

THE AGRICULTURAL SECTOR OF UKRAINE AS A COMPONENT
OF FOOD SECURITY UNDER THE MARTIAL LAW

Valentyna Ilina✉^{ORCID}, Anna Ilina^{ORCID}

Odessa State Environmental University,
15, Lvivska Str., Odesa, 65016, Ukraine
Vilina653@gmail.com

<https://doi.org/10.23939/ep2024.03.117>

Received: 10.06.2024

© Ilina V., Ilina A., 2024

Abstract. The problems of monitoring and assessing the state of the agricultural sector as an integral part of food security of the country are considered. Along with other countries, Ukraine is one of the world's leading food security countries. Grain production is one of the leading industries in the agricultural sector. Ukraine is one of the largest exporters of grain and pulses in the world. The structure of sown areas in Ukraine by types of crops is analyzed, and the main problems in connection with active hostilities in certain regions are identified. The key problems of reducing the total gross harvest, the disruption of supply chains and, as a result, the increase in the food prices around the world have been identified. Due to the growing global food crisis around the world, ensuring food security has become a primary and priority task. The article analyzes the indicators used to assess food security. The need to make adjustments to the approaches to optimizing the grain crops areas in Ukraine in the conditions of military operations and their consequences in the future was substantiated. To minimize the consequences, it is necessary to protect and support the agricultural production in Ukraine under the martial law as soon as possible. There is a list of the main measures that will help improve food security under military occupation.

Keywords: food security, agricultural sector, agricultural production.

1. Introduction

Ukraine plays a key role in ensuring food security throughout the world. The concept of food security is a global phenomenon that affects the everyday life of every person. According to the Food and Agriculture Organization of the United Nations

(FAO), food security exists when all people at all times have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and nutritional preferences for an active and healthy life (Food security, 2002). Food security depends on the state of the national agro-industrial complex and its support by the state, the land legislation, the forms of ownership and management, as well as the population solvency (Mykhasiuk, Shvaika, 2006).

The problem of food security globally began in 2020–2021 due to the negative impact of the global COVID-19 pandemic, which has led to a decrease in demand for food, mobility and purchasing power of the population, and disruption of the food production and supply system due to the introduction of quarantine measures and travel restrictions (Zurayk, 2020). The problems of ensuring food security in the context of the coronavirus pandemic are addressed by M. Buzhanska (Buzhanska, 2021), S. Tiutiunnykova and I. Skochko (Tiutiunnykova, Skochko, 2020), and O. Surilova (Surilova, 2021).

The state of the economy in which everyone has physical, social and economic access at all times to sufficient, safe and nutritious food that meets their dietary needs and food preferences and enables them to lead an active and healthy life is defined as food security in the world. FAO identifies four main provisions of food security in the world:

1) food security does not mean self-sufficiency in food;

2) a country should strive to produce enough food for its domestic needs if it has a comparative advantage;

3) the country should be able to import the necessary amount of food to meet the needs of its citizens;

4) governments should ensure that safe food is physically and economically accessible to the population.

The world has sufficient capacity to produce enough food to provide everyone with adequate nutrition. At the same time, according to FAO's preliminary estimates, in 2017, the number of people in the world suffering from malnutrition began to increase and amounted to about 821 million, or 10.9 % of the world's population.

The main causes of the food problem in the world today include: demographic situation, depletion of natural resources for food; transformation of consumption patterns; food loss and food waste; biofuels; rising global food prices; crises and conflicts.

The problem of food security occupies an important place in the system of general national security of the country and affects many spheres of life, such as economic, political, social, environmental, etc. It reflects the state of the internal and external food market, the tasks of the social policy, a complex of the agrarian problems, etc. It should be noted that national food security is an element of international food security.

The purpose of this paper is to analyze the peculiarities of the functioning of the agricultural sector of Ukraine under martial law.

2. Materials and Methods

To assess food security, the Global Food Security Index (GFSI) is used. It was first introduced in 2012 and covers 113 countries of the world, both developed and those that are in the state of development. Until 2013, GFSI was based on a three-dimensional concept – economic accessibility (6 indicators), availability (11 indicators), quality and safety (11 indicators). Indicator scores are normalized (minimum-maximum change in scale) and have a scale from 0 to 100, with 100 corresponding to the most favorable situation. Scores at the dimension level correspond to the weighted average of the main indicators. The overall GFSI score is a weighted average of the dimensions. The default weighting factors are the average weighting factors suggested by the members of the expert group.

