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GRAIN CORRIDOR INITIATIVE AS AN EXAMPLE OF MODERN AGRICULTURAL DIPLOMACY

Summary

As an example of modern agrarian diplomacy, the grain corridor initiative has played a key role in ensuring global food security and stability at the international level. It was the result of multilateral negotiations between Ukraine, Turkey, Russia, and the UN aimed at unblocking Ukrainian grain exports across the Black Sea after the outbreak of a full-scale military conflict. In addition, the initiative demonstrated the effectiveness of agrarian diplomacy as an integral part of the foreign policy of countries with significant agricultural potential, including Ukraine. The initiative helped to strengthen Ukraine's international reputation as a key food exporter and brought international cooperation in the field of agricultural trade to a new level. This shows that, despite serious conflicts, it is possible to reach a compromise to solve global problems, including in the field of food. The mediating role of Turkey and the UN is an example of the involvement of neutral parties in resolving international crises. The grain corridor also revealed the deep dependence of many countries on grain exports from Ukraine and Russia. Agrarian diplomacy has played a key role in mitigating the effects of global conflicts by helping to ensure stable food supplies.

Introduction

Today, in the international space, where globalization and integration processes and foreign policy of states are gaining priority in the context of ensuring food security in the world and national security in particular. Diplomacy serves as a means of developing international relations and maintaining peace and stability: it ensures communication in an intercultural environment, promotes international cooperation and international agreements, helps to defend state interests, and settles international disputes and conflicts. In the light of the Russian-Ukrainian war, diplomacy serves to

expand the network of foreign partners of Ukraine that support it in confronting the aggressor – the Russian Federation, to form a coalition of democratic states to counteract the barbaric civilization, and to cooperate with international organizations to help our country overcome the consequences of the war.

In today's context, agrarian diplomacy is becoming increasingly important in the face of global crises, such as wars, epidemics, or climate change, which have a direct impact on food markets and agricultural relations. Taking these factors into account, countries are actively concluding new agreements and developing diplomatic strategies to ensure food security and stability in international agricultural markets.

Food security issues are becoming increasingly important as global climate change, population growth, economic crises, and military conflicts have a significant impact on the stability of agricultural markets. In particular, the war in Ukraine, which began in 2022, has revealed the vulnerability of the global food system and the need for new mechanisms of international cooperation in the agricultural sector. In this context, the grain corridor initiative, which aims to ensure the export of Ukrainian grain crops, has become a vivid example of agrarian diplomacy and an important tool for resolving the food crisis at the global level.

The grain corridor is critical to the food supply of many countries, especially in the context of the war, which has disrupted traditional export routes from Ukraine, one of the world's largest grain suppliers. Many countries in Africa, the Middle East, and Asia depend on Ukrainian grain imports, and any reduction in these imports leads to the threat of famine and humanitarian crisis. In this context, the grain corridor initiative has helped stabilize global food markets and reduce the risk of famine.

Ukraine is one of the leading exporters of agricultural products, especially wheat, corn and barley. The blockade of Ukrainian ports due to military operations has emphasized the importance of the stability of international agricultural markets and the cooperation of countries to ensure uninterrupted food supplies. Therefore, the grain corridor has become not only an economic but also a strategic tool on the global stage.

The Grain Corridor Initiative has demonstrated the potential of agrarian diplomacy in times of war. Despite the armed conflict, agreements were reached on critical humanitarian issues. This is an example of how diplomacy can work in difficult circumstances when other areas of interaction are blocked. It also shows new trends in foreign policy practice, where economic and agricultural issues are becoming the center of international cooperation.

Russia's withdrawal from the grain agreement in July 2023 demonstrated how sensitive global food markets are to political decisions and military conflicts. This is relevant in light of the escalation of conflicts in different regions of the world and their impact on the global economy. Agricultural diplomacy, as this example shows, is an important tool for mitigating the consequences of such conflicts.

The involvement of the UN and Turkey as mediators in the creation of the grain corridor demonstrates the importance of international organizations and mediation efforts in resolving global crises, which also confirms the relevance of multilateral diplomacy in resolving conflicts and ensuring food security around the world.

Increasing environmental challenges, such as climate change, drought and other natural disasters, make access to sustainable food sources critical. Ensuring uninterrupted exports of agricultural products from Ukraine helps to reduce the risks of a global food crisis and stabilize prices on world markets.

**Chapter 1. The grain corridor initiative:
preconditions and mechanisms for implementation**

Russia’s aggression against Ukraine, which has been ongoing since 2014 and escalated significantly after the full-scale invasion in 2022, has had serious consequences for Ukrainian agriculture, which is one of the key sectors of the national economy and makes a significant contribution to global food security. The occupied territories, such as Crimea, parts of Donetsk, Luhansk, Kherson, and Zaporizhzhia regions, contain significant agricultural land, including fertile black soil, which has become inaccessible to Ukraine [1]. The loss of more than 7 million hectares of agricultural land has deprived the country of a significant amount of grain, oilseeds, vegetables, and fruits. Since the start of the full-scale invasion in 2022, the aggressor has been deliberately destroying the infrastructure that supports agricultural production and exports. Hundreds of elevators, warehouses, logistics hubs, farms, and technical facilities have been destroyed.

Before the war, Ukraine was one of the largest grain exporters on the world market (Figure1) [2]: it accounted for about 10% of world wheat exports; it was one of the largest suppliers of corn, exporting about 15% of world supplies; it occupied 13% of the world barley market, making it one of the main exporters of this crop.

