DOI: http://doi.org/10.31617/1.2025(162)02
UDC 338.439-047.44=111

SHYNKOVYCH Andrii
https://orcid.org/0000-0003-2922-3796
PhD (Economics), Associate Professor
of the Department of Public Management
and Administration
State University of Trade and Economics
19, Kyoto St., Kyiv, 02156, Ukraine
a.shynkovych@knute.edu.ua

CRITERIA FOR ASSESSING FOOD SECURITY ASSURANCE

The article substantiates the criteria and indicators for assessing food security assurance in the state regulation system for post-war revival. The characterization of Ukraine's food security during the war is carried out, covering production, logistics, economics, and international assistance, which demonstrates a decrease in sown areas, since due to active hostilities, mining of territories, occupation, and forced migration, a significant part of agricultural land became inaccessible for cultivation, especially affected were the regions where the main export crops (grains, oilseeds) were traditionally grown; the war complicated access to resources, seeds, fertilizers, fuel, and financing, and prices for all resources increased, which negatively affected production; much agricultural machinery was destroyed and damaged as a result of hostilities, granaries, elevators, and other infrastructure necessary for storing and processing the harvest were also damaged; the mobilization of men into the army and forced migration led to a shortage of labor in agriculture. It is noted that the choice of criteria and indicators for assessing food security assurance in the state regulation system for post-war revival depends on many factors, which are systematized by: context, purpose and objectives of the assessment, methodological dimension, characteristics of the food system and vulnerable population groups. Key and additional criteria and indicators of assessment are proposed, it is argued that they should be used for regular monitoring and assessment of the effectiveness of food security assurance in the state regulation system, for identifying problem areas and developing measures to eliminate them, for the

ШИНЬКОВИЧ Андрій
https://orcid.org/0000-0003-2922-3796
к. е. н., доцент кафедри
публічного управління адміністрування
Державного торговельно-економічного
університету
вул. Кіото, 19, м. Київ, 02156, Україна
a.shynkovych@knute.edu.ua

КРИТЕРІЇ ОЦІНКИ АСЕКУРАЦІЇ ПРОДОВОЛЬЧОЇ БЕЗПЕКИ

Обґрунтовано критерії та показники оцінки забезпечення продовольчої безпеки в системі державного регулювання післявоєнного відновлення. Охарактеризовано стан продовольчої безпеки України під час війни, яка охоплює виробництво, логістику, економіку та міжнародну допомогу, що свідчить про зменшення посівних площ, оскільки через активні бойові дії, мінування територій, окупацію та вимушену міграцію значна частина сільськогосподарських угідь стала недоступною для обробітку. Особливо постраждали регіони, де традиційно вирощували основні експортні культури (зернові, олійні), до того ж війна ускладнила доступ до ресурсів, насіння, добрив, палива та фінансів, ціни на всі ресурси зросли, що негативно вплинуло на виробництво. Внаслідок бойових дій знищено та пошкоджено багато сільськогосподарської техніки, зерносховища, елеватори та інша інфраструктура, необхідна для зберігання та переробки врожаю; мобілізація чоловіків до армії та вимушене переселення призвели до браку робочої сили. Вибір критеріїв та показників оцінки забезпечення продовольчої безпеки в системі державного регулювання післявоєнного відновлення залежить від багатьох факторів, які систематизовані за: контекстом, метою та завданнями оцінки, методологічним виміром, характеристиками продовольчої системи та вразливих груп населення. Запропоновано ключові та додаткові критерії і показники оцінки, обґрунтовано доцільність їх використання для регулярного моніторингу та оцінки ефективності забезпечення продовольчої безпеки в системі державного регулювання, для виявлення

formation and implementation of state policy for various categories of agricultural producers. Thus, it has been proven that an objective assessment of food security is an integral part of the successful post-war reconstruction of Ukraine, it provides the necessary information for effective planning, attracting international assistance, monitoring progress and adjusting strategies, opens up additional opportunities for innovation, diversification and development of rural areas, contributing to strengthening national security and improving the quality of life of Ukrainians.

Keywords: food security, state regulation system, insurance, assessment, criteria, indicators, agrarian policy, industry policy.

проблемних місць і розроблення заходів щодо їх усунення, для формування та реалізації державної політики щодо різних категорій сільськогосподарських товаровиробників. Сформовано і доведено гіпотезу, що об'єктивна оцінка продовольчої безпеки є невід'ємною частиною успішної повоєнної відбудови України, вона надає необхідну інформацію для ефективного планування, залучення міжнародної допомоги, моніторингу прогресу та коригування стратегій, відкриває додаткові можливості для інновацій, диверсифікації та розвитку сільських територій, сприяючи зміцненню національної безпеки та покращанню якості життя українців.

Ключові слова: продовольча безпека, система державного регулювання, асекурація, оцінка, критерії, індикатори, аграрна політика, галузева політика.

JEL Classification: E27, J43, L51, O13, Q18, R23.

Introduction

The definition of clear criteria and indicators for assessing food security in the system of state security regulation, including during post-war reconstruction, is relevant and important. First of all, food security insurance is an author's generalized concept that encompasses a comprehensive system of measures to ensure, guarantee and insure stable access of the population to a sufficient amount of high-quality and safe food products, which are implemented through mechanisms of state regulation, agricultural insurance, strategic planning, formation of reserves, regulatory and legal support and support for agricultural producers. In contrast to the narrow interpretation of insurance as a purely financial instrument, food security insurance includes both preventive actions to reduce the risks of shortages and adaptive mechanisms to respond to internal and external shocks (war, climate change, economic crises). It combines the principles of food availability (FAO, 2022, May 4), system resilience (Mostova, 2019), agricultural insurance (Gudz, 2019) and state food security policy (Nikonenko, 2022), providing a multi-faceted platform for monitoring, assessing and improving the level of national food security, especially in the post-war period.

