

# The Impact of Disruptions in Food and Energy Supply Chains during International Armed Conflicts and the Means of Public International Law to Maintain Their Stability

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## Abstract

*The research discussed the effects of disruptions in food and energy supply chains during international armed conflicts, their relevance to the concept of international peace and security, and the impact of these disruptions on the international economy and trade, as well as on relations between states, and on social peace and security. The research also examined the means of Public International Law to maintain the stability of these supply chains to prevent or mitigate these effects. The research adopted descriptive and inductive approaches to understand the link between supply chains and international peace and security, and to demonstrate their impact on the various axes discussed in the first chapter of the research. The descriptive and analytical approaches are used in the second chapter to describe the means of public international law and assess their effectiveness. The research concludes that there are effects on the international economy and trade, such as scarcity, lack of access, and unavailability. It also concluded that these disruptions negatively affect international relations through using food and energy sources as strategic weapons and negatively impact social peace and security by increasing crime rates, displacement, and illegal migration, among other effects. The research also concluded that there are relatively effective means of public international law to maintain the stability of these supply chains, with some playing a preventive role and others a remedial role.*

**Keywords:** *Supply chains, food and energy, armed conflicts.*

## Introduction

Food and energy supply chains play a vital role in human life, as they meet basic life needs such as food, electricity, transportation, and more. They also represent an important factor for economic development and growth, as agricultural industries and energy industries are key players in providing jobs, increasing production, and enhancing the competitiveness of companies and states. Food security is also a critical issue in the modern era, as the ability to meet food needs sustainably is a key factor in reducing hunger and famine and ensuring sustainable population growth. Therefore, food and energy supply chains are essential for sustainability, economic growth, and social development.

Since armed conflicts affect various aspects of life, they also impact these supply chains, hindering their ability to perform their crucial roles. This research aims to uncover the effects of disruptions in these supply chains during international armed conflicts and to highlight the means of public international law to maintain their stability.

## Research Significance

Armed conflicts leave several negative effects on various aspects, and the importance of this research lies in shedding light on one of the problems caused by these conflicts, namely the potential disruption of food and energy supply chains. This disruption may lead to several side effects in various areas, necessitating the existence of means under public international law to avoid or mitigate these effects.

## Research Problem

This research attempts to answer the following question: What is the impact of international armed conflicts on the continuity of food and energy supply chains, and what are the means of public international law to avoid or mitigate these effects?

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This main question branches into several sub-questions:

- How do food and energy supply chains affect international trade and the economy?
- How do they affect social peace and security within the territories of states?
- What are their effects on international relations?
- What are the means of public international law to avoid or mitigate these effects, and how effective are they?

## **Research Methodology**

The research attempts to answer the main research question and its sub-questions using descriptive and inductive approaches to understand the link between supply chains and international peace and security, and to demonstrate their impact on the various axes discussed in the first chapter of the research. The descriptive and analytical approaches are used in the second chapter to describe the means of public international law and assess their effectiveness.

## **Research Structure**

The research discusses its topics according to the following structure:

### **The Link Between Food and Energy Supply Chains and International Peace and Security**

- The Concept of International Peace and Security.
- The Impact of Food and Energy Supply Chains on International Trade and the Economy.
- The Impact of Food and Energy Supply Chains on Social Peace and Security.
- The Impact of Food and Energy Supply Chains on Relations Between States.

### **The Means of International Law to Maintain International Peace and Security (Maintaining Food and Energy Supply Chains)**

- Preventive Measures.
- Remedial Measures.
- The Effectiveness of Public International Law in Maintaining the Stability of Food and Energy Supply Chains.

### **The Link Between Food and Energy Supply Chains and International Peace and Security**

#### **The Concept of International Peace and Security**

The concept of international peace and security refers to a state of tranquility in the international community resulting from the absence of any physical or moral threat. The stability of international peace and security, in its broad sense, means the continuation of international relations based on public international law and the United Nations Charter, which affirm the belief of states and governments in the fundamental rights of peoples and respect for the obligations contained in the texts of treaties and other sources of international law, implemented in good faith to achieve solidarity and cooperation within the international community.

According to (Shalao and Aqrabi, 2020, p.63), security is a concept resulting from a complex network of interactions between individuals and groups in different areas of social life. Its essence, whether for individuals, societies, or states, is the ability to predict and achieve aspirations without incurring the risk of material harm or sacrificing fundamental values.

Therefore, security includes the ability to predict current and future dangers, as well as the ability to achieve goals without unexpected risks. Thus, the inability to predict risks represents the essence of a threat. We describe security as threatened when it becomes impossible to predict risks, which is the first step in avoiding their effects, and when achieving aspirations without risks becomes impossible.

Based on this, (Shalao and Aqrabi, 2020, p.65) define a security threat as: “An activity or series of events that significantly threaten, within a short period, the deterioration of the livelihood of the population of a state or significantly threaten to narrow the political options available to it.”

Although public international law and the United Nations Charter do not clearly and precisely define “international peace and security,” the task of determining whether a situation threatens international peace and security has been entrusted to the United Nations Security Council. Observing the practice of the Security Council in exercising this discretionary power reveals an expansion of the concept of international peace and security to include situations that were not traditionally within this scope. Traditionally, the concept of security was limited to dealing with military threats, but it later expanded to include human rights, terrorism, weapons of mass destruction, democracy, and others through mechanisms such as peacebuilding, peacekeeping, and peace support (Qanoufi, 2015, p. 70). This expansion further extended to what is now known as “soft security” to deal with non-military threats such as illegal immigration, population explosion, poverty, disease, the environment, food, energy, and others. This shift has also led to a change in the concept of threat based on the function against environmental security, food security, energy security, and others (Mohammed Ali and Al-Harthi, 2018, p. 440). This was expressed by the President of the Security Council in his meeting at the level of heads of state and government on January 31, 1992, in his statement: “Peace and security do not only emerge from the absence of wars and armed conflicts. There are other threats to peace and security of a non-military nature that stem from economic, humanitarian, social, and environmental instability...” (Saleh and Soufiane, 2018, p. 186).