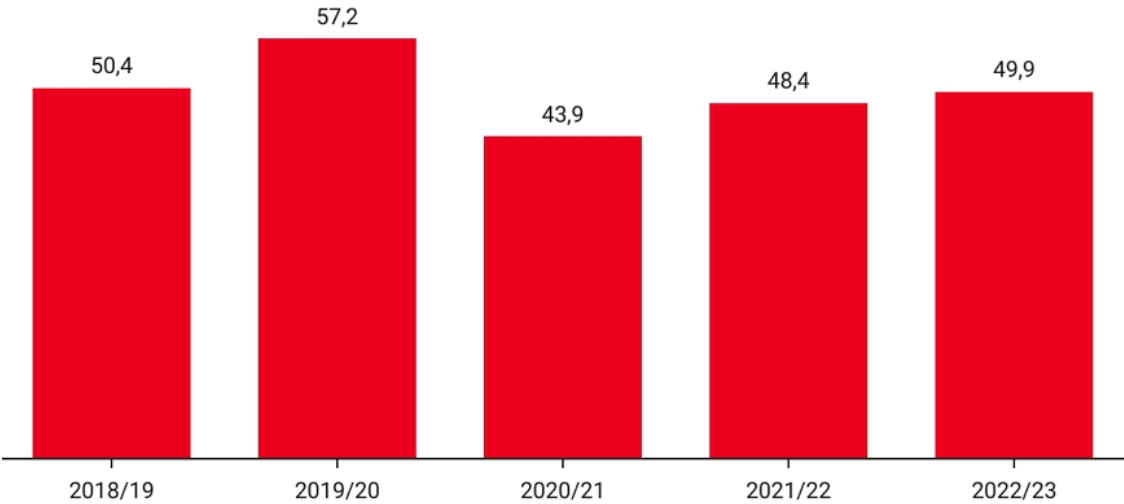


Figure 1. Grain exports from Ukraine in 2018-2023, mln tons

Source: compiled according to data from the Ministry of Agrarian Policy and Food of Ukraine [2]

Before the war, the largest importers of Ukrainian grain were: Egypt – one of the largest importers of Ukrainian wheat (approximately 5-6 million tons per year); Turkey – the main importer of Ukrainian barley and wheat; Lebanon and Syria – large importers of Ukrainian grain, especially wheat; EU – the European Union countries also actively import Ukrainian grain, partly for further export.

Ukraine has lost the ability to export more than 90% of its grain through the Black Sea, which has led to significant economic losses for the agricultural sector [3]. Estimates suggest that due to the blockade of ports, Ukraine lost more than \$5 billion in export revenues in the first few months of the war alone. In March-July 2022, before the Grain Agreement came into effect, the price was at its highest, at USD 368 per ton, which is USD 96 per ton more than at the beginning of the war. With the start of the Grain Agreement, the price of wheat stabilized and was at the level of USD 315-332 per ton.

2021 was a record year for the Ukrainian agricultural sector: Ukraine exported 25.5 million tons of wheat, which is approximately 20% of total world wheat exports; 23.5 million tons of corn were exported; 5 million tons of barley were exported, which was more than 10% of total world exports of this crop.

After the outbreak of war in February 2022, wheat prices on international markets increased by 25-30%, causing serious difficulties for grain importing countries. Corn prices have also increased by 15-20%, causing food shortages in Africa and the Middle East, where corn is a staple food.

Let's look at the key aspects of the impact:

1. Destruction of infrastructure and reduction of cultivated areas:

- Loss of territories: The occupied territories, especially in Donetsk, Luhansk, Zaporizhzhia, and Kherson regions, were important agricultural regions. Around 20% of Ukraine's cultivated land was under Russian control, which significantly reduced the total area under crops.

- Destruction of infrastructure: Elevators, warehouses, irrigation systems, farms, logistics chains, and railroad infrastructure have been destroyed.

- Land mined: Many agricultural lands are mined, making it impossible to use them for planting and harvesting.

2. Economic losses:

- Decline in production: According to the Ministry of Agrarian Policy, as a result of the war, production of grains and oilseeds decreased by more than 30% in 2023 compared to pre-war levels [2].

- Export restrictions: The disruption of seaports due to Russia's blockade of the Black Sea has made it difficult to export grain, which is one of Ukraine's main sources of revenue.

- Rising costs: Prices for fuel, fertilizers, and seeds have risen significantly, increasing production costs.

3. Humanitarian consequences:

- Threat to food security: Ukraine was one of the largest food exporters in the world. The decline in exports has led to an increase in food prices on the world market, especially in countries dependent on Ukrainian grain.

- Employment in agriculture: Due to the fighting and reduced production, many farmers lost their jobs and businesses were forced to downsize.

4. Environmental damage:

- Soil losses: Explosions and fighting damage the fertile soil layer. Chemical contamination from the use of munitions also negatively affects the quality of the land.

- Changing climate conditions: The destruction of forest belts and irrigation systems worsens the resilience of the agricultural sector to droughts and climate change.

5. Grain corridor and the role of international assistance:

- Grain corridor: The UN initiative to export Ukrainian grain through the Black Sea has partially compensated for losses, but Russian aggression constantly threatens its operation.

- International support: Ukraine receives assistance in the form of grants, investments in agricultural sector rehabilitation, equipment supply, and minimization of environmental risks.

6. Long-term consequences:

- Depopulation of rural areas: The war has led to massive migration of people, particularly from rural areas, which complicates the recovery of the sector.

- Changes in the structure of production: Ukrainian farmers are forced to reorient to less costly crops and look for new markets.