The war revealed the vulnerability of supply chains and the criticality of ensuring domestic food production; therefore, an adequate insurance assessment system will make it possible to identify key weaknesses and strengths and priority areas for the development of domestic agricultural production and reduce dependence on external supplies. Guaranteed provision of the population with affordable and high-quality food is a key factor in ensuring social stability, and the monitoring and assessment system will make it possible to identify risks of food shortages, price increases, uneven access to food and take timely measures to minimize them. In addition, food security can be used as a tool of hybrid aggression by enemies,

and an objective assessment will increase the system's resilience to external influences and ensure its smooth functioning in conditions of uncertainty.

The issue of assessing the state of food security in the system of state regulation of the economy is actively studied, which is confirmed by a large number of scientific publications on these and related issues (Babych, 2018; Berezyuk et al., 2023; Hrynyshyn, 2020; Gudz, 2019; Dykha, 2022; Zalizniuk, 2019; Kaletnik & Gontaruk, 2020; Nikishyna & Chebotaryova, 2024; Nikonenko, 2022; Mostova, 2019; Pruntseva, 2020; Tokarchuk & Furman, 2018, etc.).

Thus, Nikonenko (2022) considered current methodological approaches to the formation of food security in Ukraine in the context of global threats, regional crises, and national challenges. The author proposes a systematic model of ensuring food security, which takes into account not only the classical parameters (availability, accessibility, stability and use of food), but also adaptability to socio-economic transformations, climate change and demographic challenges. The practical significance of the publication lies in the possibility of applying the proposed methods in the activities of central and local executive bodies to analyze the situation in the field of food security, forecast crisis phenomena and form preventive policies in the conditions of post-war reconstruction of the agro-food sector of Ukraine.

Mostova (2019) in her monograph carried out a comprehensive study of the mechanisms of strategic provision of food security in Ukraine, taking into account internal and external risks, changes in the global food environment and the features of the transformation of the domestic agri-food system. The author deeply analyzes the institutional environment, legal regulation, the role of state support for the agricultural sector, the formation of strategic reserves, price and subsidy policies, as well as the problems of social inequality in access to food. The scientific novelty of the monograph lies in the combination of strategic and tactical levels of food security planning, taking into account the concept of sustainable development, integration into the international food space and adaptation of Ukrainian policy to European standards. In addition, the scientist offers the author's vision of the structure of the state's food policy in the form of a strategic risk matrix. The practical significance of the work is manifested in the development of specific recommendations for reforming the system of public food security management, implementing monitoring tools, improving the regulatory framework, as well as forming strategic documents for use by government structures, in particular the Ministry of Agrarian Policy, the Ministry of Economy, and regional administrations.

Scientists Melnyk and Tunicka (2020) conducted an analysis of institutional factors that affect the international competitiveness of the agro-industrial complex of Ukraine, considered the role of state policy, regulatory and legal support and institutional infrastructure in shaping the competitive advantages of the Ukrainian agro-industrial complex in world markets, which is important in supporting the competitiveness of Ukrainian products in the world food market, strengthening Ukraine's export potential.

A significant addition to the scientific discussion on this topic is foreign studies that highlight the impact of global risks on food security, in particular in conditions of armed conflicts and climate change. An article published in The Lancet (2022) focuses on the full-scale war in Ukraine, which has caused significant disruptions to global grain supply chains, exacerbating the problem of food insecurity in countries dependent on Ukrainian exports. A systematic review published in Nutrients analyzes the impact of the COVID-19 pandemic on food security and suggests approaches to increasing the resilience of agri-food systems in times of crisis (Gebeyehu et al., 2023).

However, there is no deep scientific research on the definition of criteria and indicators for assessing food security in the system of state regulation of the economy, which determines the relevance of the presented scientific research.

The aim of the article is to substantiate the criteria and indicators for assessing food security in the system of state regulation of the economy for post-war recovery.

The article is based on the hypothesis that an objective assessment of food security as an integral part of the successful post-war reconstruction of Ukraine provides the necessary information for effective planning, attracting international assistance, monitoring progress and adjusting strategies, opens up additional opportunities for innovation, diversification and development of rural areas, contributing to strengthening national security and improving the quality of life of Ukrainians.

The methodological basis of the research is a systematic approach to analyzing the state of food security in the conditions of post-war recovery, which allows for a comprehensive consideration of economic, social, legal and institutional aspects of ensuring insurance. Structural-functional and comparative methods were used to identify the specifics of the functioning of the agri-food system in the conditions of war and post-war transformation. The empirical basis of the study is statistical data from the State Statistics Service of Ukraine, the Ministry of Agrarian Policy, international organizations (FAO, WFP, World Bank), as well as materials from scientific publications and strategic documents. The proposed criteria and assessment indicators are built on the principles of validity, measurability, relevance, sensitivity to changes, as well as practical applicability in the state regulation system. To systematize the factors influencing insurance, the expert assessment method was used, and to form the author's assessment model – elements of index and component analysis.

The main part of the article consists of four sections: the first is devoted to the characteristics of food security during the war; the second is about factors for choosing criteria and indicators for assessing food security assurance in the system of state regulation of the economy; the third contains proposals for criteria and indicators for assessing food security assurance in the system of state regulation of the economy; the fourth is about advantages of the proposed updated system for assessing food security assurance.

1. Food security in time of war

Scientists Tokarchuk and Furman (2018) argued in the pre-war period that Ukraine had sufficient land to guarantee energy security when using agricultural raw materials for biofuel production without threatening food security. Scientists Kaletnik and Hontaruk (2020) supported this position, noting that the production of biogas and bioethanol at the region's distilleries could have the following effects on the economy: increase energy independence; reduce distilleries' energy costs; improve the ecological state of water resources; provide the livestock industry with protein feed. However, russia's full-scale war against Ukraine has halted the progressive development and strengthening of food security in Ukraine, demonstrating the vulnerability of both national and global food systems to anthropogenic (impact of armed conflicts), economic (rising world food prices) and natural factors (increasing impact of crop failures due to disruption of global food supplies) (FAO, 2022, May 4). Due to the start of hostilities, the disruption of the 2022 spring sowing campaign (reduction of sown areas) in regions where active hostilities are underway or which are temporarily occupied posed a threat to food security. Thus, the decrease in yield due to disruption of agro-technological cultivation of lands caused a decrease in grain harvests and, as a result, a decrease in grain exports (Dykha, 2022).

