АНАЛІЗ ДІЯЛЬНОСТІ МОРСЬКОГО ТРАНСПОРТУ УКРАЇНИ В КОНТЕКСТІ ЗАБЕЗПЕЧЕННЯ ГЛОБАЛЬНОЇ БЕЗПЕКИ

Актуальність. Агресія росії проти України, стала головним фактором того, що на міжнародному рівні було зафіксовано продовольчу кризу та збільшення цінової політики на продукти харчування. Прийнятні логістичні шляхи було заблоковано. Внутрішній водний транспорт, залізничний транспорт та автомобільні перевезення вантажів не мали змоги до експорту такої кількості агрокультур, для забезпечення всесвітньої продовольчої безпеки. Всі ці гострі питання в сфері діяльності морського транспорту України, спонукають досліджувати природу повнії даної проблеми.

Мета та завдання. Метою статті є проведення аналізу діяльності морського транспорту України опираючись на національну та глобальну безпеку.

Матеріали та методи. Для проведення дослідження використано результати наукових праць відповідних вчених у галузі розвитку морського транспорту та забезпечення національної, економічної та продовольчої безпеки. При написанні статті, були застосовані методи синтезу, теоретичного узагальнення, емпіричні та аналітичні моделі наукових досліджень.

Результати. В процесі дослідження проаналізовано діяльність портів Великої Одеси в рамках «Зернової угоди» (за рік існування угоди). Значний вплив на збій у систематичній роботі зернового коридору завдав РФ, що призвело до повної блокади діяльності порту «Південний» та нанесення значної шкоди портовій інфраструктурі, зерновим терміналам та елеваторам в Одесі та Одеській області. З портів Великої Одеси було експортовано 32,8 млн. тонн сільськогосподарських продуктів харчування. В загальній кількості з портів Великої Одеси вийшло 1006 суден. Найактивнішими країнами-експортерами є: Китай (8,0 млн. тонн), Іспанія (6,0 млн. тонн), Туреччина (3,2 млн. тонн), Італія (2,1 млн. тонн), Нідерланди (2,0 млн. тонн), Єгипет (1,6 млн. тонн) та Бангладеш (1,1 млн. тонн).

Висновки. Проведений аналіз свідчить про те, що задля подальшого безперебійного функціонування Чорноморської ініціативи, необхідно залучити більше впливових міжнародних організацій до її регулювання; провести вдосконалення інституційно-економічної системи морського транспорту та впровадити механізми, що стимулюватимуть його до конкуренції на міжнародному рівні; провести оптимізацію логістичних ланцюгів постачання вантажів, вдосконалити мультимодальний підхід до функціонування транспортної системи перевезення вантажів.

Ключові слова: продовольча безпека, глобальна безпека, морський транспорт, Чорноморська зернова ініціатива, зернова угода, морські порти, порти Великої Одеси.

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ANALYSIS OF MARITIME TRANSPORT ACTIVITIES OF UKRAINE IN THE CONTEXT OF ENSURING GLOBAL SECURITY

Topicality. Russia’s aggression against Ukraine was the main factor behind the food crisis and the increase in food prices at the international level. Acceptable logistics routes were blocked. Domestic water transport, rail transport and road transportation of goods were not able to export enough crops to ensure global food security. All these pressing issues in the field of maritime transport in Ukraine prompt us to investigate the nature of the problem.

 Aim and tasks. The purpose of the article is to analyze the activities of Ukraine’s maritime transport based on national and global security.


**Materials and methods.** The study was based on the results of scientific works of leading scientists in the field of maritime transport development and ensuring national, economic and food security. In writing the article, the methods of synthesis, theoretical generalization, empirical and analytical models of scientific research were applied.

**Research results.** The study analyzes the activities of the ports of Great Odesa under the Grain Agreement (for the year of the agreement's existence). A significant impact on the disruption of the systematic operation of the grain corridor is caused by the Russian Federation, which led to a complete blockade of the Pivdennyi port and significant damage to port infrastructure, grain terminals and elevators in Odesa and Odesa region. The ports of Great Odesa exported 32.8 million tons of agricultural food products. In total, 1006 vessels left the ports of Great Odesa. The most active exporting countries are: China (8.0 million tons), Spain (6.0 million tons), Turkey (3.2 million tons), Italy (2.1 million tons), the Netherlands (2.0 million tons), Egypt (1.6 million tons) and Bangladesh (1.1 million tons).

**Conclusion.** The analysis shows that for the further smooth functioning of the Black Sea Initiative, it is necessary to involve more influential international organizations in its regulation; to improve the institutional and economic system of maritime transport and introduce mechanisms that will encourage it to compete at the international level; to optimize the logistics supply chains of cargoes, to improve the multimodal approach to the functioning of the transport system of cargo transportation.