Recently, climate change, namely global warming and increasing the aridity, began to have an increasingly negative impact on global food security, which has led to needing to make adjustments to the calculation methodology. Starting from 2017, GFSI began to include the fourth indicator – natural resources and sustainability. This category takes into account the assessment of the environmental impact, realizing the need to consider the conservation of the resources, the adaptation for climate changing and sustainable agriculture (Thomas et al., 2017). Finding the right balance between food and nutrition security, the environmental protection and solving the climate changing problem remains a major challenge for sustainable food systems, as well as for using and managing the land and water resources (Willett et al., 2019).

In 2021, Ukraine took the 58th place in the Index among 113 countries of the world (Fig. 1). The main strengths that are indicated in the Index for Ukraine are: food safety; a small portion of the population below the global poverty line; minimal changes in the average food costs; a low level of food losses. The factors that are not purely agrarian and related to the general economic situation have the greatest negative impact on food security of Ukraine: a high level of corruption, expensive loans and the political instability. The results of the Global Food Security Index show that global food prices are rising all over the world. The disruptions in the supply chains, the problems with logistics, and the rising prices for the production factors became a reason for price increasing. But the factors related to the war had the most significant effect on the food and fuel cost. The surge in the demand in the safer regions through the migration of the population has also become one of the significant factors. The United Nations believes that continuing the Russian war against Ukraine may cause a mass starvation in the world. In particular, about 323 million people will be on the starvation brink. As for the geographical distribution of food insecurity in the world, out of 2 billion people facing acute and moderate forms of food insecurity, 1.03 billion live in Asia, 675 million in Africa, 205 million in Latin America and the Caribbean, 88 million in North America and Europe, and 5.9 million in Oceania.

Assessing and analyzing food security must be carried out systematically, that is, both at the national level and at the level of the administrative regions of Ukraine. When evaluating, it is necessary to take into account four types of indexes and indicators of food security, namely: 1) a resource potential; 2) food

producing; 3) distributing the food products; 4) food consuming. The food production is based on the agricultural products, which are determined as the basis for assessing the degree of implementing the resource potential. The degree of implementing the potential reflects the deviation of the actually produced agricultural products cost from the potentially possible cost. It is advisable to calculate the potential of the agricultural production in terms of land, human and capital resources:

$$P_i = p_i V_i, \tag{1}$$

where P_i is the agricultural products potential value, which can be obtained from the available volumes of the i -th type resource;

p_i is the highest value of the food products per unit of the i -th type resource among all administrative regions of Ukraine;

V_i is the actual volume of the i -th type resource in Ukraine.

