Committee: Environmental Commission

Issue: Discussing the fertilizer shortage in the farming industry

Student Officer: Georgina Anagnostopoulou

Position: Deputy President

PERSONAL INTRODUCTION

Dear Delegates,

It is my greatest pleasure and honor to welcome you all to the Environmental Commission of the 6th ACG Model United Nations Conference. My name is Georgina Anagnostopoulou, I am a student in Ekpedeftiki Anagennisi School, and I am thrilled to serve as one of your Deputy Presidents.

First and foremost, I would like to congratulate you on your decision to become active members of the MUN community. To be precise, participating in UN simulations is the most suitable way to familiarize yourselves with diplomacy, politics, and global issues. MUN will contribute to the cultivation of numerous skills, including critical thinking and resolving skills. During the conference, you will not only be able to discuss intriguing matters and policies, but you will also create long-lasting bonds.

Having said that, it is my utmost honor to serve as a member of the Presidency of the Environmental Commission. MUN has made me conscious of environmental issues which are not always a priority for world leaders. Extreme natural phenomena, such as desertification and climate change indicate that we should take action to face them. However, nations have not adapted their political agendas and all implemented solutions are rather inefficient. As the next generation, it is our duty to lead the way for environmental action. I feel honored to inspire young delegates like you with my passion for such matters.

Should you have any further questions, I am more than happy to help you. You can contact me via my email: jo.anagnostopoulou.08@gmail.com. I am looking forward to seeing you all in April!

Kind Regards,

Georgina Anagnostopoulou

TOPIC INTRODUCTION

Throughout the course of the last decade, the global economy has encountered numerous crises. Most of them, including the frequent economic recessions, the intensity of armed conflicts, and the hazardous effects of climate change, are constantly undermining all aspects of our lives and primarily, food security and nutrition globally. On top of that, it is expected that in 2023 inflation rates will be higher than in previous decades, which will further exacerbate existing inequalities and worsen the food security situation.

The ongoing conflict between Ukraine and Russia has caused unprecedented damage by hindering the world's post-pandemic financial recovery and threatening food security. Particularly, trade costs and the price of energy sources, agricultural products, and fertilizers have increased on an international scale. This is because the Russian Federation is a major supplier in the energy sector and the world's largest fertilizer exporter. Due to the sanctions imposed by the US-led alliance on Russia, the export of Russian natural gas and fertilizers has been severely restricted. Consequently, fertilizer companies cannot afford to produce fertilizers, the production of which also requires natural gas. The elevated cost of fertilizer production increases the market price of fertilizers, making them difficult to afford for farmers.

Naturally, the rapidly increasing prices for fertilizers have put additional pressure on the cost of agricultural production, which is energy-intensive, as it calls for the usage of high amounts of energy either via on-farm fuel, natural gas, and electricity or indirectly through agrichemicals such as fertilizers.[1] The limited usage of fertilizers negatively impacts global food security, leading to lower quantities of food, restricted access to agricultural products, and as a result, growing hunger and malnutrition.

With only seven years left to accomplish the 2nd Sustainable Development Goal (SDG) to end hunger, food insecurity, and all forms of malnutrition, the world is clearly not moving in the right direction. While fertilizers have been criticized in the past for their harmful environmental impacts, amid the ongoing politico-economic crisis, humanity prone to food insecurity has no other option than to support fertilizers' sustainable production and use and to work collectively to address all arising challenges.

[1] FAO and WTO. "Global Fertilizer Markets and Policies: A Joint FAO/WTO Mapping" *World Trade Organization*, 14 Nov. 2022, https://www.wto.org/english/news_e/news22_e/igo_14nov22_e.pdf. p.1. para 1.3 (hereinafter FAO & WTO Report)

DEFINITION OF KEY TERMS

Crop rotations

"The practice of growing different crops in succession on the same land chiefly to preserve the productive capacity of the soil".[2]

Dead zones

Dead zones are one of the most catastrophic effects of eutrophication. They are low-oxygen areas in oceans and lakes. As a result of the low-oxygen shortages, organisms cannot survive in said zones.[3]

Digital soil mapping

"It is a methodological framework to create soil attribute maps on the basis of quantitative relationships between spatial soil databases and environmental covariates"[4].

Energy Intensive Industries

They are industrial sectors that require high amounts of energy, and as a result energy costs are a high proportion of their production costs.[5]

Eutrophication

A process under which marine waters are excessively enriched with nutrients, especially nitrogen and phosphorus, leading to the growth of harmful algae biomass. As a result, the balance of the water ecosystem is disrupted, and the water quality is degraded. The excessive nitrogen and phosphorus load in marine ecosystems usually comes from fertilizers.[6]