Energy, like food, plays a major role in the life of societies, as it is inconceivable for these societies to exist and survive without them. Their relationship with the existence, survival, and effectiveness of these societies is directly proportional, which has led to the expansion of the concept of security to include them. A society cannot be described as secure unless it has access to food and energy.

The United Nations Development Program defines energy security as: “The availability of energy supplies in various forms, in sufficient quantities, and at reasonable prices.” This means the availability of local and imported resources to meet the increasing demand for energy at reasonable prices. The term “energy security” is used to describe the stability and continuity of energy supplies from exporting regions to consuming regions (Mohammed, 2014, p. 520). Similarly, (Kadhem and Azzi, 2021, p. 96) argue that the term “food security” can be used to describe the stability and continuity of food supplies from exporting regions to consuming regions, where food security is defined as: “The ability of a state or group of states to provide food commodities and resources either wholly or partially.” This naturally includes the availability of sufficient quantities of safe food, with the possibility and ease of access to food sources at reasonable prices, and the necessity of stabilizing these supplies, especially under abnormal conditions such as pandemics and armed conflicts.

Therefore, the concept of food security includes—among several indicators—the indicator of food stability, which means the ability to obtain food continuously without the risk of losing this ability due to a specific crisis. Thus, the concept of food security includes the concept of access (Duffy, 2021, p. 69).

Threats to energy and food security can result in negative outcomes in the commercial and economic spheres, as well as in social peace within the territory of a state, and in the context of international relations. Given the interconnectedness of interests, these outcomes will have extensions and effects on the survival

of the international community in a state of security and tranquility, free from any threat. Additionally, this will inevitably affect the building of international relations based on international law, treaties, and other sources, thereby threatening international peace and security.

### The Impact of Food and Energy Supply Chains on International Trade and the Economy

States secure their needs for food and energy either through domestic production (self-sufficiency) or through imports via known supply chains (land, air, sea, and pipeline transport). Since states are not equal in their ability to produce due to resource scarcity, natural factors, or other reasons, supply through commercial contracts represents the most suitable option for such states. The volume of trade in energy and food occupies a high rank compared to the volume of trade in goods. World Bank experts estimate that energy imports represent 11% of global goods imports in 2021, as shown in the table below.

**Table (1): Shows the volume of energy imports in the world compared to the volume of goods imports in the world 1990-2021**

Series Name	Series Code	Country Name	Country Code	1990 [YR1990]	2000 [YR2000]	2012 [YR2012]	2013 [YR2013]	2014 [YR2014]	2015 [YR2015]	2016 [YR2016]	2017 [YR2017]	2018 [YR2018]	2019 [YR2019]	2020 [YR2020]	2021 [YR2021]
Fuel imports (% of goods imports)	TM.V AL.F UEL. ZS.UN	World	WLD	12.0499	10.5383	17.91665	17.12335	15.92975	11.31887	9.684968	11.24744	12.95038	12.34546	9.143996	11.25049

Source: World Development Indicators, Last Updated: 07/20/2022

Similarly, they estimate that food imports represent 8% of global goods imports in 2021, as shown in the table below.

**Table (2): Shows the volume of food imports in the world compared to the volume of goods imports in the world 1990-2021**

Series Name	Series Code	Country Name	Country Code	1990 [YR1990]	2000 [YR2000]	2012 [YR2012]	2013 [YR2013]	2014 [YR2014]	2015 [YR2015]	2016 [YR2016]	2017 [YR2017]	2018 [YR2018]	2019 [YR2019]	2020 [YR2020]	2021 [YR2021]
Food imports (% of merchandise imports)	TM.V AL.F OOD .ZS.UN	العالم	WLD	8.64577	6.97023	7.496121	7.74814	7.933358	8.354139	8.641815	8.489953	8.065858	8.163185	9.045801	8.338629

Source: World Development Indicators, Last Updated: 07/20/2022

A quick glance at the table below shows the volume of trade in fuel and food in US dollars during the years 2015-2021, where the increase in fuel and food trade annually is evident, reaching \$22,283,819 million in 2021 and \$17,645,180 million in 2020, including \$1,803,125 million in agricultural products, \$1,526,959 million in food, \$3,087,959 million in fuel products, and \$2,364,889 million in fuel.

**Table (3): Shows the volume of energy exports in the world in US dollars 1990-2021**

Indicator	Merchandise exports by product group – annual (Million US dollar)								
	Product/Sector	Partner Economy	2015	2016	2017	2018	2019	2020	2021
World	SI3_AGG - TO - Total merchandise	World	1655 6508	1603 9355	1774 2592	1954 6006	1900 4555	1764 5180	2228 3819
World	SI3_AGG - AG - Agricultural products	World	1564 085	1584 129	1725 209	1804 030	1779 888	1803 125	
World	SI3_AGG - AGFO - Food	World	1331 133	1355 836	1468 845	1530 116	1526 959	1568 080	
World	SI3_AGG - MI - Fuels and mining products	World	2380 516	2037 338	2615 144	3270 231	3087 959	2325 713	
World	SI3_AGG - MIFU - Fuels	World	1808 607	1495 824	1949 140	2530 201	2364 889	1572 747	

Source: World Bank Database

Maritime trade has a preferential advantage over other types of trade due to several factors, including the ability to transport large quantities that match the volume of trade, in addition to the insurance advantages of this type of transport and other factors. However, maritime transport passes through several choke points (straits), which have both positive and negative aspects.

