenditures of Ukraine for the study period. When assessing the importance of the main components of the military-economic potential, the method of pairwise comparisons of these components was used. Also, the study and construction of graphical dependencies and predicted trends took place using methods of mathematical statistics and graphical display of results.

The article used the method of an expert survey to determine the importance of stability in the agricultural sector and the functioning of industry for the country's defence capability. Using content analysis, the dynamics of the main indicators characterising the military and economic importance of the agro-industrial complex in the overall national security system of the state were highlighted, as well as indicators of the dynamics of the share of industry, agriculture and other income in the GDP

of Ukraine, changes in exports and imports of industrial and agricultural products of Ukraine, GDP growth of Ukraine and growth of defence expenditure of Ukraine.

RESULTS AND DISCUSSION

Correct identification and full satisfaction of the needs of the population and the Armed Forces of Ukraine for food in peacetime or wartime, and industry for raw materials has a significant impact on the development of the military economy and the combat readiness of the Armed Forces of Ukraine. The general need of the state for food and agricultural raw materials in both peacetime and wartime is determined by the need to create reserves for the current provision of the population, the Armed Forces of Ukraine and industry, as well as the creation of guaranteed state reserves of food and raw materials and established food reserves for the mobilisation deployment of the army.

The main factor that determines the needs of the Armed Forces for food is their number. Over the years of independence of Ukraine, the size of the Ukrainian Armed Forces has changed constantly, and food needs have changed accordingly. Historically, until the 19th century, wars were fought by small armies and their food needs were met mainly at the expense of accumulated supplies in peacetime [10; 14; 19]. At the same time, military operations did not cover a large territory, so little human resources were diverted from agriculture, that is, this did not have a significant impact on the production of agricultural products. In the 19th century, when the number of belligerent armies increased significantly, states began to use not only accumulated reserves to provide armies, but also widely use the requisition of food from the population living in war zones. During this period, the cost of food and uniforms for the army accounted for 80% of all military expenses.

In the 20th century, the number of armies increased significantly compared to the previous period, for example, in the first World War, the Russian Army increased from the initial state of 1,423 thousand people to 15,338 thousand people at the end of the war, that is, more than 10 times. The annual use of important products increased from 696 thousand tons at the beginning of the war (1914) to 5,668 thousand tons in 1916, that is, by 8.1 times [6]. During the Second World War, the warring countries mobilized 1.5 times more people in the army than in the first World War, which in turn significantly increased the need for agricultural products. The growth of the absolute needs of the Armed Forces of Ukraine for food during military operations is always accompanied by a decrease in its share in the total amount of military expenditures. This is due to a sharp increase in spending on weapons and military equipment (WME) in the case of active hostilities [4; 20]. That is, the wars of the twentieth century significantly increased the negative impact on agriculture. The need to withdraw significant human and material resources

from agriculture for military needs caused an inevitable reduction in agricultural production, which made it difficult to solve the problems of providing food and agricultural raw materials.

Today, in modern wars of the 21st century, such consequences of the impact of the war on agriculture should be especially carefully taken into account, since the total volume of needs of the Armed Forces of Ukraine for food, and industry for raw materials tends to increase significantly [1-15]. Analysing the biggest wars of the 20th century, more than 40 million tonnes of food was used to supply the army of the USSR during the war against Germany, which is four times the consumption of ammunition and 2.5 times the consumption of petrol and lubricants for the same period. In modern wars, this ratio changes in the direction of reducing the volume of agricultural products, because scientific and technological progress reduces the number of armies, but increases the need for the consumption of ammunition and material and technical means.

The modern development of the Armed Forces of many countries of the world creates prerequisites for the emergence of new types, branches of the armed forces, services, and, accordingly, new contingents of military personnel, new conditions of military service that require changes in the structure and content of the food supply system of the armed forces. Changes that occur in the nature and methods of conducting modern combat operations have a significant impact on the organisation

and development of the food supply system of the armed forces. There is a need to develop qualitatively new types of products that should have a small mass and volume, but a sufficiently high caloric content, and also do not require significant cooking time, and most importantly provide the physiological needs of military personnel depending on their service conditions. Today, such products are available in almost all armies of leading countries of the world. These products are resistant to environmental influences and have a fairly long shelf life. Today, these are various types of completed rations and military rations, which should be manufactured on the scale of the Armed Forces of Ukraine by at least 100-200 special enterprises, and in the event of war, the number of these enterprises should be at least 1000. That is, today it is necessary to understand the importance of raising the requirements for mobilisation training of the food industry, which should not only master the production of new types of products for the armed forces in peacetime, but also be ready to sharply increase their production during a special period.

In general, to meet the needs of a large army, it is necessary to have a large amount of food, as well as agricultural raw materials for the production of uniforms, tools and special military products. Today, hundreds of thousands of tons of food products are used to supply the Armed Forces of Ukraine alone, and billions of hryvnias are used to purchase, store and restore them in strategic reserves (Tables 1-3).

Table 1. Dynamics of the main indicators that characterise the military-economic significance of the agro-industrial complex in the general system of national security of the state (2000-2007)

No.	Indicator/Year	2000	2001	2002	2003	2004	2005	2006	2007
1	GDP (UAH billion)	175.888	211.175	234.138	277.355	357.544	457.325	565.018	751.106
2	Share of industry in GDP (%)	23.5	24	24.7	24.7	24	26.4	27	26.6
	Share of industry in GDP (UAH million)	41.33368	50.682	57.83209	68.50669	85.81056	120.7338	152.5549	199.794196
3	Share of agriculture in GDP (%)	15.5	16.1	14.5	11.9	11.7	10.3	8.4	7.2
	Share of agriculture in GDP (UAH million)	27.26264	33.99918	33.95001	33.00525	41.83265	47.10448	47.46151	54.079632
4	Share of other services in GDP (%)	61	59.9	60.8	63.4	64.3	63.3	64.6	66.2
	Other services (UAH million)	107.2917	126.4938	142.3559	175.8431	229.9008	289.4867	365.0016	497.232172
5	Export of agricultural products (%)	22	23	27	28	27	28	29.7	29
6	Import of agricultural products (%)	12	11	7	9	8	10.2	10	9