• Ukraine's food security during the war, which encompasses production, logistics, the economy, and international aid, is characterized by a number of features:

• a reduction in sown areas, as active hostilities, land mining, occupation, and forced migration have made a significant portion of agricultural land inaccessible for cultivation, particularly in regions where the main export crops (grains and oilseeds) were traditionally grown;

• difficulties in accessing resources, seeds, fertilizers, fuel, and financing, and rising resource prices have negatively impacted production;

• much agricultural machinery has been destroyed and damaged as a result of hostilities, and grain silos, elevators, and other infrastructure necessary for storing and processing the harvest have been damaged;

• mobilization of men into the army and forced migration have led to a shortage of labor in agriculture;

• the russian blockade of Ukrainian seaports, through which a significant part of grain was traditionally exported, created serious problems for the sale of agricultural products, which led to the overflow of grain storage facilities and a decrease in prices on the domestic market;

• the use of land routes (railway, road transport) faced limited capacity, different standards of railway tracks and increased transport costs for exporting products;

• rising prices for logistics services, including transportation, insurance and storage, which increased the cost of exports;

• the war has led to rising food prices in Ukraine, especially for imported goods, which has become a serious challenge for people with low incomes;

• providing food to the population in active combat zones and occupied territories has become an extremely difficult task due to the destruction of infrastructure, limited access and security risks;

• the government and international organizations are providing humanitarian assistance (food packages to support internally displaced persons, pensioners and other vulnerable groups);

• many countries and international organizations are providing food aid to Ukraine to meet the needs of the population;

• the agreement on grain exports from Ukrainian ports (the Grain Initiative), concluded under the mediation of the UN and Turkey, has made it possible to partially unblock sea grain exports and reduce global food prices;

• the war highlighted the need to diversify global food supply chains and reduce dependence on a single supplier (Berezyuk et al., 2023; Dykha, 2022; Nikishina & Chebotaryova, 2024; Nikonenko, 2022; FAO, 2022, May 4).

Therefore, Ukraine's food security during the war is characterized by major problems, which confirms the need to substantiate objective criteria and indicators for assessing food security assurance in the state regulation system in order to develop adequate strategies and measures.

2. Factors of food security assessment in the state regulatory system

Based on the author's understanding of food security assurance, in particular its clear criteria, it is possible to assess the damage caused by the war to the agro-industrial complex, as well as to determine the needs for the restoration of infrastructure, equipment, seed material, livestock, etc. As Nikonenko (2022) argues, an important condition for achieving food security is the stability of its provision, which provides for: the ability for population groups, households and individuals to have access to a sufficient amount of food at any time and not be under pressure from losing access to food as a result of demand or supply shocks, as well as cyclical fluctuations in the economy, and the system of indicators will help determine priority areas of state support and investment in the agro-industrial complex, directing them to the most important areas for ensuring food security. At the same time, clearly defined criteria and indicators of food security will allow for the well-reasoned attraction of international assistance for the restoration and development of the agricultural sector, demonstrating the transparency and efficiency of the use of the funds received. At the same time, since the national food security system should be based on the principles of self-sufficiency, independence, accessibility, and quality, which should form the

basis for the formation of a strategy and state policy for ensuring food security (Mostova, 2019), the assessment criteria should take into account the impact of agriculture on the environment, stimulate the implementation of environmentally friendly technologies, minimize the use of pesticides and herbicides, contribute to soil conservation, take into account climate change, soil degradation, limited water resources, and other factors that will affect food security in the future. In addition, the assessment criteria and indicators should take into account the role of small and medium-sized farms in ensuring food security, promote their development and competitiveness, and become a platform for developing effective state strategies and programs aimed at ensuring food security and a methodological basis for continuous monitoring of the state of food security in order to identify problem areas and respond to threats in a timely manner. They will allow for an objective assessment of the effectiveness of state policy in the field of food security, make necessary adjustments, and improve management.

Thus, the choice of criteria and indicators for assessing food security assurance in the system of state regulation of the economy for post-war recovery depends on many factors (Babich, 2018; Hrynyshyn, 2020; Gudz, 2019; Zalizniuk, 2019; Kaletnik & Gontaruk, 2020; Mostova, 2019; Pruntseva, 2020; Tokarchuk & Furman, 2019), which are systematized into four main blocks.

The context, purpose and objectives of the assessment should primarily take into account the geographical scale, as the criteria and indicators will differ depending on the level of assessment (global, national, regional, local), which will accordingly affect the purpose of the assessment, on which aspects and components of food security should be focused, in particular, whether the assessment is assessing the availability of food, its nutritional quality, stability of supply, or the vulnerability of certain population groups. The choice of indicators, especially in wartime, is significantly influenced by the availability of data and resources for collecting and analyzing information, i. e. it is important to choose those indicators for which there are reliable objective sources of information. National and international political priorities also influence the choice of criteria and indicators, in addition, some developed countries prioritize the strategy of combating obesity, therefore indicators related to the quality of nutrition and the consumption of sugar and fat are included in the assessment of food security.

The methodological dimension requires that indicators be valid (show what they are supposed to show) and reliable (give consistent results when measured repeatedly). They should also be measurable, understandable, and easy to interpret and compare; if the assessment involves comparisons across regions or time periods, standardized indicators should be used; and they should be sensitive to changes in the food system and responsive to the implementation of different policies, strategies, and programs.

The characteristics of the food system should include the volume and structure of food production, technologies, resources used (water, land, fertilizers), climatic conditions, efficiency of supply chains, infrastructure, pricing, the role of intermediaries, economic accessibility of food for different population groups, physical accessibility (distance from places of production and sale), take into account the eating habits of the population, sanitary conditions, access to clean water, the level of education on nutrition, the resilience of the food system to external shocks such as war, climate change, economic crises, political conflicts, etc.