One of the biggest blows was the blockade of Ukrainian ports in the Black Sea, through which up to 90% of grain was exported before the war. This led to a significant reduction in Ukraine's export potential and triggered a global food crisis, especially in African and Asian countries that depend on Ukrainian grain. Export difficulties led to a drop in domestic prices, which negatively affected farmers' incomes and ability to finance subsequent sowing campaigns. Additionally, the mining of fields, the destruction of reclamation systems, the undermining of the Kakhovka hydroelectric power plant, and the lack of access to irrigation, especially in the southern regions, have led to land degradation and the inability to cultivate it. Many areas need to be demined, which requires time and significant financial resources.

The war also caused a shortage of labor, as many agricultural workers were forced to leave their homes, either to go to the front or to leave the country. The cost of inputs, such as fuel, fertilizers, seeds, and machinery, increased significantly due to the disruption of supply chains and inflation. This has significantly reduced the profitability of agricultural production. Under martial law, farmers focus mainly on basic production, postponing investments in development, modernization and innovation.

At the same time, a significant problem is the theft of Ukrainian grain in the occupied territories and its illegal export through Russia to third countries. This causes significant damage to Ukraine's international reputation as a reliable supplier and undermines the economic stability of the agricultural sector. However, despite all the challenges, Ukrainian farmers continue to work even in the midst of war, supplying the domestic market with food and exporting within the limits of their capabilities, in particular through the "grain corridor" initiated with the assistance of the UN and Turkey. However, regular shelling and disruption of agreements by Russia complicate its functioning [3]. Thus, the Russian aggression has not only caused significant damage to Ukrainian agriculture, but has also become a threat to global food security.

The grain corridor initiative was prompted by the worsening global food crisis due to wars and conflicts, which are characterized by the destruction of infrastructure, disruption of trade routes, and higher prices for basic food products. One of the most important reasons was the fact that Ukraine is one of the largest exporters of grain on the world market, in particular wheat, corn and sunflower oil, so the blockade of its ports threatens the food security of many countries. In addition, the economic consequences for Ukrainian farmers and the state budget were important factors that motivated the Ukrainian side to actively seek ways to restore export supplies [4].

These data emphasize the importance of the grain corridor as a tool for stabilizing the situation with global food security and the Ukrainian economy, as well as the role of international cooperation in overcoming global challenges.

The initiative was directly caused by Russia's blockade of the Black Sea ports since the beginning of Russia's full-scale invasion of Ukraine on February 24, 2022, which has significantly limited the export of Ukrainian grain, one of the main food products on the world market. As a result, many countries, particularly in the Middle East, Africa, and other regions that depended on Ukrainian supplies, have faced catastrophic food price increases and serious humanitarian crises. These circumstances forced the international community to actively intervene to ensure the safe transportation of grain and reduce the risks of food instability in the world.

This initiative was the result of diplomatic efforts by several international actors, including Turkey, the United Nations, and the European Union. Turkey, with its strategic position and good relations with both Ukraine and Russia, took on the role of mediator in this process. Through its mediation, an agreement was concluded between Ukraine and Russia, which allowed the opening of the so-called "grain corridor" [5].

On July 22, 2022, an important agreement was signed in Istanbul to ensure the safe passage of ships carrying Ukrainian grain through the Black Sea [6]. This corridor provided security guarantees for merchant ships and defined certain routes for their passage to avoid mine threats and attacks on civilian vessels. To coordinate the process, a special platform was created with the participation of the UN, Turkey, Russia and Ukraine, which took on the functions of monitoring and organizing transportation.

A key part of this initiative was the safety of navigation. The ports that have become the main exit points for Ukrainian grain exports – Odesa, Chornomorsk, and Pivdennyi – were chosen as safe points for the transportation of goods across the Black Sea. However, despite the agreement, security remained an important issue, as Russian military actions continued to threaten transportation routes [4]. In order to reduce the risks, decisions were made to conduct sea route demining operations, although not without difficulties.

This mechanism not only ensured the transportation of goods, but also excluded the possibility of unfair actions by one of the parties to the agreement, and allowed for equality for all participants in fulfilling their obligations. The UN and Turkey took the lead in mediation. In particular, UN Secretary-General Antonio Guterres and Turkish President Recep Tayyip Erdogan were actively involved in the negotiation process, organizing a series of diplomatic meetings and consultations with both sides.

The UN also provided technical and legal support for the agreement, while Turkey provided a platform for the negotiations in Istanbul. Their involvement facilitated compromises, as Turkey had stable relations with both Ukraine and Russia.

Because Ukraine and Russia refused to sign a joint document, the agreement was concluded in the format of two separate memoranda. Ukraine and Russia each signed their own document with representatives of the UN and Turkey. This format avoided formal recognition of the parties to the conflict, preserving neutrality for both states. The signing of separate documents was also important from a legal point of view, as it allowed for a clear definition of the obligations of each party without the need for direct interstate contact.

The UN assumed the functions of a humanitarian coordinator and actively worked to address the humanitarian consequences of the blockade. It also helped to monitor the implementation of the agreement and assisted in resolving possible disputes between the parties. Turkey, in addition to its role as a mediator, also participated in the protection of sea routes and offered its infrastructure to ensure the safety of navigation. At the same time, the European Union and the United States actively supported the initiative by expressing political support and offering financial assistance to countries affected by the food crisis.

UN Secretary-General Antonio Guterres played a central role in negotiating and promoting the idea of the Black Sea Grain Initiative at the international level. He actively called for the resumption of Ukrainian grain supplies, calling it critical to preventing a global food crisis.