Their positive aspect is that they are points that provide statistics on the volume of trade passing through them, as shown in the table below. The negative aspect is that they are choke points where supply chains can be disrupted when certain changes occur, such as armed conflicts, for example.

**Table (4): Shows the choke points for global oil and gas trade 2011-2016 – Million barrels/day**

Location	2011	2012	2013	2014	2015	2016
<b>Strait of Hormuz</b>	17	16.8	16.6	16.9	17	18.5
<b>Strait of Malacca</b>	14.5	15.1	15.4	15.5	15.5	16
<b>Suez Canal</b>	3.8	4.5	4.6	5.2	5.4	5.5
<b>Bab El-Mandeb Strait</b>	3.3	3.6	3.8	4.3	4.6	4.8
<b>Danish Straits</b>	3	3.3	3.1	3	3.2	3.2
<b>Turkish Straits</b>	2.9	2.7	2.6	2.6	2.4	2.4
<b>Panama Canal</b>	0.8	0.8	0.8	0.9	1	0.6
<b>Cape of Good Hope</b>	4.7	5.4	5.1	4.9	5.1	5.8
<b>Global Maritime Oil Trade Volume</b>	55.5	56.4	56.5	56.4	58.9	NA
<b>Global Oil and Other Liquids Supply Volume</b>	88.8	90.8	91.3	93.8	96.7	97.2

Source: World Oil Transit Checkpoints, US Energy Information Administration

The importance of energy has increased due to the growing dependence of industrial economies on energy consumption (Shalao and Aqrawi, 2020, p.67). Therefore, the interruption or tension of supplies will inevitably affect these economies, as “availability” and “ease of access”—meaning the ability to bear costs—are important elements for meeting the needs of economic development. (Mohammed, 2014, p. 540) predicts that global oil demand will increase to 105.1 million barrels per day by 2030.

(Ghazlani, 2019, p. 109) argues that the economic threat lies in the state’s inability to access resources and markets, or the sudden decline of the economy. This effect is clearly evident in the reciprocal relationship between Russia and Europe in the field of energy, which is manifested in several features, most notably the

conclusion of long-term contracts between the European Union and Gazprom, which controls the production, transportation, and distribution of gas to Europe, amounting to approximately 200 billion cubic meters of gas. Thus, Gazprom markets 70% of its production (Rashad, 2022, p. 145- 446). In 2009, the European Union consumed 484 billion cubic meters of natural gas, 64% of which was imported from Russian markets, then from Norway and Algeria after the interruption of Russian gas supplies to Europe due to the crisis between Russia and Ukraine. This is the case for the European Union as a whole, but if we look at specific countries, we find that there are countries such as Bulgaria and Slovakia that rely entirely on Russian gas supplies (Al-Nuaimi, 2018, p. 24).

There are many examples of the impact of disruptions or interruptions in energy supplies. For example, the disruption of supplies in the period preceding Iraq's invasion of Kuwait led to a 108% increase in oil prices, while the interruption of oil supplies due to Iraq's invasion of Kuwait in 1990 resulted in the loss of approximately 3.7 million barrels per day of Iraqi and Kuwaiti oil exports, representing 5.8% of global oil production. Armed conflicts also affect the security of international trade, and thus the ease of availability and access. For example, during the Tanker War in 1987, the value of premiums required for ships arriving in Kuwait was 0.375% of the value of the cargo, while during the First Gulf War in 1990, the value of war insurance increased by 1% of the insured value of the ship. Similarly, when the Gulf of Aden was declared a high-risk area due to Somali piracy in 2008, some international insurance companies added additional costs resulting from the risk premium for sailors, security measures, and changing routes or fast sailing in dangerous areas (Shalao and Aqrawi, 2020, p. 69).

Similarly, (Sahli, 2018, p. 36) argues that the instability of food supply chains leads to higher food prices, due to increased demand and reduced supply, considering population growth and changes in consumption patterns. The current war between Russia and Ukraine is one example of this impact, as this armed conflict is expected to lead to higher food prices due to the disruption of supply chains, first due to the war and second due to economic sanctions imposed on Russia.

The rise in energy and food prices affects access to goods, and thus affects food and energy security, which has negative effects on the economies of states, as most of these economies depend on energy to operate their production projects, which are a fundamental pillar of these economies. Among the effects of this is the need for these states to devalue their national currencies, which contributes to a decline in per capita income, and thus an increase in poverty rates and unemployment. It goes without saying that the same effects can result from rising food prices, as food is the primary driver of the human element, which in turn drives the wheel of production and development.

### **The Impact of Food and Energy Supply Chains on Social Peace and Security**

According to (Ghazlani, 2019, p. 109), a social threat is anything that affects the values, principles, customs, and traditions of society, and is related to society's ability to withstand real or potential threats.

One definition of energy security is: "The ability to secure sufficient quantities of energy—especially oil—at prices that help meet the needs of a growing consumer society with increasing wealth through rising per capita income." (Al-Nuaimi, 2018, p. 13) argues that the basic idea of energy security for consumers lies in reliable supplies with sufficient quantities at reasonable prices. As for food security for consumers, it is the ability to obtain an adequate and stable amount of food for each person (Abu Dawh, 2022, p. 24). Consumers need energy to reach a certain level of social welfare and achieve various economic goals required by life in modern societies.