Table 1, Continued

No.	Indicator/Year	2000	2001	2002	2003	2004	2005	2006	2007
6	Total exports (UAH million)	189096.00	208765.00	213454.00	224565.00	225676.00	227252.00	253707.00	323205.00
	Total imports (UAH million)	176544.00	207654.00	218765.00	222234.00	222345.00	223555.00	269200.00	364373.00
	Export of agricultural products (UAH million)	41601.12	48015.95	57632.58	62878.2	60932.52	63630.56	75350.98	93729.45
	Import of agricultural products (UAH million)	21185.28	22841.94	15313.55	20001.06	17787.6	22802.61	26920	32793.57
7	Export of industrial products (%)	40	40	40	40	40	40	41	41
8	Import of industrial products (%)	70	69	69	66	66	64	63	61
9	Export of industrial products (UAH million)	75386.27	83472.2	85597.09	90315.77	91026.95	91928.84	102927.7	131501.341
10	Import of industrial products (UAH million)	124286.98	142865.95	150510.32	145563.27	146080.67	143142.27	168949.92	224052.96
11	Defence expenditure (UAH million)	4821.6	6650.3	6035.6	5899.8	8756.4	7151.7	7604.9	8886.9
12	Expenditure for the maintenance of the Armed Forces of Ukraine, UAH billion	3519.77	4854.72	4405.99	4306.85	6392.17	5220.74	4399.7	4987.8
13	Expenditures on food supply of the Armed Forces, UAH billion	1055.93	1456.42	1321.80	1292.06	1917.65	1566.22	1319.91	1496.34

Table 2. Dynamics of the main indicators that characterise the military-economic significance of the agro-industrial complex in the general system of national security of the state (2008-2014)

No.	Indicator/Year	2008	2009	2010	2011	2012	2013	2014
1	GDP (UAH billion)	990.819	947.042	1079.346	1299.991	1404.669	1465.198	1586.915
2	Share of industry in GDP (%)	25.4	21.5	18.8	18.2	17.9	16.5	17.2
	Share of industry in GDP (UAH million)	251.668	203.61403	202.917048	236.598362	251.435751	241.75767	272.94938
3	Share of agriculture in GDP (%)	7.6	7.8	8.3	8.2	7.8	8.7	10.2
	Share of agriculture in GDP (UAH million)	75.30224	73.869276	89.585718	106.599262	109.564182	127.472226	161.86533

Table 2, Continued

No.	Indicator/Year	2008	2009	2010	2011	2012	2013	2014
4	Share of other services in GDP (%)	67	70.7	72.9	73.6	74.3	74.8	72.6
	Other services (UAH million)	663.8487	669.558694	786.843234	956.793376	1043.66907	1095.9681	1152.10029
5	Export of agricultural products (%)	32	33	34	37	34	27	28
6	Import of agricultural products (%)	9	7	8.4	8	8	8.9	9
	Total exports (UAH million)	444859.00	423564.00	549365.00	707953.00	717347.00	681899.00	770121.00
	Total imports (UAH million)	520588.00	438860.00	580944.00	779028.00	835394.00	805662.00	834133.00
	Export of agricultural products (UAH million)	142354.9	139776.12	186784.1	261942.61	243897.98	184112.73	215633.88
	Import of agricultural products (UAH million)	46852.92	30720.2	48799.296	62322.24	66831.52	71703.918	75071.97
7	Export of industrial products (%)	41	41	41	41	41	41	42
8	Import of industrial products (%)	60	59	54	61	64	64	67
9	Export of industrial products (UAH million)	181519.4	173326.4227	225448.9319	291359.743	296066.187	282234.749	319651.556
10	Import of industrial products (UAH million)	313498.09	258707.97	316033.54	472090.97	537158.34	518040.67	555532.58
11	Defence expenditure (UAH million)	9130.7	9907.7	12806	12477.6	16374.7	15281.6	27363.4
12	Expenditure for the maintenance of the Armed Forces of Ukraine, UAH billion	5966.5	7353.4	7005	9260.7	12096.5	12451.3	21802.2
13	Expenditures on food supply of the Armed Forces, UAH billion	1789.95	2206.02	2101.50	2778.21	3628.95	3735.39	7194.73

Table 3. Dynamics of the main indicators that characterise the military-economic significance of the agro-industrial complex in the general system of national security of the state (2015-2020)

No.	Indicator/Year	2015	2016	2017	2018	2019	2020
1	GDP (UAH billion)	1988.544	2383.182	2908.233	3558.706	3974.564	4194.102
2	Share of industry in GDP (%)	16.7	17.7	18	17.6	16.4	14.6
	Share of industry in GDP (UAH million)	332.086848	421.823214	523.48194	626.332256	651.828496	612.338892

Table 3, Continued

No.	Indicator/Year	2015	2016	2017	2018	2019	2020
3	Share of agriculture in GDP (%)	12.1	11.7	10.2	10.1	9	9.3
	Share of agriculture in GDP (UAH million)	240.613824	278.832294	296.639766	359.429306	357.71076	390.051486
4	Share of other services in GDP (%)	71.2	70.6	71.8	72.3	74.6	76.1
	Other services (UAH million)	1415.843328	1682.526492	2088.111294	2572.944438	2965.024744	3191.711622
5	Export of agricultural products (%)	32	25	28	32	35	33
6	Import of agricultural products (%)	9	7	8	6.7	7.2	7
	Total exports (UAH million)	1044541.00	1174625.00	1430230.00	1608890.00	1636416.00	1637399.00
	Total imports (UAH million)	1084016.00	1323127.00	1618749.00	1914893.00	1947599.00	1681526.00
	Export of agricultural products (UAH million)	334253.12	293656.25	400464.4	514844.8	572745.6	540341.67
	Import of agricultural products (UAH million)	97561.44	92618.89	129499.92	128297.831	140227.128	117706.82
7	Export of industrial products (%)	43	40	42	39	46	42
8	Import of industrial products (%)	68	65	60	59	56	62
9	Export of industrial products (UAH million)	452286.253	474548.5	599266.37	622640.43	744569.28	682795.383
10	Import of industrial products (UAH million)	739298.91	857386.30	976105.65	1124042.19	1086760.24	1044227.65
11	Defence expenditure (UAH million)	52005.2	59348.9	74346.2	97024	106627.7	120374.1
12	Expenditure for the maintenance of the Armed Forces of Ukraine, UAH billion	36939.8	45854.2	52249.2	66987.7	78456.7	81087.09
13	Expenditure on food supply of the Armed Forces, UAH billion	13298.33	18341.68	21944.66	26795.08	34520.95	32434.84

Tables 1-3 show the dynamics of indicators that characterise the military-economic significance of the agro-industrial complex in the general system of national security of the state in order to study the relationships between indicators of the components of the economic potential of the state and military potential. In the current conditions of Ukraine's development, in addition to the declining population of Ukraine, the number of rural population is also decreasing annually

(1-3% annually from the previous year) (Fig. 2a) and (Fig. 2b), which negatively affects the development of Ukraine's agricultural sector, but encourages the search for new alternative innovative ways to replace human labour with robotic machines. Today, the production and use of non-food products that are made from agricultural raw materials, namely cotton products, wool, linen fabrics, clothing and underwear, leather and textiles, has significantly increased.