Vulnerable population groups are the selection of criteria and indicators should take into account the specificities and needs of vulnerable population groups such as children, pregnant women, the elderly, people with disabilities, internally displaced persons, refugees, and low-income groups, i. e. it is imperative to take into account the specific nutritional needs and risk factors that affect the food security of these groups. The selection of criteria and indicators for assessing food security assurance in the state regulation system for post-conflict reconstruction is a complex and comprehensive process that requires taking into account many different factors, i. e. it is important to choose indicators that are relevant for a specific country or region and available for data collection. It is necessary to use reliable and up-to-date data from official sources (statistical offices, ministries, international organizations), it is important not only to collect data, but also to analyze it and identify key trends and problems, it is useful to compare indicators with other countries or regions to assess progress and identify areas for improvement, and most importantly, it is necessary to regularly monitor indicators to identify problems in a timely manner and take measures.

3. Recommendations for criteria and indicators for assessing food security accretion in state regulation of the economy

Based on the specified requirements for the selection of criteria and indicators for assessing food security assurance in the system of state regulation of the economy for post-war recovery, recommendations of international and scientific organizations (Berezyuk et al., 2023), proposals of scientists (Babych, 2018; Hrynyshyn, 2020; Gudz, 2019; Zalizniuk, 2019; Kaletnik & Gontaruk, 2020; Mostova, 2019; Prunt-seva, 2020; Tokarchuk & Furman, 2018) and conducted research, proposals have been developed for the criteria and indicators that should be used for such an assessment.

The author's interpretation of the key criteria and their indicators is presented in *Table 1*.

Table 1

Basic criteria and indicators of food security in the system of state regulation of the economy

Criteria	Content	Indicator	Unit of measurement
Availability	Physical availability of food in sufficient quantity	Food production per capita	tons/year
		Food imports	tons/year; % of domestic consumption
		Food exports	tons/year; % of domestic consumption
		Food stocks	tons; % of domestic production
		Agricultural land area	tons, % of domestic consumption for a certain period
		Yield of major crops	tons/hectares
		Degree of diversification of agricultural production	Index
		Use of modern agricultural technologies	% of domestic consumption
		Post-harvest food losses	%
Accessibility	Economic and physical access to food for all population groups	Per capita income	USD/year
		Percentage of population living below the poverty line	%
		Cost of a basket of basic food products	USD/month
		Ratio of the cost of a basket of basic food products to the minimum wage	%
		Consumer food price index	Reference year = 100
		Availability of food markets and shops in rural areas	Number per capita
		Condition of road infrastructure	Index
		Availability of social support programs	% coverage, amount of payment, UAH
		Unemployment rate	%
		Share of food expenditure in the total household budget	
		Poverty rate	
Utilization	The body's ability to effectively absorb nutrients from food, which depends on sanitation, access to clean water, medical care, and knowledge about nutrition	Rate of malnutrition	%
		Prevalence of stunting among children under 5 years of age	
		Rate of maternal mortality	Number of deaths per 100,000 newborns
		Provision of clean drinking water and sanitation	%
		Coverage of health care	
		Rate of infectious diseases	
		Level of knowledge about proper nutrition	Index
		Rate of consumption of different food groups	Index for each age group
Stability	Ensuring the availability, accessibility and use of food on a permanent basis, without the risk of losing access to it due to economic crises, natural disasters, political instability, etc.	Volatility of prices for basic food products	Volatility index
		Dependence on external energy sources	%
		Number and scale of natural disasters	Quantity, area, losses
		Political stability	Index
		Economic stability	GDP growth rate, inflation rate
		Level of economic diversification	Diversification index
		Existence of an early warning system for emergencies	Coverage, accuracy
		Dependence on climatic conditions	Index

Source: compiled by the author from (Zalizniuk, 2019).

For an objective and adequate assessment of food security assurance in the state regulation system, since assurance includes provision, guaranteeing, and insurance, additional criteria and indicators should be added to the key criteria and indicators (Gudz, 2019), which take into account the availability of the necessary instruments of provision, guaranteeing, and insurance, their effectiveness, impact on various market participants, and the ability to adapt to changes (*Table 2*).

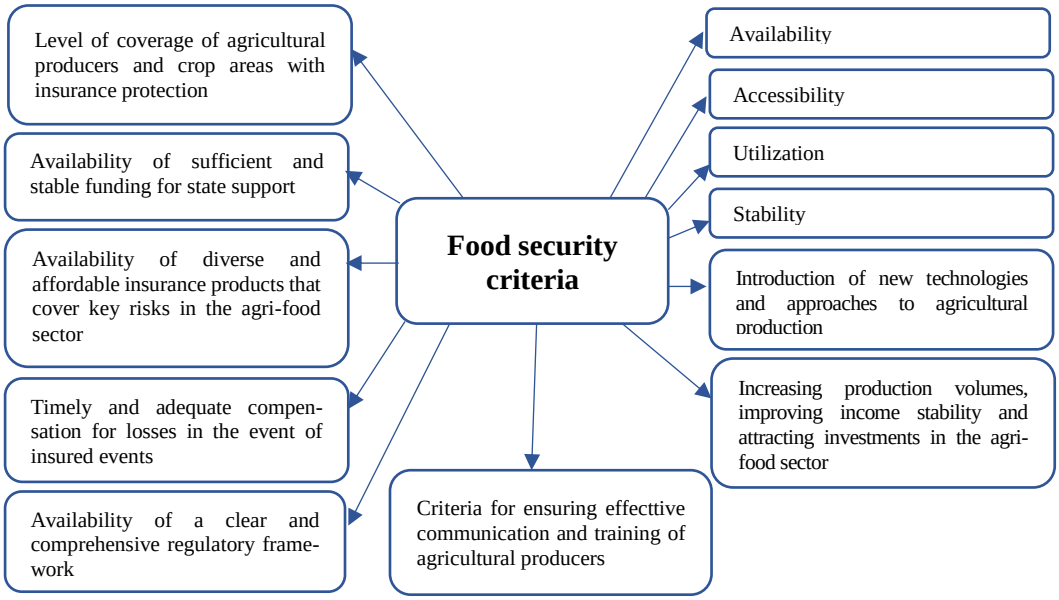
Table 2

Additional criteria and indicators of food security in the system of state regulation of the economy

