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UKRAINE'S AGRICULTURAL SECTOR IN ENSURING GLOBAL FOOD SECURITY

Larysa Vdovenko¹

Abstract. The article defines the role and place of the agrarian sector of Ukraine in ensuring not only national food security, but also global. The subject of the research is a set of practical aspects of the development of the agrarian sector of Ukraine in conditions of globalization and aggravation of problems of food security, which requires further growth of agricultural production potential and integration of Ukrainian agro-industrial complex into the world food system. *The methodological basis of the study* were the main provisions of economic theory and practice of development of the agrarian sector of the economy. The following methods and techniques were used to achieve the goal set in the article: abstract-logical, monographic, analysis and synthesis; methods of comparison, generalization. The article assesses the export potential of the agricultural sector of Ukraine in recent years (for 2019–2020), analyzes the development indicators (for 2016–2020) and the challenges of agriculture. *The results of the study* show that Ukraine is one of the leading agricultural countries in the ranking of world exporters and in recent years continues to show high performance, which requires effective measures from the state to support the priority sector of agriculture. *The practical value* of the study lies in the proposals to stimulate the development of the agrarian sector of Ukraine. It is concluded that the position of the agrarian sector of the economy of Ukraine in the future and increase its export potential to address the issues of national and global food security depends on the level of long-term investment, growth of lending and real state financial support of agricultural producers.

Key words: agrarian sector of economy, food security, agro-industrial production, export potential, financial provision.

JEL Classification: Q17

1. Introduction

The agricultural sector is a priority and strategic direction of the economy of Ukraine, which in recent years has shown positive dynamics of agricultural production, is effective compared to other sectors of the economy and has a significant share in agricultural exports. agriculture in the world food market as an exporter of agricultural products.

The current state of the agricultural sector is characterized by problems due to the specifics of agro-industrial production and associated with the seasonality of production, dependence on natural and climatic factors, unstable prices for agricultural products, insufficient investment attractiveness of the industry, the difficulty of attracting additional financial resources, inflation of logistical problems, the low level of rural infrastructure, which constrains its development. However, climate change, which is deepening and poses additional challenges for agriculture, is also having a significant impact on the effective development of agro-industrial production.

Favorable natural and climatic conditions for growing most crops and powerful human potential allow not only Ukraine to ensure its own food security, but also to continue to occupy key positions in the world food market.

The growth potential of the agricultural sector of Ukraine largely depends on the directions of agricultural policy and the proper participation of the state in its formation and implementation, in particular, the basis for sustainable and effective development is to ensure at the state level conditions to promote the competitiveness of agricultural enterprises to ensure food security.

The time has come to accelerate the process of reforming the agricultural sector of Ukraine, which requires significant modernization in the direction of entrepreneurial activity in rural areas, the introduction of innovative technologies in production, ensuring profitability of producers, as well as social infrastructure and rural development.

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2. The relevance of the problem of food security

Strengthening the processes of globalization and the aggravation of problems of food security of the population of the planet requires further growth of the potential of agricultural production and integration of Ukrainian agro-industrial complex into the world food system.

Agriculture is one of the most important sectors of the state economy. In addition to its own consumption and supply of raw materials for industry, agricultural products are exported, which significantly increases the export potential of the state (State of Development, 2016). The share of agricultural products in Ukraine's GDP in 2020 will be 9.3%.

Ukraine is considered the "bread basket of Europe", with arable land currently equal to 30% of the European Union's arable land and 2.1% of the World Bank's arable land. Ukraine has about 25% of the world's most fertile chernozems, making our country unique in terms of agricultural potential (Agrarian sector, 2017).

The growth potential of the agrarian sector of Ukraine largely depends on the directions of agricultural policy and the proper participation of the state in its formation and implementation, in particular, the basis for sustainable and effective development is to ensure at the state level conditions to improve competitiveness. priorities of the agrarian sector to ensure food security of the country. Given the existing problems of the agricultural sector of Ukraine, there is a need to create a favorable environment for the functioning of producers in the sphere of agro-industrial production.