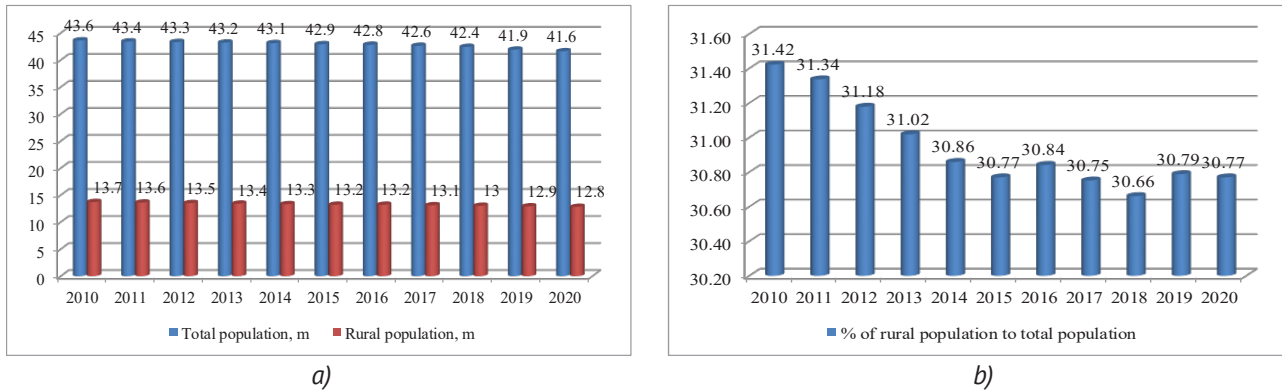


Figure 2. Dynamics of a) the population of Ukraine, the rural population and b) the percentage of the rural population from its total number

For the sustainable provision of the population and the army with food products, and industry with food raw materials, it is necessary to make a comprehensive use of all food sources, namely: current production of agricultural products; state reserves of food and agricultural raw materials; food reserves that were created in the Armed Forces of Ukraine in peacetime; commodity food resources of current consumption, which are allocated for supply to the population. These sources are the main ones and their products make up the centralised resources of the state as a whole. Additional sources include: production from agricultural enterprises of the Ukrainian Ministry of Defence and subsistence farms, as well as in the event of war in foreign territories, trophy foodstuff etc.

Modern warfare makes significant adjustments in the purpose of each of the sources, if the war is long-term as in Ukraine, then food supply is of particular importance in the process of preparing the Armed Forces to perform their assigned tasks. But if a war is fought in a short period of time with the use of weapons of mass destruction, the current production of agricultural products will not be essential for the conduct of hostilities, because in a short-term war the main burden of supplying the Armed Forces and the population of the state will fall on the advance creation of state reserves, stocks of current consumption, and stocks created specifically for the Armed Forces. Therefore, the creation and maintenance of large mobilisation and state food reserves in the required amount is an indispensable condition for uninterrupted supply of food to the Armed Forces and the population, restoring losses caused by enemy actions to provide assistance to areas of the state affected by the war. It should be noted that without creating the necessary state reserves (food reserves) in advance, it is impossible to ensure a successful defence war. The current provision of food to the population of the country and its Armed Forces, and the industry with the necessary agricultural raw materials, is always planned for a year, because agriculture has a certain cyclicity – from harvest to harvest [5; 7]. This determines the urge to have stocks that meet at least the

annual need for food [15]. State reserves of food and agricultural raw materials must meet the needs of the national economy in case of emergencies (agricultural imbalances, natural disasters, crop failures, armed conflicts or wars).

In the modern conditions of development of Ukraine, when the country is in a state of long-term armed conflict, the level of threats of a full-scale invasion of the territory of Ukraine is more than 50% annually, the role of state reserves has gained its significant strength. During combat operations, the enemy can use nuclear weapons, weapons of mass destruction, bacteriological weapons, that is, the enemy can disable most of the industrial enterprises, as well as food industry enterprises and food supplies in order to create conditions for artificial hunger and demoralisation of the Armed Forces. In addition, economic and transport links between different economic regions of the state may be disrupted for a long period of time, which will significantly complicate wide maneuvers with food and raw materials reserves. Under these conditions, state reserves will play a major role in supplying the army and population of the country, as well as the functioning of the national economy as a whole. Depending on the time of the outbreak of war and the nature of enemy actions on the territory of the country, the products of current agricultural production can be obtained only in a year, that is, with a new crop [6-11]. Therefore, in order to guarantee the satisfaction of the needs of the state in the initial period of the war, it is necessary to have state reserves of food and agricultural raw materials in the amount of at least six months or even an annual need [12-15; 18-20].

Most of the world's militarised countries, such as the United States, Germany, Russia, China, etc., pay considerable attention to creating and maintaining proper food reserves in state reserves. For example, in the United States, the food and Agriculture Act of 1977 is still in force, which regulates three-year programmes for creating fixed reserve grain reserves in the amount of more than 40 million tons, which is approximately the annual demand for the country's population.

For the purpose of sustainable and continuous support of the army at the beginning of the war, when the rapid mobilisation of troops begins and there is a rapid increase in their number. The Armed Forces must have a sufficient number of operational mobilisation food supplies. In modern conditions, when there are threats to use nuclear weapons, weapons of mass destruction, the importance of mobilisation reserves increases significantly. In addition to the mobilisation deployment of troops and their advance to operational areas, these reserves should ensure the restoration of costs and losses in the first operations (combat operations), and there should also be a reserve of food to meet the needs that may arise as a result of the use of nuclear or bacteriological weapons. Today, most NATO countries have food supplies based on the three-month need of their armed forces. If we consider the situation in relation to Ukraine, then today in Ukraine, food supplies should not be less, because the intensification of armed aggression against Ukraine by Russia without the intervention of Western countries or NATO member countries

can also last from a month to three according to experts [1; 19].

Analysis of the collected statistical data on the dynamics of the main indicators that characterise the military-economic significance of the agro-industrial complex in the general system of national security of the state (Tables 1-3) and their growth over the years (Tables 4-6) makes it possible to study the correlation between these statistics, which in turn will allow drawing conclusions about the importance of indicators of the development of the agricultural sector in ensuring a sufficient level of MEP of the state. Figure 3 shows the results of assessing the dynamics of the share of industry, agriculture and other incomes in Ukraine's GDP. From the data obtained, it can be seen that agriculture has adapted to operating in the conditions of the ongoing armed conflict on the territory of Ukraine (the level of change for 2014-2020 compared to the previous period was +0.8%), while industry has suffered irreversible losses so far and the level of decline compared to the period before 2014 was -6.2%.