There is a relationship between per capita income and the ability to purchase food. Rising food prices reduce these opportunities and negatively affect society. The relationship between security in the sense of food availability at reasonable prices and social peace is directly proportional, as rising food prices resulting from the instability of supply chains affect income levels and poverty rates, as spending on food increases at the expense of spending on other consumer needs. It also reduces the consumer's ability to save, and it is known that savings are the savior for the individual and the family, especially in emergency situations, which may lead to actions that pose a threat to social peace. Rising food prices also affect human



development in particular, as quality-of-life declines, and opportunities for individuals to achieve their potential decrease. The absence or scarcity of food is one of the factors that destabilize internal stability, as it affects several factors and variables such as poverty, unemployment, income inequality, population pressure, the decline in the level of services, geographical characteristics, natural resources, and others. Therefore, the increase in food prices can increase the chances of internal political unrest (Sahli, 2018, p. 38- 42).

When an individual is unable to secure his food needs, he becomes unable to comply with the rules of control. Therefore, food insecurity represents one of the most important causes of the spread of crime and social insecurity (Touati, 2019, p. 34).

Similarly, the threat to social security, which includes food and energy security as we have seen, contributes to several economic repercussions, such as rising prices and rising unemployment rates, which can be direct causes of other phenomena such as illegal immigration, which is considered a threat to the security of the societies to which migrants move. This constitutes a danger that can be classified as a threat to international peace and security, as the phenomenon of illegal immigration does not only leave effects on the local level, but its effects extend to the entire region and perhaps to the international level. It is often associated with organized crime, human trafficking, arms smuggling, drug trafficking, passport forgery, terrorism, and others.

### **The Impact of Food and Energy Supply Chains on Relations Between States**

Energy security challenges can positively contribute to the development of relations between states. For example, the European Union has adopted a strategy to address these challenges, the most important of which is the creation of an integrated internal market for natural gas, in which competition is regulated and normalized, resulting in the opening of markets and equal access to gas networks through pipelines across member states (Al-Nuaimi, 2018, p. 19).

(Rashad, 2022, p. 134) argues that energy plays a major role in shaping the foreign affairs of a state in international politics and is an important source of political influence as a bargaining tool in international diplomacy. Energy sources, especially oil and natural gas, are the focus of the global energy equation, and therefore they are the subject of international and regional conflicts. This results in energy sources being considered a factor of power and influence, and they can also be a reason for exposure to pressure. Therefore, (Al-Saadi and Nabhan, 2022, p. 221) argue that they can be a reason for growth as well as a reason for collapse. Therefore, energy and access to its sources are one of the reasons for the formation of alliances in the 20<sup>th</sup> and 21<sup>st</sup> centuries (Shalao and Aqrawi, 2020, p. 61).

The disruption or stoppage of energy supply chains is one of the reasons that fuel international competition over oil and gas, as the means of exerting influence and control over their sources vary. Among the most important means are expanding investments between the consuming state and the producing state, meaning providing financial assistance, in addition to another means represented by political and economic pressure (Abdullah and Marai, 2014, p. 134). Another means is direct control and seizure through using military force, and thus the disruption or interruption of supply chains in one region becomes a reason for the outbreak of war in another region.

In order to succeed in its strategy of using energy as a weapon, Russia has intensified its cooperation with the United States and Europe through joint projects that ensure its intensive presence in the West, in addition to concluding many agreements with alternative energy sources for Europe in Central Asian countries to control oil and gas transportation networks, in addition to competing over energy transportation routes in the Middle East through Syria and to some extent Iran to keep the United States away from controlling energy supplies, in addition to contributing through OPEC+ in oil production and thus global prices (Suzy, 2022, p. 137).

European energy security is closely linked to the objectives of Russian foreign policy and Russian companies such as Gazprom and Rosneft, due to Europe's increasing dependence on Russia for oil and gas. This

increase has contributed to the decline in production in domestic sources in the Netherlands, Norway, and the British North Sea. Most Russian gas passes to Europe through Ukraine, Belarus, or Turkey, and due to the volatility of Russian- Ukrainian relations, pipelines (Nord Stream) under the Baltic Sea and (South Stream) under the Black Sea have been constructed (Abdullah and Marai, 2014, p. 144).

The European Union faces the challenge of dependence on Russian gas, which could be affected in the event of any armed conflict. This is what the European Union expected when Russia invaded Crimea in Ukraine in 2014, and this is exactly what happened when Russia invaded Ukraine in 2022.

Europe is the main market for Russian oil and gas, as Russia supplies Europe with 27% of its oil needs and more than 50% of its natural gas needs. Energy is a tool of Russian foreign policy through what is known as energy diplomacy, where energy is used as a strategic weapon to increase influence, and targeted investments in the energy sector to control strategically important infrastructure (Suzy, 2022, p. 136).

According to (Mohammed Ali and Al-Harthi, 2018, p. 444) and (Sharif, 2017, p. 76), the United States is the largest consumer of energy, consuming 25% of the world's total energy consumption, using 19 million barrels of the world's oil per day. It has focused on securing its oil supplies from the Gulf of Mexico, then the Arabian Gulf, and after the Cold War, it extended its interest to the region adjacent to the Russian borders, including the Black Sea and the Caspian Sea.

Similarly, the United States has supported and strengthened NATO and its ally Japan to monitor the growing power of China and prevent it from controlling the South China Sea. In general, the United States sees access to energy in reasonable quantities and at appropriate prices as part of its national security, so it has resorted to diversifying its foreign policy tools. During the administration of Barack Obama, it shifted to using soft power instead of hard power, which it used during the administration of George W. Bush, through the use of energy as a weapon to avoid military confrontation with Russia during the escalation of the Crimea crisis in 2014, by encouraging investments in the oil sector and building plans to transport it to Europe without passing through Russian and Iranian territories (Mohammed Ali and Al-Harthi, 2018, p. 445).