Farming industry

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[2] Merriam-Webster. "Crop Rotation Definition & Meaning." *Merriam-Webster Online Dictionary*, 13 Jan. 2023, <https://www.merriam-webster.com/dictionary/crop%20rotation.>
[3] National Geographic. *Dead Zone*. https://education.nationalgeographic.org/resource/dead-zone/.
[4] FAO. "Country Guidelines and Technical Specifications for Global Soil Nutrient and Nutrient Budget Maps." *FAO*, 2022, <https://www.fao.org/3/cc1717en/cc1717en.pdf.>
[5] Hutton , Georgina, et al. "Energy Intensive Industries ." *House of Commons Library*, 23 Nov. 2021, https://commonslibrary.parliament.uk/research-briefings/cdp-2021-0195/.
[6] European Commission. "Descriptor 5: Eutrophication." *European Commission* , <https://ec.europa.eu/environment/marine/good-environmental-status/descriptor-5/index_en.htm.>; World Resources Institute. "Eutrophication and Hypoxia." *World Resources Institute*, <https://www.wri.org/initiatives/eutrophication-and-hypoxia/learn.>

It refers to industrial activities relevant to the agricultural production which entail "the practice of cultivating the soil, growing crops and raising livestock for human use including the production of food, feed, fibre, fuel, or other useful product".[7]

Fertilizers

"Chemical or natural substances and other material that are used to provide nutrients to plants, usually via application to the soil, but also to foliage or through water in rice systems, fertigation, hydroponics, or aquaculture operations".[8]

Food Security

As a concept firstly defined in the 1996 World Food Summit, it refers to the situation when "all people, at all times, have physical and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences, thus allowing them to have an active and healthy life".[9]

Global Soil Partnership

It is a mechanism established in 2012 under the auspices of UN's Food and Agricultural Organization (FAO), with the mandate to promote sustainable soil management methods.[10]

Sanctions

They are measures taken either by the UN Security Council or by other States collectively or individually against another State to pressure the latter to abide by international law. Sanctions usually include economic measures such as embargos, imports and exports restrictions, asset freezes, travel bans etc.[11]

Sustainability

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[7] Park, Chris. "A Dictionary of Environment and Conservation." *Oxford Reference*, 2012, <https://www.oxfordreference.com/display/10.1093/acref/9780198609957.001.0001/acref-9780198609957-e-181?rskey=ormZvr&result=181.>

[8] FAO. "The International Code of Conduct for the Sustainable Use and Management of Fertilizers." *Food and Agricultural Organization*, 2019, Article 1.4 <https://www.fao.org/3/ca5253en/CA5253EN.pdf.>

[9] FAO. "Food Security: Concepts and Measures." *Food and Agricultural Organization*, 2003, <https://www.fao.org/3/y4671e/y4671e06.htm.>

[10] FAO . *Global Soil Partnership* . <https://www.fao.org/global-soil-partnership/en/.>

[11] Van den Herik, Larissa, and Tom Ruys . "Sanctions, Retorsions and Countermeasures: Concepts and International Legal Framework." *Research Handbook on UN Sanctions and International Law*, Edward Elgar, Cheltenham, 2016.

Social, political and economic development that covers the needs of the present without threatening the ecosystem or in any case hindering the ability of future generations to equally meet their own needs.[12]

Sustainable Development Goals (SDGs)

A framework established by the United Nation's General Assembly in 2015, including 17 interlinked objectives designed to serve as a "shared blueprint for peace and prosperity for people and the planet, now and into the future".[13]

BACKGROUND INFORMATION

Fertilizers in the agricultural production

Fertilizers are substances of natural or chemical origin that are applied to soil or to plant tissues, to supply a plant with nutrients and improve the soil's fertility and production. There are manifold sources of fertilizers, based on both natural and industrial producing methods. The rapid evolution of technology has enabled experts to use three main macronutrients in agricultural activities, namely Nitrogen (N), Phosphorus (P), and Potassium (K). The application of fertilizers has become more convenient for farmers since they now have the opportunity to use large agricultural equipment.

Historically, humans preferred natural and organic sources of fertilization. After the course of the 19th century, plant nutrition innovations contributed to the creation of synthetic fertilizers. Particularly the use of nitrogen fertilizers dates back to 1905 when the chemical process of nitrogen was developed. Such a transition was crucial since it transformed the global food system into larger-scale industrial agriculture with large crop yields.

Production of Synthetic Fertilizers

The fertilizers' production process begins with the chemical elements themselves. Minerals, such as potassium and potash, are collected by mining, while nitrogen is extracted from the air through a chemical reaction with natural gas. These chemical elements are processed through production plants and are shipped to various storage facilities before reaching fertilizer retailers.

[12] UCLA. "What Is Sustainability?" *UCLA* , https://www.sustain.ucla.edu/what-is-sustainability/.
[13] UN. "The 17 Goals | Sustainable Development." *United Nations Department of Economic and Social Affairs*, last updated in January 2023, <https://sdgs.un.org/goals.>

Fertilizers can be in solid, liquid, or gas form and are globally transported. As such, the fertilizer supply chain consists of an incredibly elaborate network.

Most nitrogen fertilizers are produced through synthetic ammonia (NH_3). This chemical compound is used either in gas form or diluted in a water solution. However, the aforementioned process is quite energy-intensive. Amid the ongoing energy crisis, the production of nitrogen fertilizers has become expensive. Naturally, the high cost of production translates to high prices in the fertilizer market.