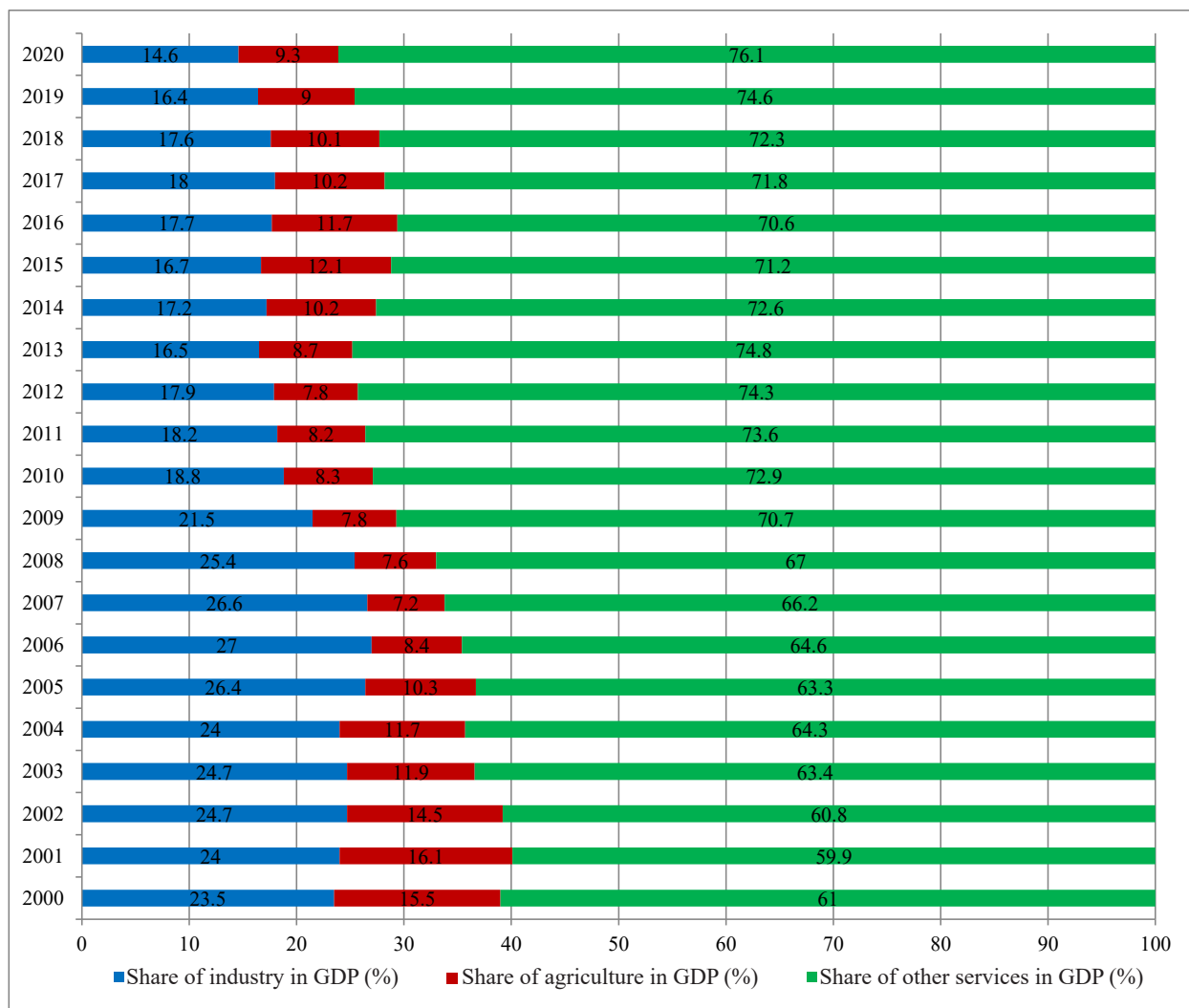


Figure 3. Dynamics of the share of industry, agriculture, and other incomes in GDP of Ukraine

Table 4. Dynamics of growth according to indicators that characterise the military-economic importance of the agro-industrial complex in the general system of national security (2000-2007)

No.	Indicator/Year	2000	2001	2002	2003	2004	2005	2006	2007
1	GDP growth, %	-	16.71	9.81	15.58	22.43	21.82	19.06	24.78
2	Increase in the share of industry in GDP (%)	-	2.08	2.83	0.00	-2.92	9.09	2.22	-1.50
	Increase in the share of industry in GDP (UAH million)	-	18.45	12.36	15.58	20.17	28.93	20.86	23.64
3	Increase in Share of agriculture in GDP (%)	-	3.73	-11.03	-21.85	-1.71	-13.59	-22.62	-16.67
	Increase in Share of agriculture in GDP (UAH million)	-	19.81	-0.14	-2.86	21.10	11.19	0.75	12.24
4	Increase in the share of other sources in GDP, %	-	-1.84	1.48	4.10	1.40	-1.58	2.01	2.42
	Increase in the share of other sources in GDP (UAH million)	-	15.18	11.14	19.04	23.51	20.58	20.69	26.59
5	Increase in export of agricultural products (%)	-	4.35	14.81	3.57	-3.70	3.57	5.72	-2.41
6	Increase in import of agricultural products (%)	-	-9.09	-57.14	22.22	-12.50	21.57	-2.00	-11.11
	Total export growth (UAH million)	-	9.42	2.20	4.95	0.49	0.69	10.43	21.50
	Total import growth (UAH million)	-	14.98	5.08	1.56	0.05	0.54	16.96	26.12
	Increase in export of agricultural products (UAH million)	-	13.36	16.69	8.34	-3.19	4.24	15.55	19.61
	Increase in import of agricultural products (UAH million)	-	7.25	-49.16	23.44	-12.44	21.99	15.29	17.91
7	Increase in export of industrial products (%)	-	0.29	0.29	0.29	0.29	0.29	0.29	0.29
8	Increase in import of industrial products (%)	-	-2.33	0.00	-5.04	0.30	-2.61	-2.02	-2.07
9	Increase in export of industrial products (UAH million)	-	9.69	2.48	5.22	0.78	0.98	10.69	21.73
10	Increase in import of industrial products (UAH million)	-	13.00	5.08	-3.40	0.35	-2.05	15.28	24.59
11	Increase in defence expenditure (UAH million)	-	27.50	-10.18	-2.30	32.62	-22.44	5.96	14.43
12	Increase in expenditure for the maintenance of the Armed Forces of Ukraine	-	27.50	-10.18	-2.30	32.62	-22.44	-18.66	11.79
13	Increase in expenditures on food supply of the Armed Forces of Ukraine	-	27.50	-10.18	-2.30	32.62	-22.44	-18.66	11.79