The relevance of the problem of food security of an individual country and the world community does not decrease with changes in the world political system, nor with the scientific and technological progress of world civilization.

Of particular importance among natural factors of food security is land, but not all of it is suitable for growing crops for 7 billion people. The total area of the planet Earth is about 55 billion hectares, of which 40 billion hectares are water and 15 billion hectares are land. Agricultural land is 4.5 billion hectares, of which arable land is 1.5 billion hectares. The structure of land use varies greatly from country to country.

Thus, in Europe and Asia, 25.3% and 17.0% of the land area, respectively, is ploughed, while the area of arable land in Australia and Oceania, Africa and Latin America is only 6.0, 6.7 and 8.9%, respectively. In the structure of land use in different regions of the world, pasture is occupied in Australia and Oceania (56%), in Latin America under forests (48.1%) of the land area. According to additional FAO studies, only 78% of the Earth's surface has serious natural limitations for agricultural development, 13.5% of the area is

characterized by low productivity, 6% – medium and only 3% – high. Only 10% of the Earth's land area is suitable for cultivation, i.e., it is arable. Approximately 1,800 million hectares (12% of the land surface) can be developed into arable land and perennial plantations. About 71% of the reserve land area is in developing countries (Ulyanchenko, & Prozorova, 2014).

Real and full-fledged system of food security of Ukraine should include the following components: a strong and reliable supply on the basis of national agro-industrial complex, capable of continuously providing the population with food at the proper level, adequately responding to the situation on the food market; the physical and economic accessibility of the necessary quantity and assortment of food for various categories of the population is ensured by their ability to pay, which does not jeopardize the satisfaction of other basic human needs; a system of protection of domestic producers of food from import dependence in both food and resource provision.

Ensuring effective functioning of the food security system directly depends on the stability of the supply subsystem, structural changes in agriculture, investment policy, formation of the technical support subsystem, improvement of tax legislation, organization of banking services, creation of commodity stocks, the current system of crop and property insurance of agricultural enterprises, scientific and information support.

Addressing food security while preserving and restoring the ecology of the environment is a priority for any country.

3. Export potential of Ukrainian agricultural sector

Ukraine is one of the leading agricultural countries, which occupies a leading position in the ranking of world exporters. Thus, in 2020, Ukraine managed to maintain its leading position in the world ranking of exporters of certain types of agricultural products, despite significant restrictions on international trade due to the spread of the COVID-19 coronavirus pandemic. It took the lead in exports of meal and cake, millet, barley, honey, rapeseed and other agricultural products. Ukraine ranks first in the export of sunflower oil. In 2019, foreign sales of this product reached 6,860 thousand tons. By increasing sales of meal and cake (mainly from sunflower) from 4957 thousand tons in 2019 to 5522 thousand tons (+11%) in 2020, Ukraine became the leader among exporters of these products in the international market. In addition, Ukraine ranks second among exporters of barley, honey and rapeseed, generally strengthening its presence in the world markets for these products.

Thanks to an increase in barley exports to 5046 thousand tons (+22% compared to 2019),

Ukraine retained second place in the ranking. Despite the decrease in rapeseed exports to 2,382 thousand tons (25%) in 2020, Ukraine remained in second place in 2019, behind Canada (11,784 thousand tons). Exports of fresh or chilled peas also continued to decline in 2020: from 49,000 tons to 18,000 tons, which eventually moved Ukraine from second to third position. Ukraine is among the world's top ten producers of many other products, including corn, peeled walnuts, dried peas, wheat, apple juice concentrate, casein, shelled walnuts, dried egg products, coriander, soybeans, corn breadcrumbs, oils, poultry meat, low erucic acid rapeseed oil (canola), canned tomatoes, corn oil (Ukraine has gained new leading positions, 2021).