Use of Fertilizers

The use of fertilizers normally results in increased yields with diminishing returns until maximum yield is reached. However, excessive fertilizer application diminishes or even damages harvests. To decrease the chances of damaging the yield, farmers ought to know the four steps of fertilizer application: source, time, rate, and place. Application of said key principles can ensure high-quality crops.

As mentioned by Dr. Norman Borlaug, Nobel Prize Winner, and Father of the Green Revolution: "Food is the moral right of all who are born into this world. This is a basic problem, to feed billions of people. Without fertilizers, forget it. The game is over".[14] Fertilizers play a key role in the accomplishment of the Sustainable Development Goals since they contribute to ending hunger, the second Goal of said Agenda. Fertilizers provide crops with the nutrients essential for their growth, which leads to an increase in crop yields and food production. Fertilizers are utilized worldwide to ensure food security since the two are clearly interconnected. Supposing that the world's population will rank about 10 billion by 2050[15] and that the agricultural sector will have to accordingly intensify its productivity, to meet the world's increasing nutrient needs, fertilizers are the only solution. To summarize, fertilizers contribute to alleviating hunger, malnutrition, and food security worldwide, particularly in vulnerable areas around the world.

Causes of Fertilizers Shortage

Soaring prices of energy sources

[14] Nutrient for Life Foundation . "Feeding Our Planet." *Nutrients for Life*, https://nutrientsforlife.org/for-students/feeding-our-planet/.
[15] FAO. *How to Feed the World, High-Level Expert Forum, Global Agriculture towards 2050*. 13 Oct. 2009,https://www.fao.org/fileadmin/templates/wsfs/docs/Issues_papers/HLEF2050_Global_Agriculture.pdf?segid=781e0102-90a5-417b-a365-b922c25292bd.

Fertilizer production is an energy-intensive industry that requires massive amounts of energy, particularly gas. Simultaneously, the basic chemical component of some fertilizers is gas while the chemical processing of certain mineral substances, including nitrogen, requires large amounts of energy.

The Russo-Ukrainian war has resulted in an unprecedented energy crisis. Russia, one of the world's biggest producers and exporters of natural gas, decided in late 2022, to restrict gas flows to the European Union by around 80%, due to the latter's support of Ukraine. As a result, gas prices have increased in the Union, which was left with a significant deficit in its energy recourses.

Amid the ongoing energy crisis, European fertilizer companies are facing serious difficulties. On August 25, Yara International of Norway, a large fertilizer company and one of the biggest EU corporates, said it will cut the output of nitrogen-based fertilizer in the face of soaring natural gas prices. Svein Tore Holsether, Chief Executive Officer (CEO) of Yara International, said higher gas prices were exercising pressure on fertilizer costs and affecting food prices worldwide. Mr. Holsether also mentioned that Yara had been forced to cut some production due to higher gas prices, which had led to shortages.[16]

Trade restrictions

Fertilizer prices were initially high in 2021, due to the increasing cost of natural gas. Russia's invasion of Ukraine resulted in a further 50% increase, according to the European Commission.

The war in Ukraine has exacerbated the fertilizer crisis, due to Russia's and Ukraine's key role in the global fertilizer market. The Russian Federation is the world's biggest producer and exporter of nitrogen-based fertilizers, the second-largest supplier of potassium fertilizers, and the third-largest exporter of phosphorus fertilizers. Ukraine is also a major exporter of phosphorus fertilizers.

The armed conflict has severely disrupted the trade of fertilizers and shipments are very expensive. They also rarely happen for security reasons since hostilities take place near major ports.

[16] Rapoza, Kenneth. "Europe's Other Crisis: Fertilizer Shortage for Farming." *Forbes* , 21 Sept. 2022, https://www.forbes.com/sites/kenrapoza/2022/09/19/europes-other-crisis-fertilizer-shortage-for-farming/?sh=48b7aeb26ddc.

The EU's response to the Russo-Ukrainian war has created further obstacles to the shipment of fertilizers. The EU's sanctions cover a plethora of economic sectors including transportation, free trade, banking, asset freezes, and travel bans. Although EU sanctions exclude food supplies and fertilizers, their export and shipment are practically impossible. This is because restrictions on potassium trade fall within these sanctions. As such, potash fertilizers are ultimately not excluded from trade restrictions. In fact, the EU had previously imposed sanctions on Belarusian potash and Belarussian companies involved in its production, after Belarus' severe human rights violations. As a result, Belarus was prohibited from exporting its potash to the EU and using EU ports as transit points.

Amid the Russo-Ukrainian war, the EU extended the potash restriction to Russian potash as well, to avoid any re-exports of Belarus potash under a Russian flag. Therefore, Russian companies have been given restricted access to European ports for their shipments. Exports of potash from Belarus as well as ammonia and potash from Russia, which have traditionally been shipped through EU and Ukraine ports have fallen significantly in 2022.