As for China, its economy is the fastest growing in the last quarter of the 20<sup>th</sup> century, which has transformed it from an oil-exporting country to the second largest consumer of the world's oil after the United States, with approximately 10 million barrels per day (Abdullah and Marai, 2014, p. 132), and the third largest importer. Based on this, energy has occupied a large space in its security concept, which began to be based on cooperation instead of the isolation it previously pursued. However, this change in concept is viewed with concern by the United States, especially regarding the expansion of its relations in Africa and Asia (Mohammed Ali and Al-Harthi, 2018, p. 447- 448).

China adopts a strategy of purchasing its energy needs from the global oil market to diversify its supply sources, in addition to purchasing shares and stakes in oil and natural gas projects abroad. This has required it to strengthen its diplomatic relations with energy-rich countries and provide economic and commercial privileges. Therefore, it can be said that China adopts a strategy of alliances and investments, in addition to purchasing foreign assets in the energy industry. In this context, China has expanded its relations with African countries that contain energy reserves, such as Angola, South Africa, Sudan, Congo, Nigeria, Algeria, Morocco, Chad, Gabon, and others, in addition to expanding its interest in some Central Asian countries and the Caspian Sea, such as the loan provided to Kazakhstan in exchange for future supplies and shares in oil-producing companies, and the construction of a natural gas pipeline that passes through Turkmenistan, Uzbekistan, and Kazakhstan to reach western China and even Hong Kong, with a length of 8,704 kilometers (Abdullah and Marai, 2014, p. 141- 143).

The lack of food security affects the sovereignty of states and keeps states exposed to this threat hostage to the will in the context of their foreign relations. Food security is the core of the economic security of the state (Mahmoud, 2006, p. 53), so it is considered one of the mechanisms that states rely on to reduce the severity of food dependence and its negative effects on economic activity. (Duffy, 2018, p. 64)



Food has been used as a means of pressure on states and people rejecting a particular policy. In 1812, the United States used its food surpluses as a strategic weapon when Congress approved sending food supplies to Venezuela under the pretext of helping it after an earthquake it had experienced, but it later became clear that it was a message directed to Spain, which was occupying Venezuela at that time. The use of food as a weapon is evident in the famous statement of former President (Henry Ford): “The American arsenal includes a political weapon of special effectiveness... It is food.” Similarly, grain deals were used in bargaining with the Soviet Union to link the immigration of Soviet Jews to Israel with the conclusion of trade agreements, resulting in an increase in the number of Soviet immigrants due to food pressure from 400 immigrants in 1968 to 35,000 immigrants in 1973 (Sahli, 2018, p. 40- 41).

## **The Means of International Law to Maintain International Peace and Security (Maintaining Food and Energy Supply Chains)**

### **Preventive Measures**

Preventive measures refer to all actions and measures necessary to maintain international peace and security before it is threatened. This includes the rules of public international law and international treaties that protect international peace and security from threats. In this regard, we will review some of these efforts related to maintaining the stability of food and energy supply chains.

### **Criminalizing Aggression**

Aggression includes several forms, such as declaring war on another state, the invasion of the armed forces of a state—even without a declaration of war—into the territory of another state or a territory under the actual jurisdiction of another state, armed attacks on the territory or people of a particular state or on its land, sea, or air forces, the blockade of the coasts or ports or any territory of a particular state by the naval or air forces of another state, the organization by a state on its own territory or on any other territory of armed bands with the aim of raiding the territory of another state, or encouraging the organization of such armed bands or allowing them to organize on its own territory, or using them as a base for their operations or as a starting point for raids on the territory of another state, as well as the direct participation of the state in such raids, or providing assistance to the participants in them, the landing or entry of the land, sea, or air forces of a state within the borders of another state without the explicit permission of its government, or the violation of the conditions of that permission, especially with regard to the duration of stay or the limits of its area and the activities permitted, the intervention of a state in the internal affairs of another state—with the use of armed forces or the threat of using them—with the aim of changing its government and overthrowing the existing legitimate government, or imposing demands in favor of the aggressor, or encouraging sabotage activities such as acts of terrorism, looting, and other forms (Attout, 2019, p. 20).

In the case of our study, armed conflicts are the main cause of threats to food and energy supply chains, and since they—armed conflicts in non-essential cases and legitimate self-defense and retaliatory actions—are one of the clearest forms of aggression, they have been criminalized by the rules of public international law, as the suppression of aggression and the resolution of conflicts by peaceful means is one of the purposes and principles of the United Nations, according to Articles 1/1 and 2/3 of the United Nations Charter issued on June 26, 1945.

### **Regulating the State of War in International Law**

Although war is criminalized under the rules of public international law, as we have mentioned, the reality confirms its existence despite this criminalization. International law has not overlooked this reality, and has regulated the state of war in case it exists. The rules of international humanitarian law have been concerned with this regulation.

The part of the rules of international humanitarian law that concerns our study is the rules related to the criminalization of attacks on civilians and civilian objects during armed conflicts, as civilians are the ones affected by the threat to supply chains, and civilian objects include facilities that fall within the scope of

these supply chains. Civilian objects are defined as all dwellings and facilities that house civilian populations and contain their food resources or water sources (Yahyaoui and Bouzazoua, 2016, p. 46).

In this regard, the rules of international humanitarian law, represented in Article 25 of the Hague Convention concerning the Laws and Customs of War on Land of 1907, prohibit the attack or bombardment of towns, villages, dwellings, and undefended buildings. Article 52 of the Additional Protocol of 1977 prohibits civilian objects from being the object of attack or reprisal attacks, and Article 57 of the same Protocol obliges the parties of the conflict to take constant care in the conduct of military operations to avoid harm to the civilian population and civilian objects.