In 2020, Ukraine supplied 6.0 billion euros to the European Union. However, due to changes in European statistics due to the UK's exit from the EU, which with an indicator of 15.5 billion euros immediately led the ranking of suppliers of agro-food to the Commonwealth, Ukraine has moved from the traditional third place in the list to the fourth. Our country is still ahead of Brazil (11.3 billion euros) and the United States (9.6 billion euros) (Ukraine topped the ranking of world exporters, 2021).

At the same time, it should be noted that the basis of Ukraine's agricultural export is the export of raw materials, namely products of plant origin – wheat, corn, barley and soybeans, whose share in the structure is 55%. Given the peculiarities of the agrarian sector of the economy, in particular the dependence on natural factors of the fall of export indicators of some types of agricultural products due to adverse weather conditions. Exports of agricultural products and food industry decreased in 2020 by \$ 115.5 million (by 1.1%), including: fats and oils of animal or vegetable origin – by \$ 560.9 million (by 23.5%); tobacco – by \$ 35.9 million (by 20.6%); residues and waste from the food industry – by \$ 20.4 million (by 2.6%); cereal products – by \$ 12.7 million (by 10.4%); various food products – by \$ 11.4 million (by 16.7%) (The agricultural sector, 2020).

Thus, Ukraine is undoubtedly an agricultural state, which in recent years continues to show leadership in the export potential of the world, which requires effective measures from the state to support the development of agriculture in the future.

4. Indicators of development of the agrarian sector of the economy of Ukraine

The role of agriculture in the sectoral structure of Ukraine's agro-industrial complex is determined by the fact that 70% of the country's territory is involved in agricultural production; its products account for a significant share of GDP; almost 70% of middle-aged workers are employed in the agricultural sector; crop

production dominates, accounting for over 70% of all agricultural products; agricultural products account for over 40% of commercial exports.

According to State Service of Ukraine for Geodesy, Cartography and Cadastre land area of Ukraine on 01.01.2020 is 603.5 thousand km², with agricultural land accounted for 68.7%, Forests and other forested areas – 15.6%, land under water – 4.0, other lands – 5.7%; built-up land – 6.0% (Statistical Yearbook of Ukraine, 2020).

As of the end of 2019, the area of agricultural land in Ukraine was – 41310.9 thousand hectares, of which: 32757.3 thousand ha – arable land; 2283.9 thousand ha – hayfields, 5250.3 thousand ha – pastures; 166.7 thousand ha – fallows and 852.7 thousand ha – perennial plantations.

Favorable natural and climatic conditions for growing the vast majority of crops and powerful human potential allow Ukraine not only to ensure its own food security, but also to become an active player in the world food market. Therefore, it is necessary to accelerate the process of reforming the agricultural sector of Ukraine, which requires significant modernization in the direction of rural entrepreneurship, introduction of innovative technologies in production, ensuring profitability of producers, as well as the construction of social infrastructure and rural development.

The distribution of enterprises engaged in agricultural activities by size of agricultural land in 2019 is as follows: 38,523 enterprises (79.4% of the total) had 1,143,600 hectares of agricultural land, including the largest number of enterprises with 20.01-50.00 hectares (10,440 or 21.4%), 100.01-500.00 hectares (7,717 or 15.9%) and 50.01-100.00 (4,778 or 9.9%) (Statistical Yearbook of Ukraine, 2020).

A positive trend is the growth of the index of agricultural production. However, Ukraine's agricultural production index in 2019 was 101.4% from the previous year, lower than in 2018 (108.2%) and 2016 (106.3%), and was only 87.6% in 2020.

In general, most types of agricultural products in Ukraine show an increase in production (Table 1), with the exception of milk production.

Producers are mainly engaged in crop production, the share of which in 2019 was 79.1%, while livestock products account for 20.9%. Among crop production, the largest share in 2019 is accounted for cereals and legumes (35.2%), industrial crops (28.6%) and potatoes, vegetables and melons (11.4%).