Criteria	Indicator
A clear and comprehensive regulatory framework governing food security insurance	The presence of laws, resolutions, orders and other regulatory acts that determine the types of risks subject to insurance, mechanisms for state support of insurance (subsidies, guarantees, insurance)
	Requirements for insurance companies engaged in agricultural insurance, the procedure for concluding and executing insurance contracts
	Mechanisms for settling insured events, regular review and updating of the regulatory framework, the presence of a clear division of responsibility between state bodies and insurance companies
Availability of diverse and affordable insurance products covering key risks in the agri-food sector	The number of available insurance products for different categories of producers
	The presence of agricultural insurance products that cover risks associated with weather conditions (drought, frost, hail, floods), plant and animal diseases and pests
	Simplicity and clarity of insurance terms
Availability of sufficient and stable funding for state support	Amount of funds allocated for state support, including for agricultural insurance
	Share of state support in the total volume of insurance premiums
	Effectiveness of budget funds use
	Availability of alternative sources of financing
Level of coverage of agricultural producers and crop areas with insurance protection	Share of agricultural producers with insurance protection
	Share of insured crop areas out of total crop areas
	Share of insured livestock out of total livestock
	Regular review and adaptation of insurance terms to changing climatic conditions
Timely and adequate compensation for losses in the event of insured events	Average term of insurance compensation payment
	Relationship between the amount of insurance compensation and actual losses
	Number and amount of settled insurance claims
	Level of satisfaction of agricultural producers with the process of settling insurance claims
Increasing production volumes, improving income stability and attracting investments in the agri-food sector	Change in agricultural production volumes
	Stability of agricultural producers' incomes
	Volume of investments in the agri-food sector
Introduction of new technologies and approaches to agricultural production	Level of digitalization of business processes, use of agro-innovations (precision farming)
	Share of production of environmentally friendly products
	Development of Internet networks
	Use of satellite data and remote sensing, introduction of index insurance, use of digital platforms
Introduction of new technologies and approaches to agricultural production	Staff training
	Number of information campaigns and training seminars for agricultural producers
	Accessibility of information

Source: compiled and supplemented by the author according to (Gudz, 2019).

Thus, we get a system of criteria for assessing food security (*Figure*).



System of food security criteria

Source: compiled by the author.

The outlined criteria and indicators should be used for regular monitoring and assessment of the effectiveness of food security assurance in the state regulation system, identification of problem areas and development of measures to eliminate them, formation and implementation of state policy for various categories of agricultural producers. At the same time, along with the national level, it is recommended to apply them also taking into account regional characteristics and ensuring transparency and openness in the assessment and reporting process. That is, the use of these criteria and indicators will allow a more objective assessment of the effectiveness of food security assurance in the state regulation system and develop measures to improve it.

As of January 1, 2025, Ukraine's food security remains under the influence of the long-term consequences of full-scale armed aggression, *which significantly affected all aspects of the agri-food system. In Table 3, 4* systematize quantitative and qualitative indicators that reflect the current state of food security assurance.

Quantitative indicators of food security insurance as of January 1, 2025 indicate a gradual stabilization of the agri-food system of Ukraine. The production volumes of grain crops remain at a sufficient level to meet domestic needs, however, the share of imports in total consumption continues to exceed optimal limits, which indicates continued dependence on external sources. The high share of household spending on food and inflationary pressure on food products are indicators of limited economic accessibility of food for broad segments of the population. Despite moderate GDP growth and increased investment in the agricultural sector, the level of insurance coverage of farmers, as well as the share of the

introduction of innovative technologies, remains insufficient. This necessitates the strengthening of state policy on the development of agro-insurance institutions, stimulation of digitalization and diversification of production in the context of strengthening national food security.

Table 3

Quantitative indicators of food security assessment in Ukraine as of 01.01.2025

Criteria	Indicators	Value
Availability	Grain production, million tons (State Statistics Service of Ukraine, 2025)	55
	Share of imports in total consumption, % (Ministry of Agrarian Policy and Food of Ukraine, 2025)	12
	Food stocks, days of consumption (FAO, 2025)	45
Accessibility	Share of household expenditure on food, % (State Statistics Service of Ukraine, 2025)	48
	Consumer food price index (annual increase), % (National Bank of Ukraine, 2025)	+8.2
	Unemployment rate, % (State Statistics Service of Ukraine, 2025)	9.5
Utilization	Prevalence of malnutrition among the population, % (WFP, 2025)	6.3
	Stunting in children under 5 years of age, % (UNICEF Ukraine, 2025)	9.1
	Access to safe drinking water, % (WHO, 2025)	92
Stability	Food price volatility index, % (FAO, 2025)	12.4
	Number of natural disasters affecting the agricultural sector, cases (State Emergency Service of Ukraine, 2025)	7
	GDP growth rate (annual), % (Ministry of Economy of Ukraine, 2025)	3.1
Insurance coverage	Share of insured agricultural areas, % (Ministry of Agrarian Policy and Food of Ukraine, 2025)	18
	Share of insured livestock, % (AgroPortal, 2025)	11
	Average term for payment of insurance compensation, days (National Commission for Regulation of Financial Services Markets, 2025)	45
Financing	Volume of state financing of agricultural insurance, UAH billion (Ministry of Finance of Ukraine, 2025)	1.2
	Share of subsidies in insurance premiums, % (Ministry of Agrarian Policy and Food of Ukraine, 2025)	35
	Number of available financial instruments for farmers (Ukrainian Agrarian Fund, 2025)	5
Technologies	Share of innovative technologies implemented in agriculture, % (Institute of Agrarian Economics, 2025)	22
	Level of digitalization of the agricultural sector, % (Ministry of Digital Transformation of Ukraine, 2025)	28
	Share of organic products in total production, % (Federation of the Organic Movement of Ukraine, 2025)	3.5
Investments	Volume of investments in the agricultural sector, billion UAH (State Statistics Service of Ukraine, 2025)	4.8
	Growth of agricultural production (annual), % (Ministry of Agrarian Policy and Food of Ukraine, 2025)	+2.7
	Stability of agricultural producers' incomes, coefficient of variation (Institute of Agrarian Economics, 2025)	0.5

Source: compiled by the author based on the above sources.