Similarly, Article 54 in paragraphs 1 and 2 of the Additional Protocol of 1979 prohibits the starvation of civilians as a method of warfare, as well as the attack, destruction, removal, or rendering useless of objects and materials indispensable to the survival of the civilian population, such as foodstuffs, agricultural areas that produce them, crops, livestock, drinking water installations and supplies, and irrigation works, if the purpose is to deny them to the civilian population or to the adversary for their sustenance value, whatever the motive, whether it is to starve civilians, to cause them to move, or for any other motive.

### **Regulating Navigation in International Law (The Principle of Freedom of Navigation)**

Maritime navigation is one of the most important factors for the continuation and progress of global trade, and thus one of the most important factors in maintaining food and energy supply chains. Article 90 of the United Nations Convention on the Law of the Sea of 1982 affirms the principle of freedom of maritime navigation. The high seas, according to public international law, are an open area that can be exploited by all, including navigation. Articles 3 and 17 of the same Convention regulate the provisions related to the territorial sea, as although it falls within the limits of the territorial sovereignty of the state, the ships of all states -whether coastal or landlocked- enjoy the right of innocent passage. Similarly, Articles 37 and 38 of the same Convention regulate the provisions for the contiguous zone and straits used for international navigation, to which the principle of transit passage applies. Articles 124-138 of the United Nations Convention on the Law of the Sea of 1958 grant landlocked states the right of access to the sea and freedom of transit, including the passage of persons, baggage, goods, and means of transport.

### **International Treaties**

International law protects food and energy supply chains through its application at the international, regional, and local levels. There are numerous international treaties aimed at safeguarding food and energy supply chains, including:

- The Convention on Biological Diversity, which focuses on protecting biological diversity and encourages the sustainable use of biological resources, including food and renewable energy.
- The Convention on Agricultural Diversity, which supports research, development, technical exchange, and joint cooperation in agriculture and agricultural diversity, including renewable energy production technologies.
- The United Nations Convention to Combat Desertification, which promotes the preservation of arable and grazing lands, prevents desertification, and improves the management of natural resources.
- The Climate Change Convention, which aims to reduce harmful emissions affecting the environment and natural resources, and encourages the development of clean technology, the use of renewable energy, and increased energy efficiency.

In addition, governments and various international organizations collaborate to ensure sustainable food and energy supply chains by implementing necessary laws, regulations, and guidelines to ensure the safety and efficiency of these chains. For example, international public health laws, consumer protection

agreements, and international transport agreements, such as the United Nations Convention on the Law of the Sea, regulate international maritime transport and define the rights and obligations of sailors and coastal states regarding ships passing through their territorial waters. The United Nations Convention on Road Transport aims to regulate the movement of vehicles on international public roads and defines the legal and financial liabilities of states and road transport companies to ensure the safety and security of road traffic. These agreements aim to improve the security and safety of international transport of goods and passengers, preserve the natural environment and human health, and ensure compliance with quality and efficiency standards in this sector.

## **Remedial Measures**

### **Peaceful Measures**

The peaceful settlement of all forms of conflict in international relations is the preferred method under international law, given the nature of the international community, which is fundamentally composed of sovereign states. This differs from domestic society, where the rule of law is based on coercion. Therefore, according to Article 2/3 of the United Nations Charter, issued in San Francisco on June 26, 1945, the United Nations adopts the peaceful settlement of disputes that may arise among members of the international community as one of the principles under which the organization operates. In this subsection, we will review some of these methods used in international law.

### **Non-Judicial Means**

#### **Negotiations**

Negotiations involve the exchange of views between two disputing states to resolve the conflict. They take the form of discussions and consultations between two or more states, where each party presents its proposals to solve the problem (Moussa and Omar, 2017, p. 72).

Negotiations play a significant role due to the interconnected nature of international relations. They are usually resorted to when the balance of power is such that neither party can achieve its goals through force or for other reasons. Negotiations aim to create solutions, warn of potential disasters, involve a third party to continue pressure on one of the disputing parties, or narrow the scope of existing disagreements. Negotiations are typically used to resolve conflicts when they reach a mature stage, meaning they are suitable when the damage, costs, or effects of continuing the conflict are too great to bear or tolerate, or when a change in circumstances leads the parties to seek resolution through negotiation. The will of the parties plays a fundamental role in this process (Abu Al-Wafa, 2003, p. 35- 36).

Among the goals set by the World Energy Council, which form the basis of global energy policies, are:

- Energy Access for All: This involves striving to provide the minimum level of commercial energy services and stable energy use or transfer at affordable prices. This goal also addresses the issue of oil price instability and sharp increases, aiming to improve the continuity of supply in oil markets, regulate them, and ensure transparency. It also seeks to find solutions to the economic effects of energy price fluctuations and the link between oil market instability and food markets.

- Supply Continuity: Any shortage or deficit in energy can cause a deficit in economic growth (Ghazlani, 2019, p. 112).

### **Mediation and Conciliation**

Mediation and conciliation involve the intervention of a third party between disputing parties to resolve the conflict through negotiation. Thus, they represent an effort made by a party trusted by the disputing parties,

offering a solution hoped to gain their satisfaction and acceptance. The decision of the conciliation body is not binding on the parties, which distinguishes it from arbitration decisions.

The mediator is the third party, often a person with no direct connection to the dispute or the core issues at hand. This factor is essential in managing and resolving conflicts, as the involvement of a third party often provides new perspectives on the issues dividing the parties, in addition to effective means of building the necessary relationships to end problems. Mediation is divided into several types:

-Direct Mediation: This is mediation conducted by a third party who directly contacts the disputing parties. This type of mediation is the most common and beneficial.