The largest share of livestock production in 2019 is farm animals – 10.9%, milk – 6.3% and eggs – 2.8%.

In general, there is an increase in the share of major crops in livestock production, including cereals and legumes, industrial crops, fruits and berries (Statistical Yearbook of Ukraine, 2020).

Table 1

Production of agricultural products in Ukraine for 2016–2020

See s.-g. products	2016	2017	2018	2019	2020
Livestock products					
Meat (live weight), million tons	3.3	3.3	3.3	x	x
Milk, million tons	10.4	10.3	10.1	x	x
Eggs, billion pieces	15.1	15.5	16.1	x	x
Crop production, thousand					
Cereals and legumes	37399.2	40789.8	49094.5	50092.3	53892.9
Sugar beet factory	2894.9	2693.0	2497.7	2165.9	2002.9
Sunflower	5375.0	4677.5	5760.0	6336.9	6921.6
Potato	12018.0	14473.6	14080.0	12047.4	12645.0
Vegetable crops	1870.8	1736.5	1902.1	1985.6	2200.2
Fruit and berry crops	145.1	192.1	219.5	142.2	214.4

Source: (Statistical Yearbook of Ukraine, 2020)

Table 2

Sown area of crops, thousand hectares

Plant growing	2016	2017	2018	2019	2020
Cereals and legumes	661.4	697.0	717.8	772.9	824.3
Sugar beet	6.9	6.3	5.7	5.2	5.6
Sunflower	208.9	194.3	203.4	212.2	239.7
Potato	79.4	77.8	74.2	75.0	75.6
Vegetable crops	10.7	10.0	11.1	11.6	11.6

Source: (Statistical Yearbook of Ukraine, 2020)

It should also be noted the change of sown areas in 2015–2020 under the main crops in Ukraine: in particular, the area under cereals and legumes increased 1.2 times (from 661.4 thousand ha in 2015 to 824.3 thousand ha in 2020), the area under sunflower increased 1.1 times in this period (from 208.9 thousand ha to 239.7 thousand ha). The reduction of sown areas is observed under potatoes and sugar beet (Table 2).

Assessing the profitability of the main types of agricultural products in the agricultural sector of Ukraine, we can conclude that the highest profitability in 2019 shows sunflower (23.5%), potatoes (15.4%) and milk (20.6%). It should be noted that the profitability of these types of agricultural products has been dynamically decreasing in recent years.

The most unprofitable in 2019 in Ukraine was the production of agricultural products such as sugar beet (-15.4%), as evidenced by the reduction of cultivated areas under this crop by 1.42 times in 2019 compared to 2017 and by 1.14 times in 2018 compared to 2017.

At the same time, the most unprofitable in 2019 among livestock products in Ukraine are cattle for meat (-27.1%), sheep and goats for meat (-39.7%), poultry for meat (-3.7%), eggs (-23.5%) and wool (-71.1%) (Statistical Yearbook of Ukraine, 2020).

Of these livestock products, only milk production is profitable (during 2015–2019), while egg production shows a declining trend.

Thus, Ukrainian producers are more specialized in the production of crop products, which is more profitable in today's agricultural business.

5. Existing problems of the agrarian sector of Ukraine

The current state of the agrarian sector is characterized by problems and challenges (low added value of exported agricultural products; low purchasing power of the population; lag in the level of scientific and technological progress, new technologies; high level of dependence on production of imported resources; low level of rural infrastructure development; increasing soil degradation, depletion of water resources; logistics problems; aggravation of internal devaluation and inflationary processes; insufficient investment attractiveness of the industry; climate change; risk of activity; imperfection of existing financial mechanisms of development of agricultural enterprises) caused by the specifics of agro-industrial production and caused by seasonality, high dependence on climatic factors, unstable prices for agricultural products, difficulty in attracting additional financial resources, which constrains the development of the industry, reduces its competitiveness compared to other sectors.