Table 4

Qualitative indicators of food security assurance in Ukraine as of 01.01.2025

Criteria	Indicators	Assessment
Legal framework	Relevance of legislation in the field of food security	Partially updated in accordance with EU requirements; requires further harmonization (State Service of Ukraine on Food Safety and Consumer Protection, 2024)
	Availability of strategic documents and action plans	Food Security Strategy of Ukraine until 2027 approved; operational implementation plan in place (Cabinet of Ministers of Ukraine, 2024)
Insurance products	Availability of insurance products for farmers	Limited; mainly for large farms; needs expansion for small and medium-sized producers (AgroPortal, 2025)
	Coverage of risks related to climate change and natural disasters	Partial; introduction of new products that take into account modern climate challenges is necessary (AgroPortal, 2025)
Communication and training	Availability of awareness-raising and training programs for farmers	Limited number of programs (Caritas Ukraine, 2024)

Source: compiled by the author based on the sources indicated.

Qualitative indicators allow assessing the systemic and institutional prerequisites for ensuring food security. As of the beginning of 2025, there has been a partial update of the regulatory framework in accordance with European standards, however, there is still a need for harmonization and development of by-laws regulating agricultural insurance. Strategic documents, in particular the Food Security Strategy of Ukraine for the period until 2027 (Cabinet of Ministers of Ukraine, 2024, July 23), create the basis for medium-term planning, however, the effectiveness of implementation remains limited due to low awareness of producers and the lack of systematic training programs. The offer of insurance products is uneven and focused mainly on large enterprises, which creates a risk of deepening disparities between producers. In general, qualitative indicators confirm the need to strengthen the institutional capacity of the state regulatory system in the field of food security by expanding the functionality of insurance mechanisms, increasing transparency and developing communication mechanisms with the agricultural environment.

Defining clear criteria and indicators for assessing food security assurance in the state regulatory system is an urgent need for the successful recovery and development of Ukraine in the post-war period, which will contribute to ensuring national security, effective restoration of the agro-industrial complex, development of sustainable agriculture and improvement of the state regulatory system, thereby guaranteeing access to high-quality and safe food for every Ukrainian. This task requires consolidated efforts of the state, scientists, business and the public.

4. Advantages of the proposed updated food security assessment system

In fact, an objective assessment of food security assurance in the state regulation system according to the proposed criteria and indicators reveals significant advantages for the rapid recovery and rapid development of Ukraine, since:

• accurately outlines the scale of the problem, provides a clear understanding of the current state of food security, identifying specific regions, population groups and sectors of the economy that have suffered the most from the war, which allows for targeted allocation of resources and development of effective assistance strategies;

• provides objective data on losses in the agricultural sector, destruction of infrastructure and changes in consumer habits, contributes to the development of substantiated specific plans and measures aimed at restoring production capacities (agricultural machinery, seeds, fertilizers), rebuilding logistics chains (elevators, ports, roads), supporting agricultural enterprises;

• becomes a convincing argument for attracting financial and technical assistance from international organizations, governments of other countries and donors, as it is supported by independent research and international standards on needs and recovery plans, which increase confidence in Ukraine and contribute to the mobilization of necessary resources;

• allows to monitor progress in restoring food security, identify new challenges and timely adjust strategies and programs, which will ensure flexibility and adaptability in the recovery process;

• allows to identify vulnerabilities and develop measures to address them, reducing dependence on imports and increasing resilience to external shocks;

• promotes transparency and accountability in the use of resources aimed at restoring food security, which increases public trust in the government and other stakeholders.

At the same time, an objective assessment of food security assurance in the state regulation system according to the proposed criteria and indicators generates additional opportunities:

• helps to identify the most promising areas for investment in the agricultural sector, such as the development of irrigation systems, the introduction of modern technologies and support for organic farming;

• outlines such guidelines for stimulating innovation in the agricultural sector as the development of new varieties of agricultural crops that are resistant to climate change and the development of alternative food sources, which contributes to the diversification of production, reducing dependence on certain crops;

• allows for the development of more effective risk management systems in the agricultural sector, including crop insurance, the creation of reserve food stocks and the development of emergency response plans;

• helps to develop integrated recovery programs aimed at the development of rural areas, job creation, infrastructure improvement and improving the quality of life in rural areas;

• serves as the basis for developing a more effective and targeted state policy in the field of food security, including supporting producers, regulating prices, and ensuring access to food for vulnerable groups of the population.

Thus, an objective assessment of food security is an integral part of the successful post-war reconstruction of Ukraine, providing a basis for effective planning, attracting assistance, monitoring results, and opening up new opportunities for innovation, diversification and development of rural areas, strengthening national security and improving the well-being of citizens.

Conclusions

Based on the results of the research, the criteria and indicators for assessing food security in the system of state regulation for post-war recovery are substantiated. The food security system of Ukraine during the war is characterized, including production, logistics, economics, and international assistance.

The choice of criteria and indicators for assessing food security in the system of state regulation of the economy for post-war recovery depends on many factors, which are systematized by: the context, purpose and objectives of the assessment, methodological dimension, characteristics of the food system and vulnerable population groups. Key and additional criteria and indicators for assessment are proposed, and it is argued that they should be used for regular monitoring and assessment of the effectiveness of food security in the system of state regulation, for identifying problem areas and developing measures to eliminate them, for forming and implementing state policy for various categories of agricultural producers.

Thus, the hypothesis that an objective assessment of food security is an integral part of the successful post-war reconstruction of Ukraine is confirmed. It provides the necessary information for effective planning, attracting assistance, monitoring progress and adjusting strategies, opens up additional opportunities for innovation, diversification and development of rural areas, strengthening national security and improving the well-being of citizens.