**Keywords:** food security, global security, maritime transport, Black Sea Grain Initiative, grain agreement, seaports, ports of Great Odesa.

**Problem statement and its connection with important scientific and practical tasks.** Ensuring global security is the responsibility of every civilized country in the world. Starting from February 24, 2022, this issue became more acute in connection with the blockade of the seaports of Ukraine by the Russian military and naval forces, which led to a new food crisis at the international level. Countries dependent on the Ukrainian agro-industrial complex remained in a hopeless situation. Before the war, more than 90% of agricultural crops were exported through Ukrainian seaports. With the beginning of the blockade, agricultural crops were exported using rail, road and river transport. This type of export could not solve the crisis situation, which began to grow every day.

Therefore, in order to solve this issue, on July 22, 2022, the "Grain Agreement" was officially signed between the aggressor country, Ukraine, Turkey and the UN. Over time, Russia will begin to neglect its obligations and negatively affect the trend of agricultural exports from the ports of Great Odesa, and over time, to completely destroy the infrastructure of sea and river ports of Ukraine, which will negatively affect the export of grain crops to countries that depend on Ukrainian agricultural crops.

**Analysis of recent publications on the problem.** When writing the article, the scientific works of the following scientists were analyzed: Ilchenko S., Laiko O., Grishchenko I., Grishchenko V., Khumarova N. considered the competitiveness of sea transport in the system of economic security on the example of the countries of the Black Sea region; Demyanchuk M. and Maslii N. researched tools for balanced development of maritime transport in Ukraine, which in turn will consolidate competitiveness on the international market and ensure Ukraine's economic security.

Also, when writing the article, the latest publications of scientists in the field of ensuring international food security were used, such as Pavlyk K., Kolodzieczak M., Lamsa Alhassan Sesai, Teresia Gunavan, Rulyusa Pratikto, Pius Sugen Prasetyo and Indrastvari dealt with the issue of ensuring food security at the international level and the impact of negative factors that slow down the process of providing food products to less developed countries and, of course, fundamental works on ensuring food security of domestic scientists: Rumyk I., Gates V., Shlemko V., Basyurkina N.

**Allocation of previously unsolved parts of the general problem.** Therefore, based on the experience we gained during the entire period of Russian aggression against our state, it is necessary to analyze the activity of the maritime transport of Ukraine in order to understand how it can be modernized and improved in order to ensure national and international security in the future.

**Formulation of research objectives (problem statement).** The purpose of the article is to conduct an analysis of the activity of maritime transport of Ukraine based on national and global security, and based on the analysis, it is necessary to formulate proposals for improving the activity of maritime transport in the context of strengthening the provision of economic and food security of Ukraine.

**Materials and Methods.** The results of scientific works of leading scientists in the field of maritime transport development and ensuring national, economic and food security were used to conduct the research. When writing the article, the methods of synthesis, theoretical generalization, as well as empirical and analytical models of scientific research were used to provide an up-to-date coverage of maritime transport activities in
the context of ensuring global security. Methods of graphical summarization of information for visual representation of statistical data.

**An outline of the main results and their justification.** Global security carries the concept of several components: economic, financial, informational, food, ecological, social, energy, military global security. That is, global security has a close relationship with the national security of each of the world's states.

According to the Law of Ukraine "On National Security of Ukraine", national security of Ukraine is the protection of state sovereignty, territorial integrity, democratic constitutional system and other national interests of Ukraine from real and potential threats (The Law of Ukraine "On National Security of Ukraine", 2018), and food security – is the economic ability and obligation of the state to provide the population with high-quality food products, in the necessary quantity and self-sufficiency in food, under any external or internal conditions (Pavlova, 2022).

Maritime transport of Ukraine and its activities are one of the main influential industries that ensure the national security of our state, as well as economic and food security, which are directly components of national security.

The activity of the seaports of Ukraine is the basis of the functioning of international maritime transport and a strategic link of the transport system in general.

To ensure the economic security of Ukraine, it is necessary to increase the competitiveness potential of maritime transport, because the competitive potential is one of the foundations of the development of maritime transport. Success in meeting the needs of individuals and legal entities in high-quality, safe and affordable transport directly depends on its growth (Laiko et al., 2023).

The combined use of tools for the balanced development of maritime transport in Ukraine will lead to positive results (Ilchenko et al., 2021). In the context of ensuring economic security, the use of these tools will lead to an increase in the gross domestic product due to an increase in cargo transportation by sea, an increase in the efficiency of transportation due to the maximum use of the carrying capacity of ships by improving the technical characteristics of shipping logistics routes and increasing the speed of ships.