Table 5. Dynamics of growth according to indicators that characterise the military-economic importance of the agro-industrial complex in the general system of national security (2008-2014)

No.	Indicator/Year	2008	2009	2010	2011	2012	2013	2014
1	GDP growth, %	24.19	-4.62	12.26	16.97	7.45	4.13	7.67
2	Increase in the share of industry in GDP (%)	-4.72	-18.14	-14.36	-3.30	-1.68	-8.48	4.07
	Increase in the share of industry in GDP (UAH million)	20.61	-23.60	-0.34	14.24	5.90	-4.00	11.43
3	Increase in Share of agriculture in GDP (%)	5.26	2.56	6.02	-1.22	-5.13	10.34	14.71
	Increase in Share of agriculture in GDP (UAH million)	28.18	-1.94	17.54	15.96	2.71	14.05	21.25
4	Increase in the share of other source in GDP, %	1.19	5.23	3.02	0.95	0.94	0.67	-3.03
	Increase in the share of other sources in GDP (UAH million)	25.10	0.85	14.91	17.76	8.32	4.77	4.87
5	Increase in export of agricultural products (%)	9.38	3.03	2.94	8.11	-8.82	-25.93	3.57
6	Increase in import of agricultural products (%)	0.00	-28.57	16.67	-5.00	0.00	10.11	1.11
	Total export growth (UAH million)	27.35	-5.03	22.90	22.40	1.31	-5.20	11.46
	Total import growth (UAH million)	30.01	-18.62	24.46	25.43	6.75	-3.69	3.41
	Increase in export of agricultural products (UAH million)	34.16	-1.84	25.17	28.69	-7.40	-32.47	14.62
	Increase in import of agricultural products (UAH million)	30.01	-52.52	37.05	21.70	6.75	6.80	4.49
7	Increase in export of industrial products (%)	0.29	0.29	0.29	0.28	0.28	0.28	0.28
8	Increase in import of industrial products (%)	-2.11	-2.15	-8.36	10.23	5.75	0.00	3.45
9	Increase in export of industrial products (UAH million)	27.56	-4.73	23.12	22.62	1.59	-4.90	11.71
10	Increase in import of industrial products (UAH million)	28.53	-21.18	18.14	33.06	12.11	-3.69	6.75
11	Increase in defence expenditure (UAH million)	2.67	7.84	22.63	-2.63	23.80	-7.15	44.15
12	Increase in expenditure for the maintenance of the Armed Forces of Ukraine	16.40	18.86	-4.97	24.36	23.44	2.85	42.89
13	Increase in expenditures on food supply of the Armed Forces of Ukraine	16.40	18.86	-4.97	24.36	23.44	2.85	48.08

Table 6. Dynamics of growth according to indicators that characterise the military-economic importance of the agro-industrial complex in the general system of national security (2015-2020)

No.	Indicator/Year	2015	2016	2017	2018	2019	2020
1	GDP growth, %	20.20	16.56	18.05	18.28	10.46	5.23
2	Increase in the share of industry in GDP (%)	-2.99	5.65	1.67	-2.27	-7.32	-12.33
	Increase in the share of industry in GDP (UAH million)	17.81	21.27	19.42	16.42	3.91	-6.45
3	Increase in Share of agriculture in GDP (%)	15.70	-3.42	-14.71	-0.99	-12.22	3.23
	Increase in Share of agriculture in GDP (UAH million)	32.73	13.71	6.00	17.47	-0.48	8.29
4	Increase in the share of other sources in GDP, %	-1.97	-0.85	1.67	0.69	3.08	1.97
	Increase in the share of other sources in GDP (UAH million)	18.63	15.85	19.42	18.84	13.22	7.10
5	Increase in export of agricultural products (%)	12.50	-28.00	10.71	12.50	8.57	-6.06
6	Increase in import of agricultural products (%)	0.00	-28.57	12.50	-19.40	6.94	-2.86
	Total export growth (UAH million)	26.27	11.07	17.87	11.10	1.68	0.06
	Total import growth (UAH million)	23.05	18.07	18.26	15.47	1.68	-15.82
	Increase in export of agricultural products (UAH million)	35.49	-13.82	26.67	22.22	10.11	-6.00
	Increase in import of agricultural products (UAH million)	23.05	-5.34	28.48	-0.94	8.51	-19.13
7	Increase in export of industrial products (%)	4.14	-7.18	3.58	-8.27	14.95	-9.11
8	Increase in import of industrial products (%)	2.35	-5.25	-7.46	-2.73	-5.20	10.14
9	Increase in export of industrial products (UAH million)	29.33	4.69	20.81	3.75	16.38	-9.05
10	Increase in import of industrial products (UAH million)	24.86	13.77	12.16	13.16	-3.43	-4.07
11	Increase in defence expenditure (UAH million)	47.38	12.37	20.17	23.37	9.01	11.42
12	Increase in expenditure for the maintenance of the Armed Forces of Ukraine	40.98	19.44	12.24	22.00	14.62	3.24
13	Increase in expenditures on food supply of the Armed Forces of Ukraine	45.90	27.50	16.42	18.10	22.38	-6.43

Figure 4 shows the dynamics of exports and imports of industrial and agricultural products in Ukraine in the period of 2000-2020. Imports of industrial products have a slightly declining trend (on average in 2014-2020, the decline was 6.7% compared to the initial period), and exports have a growing trend (changes + 2.2%).

Imports of agricultural products remained in their positions, fluctuations did not differ significantly to 1-1.5%, but agricultural products had a much greater dynamics of change to 5.7% on average. A significant factor in such fluctuations is the unstable military and political situation both around Ukraine and within it.