Prospects for further research include the development of an integrated system of digital monitoring of food security assurance using geo-information technologies and artificial intelligence. It is also advisable to conduct an in-depth study of regional features of food security in the context of decentralization and development of territorial communities.

REFERENCE/СПИСОК ВИКОРИСТАНИХ ДЖЕРЕЛ

AgroPortal. (2025). Farmers call for the introduction of climate risk insurance. https://agroportal.ua/news/finansy/agrariji-zaklikayut-vprovaditi-strahuvannya-vid-klimatichnih-rizikiv	
AgroPortal. (2025). The cattle stock in Ukraine decreased by 100 thousand over the year. https://agroportal.ua/news/zhivotnovodstvo/pogoliv-ya-koriv-v-ukrajini-za-rik-skorotilos-na-100-tisyach	*AgroPortal*. (2025). Поголів'я корів в Україні за рік скоротилось на 100 тисяч. https://agroportal.ua/news/zhivotnovodstvo/pogoliv-ya-koriv-v-ukrajini-za-rik-skorotilos-na-100-tisyach
Babych, M. M. (2018). Criteria and indicators of food security at the global level. *Investments: Practice and Experience*, (10), 56–59.	Бабич, М. М. (2018). Критерії та індикатори продовольчої безпеки на глобальному рівні. *Інвестиції: практика та досвід*, (10), 56–59.
Bereziuk, S., Hontaruk, Ya., & Yasinska, B. (2023). Ensuring food security of the state under martial law. *Economy and Society*, (47). https://doi.org/10.32782/2524-0072/2023-47-44	Березюк, С., Гонтарук, Я., & Ясінська, Б. (2023). Забезпечення продовольчої безпеки держави в умовах воєнного стану. *Економіка та суспільство,* (47). https://doi.org/10.32782/2524-0072/2023-47-44
Cabinet of Ministers of Ukraine. (2024, July 23). On the approval of the Food Security Strategy of Ukraine for the period until 2027 and the adoption of the operational action plan for its implementation: Order No. 684-r. https://zakon.rada.gov.ua/go/684-2024-%D1%80	*Кабінет Міністрів України*. (2024, 23 липня). Про схвалення Стратегії продовольчої безпеки України на період до 2027 року та затвердження операційного плану заходів з її реалізації: Розпорядження № 684-р. https://zakon.rada.gov.ua/go/684-2024-%D1%80
Caritas Ukraine. (2024). *Food security and economic recovery*. https://caritas.ua/hum/prodovolcha-bezpeka-ta-ekonomichne-vidnovlennya/	
Dykha, M. V. (2022). *Food security through the prism of military actions in Ukraine*. In Sustainable development of the agrarian sector: engineering and economic support, 55–57. Proceedings of the 4th International Scientific and Practical Conference, May 25, 2022. Separated Subdivision of NUBiP of Ukraine.	Диха, М. В. (2022). *Продовольча безпека під призмою воєнних дій в Україні.* Сталий розвиток аграрної сфери: інженерно-економічне забезпечення: матеріали IV Міжнародної науково-практичної конференції 25 травня 2022 р. ВП НУБіП України, 55–57.
FAO. (2025). *Food security report: Ukraine. Food and Agriculture Organization of the United Nations*. https://www.fao.org/ukraine	
FAO.org. (2022, May 4). Food and Agriculture Organization of the United Nations. *Global Report on Food Crises: acute food insecurity hits new highs*. https://www.fao.org/newsroom/detail/global-report-on-food-crises-acute-food-insecurity-hits-new-highs/en	
Federation of Organic Movement of Ukraine. (2025). *Organic production in Ukraine: Annual report*. https://organic.com.ua	Федерація органічного руху України. (2025). *Звіт про органічне виробництво в Україні*. https://organic.com.ua
Gebeyehu, D. T., East, L., Wark, S., & Islam, M. S. (2023). A systematic review of the direct and indirect COVID-19's impact on food security and its dimensions: Pre- and post-comparative analysis. *BMC Public Health, 23*(1), 2298. https://doi.org/10.1186/s12889-023-17104-6	
Gudz, O. Ye. (2019). Development of insurance: new tools and methods of risk management in the digital economy. *Economy. Management. Business*, *3*(29), 12–19.	Гудзь, О. Є. (2019). Розвиток страхування: нові інструменти та методи управління ризиками в цифровій економіці. *Економіка. Менеджмент. Бізнес*, *3*(29), 12−19.
Hrynyshyn, V. Ye. (2020). Methodological foundations of research on the country's food security. *Economy and State*, (2), 141–146.	Гринишин, В. Є. (2020). Методологічні основи дослідження продовольчої безпеки країни. *Економіка та держава*, (2), 141–146.