Violations of Ukraine's national security, with the start of hostilities, led to the disruption of an important maritime logistics route between Ukraine and the international community, which affected international food security.

The negative consequences of food insecurity around the world remain a major challenge for defining the UN's global sustainable development policy agenda, which aims to end global hunger and improve sustainable nutrition for everyone (Pawlak & Kołodziejczak, 2020).

Assessing the critical challenges of food availability, research (Lansana Alhassan Sesay, Theresia Gunawan, Rulyusa Pratikto, Pius Sugeng Prasetyo and Indraswari, 2021) emphasize that structural poverty, economic inequality and persistently rising food prices are the main factors impeding food affordability in developing countries. Also, we should not ignore global problematic issues that already play a rather relevant role in ensuring international food security, namely: climate change, population growth, the global economic crisis that affected the price policy of food products and, of course, the war in Ukraine.

Starting from February 24, 2022, the maritime transport of Ukraine proved to be completely unable to perform its direct functions, namely, cargo transportation by sea. Countries exporting Ukrainian food appeared to be interdependent on blocking the entire sea coast of Ukraine.

The blockade of all seaports led to a decrease in exports from 6-7 million tons per month to 1.5 million tons (Project of the Recovery Plan of Ukraine, 2022).

In order to settle this issue, a decision was made to create a Joint Coordination Center, which is based in the city of Istanbul and includes both civilian and military representatives from Ukraine, Turkey, the UN and Russia. The purpose of this coordination center is to monitor the safe export of agricultural products through the waters of the Black Sea.

Data on the movement of vessels of the Black Sea Grain Initiative were analyzed (UN: Joint Coordination Center of the Black Sea Grain Initiative, 2023), during the year of existence of the "Grain Agreement" to the countries of Africa, Asia and Europe from the ports of Great Odesa.

Figure 1 schematically shows the movement of vessels under the conditions of the "Grain Corridor". According to the scheme, it is possible to trace the extent to which the international community, especially less developed countries, are dependent on the Ukrainian agro-industrial complex.
Figure 1 – The shipping routes under the terms of the "Grain Agreement"
Source: taken by the author from the data of the UN: Joint Coordination Center of the Black Sea Grain Initiative.

Figure 2 shows the total number of ships that left the ports of Great Odesa during the year of existence of the "Grain Agreement".

The data analysis on the movement of ships of the Black Sea Grain Initiative, during the year of existence of the "Grain Agreement" 1,006 ships left the ports of Great Odesa for the countries of Africa, Asia and Europe, namely:
- "Odesa" - 324 vessels;
- "Pivdenny" - 272 vessels;
- "Chornomorsk" - 410 vessels.

Figure 2 – The total number of ships that left the ports of Great Odesa during the period from August 2022 to August 2023
Source: built by the author on the basis of the Black Sea Grain Initiative Vessel Movement database

It is necessary to note the events that affected the departure of ships from the ports of "Odesa", "Chornomorsk" and "Pivdenny", namely:
- from October 29 to November 2, Russia
prematurely stopped participating in the inspection of ships, which led to the formation of a "traffic jam" in the Bosphorus Strait, a decrease in the number of ships undergoing inspection (from 20 ships to 10 per day), and an increase in the freight share;
- since April 29, a complete blockade of the "South" port;
- from May 6 to May 18, Russia refused to register ships for entry and carry out relevant inspections;
- on July 18, 2023, Russia again blocked its participation in the Grain Agreement;
- on July 18 and 19, 2023, the aggressor country carried out a targeted air attack on the grain terminals in the ports. The grain infrastructure of international and Ukrainian traders and carriers Kernel, Viterra, CMA CGM Group was damaged (Ministry of Infrastructure of Ukraine: news, 2023);
- on July 24, 2023, Russia attacked the port infrastructure in the city of Reni, damaging grain tanks in which agricultural products were stored;
- on July 27, 2023, Russia again damaged the port infrastructure in the Odessa region.

Next, the largest exporting countries of Ukrainian agricultural crops were analyzed (Figure 3), among them the most active are observed: China (8.0 million tons), Spain (6.0 million tons), Turkey (3.2 million tons), The Netherlands (2.0 million tons), Italy (2.1 million tons), Egypt (1.6 million tons) and Bangladesh (1.1 million tons).

As of August 2023, within the framework of the "Grain Initiative", 32.8 million tons of grain and other agricultural food products (Figure 4), instead of the planned 51 million, all due to the fact that Russia has repeatedly blocked the work of the Grain Initiative for the period from August 2022 to August 2023.