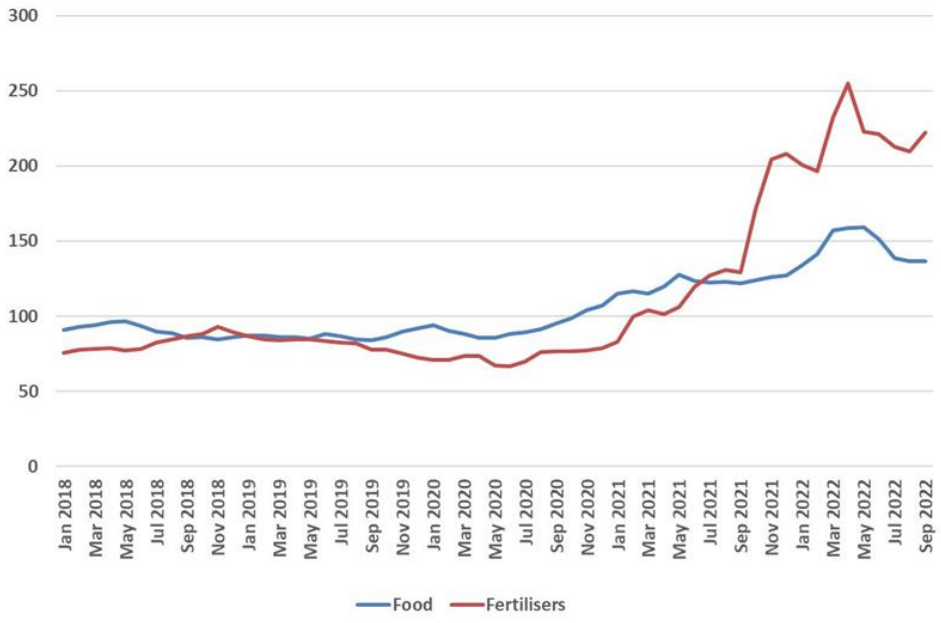


Figure 1: Graph depicting the food and fertilizers prices index[17].

Effects of the shortage of chemical fertilizers

Food insecurity

[17] FAO and WTO. "Global Fertilizer Markets and Policies: A Joint FAO/WTO Mapping" *World Trade Organization*, 14 Nov. 2022, https://www.wto.org/english/news_e/news22_e/igo_14nov22_e.pdf.

Food insecurity has been threatening humanity for the past decade. Even before the ongoing conflict against Ukraine, the high frequency and intensity of climate change, regional armed conflicts, and the Covid-19 pandemic have all contributed to the disruption of agricultural production and food distribution. The Russo-Ukrainian war further increased the prices of food and fertilizers.

The result of the fertilizer crisis is the unprecedented number of 45 million people whose lives are in danger due to food insecurity.[18] The data provided by the World Food Program (WFP) suggests that more than 828 million people face serious difficulties when it comes to food shortages. This is particularly evident in countries highly dependent on imports from Russia, most of which are Less Economically Developed Countries (LEDCs).

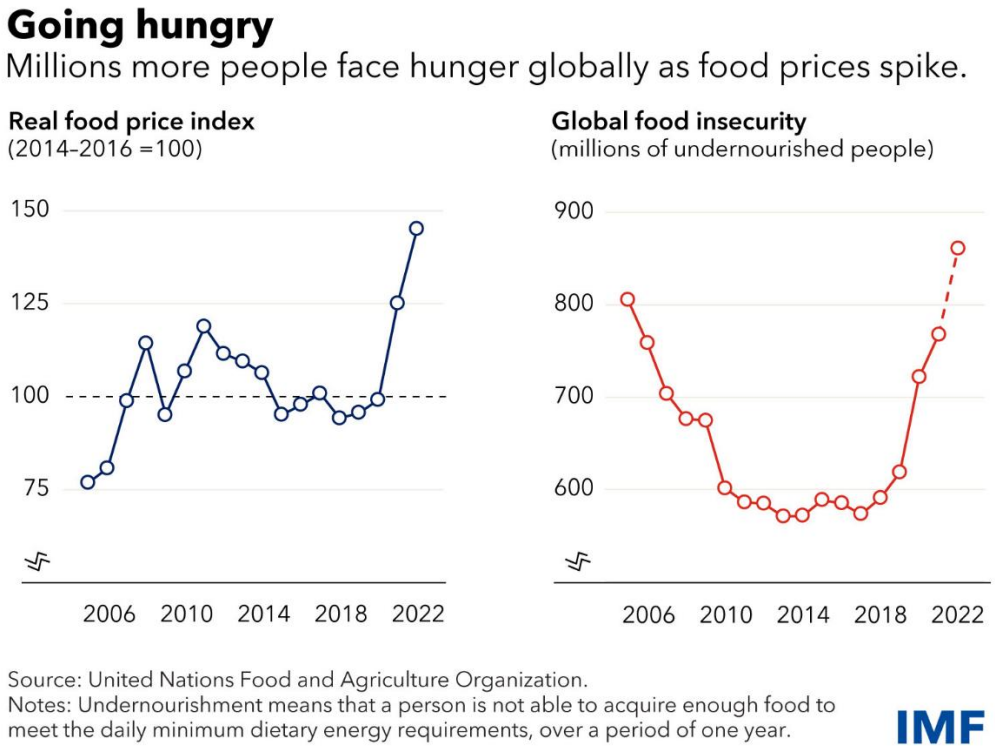


Figure 2: Graphs depicting the food price and food insecurity index[19]

