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PECULIARITIES OF THE RESILIENCE RESEARCH OF THE AGRARIAN SPHERE OF THE KYIV PRYDNIPROVIA REGION, AFFECTED BY RUSSIAN AGGRESSION

Russia's invasion has caused enormous damage to Ukraine's agricultural sector, with reduced crop areas, lower production volumes, damaged production facilities, shortages of labour, equipment and fuel, disruption of logistics routes, etc. The World Bank estimates that in the first year of the war, Ukraine's agricultural sector suffered losses of USD 8.72 billion, with total economic losses amounting to USD 31.5 billion. The territory of Kyivske Prydniprovya (Kyiv, Zhytomyr, Chernihiv, Cherkasy regions) was negatively affected from the first days of the full-scale invasion. Some of the territorial communities were occupied or active hostilities were taking place within their borders.

We consider the agricultural sector an independent formation that includes interrelated components: agriculture, the territory with its natural conditions and resources, as well as the population living on these territories and engaged in agricultural activities. The agricultural sector is not only a production entity, but also a place of human activity. Accordingly, this understanding of the agricultural sector is closely correlated with the concept of sustainable development, which is based on the close interconnection of environmental, economic and social problems of human development and the understanding that their solution is possible only on a comprehensive basis, taking into account the balance of interests of nature and society. Achieving this development involves harmonious growth in three main aspects - economic, social and environmental.

In this context, our scientific task is to assess resilience as the ability to change, adapt and recover from crises and destruction in the territories directly affected by Russian aggression.

The issue of resilience in the agricultural sector is quite diverse and has its own research experience. A summarizing publication on indicators for assessing the resilience of the agricultural sector is written by Joshua F. Cabell and Myles Oelofse [1]. Based on a review of the literature on the resilience of socio-ecological systems, the authors identified 13 indicators for the agricultural sector. When they are identified in a functioning agricultural sector, we can talk about the degree of its resilience. These are the following indicators: socially self-organized; ecologically self-regulated; appropriately connected; functional and response diversity; spatial and temporal heterogeneity; exposed to disturbance; coupled with local natural capital; reflective and shared learning; globally autonomous and locally interdependent; honors legacy; builds human capital; reasonably profitable. Each individual indicator has its own definition, features and a brief description of what to look for in order to identify the indicator.

Joel Tallaksen [2], substantiating the theoretical provisions of agricultural resilience, concludes that there are three groups of factors that determine it: economic, environmental and social. He also notes that if all three of them do not work together, the system is out of balance and eventually fails. By understanding the problems in each of these three groups, it is possible to better determine how to improve the resilience of the agricultural sector. He points to three factors that need to be considered to make the system more resilient: persistence, adaptability and transformation. Persistence is the ability to cope with short-term challenges, which does not necessarily mean significant changes in operations. Adaptability is the ability to make drastic changes to the way the business operates in order to maintain profitability in the long term. Transformation - the ability to rebuild the farm to complement or replace the existing system.

A group of European researchers [3], studying the basis for assessing agricultural resilience, also notes the above challenges and complements them to some extent. They consider economic (falling commodity prices, new competitors, internationalization, etc.), environmental (extreme weather events, heavy metal pollution, etc.), social (available labour force, access to social services for workers, etc.) and institutional (sanctions, changes in environmental regulations, war, etc.) issues that affect the resilience of the agricultural sector. In each of these aspects, they distinguish between temporary shocks (extreme weather events, falling commodity prices, etc.) and long-term stresses (climate change, war, etc.). They propose to define three resilience capacities: robustness, adaptability and transformability. Robustness is the ability of an agricultural system to withstand stresses and (un)expected shocks. Adaptability is the ability to change the composition of inputs, production, marketing and management in response to shocks and stresses, but without changing structures and mechanisms. Transformability is the ability to significantly change the internal structure and mechanisms of the farming system in response to major shocks or prolonged stress.

The practice of assessing the resilience of the agricultural sector of individual countries, territories, and farms is based on the above theoretical provisions and has a number of specific features in each case. For example, to analyse the resilience of the agricultural sector when comparing two peasant communities in Latin America (Brazil and Colombia), a conceptual and methodological framework was proposed in which such aspects as the agricultural structure and activities of the peasant communities are included as determining factors [4]. The authors believe that resilience is the result of complex interactions between ecological, economic, social and cultural systems and cannot be analysed by looking at each component in isolation. The proposed methodology for measuring the resilience of rural communities is based on the quantification and weighting of 17 variables, each with its own percentage weight. All variables are related to a specific criterion (there are 8 of them), and the criteria in turn correspond to one of 4 factors. This methodology for determining resilience is clear in terms of the weight assigned to each variable (indicator/criterion). At the same time, these variables are subjective, as the vast majority of them relate to a given oblast and given communities.

As a result of the introduction of the EU's Common Agricultural Policy, Lithuania also assessed the resilience of the agricultural sector. It was based on the analysis of purely economic indicators of this sector [5] and had a multifactorial approach [6]. The study used data from the Lithuanian Statistical Service and the Farm Accounting Data Network (FADN) for the period 2010-2019. This approach is certainly one of the most extensive in terms of the level (national) and volume of statistical information used. The main functions analysed were: production of food at affordable prices, guarantee of farm viability, and provision of employment opportunities with decent income for agricultural workers. All indicators of the functions were presented in monetary terms (million euros) and calculated using the formula.

Ukrainian research practice in the field of agricultural resilience is rather limited. It is located at the intersection of assessments of the overall impact of military operations on the agricultural sector of Ukraine [7, 8] and theoretical aspects of studying the resilience of various sectors of the economy [9, 10]. One of the most comprehensive works on the resilience of the agricultural sector of Ukraine is the material of the State Institution «Institute for Economics and Forecasting of the National Academy of Sciences of Ukraine», presented at the end of 2023 [11]. These research findings are complemented by interviews with civil society representatives, politicians, and agribusiness representatives conducted in 2022-2023. This work was supported by the Transnational Institute (TNI) and the Swedish Research Council for Sustainable Development FORMAS, and is presented in the form of a report in Ukrainian and English.

The above theoretical provisions and practices of assessing the resilience of the agrarian sphere in the world have become the basis for outlining the main aspects of such work within the scope of territorial communities of the Kyivske Prydniprovia affected by Russian aggression. In our opinion, such an assessment should include interrelated components: 1) changes in the structure of agriculture as a basic system-forming economic activity; 2) natural conditions, resources and the impact of military operations on them; 3) the population living on these territories and changes in their social conditions. This work is planned to include a comparison of the relevant indicators before the large-scale invasion and after the de-occupation. The approach is based on the use of analytical data with a geographical aspect. This analysis will be based on field research (selection of soil samples, interviews, etc.), software that allows to trace the change in the use of agricultural areas and create mapping schemes for processing spatial data, including primarily the use of GIS tools. In particular, satellite imagery from Planet Labs with medium spatial resolution (3 m per pixel) will be used.

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