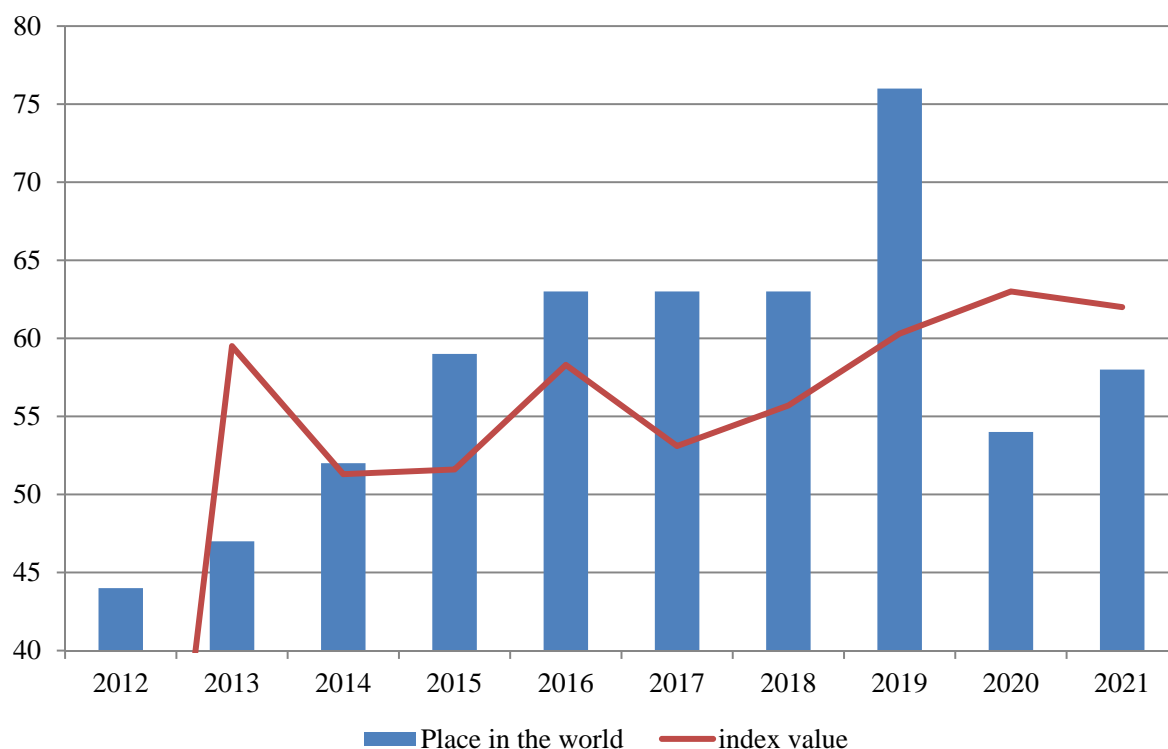


Fig. 1. A place of Ukraine in the ranking according to the Global Food Security Index (Global Food Security Index) for 2012–2021

The potential value of the agricultural products makes it possible to compare how much the value of the gross products produced in Ukraine could be increased if all the regions functioned with the same productivity of the land, labor and monetary resources as the most efficient administrative regions (Hrynyshyn, 2019).

Food security of the country is measured by specific parameters that quantify a state of its agro-industrial sector. FAO experts assess a state of the world food security by two indicators – the volume of transitional (until the next harvest) global grain reserves and the level of its production per person on average.

To assess the state of food security, FAO adopted a methodology based on four areas and more than 30 indicators corresponding to them. The

indicators for assessing food security according to the FAO methodology are: the ratio of the world grain reserves to the world consumption allows to determine the levels of food security and the guarantee in case of emergency (a normative of 17 % means that the grain reserves must correspond to the volumes required for 60 days of consumption); the ratio of the exporters proposition to the total demand for grain; transitional stocks of grain, both total and by food types, as a percentage of domestic consuming in the exporting countries; the grain production trends (the annual percentage increase over the last decade and up to the previous year); the changes in the grain production in the developing countries, i.e. importers; the average annual export prices by the grain types (Pruntseva, 2020).

Regular monitoring food security and the agrarian policy in the wartime is carried out by the Ministry of Agrarian Policy and Food of Ukraine and the Center for Food and Land Use Research. Agriculture is a food base for the population and a source of raw materials for industry. According to the Law of Ukraine “On State Support of the Agriculture of Ukraine”, the effectiveness of the state support of the agriculture of Ukraine is ensured by creating the favorable conditions for implementing the agricultural activities, improving the agricultural products quality and competitiveness in order to minimize the natural, climatic and economic risks of the agricultural production and to guarantee food security of the state (Pro derzhavnu pidtrymku silskoho hospodarstva Ukrainy, 2004). Ensuring food security largely depends on the potential of the agro-industrial sector. According to the “Comprehensive program of supporting the development of the Ukrainian countryside for the period until 2015” project, a special role of the agricultural sector in the socio-economic life of the country is determined by the unique combination of favorable natural and climatic conditions and the geostrategic position, the ability of Ukraine to occupy an important place in the international food market (Pro zatverdzhennia tsilovoi prohramy rozvytku ukrainskoho sela na period do 2015 roku, 2007).

3. Results and Discussion

Grain production is the basis of the agrarian economy of our country, and Ukraine is one of the

largest exporters of grain and leguminous crops in the world. In the period from 2000 to 2019, Ukraine quadrupled its grain exports, and the list of main importers of Ukrainian grains was supplemented by new countries. The main consumers of grain crops are the countries of Asia (China, Israel, Thailand), North Africa (Egypt, Tunisia, Morocco), as well as EU countries (Spain, the Netherlands, Italy). According to the product structure, the “Big Three” cereal grains are distinguished – they are corn, wheat and barley, they are exported from Ukraine in the volumes of more than 1 million tons. And such crops as beans, peas, rye, millet and oats are delivered to the foreign markets mainly in the volumes of more than 10,000 tons. Ukraine is the largest country in Europe by area, it is the main granary of the world and more than half of its territory is occupied by very fertile soils. The territorial specialization of Ukrainian agriculture is the orientation of a certain region to produce the certain types of the agricultural products. There are three agricultural zones – Polissia, the Forest Steppe zone and the Steppe zone. The winter wheat main sown areas, which is a part of the “Big Three” grains, are concentrated in the Steppe zone of Ukraine (55%), the leaders in its production are the Zaporizhzhia, Odesa, Kherson and Mykolaiv regions. Also, the sizable areas are concentrated in the forest-steppe zone (32%), the Kharkiv and Vinnytsia regions take the leading places here (Fig. 2).