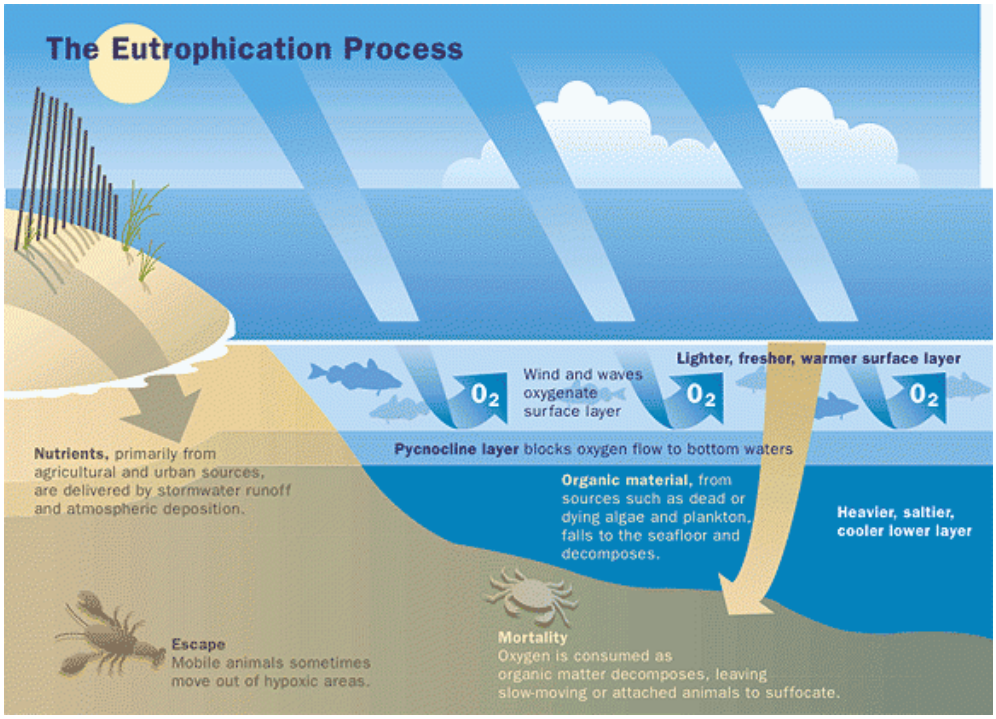
[18] Georgieva, Kristalina, et al. "Global Food Crisis Demands Support for People, Open Trade, Bigger Local Harvests." *IMF Blog* , 30 Sept. 2020, https://www.imf.org/en/Blogs/Articles/2022/09/30/global-food-crisis-demands-support-for-people-open-trade-bigger-local-harvests.

[19] Georgieva, Kristalina, et al. "Global Food Crisis Demands Support for People, Open Trade, Bigger Local Harvests." *IMF Blog* , 30 Sept. 2020, https://www.imf.org/en/Blogs/Articles/2022/09/30/global-food-crisis-demands-support-for-people-open-trade-bigger-local-harvests.

The environmental footprint of fertilizers

The global food system depends on chemical fertilizers**.** Although chemical fertilizers boost global food production, their extensive use has come at a high environmental cost, as shown by numerous studies and reports. The adverse effects of fertilizers occur since the chemical compounds of fertilizers are toxic. While they eliminate undesirable insects and other living organisms that affect agricultural productivity, they may also harmfully affect the environment. The over-use of fertilizers leads to the release of toxic chemicals into the environment which in turn negatively affect local ecosystems.

The production and use of fertilizers are primarily correlated with increased air pollution. Ammonia, one of the basic chemical components of fertilizers, is processed under very high temperatures, requiring thus a lot of energy stockpiles, which usually come from burning fossil fuels like coal and methane gas. As a result, the greenhouse gas, carbon dioxide, which is the main cause of climate change, is produced. Ammonia manufacturing today contributes between 1 and 2% of worldwide carbon dioxide emissions. But the application of fertilizers is also linked with greenhouse emissions. Specifically, the use of synthetic nitrogen fertilizers accounted for 8.3% of farm-related emissions in 2019.[20]



[20] Menegat, Stefano, et al. "Greenhouse Gas Emissions from Global Production and Use of Nitrogen Synthetic Fertilisers in Agriculture." *Nature News*, Nature Publishing Group, 25 Aug. 2022, https://www.nature.com/articles/s41598-022-18773-w.

Figure 3: Image depicting the eutrophication process.[21]

Additionally, chemical fertilizers cause water eutrophication. Eutrophication is a process driven by the excess amounts of nitrogen and phosphorus in marine ecosystems. The enrichment of water in said nutrients leads to increased growth of harmful algae. The increased algae biomass changes the balance of organisms living in marine ecosystems, based on the food chain, and destroys the quality of water. In fact, in some parts of the world, including the Baltic Sea and the Mexican Gulf, dead zones (hypoxic areas, meaning areas low in oxygen) have been formulated. Therefore, biodiversity is threatened.