The main task for the near future will be to prepare for global climate change, to implement all overdue reforms

in the agricultural sector to increase production, the introduction of new technologies in agricultural production and, consequently, increase the capacity of the industry as a whole.

Consideration of various factors affecting the effective development of the agricultural sector, including climate change associated with global warming, becomes a determining factor for the sustainable development of agro-industrial production.

International experts estimate the years 2015–2019 as the hottest periods of the era of industrial development of mankind. The Earth's climate has become warmer than the average for the twentieth century. Thus, the average global temperature in July 2019 was the hottest in the last 140 years (Nechiporenko, 2020).

Agroclimatic zones of Ukraine, which are classified into Steppe, Forest-steppe and Polesie according to the ratio of precipitation and the amount of accumulated heat, are transformed and shifted to the north with increasing average annual temperature. After all, according to experts, an increase in the average annual temperature by 1°C shifts the tolerance limit of terrestrial species by an average of 100-125 km towards the poles and 150 m vertically upwards. At the same time, the average annual temperature in Ukraine increased by almost 2°C. Thus, if in 1961-1990 its norm was 7.8°C, in 2011-2019 it was already 9.5°C. Thus, the boundary of climatic zones has shifted by at least 200 km. At the same time, more than 130 mm of precipitation per year is not enough to provide the norm necessary for agriculture (not less than 700 mm). Thus, the amount of precipitation decreases and the average temperature increases, which causes rapid evaporation of moisture and, as a consequence, significant crop losses (Nechiporenko, 2020).

The climatic crisis has ambiguous consequences for agriculture in Ukraine. Thus, there are positive and negative results of warming, in particular, the positive include: an overall increase in the efficiency of crop production by increasing the duration and heat supply of the growing season; strengthening the effect of fertilizers; increasing the duration of frost-free period; improvement of conditions for overwintering of field and garden crops; earlier beginning of spring vegetation processes and sowing dates of spring crops; acceleration of grain ripening and terms of their harvesting; expansion of the growing zone of heat-loving crops (corn, sunflower, soybean, millet, melons, peaches, grapes, etc.); reduction of costs for stabling of agricultural animals due to increased temperature and reduction of the winter stabling period. The negative factors of warming include: reduction of gross agricultural output due to drought in some regions and extreme precipitation and flooding in others; uncertainty about the timing of sowing or planting crops, as well as the choice of optimal plant species to grow; weakening of plant hardening with a possible

increase in the probability of damage from soaking, various diseases, etc.

With this in mind, Ukraine needs to accelerate its transition to FAO's recommended climate-smart agriculture, which includes a three-pronged approach: sustainable productivity and profitability; adaptation and resilience to climate change; and mitigation of long-term impacts by reducing or halting GHG emissions. These components must become the imperatives of the risk management strategy caused by the current climate crisis, and its basis will be significant improvements in the trade-off, or better, optimal synergy of land, water, biodiversity, and energy (Nechiporenko, 2020).

The global climate crisis is deepening every year, which creates additional problems for agro-industrial production. Under these conditions, effective measures to mitigate the negative effects of weather disasters, which will affect the production of products that determine global food security, are needed to preserve the country's food security and ensure the profitability of producers. Timely implementation of climate change risk management strategies that include adaptive changes at the national, regional, and individual levels can reduce the anthropogenic pressure on natural resources and ensure sustainable socio-economic development.

Thus, global climate change exacerbates additional problems for agro-industrial production and agriculture, in particular, in such conditions, maintaining food security of the country and ensuring the profitability of Ukrainian agricultural producers depends on the need to use effective measures to mitigate this impact. An important component of effective agribusiness is the introduction of the latest in-demand technologies in agro-industrial production, aimed at the development of agriculture as an important and priority sector and contributing to the alignment of economic interests of agribusiness and the state.