-Indirect Mediation: This is mediation conducted by more than one party, where each disputing party chooses a person to communicate with the person chosen by the other party. The mediators then propose solutions to resolve the dispute within a specified period, and the disputing parties cease direct communication regarding the dispute. The dispute is referred to the mediators, who must make every effort to resolve it, and the parties are not bound by any agreed solution.

-Compulsory Mediation: Following developments in the international system since 1990, a new type of mediation emerged where a state imposes its mediation on the disputing parties. The mediator may impose solutions in favor of one party against another or in their own favor.

### **Judicial Means (Arbitration and International Courts)**

International arbitration as a means of settling international disputes refers to submitting the dispute, which the parties have agreed to submit, to a third party, which may be an individual, a body, or a court, to examine the dispute and issue a ruling based on the law. Arbitration has several types, including:

-Individual Arbitration: This involves the disputing parties resorting to an arbitrator for the entire dispute, where the arbitrator is respected and esteemed, and the decision issued is binding and respected.

-Mixed Committees Arbitration: This involves forming a committee of three or five arbitrators, with one or two members for each party to the dispute, and an additional member to chair the committee.

-Arbitration by an Arbitration Court: This involves arbitration through a court where the task of adjudication is entrusted to independent, impartial individuals known for their knowledge, integrity, and legal expertise, enabling them to adjudicate the dispute and issue reasoned decisions based on the law (Salim, 2016, p. 67- 70).

Due to the considerations related to the persons of international law, who are sovereign states, the characteristics of domestic courts cannot be applied to international courts. Therefore, it is known that international courts are voluntary (optional) and differ from international arbitration in that the rules and procedures to be applied are chosen by the parties in the case of arbitration.

### **Economic and Diplomatic Sanctions**

When an armed conflict reaches a level of severity that the Security Council deems a threat to international peace and security, the Council, under Article 41 of the United Nations Charter, may resort to imposing several measures, including the use of armed force. Among these measures, the Council may decide to suspend economic relations, rail, sea, air, postal, telegraphic, radio, and other communications. It may also decide to cessation diplomatic relations with one or both parties to the conflict who are deemed responsible for the threat.

Economic sanctions represent a penalty aimed at influencing the will of a state to exercise its rights to compel it to respect its international obligations, thereby making its decisions consistent with what

international law imposes. Thus, they are a tool of coercion directed against the economic relations of a state that violates normal international relations to force it to change its behavior. Economic sanctions take various forms, including:

- Economic Embargo: This involves prohibiting the export of goods, either wholly or partially, to the targeted state.

- Economic Blockade: This involves preventing communications with the targeted state.

- Economic Boycott: This involves halting economic transactions with the targeted state to isolate it from the international community in all cultural, social, and economic aspects (Shiban and Abbasiya, 2018, p. 264).

### **Non-Peaceful Measures**

According to Article 42 of the United Nations Charter, if peaceful means do not achieve the settlement of an international dispute, and if the Security Council deems the situation is a threat to international peace and security, it may resort to the use of force to remove the threat under Chapter VII of the United Nations Charter. In such cases, the Security Council may authorize the use of land, air, or sea forces as necessary to remove the threat to international peace and security. This is done under Article 44 of the Charter by a force composed of member states of the Council or from outside the Council upon the Council's invitation.

Article 47 of the Charter stipulates that plans for military operations used by this force are to be drawn up in consultation with a committee known as the Military Staff Committee, composed of the chiefs of staff of the permanent members of the Security Council, which may invite other members as it sees fit. This committee is responsible, under the supervision of the Security Council, for the strategic direction of the forces. Article 48 of the Charter obliges all member states to take the necessary actions to implement the decisions of the Security Council taken under Chapter VII of the Charter. Article 49 obliges them to provide mutual assistance in carrying out the measures decided by the Security Council.

### **The Effectiveness of International Law in Maintaining the Stability of Food and Energy Supply Chains**

The effectiveness of international law cannot be verified in the same way as national law, given the differences in the characteristics of the persons of each. These differences affect the nature of the legal rules in each system, as the principle of sovereignty is the foundation upon which the rules of international law are based, leading to equality of states under this law. This contrasts with the existence of a higher authority that enforces and compels compliance, as in the case in national law.

In the context of our study, the disruption of food and energy supply chains is merely an effect of armed conflict. If the cause is removed, the effect disappears. Therefore, we note that the discussion of international law measures to maintain food and energy supply chains does not go beyond the general framework of international law in resolving international armed and non-armed conflicts.

In this regard, a review of the history of international relations and conflicts confirms the success of negotiations, mediation, and arbitration in resolving many disputes, thereby maintaining the stability of food and energy supply chains. For example, the negotiations between Russia and Ukraine, mediated by Turkey and the United Nations in July 2022, resulted in an agreement to export Ukrainian and Russian grains through the Black Sea (the Black Sea Grain Initiative). This made it possible to export grains from Ukrainian ports that were closed due to the armed conflict, leaving 20 million tons of grains stuck in silos, which led to a rise in global grain prices and the potential for famine in the medium and long term (Al Arabiya, 2022).

It should be noted that the effectiveness of negotiations depends on several factors, including the presence of goodwill and flexibility among the parties to the conflict. Another important factor is the balance of power, so that the negotiations do not result in imposed solutions that merely calm the conflict and postpone its recurrence. Another crucial element is the parties' belief that failing to resolve the conflict through negotiations could lead to catastrophic outcomes (Hussein, 2017, p. 36- 37).

Arbitration is also an effective means of resolving all disputes and their consequences, due to its advantages, including the speed of resolving disputes within a set timeframe determined by the parties. Arbitration is also a single-instance adjudication, where the decision issued has the force of *res judicata*. Arbitration is also characterized by confidentiality, which suits most disputes in international relations. Additionally, arbitration allows the parties to choose the arbitrators, which provides confidence and reassurance to the parties (Wassel, 2022, p. 2783- 2784).