To conclude, although chemical fertilizers play a decisive role in the mass production of agricultural products, thus ensuring food security across the globe, they simultaneously pose a serious threat to the environment and animal and human health. The war in Ukraine and the subsequent fertilizer-shortage crisis are about to dramatically change the global market and the world's food security index. Nevertheless, amid these hard times, governments can take measures to systematically promote and invest in the production and use of bio-fertilizers, to address the environmental and sustainability crises that plague the modern world.

MAJOR COUNTRIES AND ORGANIZATIONS INVOLVED

Russian Federation

The Russian Federation is the leading producer and exporter of energy and fertilizers. More specifically, in 2021 Russia exported $7.6B in fertilizers, ranking 1st as the world's largest exporter of fertilizers worldwide. The main destinations of Russian fertilizers are "Brazil ($1.43B), Estonia ($555M), India ($540M), China ($531M), and the United States ($442M)".[22]

Western sanctions on Russia including trade restrictions, after the Russian invasion of Ukraine, have severely disrupted shipments of fertilizers globally. Various western banks and international trade companies are distancing themselves from Russian supplies and products, while shipping firms are avoiding the Black Sea region due to safety concerns.

[21] Libretexts. "13.7: Eutrophication." *Geosciences LibreTexts*, Libretexts, 3 May 2021, https://geo.libretexts.org/Bookshelves/Oceanography/Book%3A_Oceanography_%28Hill%29/13%3A_Human_Impacts_on_the_Ocean/13.7%3A_Eutrophication.

[22] OEC. "Fertilizers in Russia." *OEC*, 2020, <https://oec.world/en/profile/bilateral-product/fertilizers/reporter/rus.>

As a result, Russian fertilizers cannot reach European and other regional markets since European ports cannot be used as transit points anymore. As a result, Russian products are not accessible in the global market. Thus, the ongoing conflict in Ukraine has exacerbated the energy and fertilizer crisis.

Belarus

Belarus ranks in the third position globally in fertilizer production. It is also the biggest producer and exporting state of potash fertilizers. However, its international trade relations have been severely affected by the EU sanctions. Belarus' exports of potassic fertilizers declined from 3.62 million tons in the first half of 2021 to 1.95 million tons in the first half of 2022[23].

The EU has imposed severe economic sanctions against Belarus over the past three years, due to policy and human rights violations. Belarussian sanctioned companies and entities can no longer export potash, and as a result companies outside Belarus cannot produce potash-based fertilizers. This creates serious problems with regard to international fertilizer shortages.

Food and Agricultural Organization (FAO) and The World Food Forum (WFF)

Established on the 16th of October 1945, it is the UN specialized agency that plays a leading role in international efforts to combat hunger and malnutrition.

As part of its policy to promote sustainability, FAO established the Global Soil Partnership (GSP) in 2012. Through this forum, sustainable soil management to achieve food security worldwide is promoted. GSP's mandate includes the establishment of the coordination of regional soil partnerships and the codification of guidelines for sustainable soil management. Through its projects, GSP has managed to assist Less Economically Developed Countries in developing digital soil maps.

In its first Plenary Assembly in 2013, the GSP established the Intergovernmental Technical Panel on Soils (ITPS). The ITPS has 27 members including leading academic experts on soil studies, who represent all the regions of the world. The ITPS functions as a scientific and technical body that offers its advice and guidance on global soil issues primarily to the GSP and to specific requests submitted by global or regional institutions.[24]

[23] FAO and WTO Report.
[24] FAO . *Intergovernmnetal Technical Panel on Soils* . https://www.fao.org/global-soil-partnership/itps/en/.

In 2021, FAO launched a global network of partners titled World Food Forum (WFF). Its goal is to empower young people and world leaders to actively shape food systems compatible with the concept of sustainability.

During the 2nd WFF, a special session, entitled "Global Assessment and Solutions for the Fertilizer Crisis" was organized. During the specialized session panelists, FAO, and UN representatives, analysts and politicians assessed the current fertilizer-related problems faced in the global market and discussed potential science-based solutions. Highlights of the discussion include suggestions to reduce the carbon footprint resulting from excessive use or misuse of fertilizers, promote bio-fertilizers, composting methods, and bio-stimulants, and invest in fertilizer research and technology.

World Trade Organization (WTO)

Established in 1995, WTO is the only international organization with the mandate to establish free-trading rules and monitor their enforcement among nations. Since fertilizer trade is within its mandate, the WTO has expressed its concerns regarding the ongoing crisis and its adverse effects on food security.

Recently the WTO partnered with the FAO and produced a report on fertilizer shortages, calling for global transparency in the market of fertilizers. The study depicts that at least 19 WTO Member-States implemented fertilizer-related measures during the last 2 years. In light of these trade-restrictive measures, the study forecasts that shortages in fertilizers will threaten the agricultural sector and subsequently food security, particularly in Africa, where farmers are heavily dependent on imported agricultural inputs.