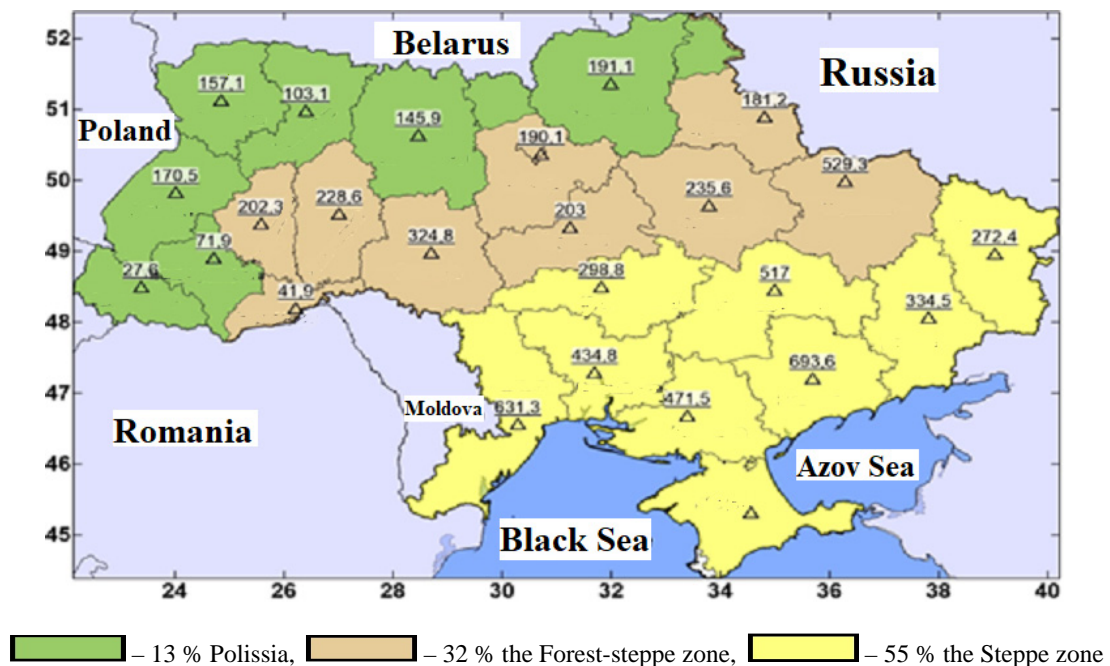


Fig. 2. Winter wheat sown areas for 2018, thousand hectares

The sowing campaign in 2022 under the martial law became the most difficult in the history of our country. In general, in Ukraine this year spring sowing was marked by a decrease in the sown areas due to the partial occupation of the part of the Ukrainian territories by Russian troops, the territorial vicinity to the hostilities, as well as the impossibility to sow due to the mined fields and the damaged material and technical base in the liberated territories. Due to the Russian occupation and hostilities, spring barley sowing decreased by 31 % and shifted to the north, with the greatest concentration in the Dnipropetrovsk region. However, thanks to the rapid liberation of the occupied territories of the Kyiv, Chernihiv and Sumy regions and a certain part of the territories

in the Kharkiv direction, no significant difference between the sowing and harvesting areas for spring grain crops was noted. But it can not be said about the winter ones. The biggest difference will be noticeable precisely with winter wheat, since it is most concentrated in the South of Ukraine, a large part of which is still under the occupation or in the zone of active hostilities. The Kherson, Zaporizhzhya, Donetsk and Luhansk regions account more than 1.8 million hectares in total (Fig. 3). In the areas where fighting is ongoing or has recently been ongoing, the crops have been damaged as a result of equipment maneuvers, explosions and demining. Spring wheat was the closest to the last year indicators. Millet has the lowest rate – it is only 41.1 % of the last year rate.