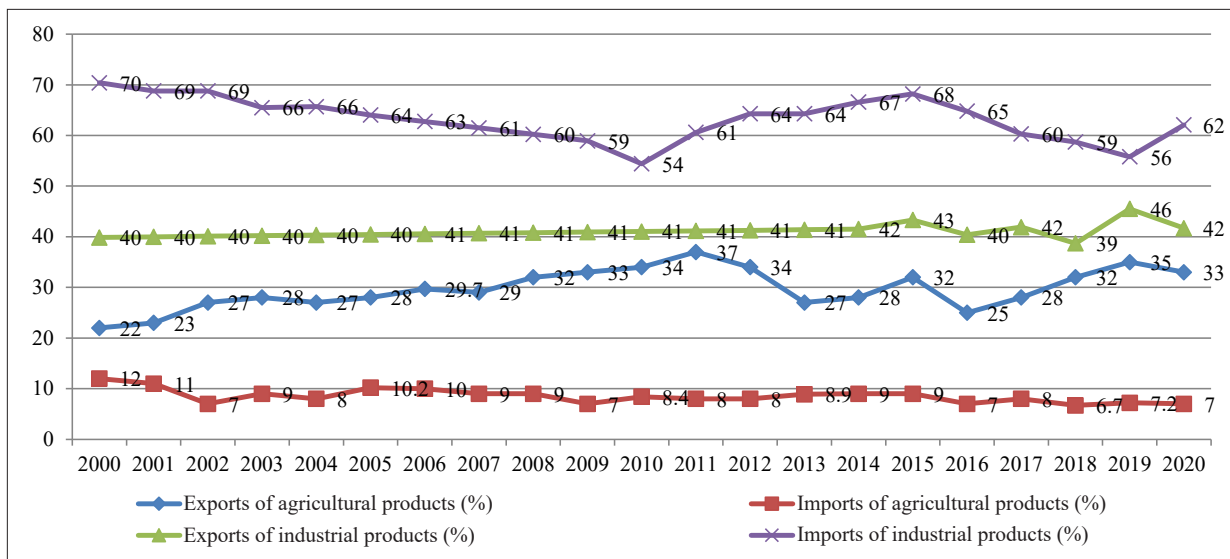


Figure 4. Dynamics of the share of industry, agriculture, and other incomes in GDP of Ukraine

Tables 4-6 and Figure 5 show the dynamics of growth in defence expenditure, expenditure for the maintenance of the Ukrainian Armed Forces and expenditure on food supply. From the data obtained, it can be seen that these indicators are quite closely correlated with each other. Their correlation coefficient is almost 91.4%. Such a coincidence of increases in these indicators shows that the issue of maintenance, and especially food

supply of the Armed Forces is an integral component of any defence budget, as well as the volume of expenses for the maintenance of the Armed Forces is from 70 to 80% of all defence expenditures of Ukraine today, which is a negative trend, because according to the experience of the leading countries of the world, this indicator should not exceed 50-60% depending on the number of Armed Forces.

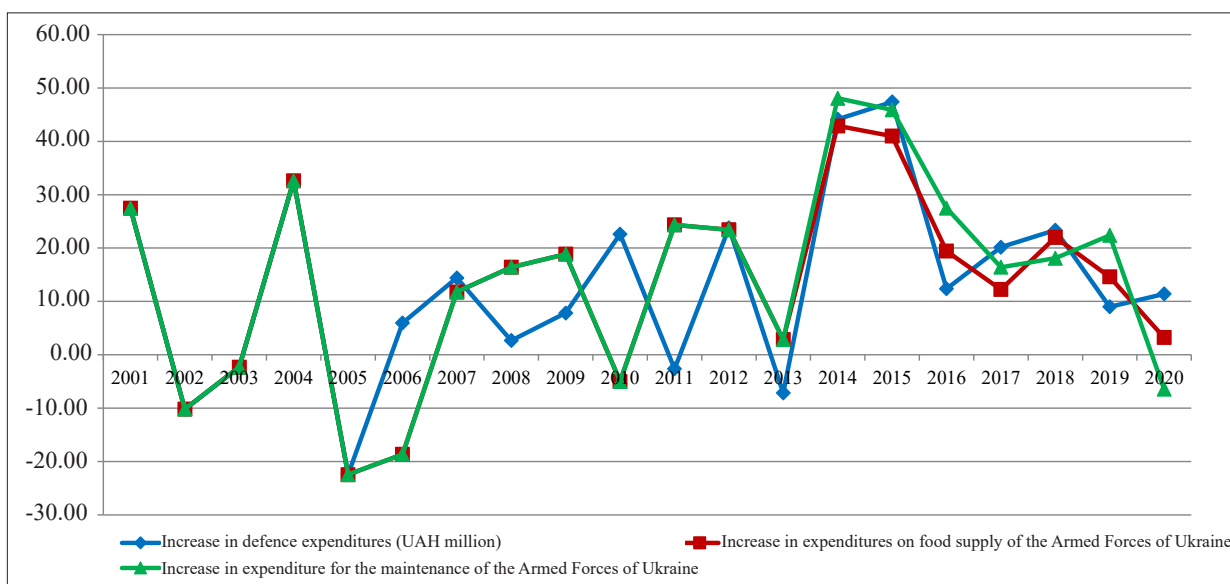


Figure 5. Dynamics of growth in defence spending, maintenance of the Armed Forces of Ukraine and its food supply

Figure 6 shows a petal chart of changes in exports and imports of industrial and agricultural products of Ukraine for the period of 2000-2020 in order to form a general idea of the priority directions of development of the national economy of the state.

Figure 7 shows the dynamics of Ukraine's GDP growth and increase in defence expenditure. From the

data obtained, it can be seen that even under the influence of significant destabilising factors, the overall dynamics still has a very stable and steady upward trend, which cannot be said about defence expenditure, which, even with a significant increase during 2014-2020, is still on a downward trend due to the impact of a number of negative factors.

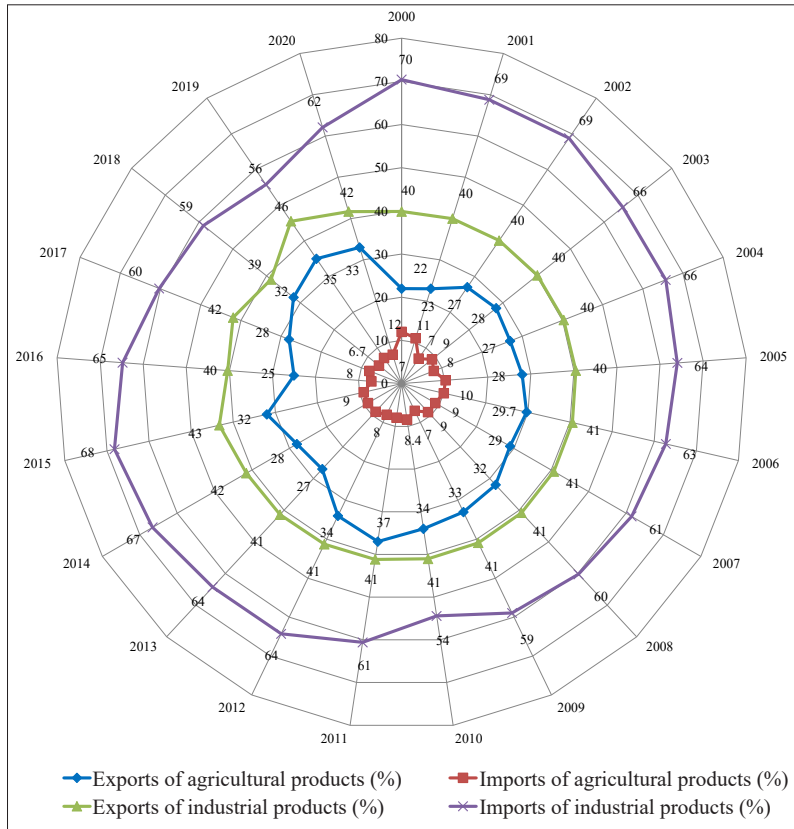


Figure 6. Petal chart of changes in exports and imports of industrial and agricultural products of Ukraine for the period of 2000-2020