In November 2022, the WTO initiated formal meetings and round table discussions, where WTO's Deputy Director-General Jean-Marie Paugam, commented on the availability and affordability of fertilizers for farmers and urged members to find ways to mitigate the current negative market conditions.[25]

International Fertilizers Association (IFA)

The IFA is the only global fertilizer association. Its membership reaches approximately 400 entities and companies across the fertilizer value chain varying from producers, traders, and distributors to service providers, advisors, research organizations, and NGOs. The IFA's vision is to contribute to a world free of hunger and malnutrition by producing sustainable agricultural systems.

[25] WTO. *Cotton Meetings Stress Need to Advance Talks, Focus on Fertilizer Issues and Development*. 10 Nov. 2022, https://www.wto.org/english/news_e/news22_e/cott_10nov22_e.htm.

Moreover, the IFA's forum has been making remarkable efforts over the last few years as far as negotiations and policy-making are concerned. The International Fertilizers Association was also present at the COP26, the conference held in Glasgow in 2021 for climate change, to highlight the fertilizer industry's commitment to feeding the world sustainably. The IFA joined the industry to raise awareness among all Parties to enable a low-carbon transition in nitrogen fertilizer production.

The IFA has additionally adopted the "12 SHE Principles". All private companies that are IFA members are bound by these 12 Safety, Health, and Environment Principles. Through these 12 principles, IFA members aim at establishing and improving their safety, security, health, and environmental performance. The IFA supervises the implementation of the "12 SHE Principles" and publishes annual reports that show members' progress.

To reduce the negative environmental footprint of fertilizer production, the IFA is creating plans of action for industries to help them increase energy efficiency, minimize emissions, cut water consumption, and increase water recycling. In 2019, the IFA partnered with the International Energy Agency (IEA) to develop a Low-Carbon action plan for fertilizer industries. The effort was sponsored by the European Bank for Reconstruction and Development.

BLOCS EXPECTED

Bloc 1

The first alliance should include UN member-states that have either imposed sanctions on Russia or support the sanctions regime and have started investing in bio-fertilizers.

Bloc 2

The second alliance should consist of member-states that are either against the imposition of sanctions or are adversely impacted by them and have additionally not invested in biofertilizers.

TIMELINE OF EVENTS

Date	Description of event
1905	First use of nitrogen fertilizers

16 October 1945	Establishment of the Food and Agricultural Organization
24 October 1945	Establishment of the United Nations
1 January 1995	Establishment of the World Trade Organization
1995	Organization of the World Food Summit that defined for the first time the concept of food security
September 2000	Adoption of the UN Millennium Goals Agenda that was to be implemented by 2015.
2015	Adoption of Resolution known as Agenda 2030 for Sustainable Development
13 September 2019	Adoption of the International Code of Conduct for the Sustainable Use and Management of Fertilizers
2021	Launch of the World Food Forum
24 February 2022	Beginning of the War in Ukraine
3 June 2022	Implementation of EU's Sanctions against Russia
12 July 2022	Adoption of the Black Sea Grain Initiative
25 August 2022	Yara International of Norway announced the temporary suspension of its operations

RELEVANT UN RESOLUTIONS, TREATIES AND EVENTS

Resolution UNEP/EA.3/Res4. On Environment and Health[26]

On the 4th of December 2017, the United Nations Environmental Assembly of the United Nations Environment Programme (UNEP) passed Resolution 3/4 which was published on the 30th of January 2018. The resolution emphasizes the safe management of chemical wastes and aims at tackling the adverse impacts of toxic chemicals on the environment and human health. As such, the resolution invites UN Member States to increase awareness of the risks chemical fertilizers pose to the environment and human health. Additionally, the resolution calls for the implementation of measures to address the negative environmental footprint of fertilizers through close collaboration between states, the UN Environmental Assembly, the World Health Organization, and the Food and Agricultural Organization.

[26] United Nations Environment Programme. "Resolution 3/4. Environment and Health [UNEA Resolution UNEP/EA.3/Res.4]". Knowledge Repository - UNEP. UNEP. 2017. Web. 25 Feb 2023 https://wedocs.unep.org/20.500.11822/30795

The International Code of Conduct for the Sustainable Use and Management of Fertilizers[27]

The International Code of Conduct for the Sustainable Use and Management of Fertilizers was adopted under the auspices of the 41st session of the FAO Conference on 13 September 2019. The request to codify rules relating to the safe usage of fertilizers was first expressed in the 25th session of FAO's Committee on Agriculture (COAG). The Fertilizer Code further responds to the Declaration of the 3rd UN Environmental Assembly on soil pollution and is in full conformity with FAO's Voluntary Guidelines for Sustainable Soil Management.

The Code aims in guarantying a sustainable, effective, and environmentally friendly use of fertilizers. It strongly promotes efforts toward minimizing the negative environmental effects of toxic contaminants in fertilizers, while enhancing global food production.