Turkish President Recep Tayyip Erdogan acted as a key mediator in the negotiations, ensuring Turkey's role as a neutral party capable of reaching an agreement with both Ukraine and Russia [6]. The President of Ukraine, Volodymyr Zelenskyy, actively supported the initiative, emphasizing its importance for the country's economy and global food security.

Diplomatic efforts by all these countries led to the conclusion of an agreement that not only allowed the resumption of Ukrainian grain exports, but also helped stabilize food markets. Ukraine was able to restore its supplies, which was important for its economy and for supporting local farmers. For Turkey, this initiative was an opportunity to strengthen its position in the international arena as an important mediator and player in agricultural diplomacy. Russia, although participating in these negotiations, tried to use the situation to achieve its own goals, in particular to obtain sanctions relief and ensure the export of its agricultural products.

Exports through the grain corridor (2022-2023).

After the signing of the Grain Corridor Agreement in July 2022, Ukrainian grain exports through the Black Sea resumed, which had a major impact on global food security.

On August 6, 2022, the first ship with grain left the Ukrainian port of Odesa under the agreement, which was an important step in the implementation of the grain corridor.

After the opening of the grain corridor in August 2022, Ukraine was able to resume exports at the level of 3-4 million tons per month [7]. This is about 50% of the pre-war export level. It was the first Ukrainian grain to go to Europe, Asia, and Africa.

68% of total wheat exports were purchased by Asian and African countries, and 58% of corn exports were purchased by European countries.

From August 1, 2022, to January 2023, 1136 vessels with food grain were shipped from Ukrainian ports via the grain corridor. The countries of Africa, Asia and Europe received 33 million tons of food, while they were supposed to receive 51 million tons.

Ukrainian corn, rapeseed, wheat, and sunflower are exported to Central European countries such as Poland, Romania, Hungary, Bulgaria, and Slovakia. In the period from February 2022 to May 2023, these countries purchased products worth 4302 million euros. The European Union has significantly increased its share of exports due to restrictions on sea routes, while supplies to Africa and Asia have declined due to logistical problems and port blockades.

The economic consequences of this initiative for the participants were significant. Ukraine was able to return to world markets with grain exports, which helped to secure foreign exchange and partially mitigate economic losses from the war. In addition, the resumption of exports helped to reduce food prices, which is important for global markets. Turkey has been able to strengthen its economic ties with countries along the grain transit route and increase its role as a strategic partner in agricultural issues [8].

Although Russia was involved in the implementation of the agreement, its motivation was not only driven by a desire to resume grain supplies, but also by a desire to gain certain economic benefits from the easing of sanctions imposed on the country in response to its aggression in Ukraine. In fact, the discussion of lifting or easing sanctions has become part of the negotiation process, which continues to be an important factor for Russia.

In terms of humanitarian aid and assistance to countries suffering from the food crisis, the initiative was also important. The resumption of grain supplies helped to avoid humanitarian disasters in countries such as Yemen, Somalia, Lebanon, and a number of developing countries.

The signing of the agreement was welcomed internationally, as it resolved one of the largest humanitarian crises and restored stability to global food markets. The European Union and the United States, although not directly involved in the negotiations, expressed support for the agreement and contributed to its implementation by providing political and economic assistance to countries affected by food insecurity.

However, despite the successful signing of the agreement, the issue of security remained relevant. Due to the military threat and tensions in the region, Russia and Ukraine continued to have different interests in how the terms of the agreement should be implemented, and there were even cases when Russia expressed its intention to suspend its implementation [9].

The effectiveness of the Armed Forces of Ukraine in ensuring the functioning of the “grain corridor” and the security of the Black Sea was an important factor in the implementation of this initiative, despite the difficult conditions and constant threats from Russia.

The main aspects of the Armed Forces’ actions to ensure the functioning of the “grain corridor”:

1. Mine clearance of sea routes: The Armed Forces of Ukraine, together with international organizations and partners, made efforts to mine part of the sea routes used by ships carrying Ukrainian grain. This was a necessary measure to ensure the safe passage of ships, as mining was one of the biggest risks to navigation in the Black Sea.

2. Monitoring and coordination: In the face of instability and threats from Russian forces, the Ukrainian military organized constant monitoring and coordination, which allowed it to control the situation at sea and respond promptly to any violations. The Ukrainian Armed Forces also actively cooperated with the International Coordination Center in Istanbul, which was responsible for monitoring shipping under the agreement.

3. Protection of port infrastructure: The Ukrainian Armed Forces defended port infrastructure to protect it from possible attacks. The protection of the ports of Odesa, Chornomorsk, and Pivdenne was important to ensure the smooth functioning of the “grain corridor” and preserve the infrastructure that supported export flows.

4. Repelling attacks and securing airspace: Ukrainian air defense forces were tasked with protecting the airspace over ports and transportation routes. This was important as the threat of Russian missile attacks remained constant, and each strike could disrupt the process of grain shipment and transportation.

5. Maritime defense and the use of new technologies: Ukraine used unmanned boats and other modern means of defense against Russian ships. Drones were used to repel attacks and create additional security for ships in the grain corridor. These actions helped to deter Russian military forces and reduce the risk of attacks on grain ships.

6. Information operations and support of the international image: The Armed Forces of Ukraine and Ukraine in general actively covered the situation around the corridor in the global media, drawing attention to any violations of the agreement by Russia. This maintained pressure on the Russian side from the international community, which also contributed to the implementation of the corridor by supporting Ukraine.

The actions of the Armed Forces of Ukraine were extremely important for the implementation of the “grain corridor” in both the military and diplomatic spheres. The Ukrainian Armed Forces managed to ensure the relative safety of sea routes in the face of active confrontation, which allowed countries that needed Ukrainian grain to gain access to vital products.