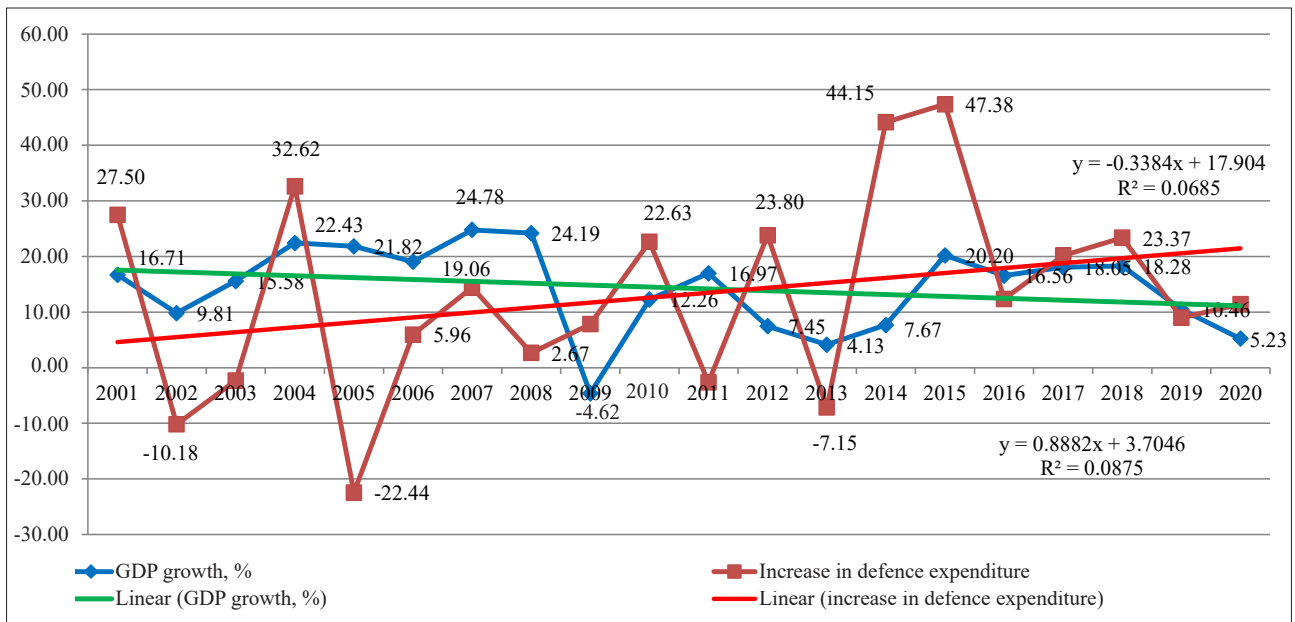


Figure 7. Ukrainian GDP growth rate and increase of the defence expenditure of Ukraine over the period 2000-2020 with linear trends

The analysis makes it possible to determine the economic opportunities of the state to provide its Armed Forces, that is: to form views on determining the share of the country's GDP in order to protect national interests in order to strengthen the state's MEP; to form the main priorities for further development of the country

as a whole. One of the most important priorities is and always will be the development of the country's agricultural sector, as the main source of ensuring the needs of the armed forces in the nutrition of personnel, because if there is no foodstuff, then there will be no army, and if there is no army, then there will be no state.

Therefore, the issues of military-economic significance of agriculture are one of the most pressing issues of the military economy, and the formation of reserves for the Armed Forces is the main element of effective preparation for combat operations during the defence of the state.

Today, when determining specific volumes of mobilisation and operational reserves, it is necessary to approach each strategic direction differentially in terms of possible combat operations, taking into account its operational and strategic importance, operational capacity, remoteness, transport links, economic development of the region, and so on. Established food supplies, especially those found in remote areas, should have some autonomy in their region. When accumulating reserves, it is advisable to place the main part of them within each strategic direction of combat operations, taking into account the appointment of troops, that is, their correct echelon plays an important role. According to experience, it is advisable to have 50% directly with the troops, while the remainder should be stored in bases and warehouses for government use, giving the Ukrainian Armed Forces the right to dispose of them in the event of a transition to operations in a special period. The storage conditions of reserves should ensure their safety, maneuver of reserves in necessary situations, as well as destruction in the event of a threat of capture of this territory by the enemy.

In the event that the war continues for three months, as is the case in Ukraine today, the current agricultural sector will be used indiscriminately to provide the Armed Forces. But according to the experience of the beginning of hostilities in 2015, in the first period, the provision of the Armed forces of Ukraine was at the expense of state reserves and food supplies. Today, the Armed Forces of Ukraine are provided in a combined way, that is, agricultural products of both current production are used, and products from warehouses and reserves of state significance are used in order to update reserves. During a large-scale war, the main role in providing the Armed Forces of Ukraine with food will be played by centralised reserves of the state, but additional sources will also be of great importance (volunteering, humanitarian aid, etc.).

It should be understood that a stable and steady supply of foodstuff to the army and population, and to industry with agricultural raw materials during combat operations, is possible only if maximum mobilisation and integrated use of all sources of agricultural production is possible. In modern conditions, the volume and rate of overgrowth of agricultural production today do not yet sufficiently meet the needs of the army and society. The problem of agricultural production growth rates remains one of the most acute economic issues in Ukraine.

The efficiency of agricultural production depends on natural, climatic and economic factors. Ukraine has the necessary natural and climatic factors for the effective

development of agriculture, so for the development of agricultural production today, economic factors (machinery, technologies, organisation, development of the chemical industry, etc.) and factors of external influence (loss of part of the agricultural territory and the presence of an armed conflict on the territory of Ukraine) have the greatest weight. Today, the growth of the economic and military-economic significance of the agro-industrial complex (AIC) is an objective pattern in the development of the economy of any modern state. In terms of the cost of products produced by the agro-industrial complex and the volume of capital investments, this complex ranks first among other sectors of the national economy.

Today in Ukraine, the share of the agro-industrial complex is 30-40% of all production assets, and more than 40% of the working-age population. The final products of the agro-industrial complex, which are produced from agricultural matter, make up 40-60%, including food occupies more than 40% of these volumes. Ukraine today occupies one of the leading positions in the export of certain types of grain and legumes, as well as some types of other agricultural products. It should be understood that the rapid development of the agro-industrial complex will significantly increase the economic potential of the state, which in turn will increase the military potential, and thereby increase the level of protection of the national interests of Ukraine. Material and human resources that are employed in the agro-industrial complex are a significant source of increasing the mobilisation capabilities of the state economy. Currently, the military and economic opportunities of the agro-industrial complex are growing as a result of adapting the state economy to function in the context of a long-term armed conflict and as a result of re-targeting the necessary capital investments in this complex.