Fig. 3. Forecast of the gross grain harvest in 2022, million tons

4. Conclusions

The global financial and economic crisis, unstable trends in the development of the world agriculture and the complexity of solving the food problem at the international level require an increased attention to the national food security. Despite all the difficulties and risks of the martial law, the economy of the country remains stable. The Cabinet of Ministers of Ukraine, by Order No. 327-p of April 29,

2022, approved the plan of measures to ensure food security under the martial law. The action plan includes a set of actions in many directions:

- monitoring the state of food security (analyzing forecast balances of supply and demand for the main types of agricultural products; determining the list of basic goods of significant social importance, in particular food products, the prices of which are monitored by the State Statistics Service; regulating price ceilings, etc.);

- ensuring the uninterrupted production of the agricultural and food products (preparation of proposals for financing the expansion of enterprises engaged in the cultivation, production and processing of agricultural products);
- forming an extensive network of storing the reserves of raw materials and food resources to meet the strategic needs of the state;
- ensuring the full functioning of the enterprises of the agro-industrial complex, in particular by meeting the need for the imported components (procurement of necessary food products);
- regulating filling the domestic market with the products of own production and ensuring the export demand (regulation of agricultural exports, export promotion and increase in export quotas in case of a steady increase in stocks of the commodity group), etc. (Rozporiadzhennia, 2022).

References

- Buzhanska, M. V. (2021). Problemy sfery prodovolchoi bezpeky Ukrainy v umovakh pandemii koronavirusu. *Visnyk Lvivskoho torhovelno-ekonomichnoho universytetu. Tekhnichni nauky*, 27, 40–46. doi: <https://doi.org/10.36477/2522-1221-2021-27>
- Food security: concepts and measurement. (2002). Edward Clay of the Overseas Development Institute, London, UK, for the FAO Expert Consultation on Trade and Food Security: Conceptualizing the Linkages. Rome.
- Hrynshyn, V. Ye. (2019). Monitorynh rivnia prodovolchoi bezpeky Ukrainy. *Ahrosvit*, 23, 107–114. doi: <https://doi.org/10.32702/2306-6792.2019.23.107>
- Mykhasiuk, I. R., & Shvaika, L. A. (2006) *Derzhavne rehulivannia ekonomiky: pidruchnyk*. Lviv: Mahnoliia plius.
- Pro derzhavnu pidtrymku silskoho hospodarstva Ukrainy: Zakon Ukrainy 2004, No. 49 (2004). Retrieved from <https://zakon.rada.gov.ua/laws/show/1877-15#Text>
- Pro zatverdzhennia Derzhavnoi tsilovoi prohramy rozvytku ukrainskoho sela na period do 2015 roku: Postanova Kabinetu Ministriv Ukrainy 2007, No. 1158 (2007). Retrieved from <https://zakon.rada.gov.ua/laws/show/1158-2007-%D0%BF#Text>
- Pro zatverdzhennia planu zakhodiv zabezpechennia prodovolchoi bezpeky v umovakh voiennoho stanu: Rozporiadzhennia Kabinetu Ministriv Ukrainy 2022, No. 327-r (2022). Retrieved from <https://zakon.rada.gov.ua/laws/show/327-2022-%D1%80#Text/>
- Pruntseva, H. O. (2020). Metodolohichni zasady otsinky systemy prodovolchoi bezpeky. *Ekonomika ta derzhava*, 6, 151–154. doi: <https://doi.org/10.32702/2306-6806.2020.6.151>
- Surilova, O. O. (2021). Prodovolcha bezpeka v umovakh pandemii. *Naukovi pratsi Natsionalnoho universytetu "Odeska yurydychna akademiia"*, 28, 117–123. doi: <https://doi.org/10.32837/npnuola.v28i0.704>
- Thomas, A.C., & D'Hombres, B., & Casubolo, C., & Saisana, M., & Kayitakire, F. (2017). The use of the Global Food Security Index to inform the situation in food insecure countries, EUR 28885 EN, JRC, Ispra.
- Tiutiunykova, S. V., & Skochko, I. Yu. (2020). Prodovolcha bezpeka v umovakh pandemii. *Biznes Inform*, 11, 69–75. doi: <https://doi.org/10.32983/2222-4459-2020-11-69-75>
- Willett, W., Rockström, J., Loken B., ... & Murray, C. J. L. (2019). Food in the Anthropocene: the EAT-Lancet Commission on healthy 42 diets from sustainable food systems. *Lancet*, 393(10170), 447–492. doi: [https://doi.org/10.1016/s0140-6736\(18\)31788-4](https://doi.org/10.1016/s0140-6736(18)31788-4)
- Zurayk, R. (2020). Pandemic and food security: A view from the Global South. *Journal of Agriculture, Food Systems, and Community Development*, 9(3), 17–21. doi: <https://doi.org/10.5304/jafscd.2020.093.01>