One of the most significant practical applications of arbitration in resolving international disputes was the Egyptian- Israeli dispute over Taba, in accordance with the provisions of the peace treaty signed between them in 1979, which stipulated that dispute regarding the application or interpretation of the treaty be resolved through negotiation. If this is not possible, they should be resolved through conciliation or referred to arbitration. This was indeed done, as an arbitration agreement was signed in 1986, and the arbitration decision was issued in 1988 (Wassel, 2022, p. 2764- 2770).

Sanctions are an important tool in dealing with armed conflicts and achieving peace, as they aim to change the behavior of the parties involved in the conflict and impose penalties on them for non-compliance with international standards and laws. Sanctions can be directed individually against individuals or entities involved in conflict, or collectively against states and related institutions.

Sanctions, as mentioned earlier, include a variety of measures, such as economic sanctions, including trade and financial embargoes, diplomatic sanctions, such as Cease of diplomatic relations and closing embassies, and military sanctions, such as arms embargoes and military operations. Sanctions vary depending on the conflict in which they are imposed and are linked to the objectives to be achieved, such as pressuring the parties to negotiate and end the conflict peacefully.

The effectiveness of sanctions in times of armed conflict depends on several factors. Firstly, sanctions must be accompanied by a comprehensive plan for peace and reconciliation in the conflict zone, with a clear opportunity to end the conflict and achieve peace. If no realistic alternative is offered to the parties to achieve their interests, sanctions may not be effective.

Secondly, the parties involved in the conflict and their potential interests must be considered in designing the sanctions. Imposing sanctions on the affected population in general may increase their suffering and fail to achieve the desired goals. Therefore, care must be taken not to harm civilians and to direct sanctions specifically against individuals and entities that can be influenced.

Thirdly, the impact of sanctions can change over time. At the beginning of a conflict, sanctions may be sufficiently effective in changing the behavior of the parties and pushing them towards a peaceful resolution. However, over time, the parties may ignore the sanctions or find ways to overcome them. Therefore, it is important to regularly assess the effectiveness of sanctions and adjust them as needed.

In general, sanctions can be effective in changing the behavior of the parties and achieving peace and stability in times of armed conflict, thereby maintaining the stability of supply chains. However, the success of sanctions requires comprehensive plans for peace and reconciliation, agreed upon by the parties.



## Conclusion

Food and energy supply chains are fundamental issues that concern the entire world, as these vital chains are an essential part of daily life and the economies of nations. No country, nor the whole world, can progress without sustainable and reliable supply chains for food and energy.

However, many challenges facing food and energy supply chains pose a significant challenge to the world. Since the beginning of the 21st century, the world has witnessed numerous devastating crises, such as droughts, floods, hurricanes, pandemics, and even armed conflicts, which have disrupted or halted some food and energy supply chains.

One of the measures recognized by international law to protect vital supply chains is the preservation of critical infrastructure. Water, electricity, gas, and sanitation facilities must not be destroyed, and roads and seaports must be protected from damage and destruction. This ensures the continuity of supply distribution and the achievement of economic and social stability.

In addition to preserving infrastructure, parties involved in armed conflict must respect the right to access food, water, and energy, and refrain from using blockades that negatively affect the availability of supplies and essential services. Blockades hinder social cohesion, exacerbate tensions and unrest, and force populations to migrate and leave their homes and countries, thereby intensifying the conflict.

Finally, among the measures that can help maintain food and energy supply chains is respect for international bodies specialized in arbitration and humanitarian intervention, as these bodies facilitate necessary humanitarian interventions to provide civilians with basic needs without exposing them to danger or blockade.

The protection of food and energy supply chains during armed conflicts is one of the most important humanitarian, economic, and social priorities. International law has been developed to protect these chains through various means, including:

- Humanitarian Conventions: These conventions are based on the sanctity of human life and protect civilians in warring states, ensuring their right to access food, water, energy, and other essential services.
- Broad International Conventions: These conventions protect human rights and define international responsibilities in maintaining food and energy supply chains, aiming to limit the effects of armed conflicts on the natural environment and the economy.
- Partial Conventions: These conventions regulate the rights of civilians and those under siege in armed conflicts, ensuring their access to food, water, energy, and healthcare.
- National Laws: States formulate and implement national laws and policies to protect food and energy supply chains, providing protection to civilians and vital infrastructure during armed conflicts.

In addition, the protection of food and energy supply chains during armed conflicts depends on the cooperation of the warring parties, humanitarian organizations, and various international entities, as well as the proper design of emergency plans and rapid response to any disruption in supply chains.

Several humanitarian conventions have been signed to protect food and energy supply chains during armed conflicts, including:

- The Fourth Geneva Convention of 1949 on the Protection of Civilians and Their Habitats in Times of Armed Conflict: This is one of the main conventions in the field of civilian protection, ensuring the right to access food, water, energy, and other essential services during armed conflicts.

- The Fundamental Convention on Human Rights: This convention includes provisions related to individuals' rights to access food, shelter, healthcare, and appropriate medical care.
- The International Convention on the Protection of All Persons from Racial Discrimination: This convention relates to protection from racial and ethnic discrimination and includes provisions protecting the rights of Muslims and other ethnicities regarding access to food, energy, and shelter.
- The International Convention on the Rights of the Child: This convention aims to protect the rights of children in armed conflicts, including protection from malnutrition, hunger, and lack of access to appropriate healthcare.
- The International Convention on the Rights of Refugees: This convention includes provisions related to the right to access food, shelter, and other essential services for refugees, displaced persons, and missing persons during armed conflicts.

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