Despite the signed agreement and the export of products, Russia still blocked its implementation and impeded the movement of ships with grain.

The Grain Corridor initiative is an important example of modern agricultural diplomacy that has helped to solve some of the global food security problems caused by the war in Ukraine. Its successful implementation was the result of comprehensive diplomatic work between states and international organizations. The efforts of actors such as the UN, Turkey, the EU, the US and Russia, as well as clear coordination and agreements, helped to ensure stability in food markets and assist countries on the verge of a humanitarian crisis.

Chapter 2. The impact of the grain corridor's on global food security and international relations

The Grain Corridor negotiations, which dealt the supply of Ukrainian grain across the Black Sea after Russia's full-scale invasion of Ukraine, became an important part of the international diplomatic effort to resolve the food crisis caused by the war. The Grain Corridor was created through a series of diplomatic negotiations and agreements involving several key actors: Ukraine, Russia, Turkey, and the United Nations.

The first steps in creating this corridor took place in the context of a difficult situation on global food markets. Russia blocked Ukrainian ports, which disrupted grain supplies to many countries, especially to developing countries where grain from Ukraine is an important component of food security. In August 2022, negotiations began to create safe conditions for grain transportation. One of the main factors was that without external mediation, it would not have been possible to guarantee the safety of ships leaving Ukrainian ports.

Turkey, as a NATO member and a country with a favorable geographical location, took on the role of mediator in these negotiations, which became known as the Istanbul talks. Turkey offered its services in ensuring the safety of navigation, which led to the establishment of special corridors for the transportation of grain across the Black Sea. The idea was to create safe channels through which grain cargo could be transported without the threat of attack from Russia.

One of the important stages of the negotiations was the signing of the "Black Sea Grain Initiative" on July 22, 2022 in Istanbul. The agreement provided for several key points, including the establishment of a Joint Coordination Center in Turkey to control the movement of ships, check cargo for military supplies, and ensure the safety of navigation. In particular, Ukraine and Russia agreed to certain restrictions on military activity in this area, and the UN acted as a guarantor of the agreement. Turkey, for its part, ensured the safety of ships and provided the relevant infrastructure for the implementation of the agreement [6].

In the first months after the agreement was signed, grain cargoes began to arrive on global markets. This significantly reduced the price pressure on food products in the world. However, the agreement was not entirely stable, and new issues have been arising since its signing. For example, Russia has repeatedly accused Ukraine of violating the terms of the agreement, and has also demanded that the agreement be expanded to cover other types of goods, such as fertilisers, which are also of strategic importance to global agriculture.

In mid-2023, Russia made several statements about its desire to renegotiate the agreement. In particular, it demanded that restrictions on its ships and cargoes be lifted, and that it receive guarantees that some Ukrainian grain would be sent to countries facing a food crisis due to the fighting. Accordingly, the negotiations intensified again, and Turkey continued to work as a mediator, advocating for the agreement to remain in its original form.

Over time, the situation in the Black Sea became increasingly tense due to the constant escalation of hostilities. Russia attacked Ukraine's port cities and maritime infrastructure, which caused new problems in the implementation of the grain

corridor. At the same time, the UN continued to call for the extension of the agreement, emphasising its importance for ensuring food security not only in Ukraine but also in Africa and Asia [10].

Throughout 2024, both sides – Ukraine and Russia – showed their readiness to continue the dialogue, but also constantly put forward new conditions. The Ukrainian side stressed the need to preserve the independence and security of its ports, while Russia sought to expand the terms of the agreement, in particular with regard to access to Russian ports and expanded fertiliser supplies. In addition, problems with the delivery of grain through the Black Sea ports remained relevant due to threats from Russian troops.

During this period, Turkey continued to play an important role in preserving the stability of the grain corridor, offering platforms for negotiations but also calling for a peaceful resolution of the conflict to ensure long-term stability in the region.

The launch of the grain corridor began in August 2022, after all technical and organisational preparations were completed. The first ship to leave the Ukrainian port was the *Razoni*, a bulk carrier that sailed from Odesa to Lebanon with more than 26,000 tonnes of corn. This step was an important event in the process of stabilising food supplies.

The termination of the grain corridor agreement concluded in July 2022 between Ukraine, Russia, Turkey and the UN was one of the most difficult situations in the global food chain. Since then, Ukraine has been forced to look for alternative opportunities to export its grain crops by sea, as the blockade of Black Sea ports since Russia's full-scale invasion of Ukraine has severely limited access to important international trade routes.

The grain corridor initiative, despite its success in restoring Ukrainian grain exports and ensuring food security, had a number of serious shortcomings and problems. Several key aspects that significantly affected the effectiveness of its implementation can be described in more detail: instability due to military threats; attacks on port infrastructure; and missile attacks.

Despite the signing of the agreement and the creation of safe sea routes for grain transportation, military threats remained a serious challenge. Russia periodically violated the terms of the agreement, in particular by shelling port infrastructure, which led to a temporary suspension or delay of grain shipments [11].

At times, Russia has attacked ports and other critical facilities, undermining confidence in the security of the corridor. This increased the risks for ships transporting grain and forced international organisations, including Turkey, to take these threats into account when organising the process. As a result, ships were sometimes stopped and exports decreased.

Frequent missile attacks on Ukrainian port cities and oil and gas infrastructure also repeatedly undermined the stability of the agreement, even when the grain corridor remained open for shipping.

Political dependence on Russia

A significant problem was political dependence on Russia, which was able to use the agreement as a lever for diplomatic pressure. Russia repeatedly stated that it could

suspend its participation in the agreement, which became an element of the negotiation process.