The main obstacles for acceleration of innovative processes in agroindustrial complex of Ukraine are orientation on outdated mechanisms and models of energy saving, small scale and low efficiency of world experience in introduction of high technologies, imperfection of infrastructure of agrarian market and many other things. The current practice of simplifying technology to the most necessary operations in many agricultural enterprises of Ukraine, the violation of ancient agricultural traditions on the use of scientifically sound crop rotations – all this negatively affects not only the energy conservation and macroeconomic efficiency, but also leads to depletion and degradation of soils (Korol, 2012). According to the author, "One of the most important and particularly difficult problems of energy conservation in the agricultural sector of Ukraine is the lack of effectiveness of scientific achievements, especially at the boundaries of sciences

(agricultural, environmental, technical, etc.). It should be noted that even where the energy supply of agriculture doubled or increased several times, the yield of grain and industrial crops has increased by only 5-10%" (Korol, 2012).

Certain shortcomings in the development of the mechanism of state financial support for enterprises in the agricultural sector of the economy were revealed: annual changes in the procedures and mechanisms for allocating funds from the state budget, their unwieldiness, late approval and repeated changes during the year, untimely receipt of state financial support and inefficient use and return to the state budget at the end of the year. The effective use of limited budgetary funds requires an appropriate long-term strategy for the development of the agricultural sector of the economy, the direction of financial resources from budgets of all levels exclusively on the priority areas of agricultural development and entrepreneurship in rural areas.

6. Conclusions

Thanks to the significant potential of Ukraine for the development of agriculture and given the worsening of hunger on earth (according to UN forecasts, the population by 2050 will increase to 9.3 billion people, and crop yields – only 15%) in the future Ukraine will not only ensure food security of its own country, but also to strengthen its leading export position in the world food market.

Therefore, the issues of state support at the proper level of agro-industrial production as an important component of economic development in order to ensure the effectiveness of producers aimed at the production of safe competitive agricultural products, both in the domestic and foreign markets, which in turn will guarantee not only food but also environmental and national security of the country.

Most of the problems of the agricultural sector of Ukraine remain unresolved, so in our opinion, it is necessary to accelerate the reform of the agricultural sector of Ukraine, which requires significant modernization towards rural entrepreneurship, the introduction of innovative technologies in production, preparation for global changes in producer climate, as well as the development of social infrastructure and rural development. The work considers that the policy

of state regulation of the agrarian sector of the economy should have clear stable vectors of support of priority directions of financial, credit, price and insurance activities.

To develop and implement an effective and favorable scenario of development of the agricultural sector in Ukraine it is necessary to clearly understand the vector of development and direction of a particular sector of the agricultural sector and the environment in which it is located, namely the financial policy and the investment climate. The effective development of enterprises of agrarian sector of Ukraine's economy is largely determined, first of all, by a high level of financial security.

In world practice, the basis of economic policy of the world is the support of the agricultural sector as a priority sector through the development and use of state and interstate development programs. Thus, Ukraine is interested in the experience of the United States, which uses a system of various financial instruments and levers of influence (direct cash payments, soft loans, interest-free loans, irrevocable payments on loans) on the level of profitability of agro-industrial enterprises. However, compared with global practice, the level of financial support for agriculture remains low. Therefore, to improve the financial security of agricultural enterprises, including small and medium-sized businesses, it is necessary to use Guarantee Funds, including in the area of lending, which will solve a number of lending problems and minimize the risk of non-repayment of loans. The author considers it necessary to develop the infrastructure of guarantee funds as institutions of credit support of farmers in the current unfavorable conditions of ensuring their creditworthiness (high collateral, high interest rates, etc.).

Given the increased risks of agribusiness, the role of agricultural insurance must be decisive and taken into account by producers in planning their activities (financial policy of the enterprise), it should also be a priority in government financial policy to support this business, as the best international practice.

The position of the agrarian sector of Ukraine's economy in the future and increase of its export potential to solve the problems of national and global food security depends on the level of long-term investment, growth of lending and real state financial support of agricultural producers.

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