Institute of Agrarian Economics. (2025). *Innovations and income stability in Ukraine's agriculture*. https://iae.org.ua	Інститут аграрної економіки. (2025). *Інновації в аграрному секторі України*. https://iae.org.ua
Kaletnik, H. M., & Hontaruk, Ya. V. (2020). Differentiation of the development of processing industries in the agrarian sector of Vinnytsia region. *Economics, Finance, Management: Topical Issues of Science and Practice*, *3*(53), 7–23. https://doi.org/10.37128/2411-4413-2020-3-1	Калетнік, Г. М., & Гонтарук, Я. В. (2020). Диференціація розвитку галузей переробної промисловості аграрного сектору Вінницької області. *Економіка, фінанси, менеджмент: актуальні питання науки і практики*, *3*(53), 7–23. https://doi.org/10.37128/2411-4413-2020-3-1
Melnyk, T., & Tunitska, Yu. (2020). Institutional support for the international competitiveness of Ukraine's agro-industrial complex. *Foreign trade: economics, finance, law*, *4*(111), 69–89. https://doi.org/10.31617/zt.knute.2020(111)05	Мельник, Т., & Туніцька, Ю. (2020). Інституційне забезпечення міжнародної конкурентоспроможності АПК України. *Зовнішня торгівля: економіка, фінанси, право*, *4*(111), 69–89. https://doi.org/ 10.31617/zt.knute.2020(111)05
Ministry of Agrarian Policy and Food of Ukraine. (2025). *Agrarian overview 2024*. https://minagro.gov.ua	Міністерство аграрної політики та продовольства України. (2025). *Аграрний огляд 2024*. https://minagro.gov.ua
Ministry of Digital Transformation of Ukraine. (2025). *Digitalization in the agricultural sector*. https://thedigital.gov.ua	Міністерство цифрової трансформації України. (2025). *Цифровізація в аграрному секторі*. https://thedigital.gov.ua
Ministry of Economy of Ukraine. (2025). *Macroeconomic review and forecast*. https://me.gov.ua	Міністерство економіки України. (2025). *Макроекономічний огляд та прогноз*. https://me.gov.ua
Ministry of Finance of Ukraine. (2025). *Budget report 2024*. https://mof.gov.ua	Міністерство фінансів України. (2025). *Бюджетний звіт за 2024 рік*. https://mof.gov.ua
Mostova, A. D. (2019). *Strategic provision of food security in Ukraine*. Kharkiv: *Tochka Publishing House*. 311 p.	Мостова, А. Д. (2019). *Стратегічне забезпечення продовольчої безпеки України*. Харків: *Точка*. 311 с.
National Bank of Ukraine. (2025). *Inflation report, January 2025*. https://bank.gov.ua	Національний банк України. (2025). *Інфляційний звіт, січень 2025*. https://bank.gov.ua
National Commission for the State Regulation of Financial Services Markets. (2025). *Report on the activities of insurance companies*. https://nfp.gov.ua	Національна комісія з регулювання ринків фінансових послуг. (2025). *Звіт про діяльність страхових компаній*. https://nfp.gov.ua
Nikishyna, O., & Chebotarova, N. (2024). Risks and threats to Ukraine's food security and the resilience of agri-food markets during wartime and postwar periods. *Grail of Science*, (45), 219–236. https://doi.org/10.36074/grail-of-science.01.11.2024.023	Нікішина, О., & Чеботарьова, Н. (2024). Ризики й загрози продовольчій безпеці України та стійкості функціонування агропромислових ринків у воєнний і повоєнний періоди. *Грааль науки*, (45), 219–236. https://doi.org/10.36074/grail-of-science.01.11.2024.023
Nikonenko, O. A. (2022). Methodological support for the formation of food security in Ukraine. *Agrosvit*, (9–10), 86–92. https://doi.org/10.32702/2306-6792.2022.9-10.86	Ніконенко, О. А. (2022). Методичне забезпечення формування продовольчої безпеки України. *Агросвіт*, (9-10), 86–92. https://doi.org/10.32702/2306-6792. 2022.9-10.86.
Pruntseva, H. O. (2020). Methodological principles for assessing the food security system. *Economy and State*, (6), 151–154.	Прунцева, Г. О. (2020). Методологічні засади оцінки системи продовольчої безпеки. *Економіка та держава*, (6), 151–154.
State Emergency Service of Ukraine. (2025). *Report on emergencies in 2024*. https://dsns.gov.ua	Державна служба України з надзвичайних ситуацій. (2025). *Звіт про надзвичайні ситуації у 2024 році*. https://dsns.gov.ua

State Service of Ukraine on Food Safety and Consumer Protection. (2024). *Ukraine on the path to the EU: harmonization of standards regarding the welfare of farm animals*. https://dpss.gov.ua/news/ukraina-na-shliakhu-do-ies-harmonizatsiia-standartiv-shchodo-blahopoluchchia-silskohospodarskykh-tvaryn

State Statistics Service of Ukraine. (2025). *Statistical yearbook of Ukraine for 2024*. https://ukrstat.gov.ua

Державна служба статистики України. (2025). *Статистичний щорічник України за 2024 рік*. https://ukrstat.gov.ua

The Lancet. (2022). Health impacts of the russian invasion in Ukraine: Need for global response. *The Lancet*, *399*(10334), 1229. https://doi.org/10.1016/S0140-6736(22)00615-8

Tokarchuk, D. M., & Furman, I. V. (2018). Food security and economic foundations of biofuel production. *Economic Analysis*, (1), 168–174.

Токарчук, Д. М., & Фурман, І. В. (2018). Продовольча безпека та економічні засади виробництва біопалива. *Економічний аналіз*, (1), 168–174.

Ukrainian Agrarian Fund. (2025). *Catalogue of financial instruments for agricultural producers*. https://uaf.gov.ua

Український аграрний фонд. (2025). *Каталог фінансових інструментів для аграріїв*. https://uaf.gov.ua

UNICEF Ukraine. (2025). *Children's health and nutrition in Ukraine*. https://www.unicef.org/ukraine

WFP. (2025). *Ukraine food security and vulnerability analysis. World Food Programme*. https://www.wfp.org

WHO. (2025). Water access in Ukraine: *Global health report*. https://www.who.int

Zaliznіuk, V. P. (2019). Assessment of Ukraine's food security indicators. *Investments: Practice and Experience*, (2), 128–133. http://www.investplan.com.ua/?op=1&z=6492&i=19

Залізнюк, В. П. (2019). Оцінка індикаторів продовольчої безпеки України. *Інвестиції: практика та досвід*, (2), 128–133. http://www.investplan.com.ua/?op=1&z=6492&i=19.

Conflict of interest. The author certify that doesn't have financial or non-financial interest in the subject matter or materials discussed in this manuscript; the authors have no association with state bodies, any organizations or commercial entities having a financial interest in or financial conflict with the subject matter or research presented in the manuscript. Given that the author is affiliated with the institution that publishes this journal, which may cause potential conflict or suspicion of bias and therefore the final decision to publish this article (including the reviewers and editors) is made by the members of the Editorial Board who are not the employees of this institution.

The author received no direct funding for this research

Shynkovych, A. (2025). Criteria for assessing food security assurance. *Scientia fructuosa, 4*(162), 20–37. http://doi.org/10.31617/1.2025(162)02

Received by the editorial office 28.02.2025.
Accepted for printing 15.04.2025.
Published online 16.09.2025.