Russia used the grain deal to set conditions for lifting some of the sanctions imposed on its economy for military aggression. This caused concern among Ukraine's Western partners, as the lifting of sanctions could have given Russia more economic benefits despite its aggressive actions.

The uncertainty about Russia's behaviour created a constant threat that the agreement could be derailed. Therefore, the participating countries had to keep up diplomatic pressure to ensure that the agreement was implemented.

And although the grain corridor allowed for the resumption of some supplies of Ukrainian grain to international markets, the problem of volumes remained.

Low throughput: Ukraine's Black Sea ports were damaged after the outbreak of the war, which significantly limited the ability to transport large volumes of grain. The port infrastructure could not fully restore the pre-war level of exports, and only a portion of grain reached international markets. In addition, the mining of ports and shipping lanes caused difficulties with the safety and speed of transportation.

Time delays: The process of clearing routes of mines and escorting ships through special corridors also caused significant delays. This meant that countries dependent on Ukrainian grain imports had to deal with interrupted supplies and higher food prices.

Security and infrastructure costs

The implementation of the agreement required large expenditures, in particular to ensure the security of sea routes, as well as for mine clearance and port security.

Since the security of the corridor depended on constant control of ship traffic and ongoing monitoring by international actors, it required significant financial expenditures on security equipment, infrastructure, and maintenance.

The costs of maintaining the grain corridor were borne by Ukraine, as well as by international partners, including Turkey and the EU. In addition, the de-mining of sea routes and ports required significant time and money, resulting in delays and additional costs.

Difficulty of monitoring and control

Following the signing of the agreement, a coordination centre was established to ensure that the terms of the agreement were implemented. However, monitoring and controlling shipping and corridor security was difficult and required constant effort. There were difficulties in ensuring full transparency in the movement of goods. This created opportunities for violations of the agreement and called into question the effectiveness of the monitoring system, especially when it came to the selection of vessels and cargo for export.

– Violation of the terms of the agreement: Although the main purpose of the agreement was to ensure security and stability for grain shipments, Russia sometimes violated the agreement by speculating on unclear terms of performance and technical issues regarding the admission of vessels to ports.

Dependence on international intermediaries

The grain corridor initiative was extremely dependent on Turkey's mediation role, as well as on the support of international organisations such as the UN. This created a certain dependence on diplomatic and political decisions made by other countries.

Turkey, although an important partner for Ukraine in the process, had its own strategic interests. Its role as a mediator meant that Ukraine could not always control all aspects of the agreement without taking into account Turkey's interests, which was an additional limitation.

As the agreement was international, the UN and other organisations influenced many aspects of its implementation. This meant that, although Ukraine had a certain benefit from the agreement, it was still limited in its ability to determine its own terms and change it to suit its own national interests.

Fluctuations in grain prices

Although the agreement significantly reduced grain prices, fluctuations in the food market remained. The Initiative could not fully stabilise the situation on global grain markets, and some countries, especially in Africa and the Middle East, still faced high food prices.

Due to political instability and potential threats to the agreement, price fluctuations persisted even when the corridor was operational. Sometimes, disruptions in grain supplies or delays in delivery due to attacks on ports or ships led to sharp price increases on international markets [12].

Despite the obvious benefits of the grain corridor initiative, such as restoring Ukrainian grain supplies and mitigating the food crisis, its implementation was not without its challenges. Military threats, political dependence on Russia, technical constraints and other factors have called into question its full effectiveness. This shows how challenging global food initiatives are in a time of geopolitical instability.

Overall, the Grain Corridor initiative has become an important part of agricultural diplomacy, helping to reduce the economic and humanitarian consequences of the war for many countries and prolonging the functioning of global food chains. It has demonstrated the importance of international cooperation, dialogue and compromise in the face of global challenges such as wars and food crises.

Technological development is one of the most important areas of agricultural diplomacy. The latest technologies in agriculture, such as biotechnology, process automation, genetic improvement of crops, the use of drones for land monitoring, and agrotechnical innovations in soil cultivation, can significantly increase the efficiency and sustainability of agricultural production.

Agricultural diplomacy in the future should stimulate investment in the latest technologies and their dissemination on global markets. Countries with a high level of technological development in the agricultural sector can enter into agreements with other countries to transfer knowledge and innovations, which will help to increase the efficiency of agriculture worldwide.

With the globalisation of world agricultural markets, the development of multilateral agreements and platforms for cooperation will become an important area of agricultural diplomacy. International organisations and governments will need to work more closely together to create stable trading conditions, regulate agricultural

supplies, and ensure access to food in countries with limited capacity to produce enough food.

One of the key aspects in this process will be the creation of international standards and agreements that reduce trade barriers, facilitate the opening of new markets for agricultural products, and introduce mechanisms for monitoring product quality and environmental standards.

In today's environment, agricultural diplomacy plays an important role in resolving geopolitical and economic disputes. Food resources are becoming not only an economic but also a political tool. Conflicts over access to resources (e.g. land, water, grain) can become the basis for diplomatic negotiations and agreements. Agrarian diplomacy will play a key role in ensuring a balance between the economic interests of the participating countries and the stability of food supplies [13].

In particular, in the context of current sanctions, blockades and other economic levers, countries can use agrarian diplomacy to maintain food security in the world by concluding agreements that allow them to overcome trade barriers or replace scarce products with other goods.

The prospects for agrarian diplomacy also include a greater focus on supporting countries with limited resources or experiencing humanitarian crises. In this context, it is important to promote the development of programmes that not only provide food supplies to countries, but also help develop local agricultural sectors, in particular through technical assistance, training of farmers, and infrastructure.