![Figure 3 - Exporting countries of agricultural products from Ukraine](image)

Source: developed by the author based on data from the United Nations: Joint Coordination Center of the Black Sea Grain Initiative.

The majority of agricultural products from Ukraine are sold through ports, in particular corn (51%) and wheat (27%) of the total tonnage.
Figure 4 – The total amount of exported agricultural products within the framework of the "Grain Initiative". Source: developed by the author based on data from the United Nations: Joint Coordination Center of the Black Sea Grain Initiative.

Figure 5 shows the volume of exported agricultural products by the ports of Great Odesa: "Odesa", "South", "Chornomorsk". The largest agricultural crop unloaded is corn, 6.47 million tons from the port of Chornomorsk, 5.65 million tons from the port of Chornomorsk, and 4.61 million tons from the port of Odesa. The next place in exports is wheat, namely, 3.3 million tons of wheat were unloaded from the port of "Odesa", from the port of "Chornomorsk" - 3.0 million tons, from the port "Pivdenny" - 2.38 million tons. Such active unloading of corn and wheat from the ports of Great Odesa indicates that it was necessary to make room for agricultural crops from the summer harvest.

Figure 5 – Volumes of exported agricultural products in the section of the ports of Great Odesa. Source: built by the author on the basis of the Black Sea Grain Initiative Vessel Movement database.
Agricultural enterprises are at the end of the pricing chain, so when the "grain corridor" is deliberately blocked, there are chances of an increase in freight, which affects the share that agriculturists will receive. Before the war, it made up about 80% of the export price, currently it is about 35%.

Below we will present the dynamics of changes in the main indicator used to calculate transport costs - the Baltic Dry Index (Figure 6) for the period from July 2022 to July 2023.

Figure 6 – Dynamics of changes in the Baltic Dry Index for the period from August 2022 to 2023.
Source: taken by the author from the official Baltic Dry Index website

So, after analyzing the dynamics of changes in the indicator of transport costs (Baltic Dry Index, 2023), we can say that the main index of sea transportation of the Baltic Exchange, which measures the cost of shipping goods around the world, fell by 326 points (25.6%) during the period under study. The largest decrease observed during the considered period was 527 points (February 16, 2023). The panamax index, which is more interesting for us, decreased by 3% to 1052 points, compared to May 2023.

Due to the above-mentioned actions of the Russian federation, the number of ships entering the seaports of Odesa, Pivdenniy, and Chornomorsk to be loaded with agricultural crops has decreased. In order to eliminate this situation, the Ministry of Infrastructure decided to increase the tonnage of vessels in order to avoid long periods of downtime. It is for grain crops that the tonnage should be from 20 to 25 thousand tons, and for oil - from 6 thousand to 10 thousand tons.

Having analyzed the most acute, at the moment, problematic situation of the international level, which is observed in the waters of the Black Sea, it is possible to state the fact that Russian aggression, which harmed the national security of Ukraine, also affected international security, causing a global food crisis.

Conclusions and perspectives of further research. As a result, the "Grain Agreement" contributed to the significant export of grain crops to countries dependent on Ukrainian agricultural crops (for example, Bangladesh, Sudan, Ethiopia and Djibouti). The gap in exports in 2023 compared to 2021 is more than 50%. In addition, a variety of negative factors, such as, for example, restrictions on exports from Ukraine, an increase in transport tariffs, an increase in tariffs for communal services in Ukraine (electricity), as well as climate changes, may become problematic issues regarding the increase in the price of food what the report of the Food and Agricultural Organization of the United Nations says about the global index of food security of Ukraine in the world (Country report: Ukraine. Global food security index, 2022).

The "Grain Agreement" is an example of clear and specific actions to ensure global food security, with the participation of Ukrainian maritime transport, during the blockade of Ukrainian seaports and military operations in the Black Sea.

For the further smooth operation of this agreement, it is necessary:
- involve more influential international organizations in the regulation of the "Grain Agreement" in order to prevent disruption of the signed agreement from the Russian side;
- to improve the institutional and economic...
system of marine transport of Ukraine, by optimizing the logistics chains of cargo supply, strengthening the integrated multimodal approach to the functioning of the transport system of cargo transportation, as well as introducing into practice the tonnage tax system used by the world's leading countries (Ilchenko, 2023);

- having a sufficiently high level of the natural resource component and labor potential, Ukraine is significantly inferior to other countries in such components of the competitive potential of maritime transport as production, institutional and innovation-investment, therefore it is necessary to implement mechanisms that will stimulate Ukrainian maritime transport to compete at the international level.

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