Agriculture has a number of specific features compared to industry. The main means of production in agriculture is land that cannot be evacuated from threatened areas, and it is also impossible to create a new one or replace it with anything. Agriculture also differs from other sectors of the national economy by seasonality of production, so in a modern war, agriculture is quite vulnerable. If military operations interfere with the implementation of sowing or harvesting in the required time frame, then this will lead to its loss or significant deterioration in the quality of products. In turn, the crop during the ripening period can become an object of destruction, that is, the active action of the enemy during the ripening period of the crop can significantly reduce the volume of agricultural production. At the same time, the restoration of agriculture will require not only a lot of effort and resources, but also a lot of time. Thus, today in Ukraine there is an acute problem of preparing agriculture for functioning in the conditions of combat operations and the use of the Armed Forces of Ukraine in part or in full. The preparation of agriculture for functioning in the conditions of military operations

(special period) largely depends on the extent to which the task of protecting agricultural production from enemy weapons and other damaging factors will be solved. Since the beginning of the war, changes in production conditions are significant for agriculture, so it is necessary to take measures in advance to reduce the vulnerability of agriculture and ensure its sustainable functioning in different natural and climatic zones, taking into account the economic characteristics of different areas. The nature of these measures is determined by the properties of the weapons that the enemy will use and the scope of the enemy's intentions to resolve an armed conflict or war. It should be understood that in a modern war, ensuring sustainable agricultural production will be one of the most difficult problems of

the military economy, so the preparation of agriculture should take place in peacetime and on an ongoing basis, taking into account the build-up and maintenance of its high level during combat operations. One of the important directions for improving the efficiency of agricultural production is to provide it with qualified labour (human resources), so according to the experience of wars, the outflow of human resources from agriculture was 2-3 times less than from other sectors of the economy of states that took part in armed conflicts or wars.

Figure 8 shows the results of an expert survey conducted by the method of pairwise comparisons on the distribution of the share of the main components in the formation of the state's MEP.

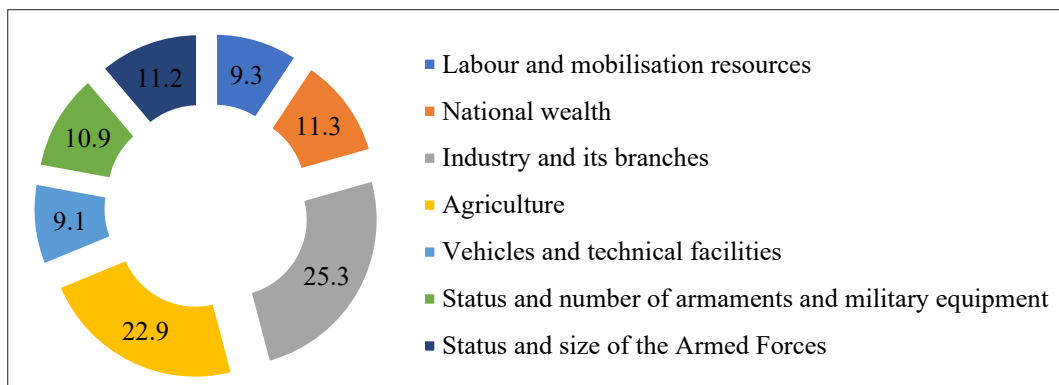


Figure 8. Distribution of the main components of the formation of the military-economic potential of the state

From the results obtained, it can be seen that the basis of any MEP of the state is the stability of the functioning of industry and the agricultural sector since this is the basis for ensuring the defence capability of the country as a whole.

CONCLUSIONS

The successful development of the Ukrainian agro-industrial complex, taking into account the requirements of the current war, will make it possible to provide not only for the rapidly growing needs of the Armed Forces and the state in food and agricultural production, but also to accumulate sufficient state reserves to meet the projected military requirements. This, in turn, will significantly increase the possibilities of sustainable and

efficient functioning of agriculture, even during hostilities. The realisation of these opportunities depends on the early implementation of agreed measures to ensure the sustainable functioning of the agricultural production system, as well as food supply to the state and its Armed Forces. The sustainable functioning of agriculture should be understood as its ability to produce established types of products in the required volumes in wartime.

Early implementation of scientific measures to ensure the sustainability of agricultural production will certainly contribute to the preservation of this vital element of the state's economic potential, and therefore, it will have a positive impact on the military capabilities of the state during its protection.

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Методологічні аспекти воєнно-економічного значення сільського господарства та сучасні проблеми продовольчих ресурсів воєнного призначення в Україні

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Анотація. На сьогодні дослідженню питань воєнно-економічної значимості сільського господарства приділяється значна увага як керівництвом ЗС України так і держави загалом, тому основною метою статті є визначення деяких методологічних аспектів воєнно-економічного значення сільського господарства для зміцнення воєнно-економічного потенціалу держави та розкриття проблематики використання продовольчих ресурсів воєнного призначення. У статті авторами проведено аналіз статистичних даних щодо динаміки основних показників, що характеризують воєнно-економічне значення агропромислового комплексу у загальній системі національної безпеки держави, а також динаміки приросту їх за роками з подальшим дослідженням кореляційних зв'язків між цими показниками та оборонними витратами України з метою розроблення рекомендацій щодо оцінювання важливості показників розвитку сільськогосподарської галузі у забезпеченні достатнього рівня воєнно-економічного потенціалу держави. За допомогою такого аналізу автори статті встановили економічні можливості держави щодо забезпечення власних ЗС, сформувавши погляди щодо визначення частки ВВП країни на захист національних інтересів з метою зміцнення ВВП держави, сформувавши основні пріоритети подальшого розвитку країни загалом. Також у статті методом експертного опитування на основі попарних порівнянь оцінено показники внеску основних складових у загальний показник достатності рівня воєнно-економічного потенціалу держави з метою визначення важливості сільськогосподарської галузі у становленні цього потенціалу. За результатами було визначено, що основою будь-якого ВВП держави є наявність стабільності функціонування промисловості та сільськогосподарської галузі, оскільки це основа забезпечення обороноздатності країни в цілому. Зібрані статистичні дані та отримані практичні результати можуть бути корисними спеціалістам оборонної та сільськогосподарської галузі держави, а також науковцям для проведення подальших досліджень за визначеним у статті напрямом

Ключові слова: збройні сили, армія, національна безпека держави, війна, продовольчі товари