In addition, global initiatives aimed at combating hunger and ensuring sustainable rural development, particularly in African and Asian countries, should be more actively supported.

Russian aggression and the full-scale war have caused a significant increase in the cost of key agricultural inputs in Ukraine. In particular, fertiliser prices have risen significantly due to disruptions in supply and rising global natural gas prices, which is a key component of fertiliser production. Compared to 2021, the cost of fertilisers tripled in 2023. A similar situation was observed with fuel, the price of which more than doubled in Ukraine due to shortages, the destruction of oil depots and import restrictions. Seeds also rose by 50-80% due to difficulties in their production and delivery caused by the war [14].

This increase in input costs has made sowing campaigns much more difficult. Many farmers have been forced to reduce planting volumes or switch to less costly crops, which has affected the overall productivity of the agricultural sector. This puts additional pressure on farmers who are already facing logistical challenges, infrastructure destruction and the threat of hostilities in rural areas.

Russian aggression has left vast areas of Ukrainian land mined, especially in regions where active hostilities have been ongoing. As of 2023, it is estimated that around 5 million hectares of agricultural land need to be cleared of mines. The regions most affected are those in the east (Kharkiv, Donetsk, Luhansk) and south (Kherson, Zaporizhzhia, Mykolaiv). The mined fields make them unusable for cultivation and pose a serious threat to farmers' lives.

The demining process is expensive and time-consuming. Ukrainian and international experts predict that it may take 5-10 years to clear the land of mines and

ammunition. In many cases, farmers cannot wait for this work to be completed, so they look for alternative land for cultivation or reduce production. As a result, this further reduces Ukraine's agricultural potential and complicates the economic recovery of the sector after the war.

The Grain Corridor Agreement was renewed in August 2022, but Russia began to voice its dissatisfaction with its terms. Russia's constant accusations of violations by Ukraine, as well as fatigue from uncertainty and tensions in the Black Sea, led to Russia's withdrawal from the agreement in August 2023.

The main reasons for the termination of the agreement were:

1. Military actions in the Black Sea. Russia began actively attacking infrastructure in Ukraine, which had a direct impact on the stability of the corridor. Numerous cases of shelling of port cities, as well as attacks on merchant and humanitarian vessels, raised questions about the security of exports.

2. Accusations of violations of the agreement. Russia has repeatedly claimed that Ukraine is violating the terms of the agreement, in particular with regard to the transportation of non-grain goods and the supply of military materials through Black Sea ports.

3. Pressure for sanctions. One of the main factors for Russia was dissatisfaction with restrictions on its agricultural products and fertilisers. Russia demanded a review of sanctions and relaxation of requirements for its cargo, which was one of the conditions for the continuation of the agreement.

4. Political disagreements. The deterioration of political relations between Russia and Western countries has led to an escalation of the situation in the Black Sea, which has called into question the long-term stability of the agreement.

Alternative ways to export grain after the termination of the agreement [15-17].

After Russia withdrew from the agreement, Ukraine was faced with the need to find alternative ways to export its agricultural goods. Given the restrictions caused by the blockade of the Black Sea ports, Ukraine was forced to focus on other transport routes and infrastructure solutions.

1. Rail exports via the western borders. The most obvious direction was to export grain through Ukraine's western border, in particular to Poland, Romania, and other European countries. However, this route has a number of limitations, including congestion on railway routes and infrastructure difficulties at border stations, which slows down cargo handling.

2. Road transport. For some time, Ukraine has also used road transport to deliver grain to European ports, in particular to Romania, where grain was shipped to international markets through the port of Constanta. However, the high costs of road transport and rising fuel prices limited the efficiency of this route.

3. River transport across the Danube. The Danube became an important alternative route for Ukrainian grain after the termination of the grain agreement. Shipment through Danube ports such as Reni and Isaccea allowed for deliveries to international markets, although this route also faced limitations due to navigational conditions and water levels.

4. Agricultural Silk Road (Eastern European rail routes). To diversify its trade routes, Ukraine turned its attention to more complex routes through Eastern Europe,

including rail links to China and other Asian countries. However, this route was more expensive and less efficient due to difficulties at border crossings.

5. Initiatives to restore maritime exports. One of the alternatives to the grain corridor was attempts to restore exports through alternative sea routes, in particular through ports located in the government-controlled areas, such as Odesa region, which were not directly blocked. However, this required the expansion of secure corridors and the use of new technologies to protect ships from Russian attacks.

6. International diplomatic efforts for a new agreement.

In parallel with the search for alternative routes, Ukraine continued to work internationally to try to restore the grain corridor or find new ways to ensure stable supplies through the Black Sea ports. Ideas that were put forward included security guarantees through international military observation missions or the creation of new control mechanisms to ensure the safety of sea lanes.

The suspension of the grain corridor agreement was a serious challenge for Ukraine, but did not stop its efforts to ensure stable grain exports. Alternative export routes, although less efficient, allow Ukraine to maintain supplies to international markets, but without the support of the traditional Black Sea route in the long term, the country will remain dependent on international assistance and constant diplomatic pressure to ensure stability in the grain trade.

Prospects for the restoration of the maritime grain corridor are among the most discussed topics in the context of global food security and geopolitical stability in the Black Sea. Following the termination of the grain corridor agreement by Russia in August 2023, Ukraine, together with its international partners, has been making significant efforts to find ways to restore and stabilise this important grain supply channel.

Restoring the maritime corridor is not only an economic but also a geopolitical issue that requires a comprehensive approach, including diplomatic efforts, international support and security guarantees. The biggest challenge is to ensure the safety of navigation in the Black Sea, where Russia's military operations and military attacks threaten the safety of grain ships.

Let us consider the main ways for the prospect of restoring the grain corridor [15-18].

Diplomatic efforts and international pressure

Restoring the corridor requires active diplomacy at the international level. Ukraine continues to appeal to its partners, including Turkey, the UN, and the European Union, to restore secure access to its ports. For this purpose, negotiations involving all key parties to the conflict will be important. One possible option would be to conclude a new agreement or additional protocols to the previous one, which would ensure the restoration of safe passage for ships under international control. Such a step would require Russia's readiness to return to the negotiating table and find a compromise on security and sanctions requirements.

Turkey, as one of the main mediating countries, has a key role to play in this process. It can act as a guarantor of security in maritime waters and even invite international military missions to monitor the situation.

Support from international organisations such as the UN can include providing security guarantees for commercial vessels and organising monitoring mechanisms to ensure neutral monitoring of the agreement.

Technical and technological solutions

One of the options for restoring the corridor is to use new technologies to ensure the safety of navigation in the Black Sea. The introduction of automated monitoring systems, air and sea patrols, and the use of the latest communications and navigation equipment could reduce the risks of attacks on merchant ships. This could allow Ukraine and its partners to export grain in a more secure environment, even if Russia continues its aggression in the region.

One possible scenario involves the creation of so-called ‘green corridors’ that provide a direct and secure route for grain transport vessels. This will require not only technical solutions, but also direct cooperation with international structures to protect these routes.

International security guarantees

The security of the sea routes is a key factor for the restoration of the corridor. Following Russia’s withdrawal from the agreement in August 2023, Ukraine began active negotiations with international partners to create conditions for the safe passage of ships under the joint control of international organisations. One of the main requirements may be the involvement of military forces or peacekeepers to guarantee the protection of vessels from possible attacks by Russia.

European countries, such as Poland and Romania, can also be important partners in the restoration of the corridor. They have experience in addressing maritime security issues and can provide technical and financial assistance to develop infrastructure and ensure the stable operation of alternative routes.

Extending the terms of the agreement

If the grain corridor is restored, new conditions may arise that take into account both security issues and the needs of global markets. The possibility of expanding the agreement to include other agricultural commodities or extending the terms could also be an important element to ensure export stability.

This could mean creating new mechanisms that align the interests of all parties and ensure long-term supply security. Ukraine can also insist on clearer and more binding conditions that ensure maximum security for its ports and vessels.

Political factors and the role of international partners

The political situation plays an important role in the restoration of the grain corridor. Given that Russia may continue to block or impose new conditions for the resumption of the agreement, the role of major international players, including the United States, the European Union, and the United Nations, will be important. They can increase pressure on Russia through economic sanctions or other diplomatic mechanisms to preserve the importance of the grain corridor as an element of global food security.

Diplomatic efforts to ensure stable grain supplies to the most vulnerable regions, such as Africa and Southeast Asia, which are heavily dependent on Ukrainian supplies, are particularly important. Involvement of the international community in

ensuring the stability of the corridor could be an effective tool in addressing the food crisis.

Conclusions

The Grain Corridor Initiative is an outstanding example of modern agricultural diplomacy, reflecting the importance of the agricultural sector in international relations and global food security. In the context of Russia's military aggression against Ukraine, this agreement demonstrates how diplomatic mechanisms can contribute to crisis resolution and ensure stability at the global level.

The initiative also demonstrates how international institutions such as the UN can serve as a platform for dialogue and negotiation between states, particularly in cases where their relations are extremely tense. This highlights the role of international organisations in maintaining food security and economic stability.

It should be noted that one of the reasons for considering this topic is the beginning of Russia's full-scale invasion of Ukraine on 24 February 2022. Russian troops blockaded key Ukrainian ports on the Black Sea, such as Odesa, Chornomorsk and Pivdennyi. This has disrupted logistics routes for grain exports, one of Ukraine's main export products. Prior to the invasion, Ukraine was among the leading exporters of wheat, corn, barley and other grain crops, and the blockade has significantly hampered supplies to world markets, affecting global food prices and threatening food security in many countries, especially in Africa and the Middle East.

Analysing the mechanisms used by both participating and guarantor countries and intermediary countries, the focus is on the cooperation of several key international players – Ukraine, Russia, the UN and Turkey.

This shows that, despite serious conflicts, it is possible to reach a compromise to solve global problems, including food. The mediating role of Turkey and the UN is an example of the involvement of neutral parties in resolving international crises. The grain corridor also revealed the deep dependence of many countries on grain exports from Ukraine and Russia. Agrarian diplomacy has played a key role in mitigating the effects of global conflicts by helping to ensure stable food supplies.

In the case of the Grain Corridor initiative, agrarian diplomacy manifested itself in several important ways:

1. Ensuring food security: Ukraine is one of the largest grain exporting countries in the world, and the blockade of its ports threatened the food security of many countries, especially those in Africa and the Middle East. The Grain Corridor Initiative was an important step in mitigating the food crisis caused by the disruption of agricultural supplies.

2. Global cooperation: The initiative was the result of cooperation between several key international players – Ukraine, Russia, the UN and Turkey. This demonstrates that despite serious conflicts, it is possible to reach a compromise to solve global problems, including food. The mediating role of Turkey and the UN is an example of the involvement of neutral parties in resolving international crises.

3. Geopolitical context: The grain corridor has also revealed the deep dependence of many countries on grain exports from Ukraine and Russia. Agrarian diplomacy has

played a key role in mitigating the effects of global conflicts by helping to ensure stable food supplies.

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