The Black Sea Grain Initiative

The Initiative on the safe transportation of grain and other agricultural products from Ukrainian ports, also known as the Black Sea Grain Initiative, is an agreement between the Russian Federation, Ukraine, Türkiye, and the UN, signed on 22 July 2022. The agreement entails provisions regarding the safe export of grain and other products as well as fertilizers, including ammonia, that were originally blocked because of trade restrictions and shipment insecurity. According to set provisions, the products will be shipped through Ukrainian ports and will further traverse the Black Sea in designated corridors.

The UN coordinator, Amir Mahmoud Abdulla, expressed his hope that the agreement could be renewed for another round of exports if UN-facilitated discussions continued.[28] The agreement was eventually renewed on 19 November 2019 for 120 extra days.

PREVIOUS ATTEMPTS TO SOLVE THE ISSUE

Sri Lanka's Effort to Ban Chemical Fertilizers

Sri Lanka is currently facing the biggest financial crisis since its independence in 1948. Amid the ongoing economic emergency, Sri Lanka's President, Gotabaya

[27] FAO. 2019. The international Code of Conduct for the sustainable use and management of fertilizers. Rome. Licence: CC BY-NC-SA 3.0 IGO.
https://doi.org/10.4060/CA5253EN

[28] United Nations. "Black Sea Grain Initiative | Joint Coordination Centre." *United Nations*, 2022, https://www.un.org/en/black-sea-grain-initiative.

Rajapaksa, unexpectedly announced a ban on chemical fertilizers in April 2022, despite the fact that Sri Lanka's farmers are overdependent on fertilizers for the cultivation of their lands. The reasons behind this decision were the high prices in the international trade market of fertilizers and the need to minimize dependency on chemical fertilizers.

Farmers, having received no previous training in organic farming practices, started protesting. After the implementation of the fertilizers ban, farmers in the farming community of the village of Rajanganaya reported a 50% to 60% reduction in their crop harvest. After the protests, the Prime Minister announced his government would be reintroducing the fertilizer subsidy for farmers.

European Union (EU) Efforts to Tackle Food Insecurity

The EU has imposed economic sanctions against Russia and Belarus, thus restricting its trade relations with them. The sanctions are not directly imposed on fertilizer products, but they affect their global shipment. As a result of the trade restrictions, the global market faces considerable shortages in fertilizers, and countries outside the EU have limited access to Russian and Belarussian products. Major European fertilizer companies are facing severe difficulties in producing fertilizers, due to the high prices of natural gas.

On 9 November 2022, the European Commission introduced its program called *Communication on ensuring the availability and affordability of fertilizers*. The Plan included a variety of actions aiming at offering guidance to European countries on how to tackle the challenges that EU farmers and the agricultural industry face. The overall aim of the Plan was to maintain the resilience and sustainability of European food systems in the long run. The Plan further listed a number of good practices governments and farmers can endorse, to optimize their fertilizer use, including targeted financial support, improved market transparency, and investment in organic fertilizers. The EU's Plan was determined in helping Less Economically Developed Countries as well, by strengthening the global market's transparency in fertilizer production and distribution and providing humanitarian food assistance in vulnerable areas.

POSSIBLE SOLUTIONS

Minimizing Trade Restrictions Through Negotiations

Maintaining open trade to allow food, fertilizers, and other energy resources to flow from surplus areas to those in need, would be a crucial step toward alleviating the ongoing food and energy crisis. Though States may be unwilling to lift the

restrictions, pursuant to Russia's and Belarus' violations of international law, another solution would be negotiations. The Black Sea initiative was a result of negotiations facilitated by Türkiye and the UN. It would be of utmost importance that the UN continues to facilitate such negotiations between Russia, Belarus, EU member-states, private corporations, and countries strongly dependent on Russian products, to ensure global stability in fertilizers' distribution. Policy coordination wordlwide

Improving Global Market Transparency

Additionally, improving the fertilizer global market transparency would be a major step toward alleviating the adverse impact of the war in Ukraine on the agricultural community. Countries can contribute to the ongoing international initiatives concerning the distribution of fertilizers, including the Group of Twenty's (G20's) Agricultural Market Information System (AMIS), an inter-agency network established in 2011 and working to increase transparency in the food market and promote crisis-related coordination globally, and the EU's Plan of Action. Particularly, member states, in close collaboration with the WTO could establish and strengthen existing information exchange, and policy monitoring mechanisms with a view to enhance transparency in fertilizers trade and mitigate supply chain and food security risks.

Sustainable Management of Existing Fertilizers Shortages

The sustainable management of existing limited fertilizer shortages would be an efficient solution to implement towards alleviating the adverse effects of the fertilizer crisis and achieving the 2030 Agenda in the long-run. Under the auspices of the FAO, the IFA, and the UN, a framework can be established, which will enhance existing guidelines and will further assist member states, private companies, and farmers in sustainable fertilizer management and use. Financial support is also needed for projects and campaigns, to inform farmers on soil education and sustainable farming methods and practices, including sustainable management of fertilizer shortages, use of compost and manure, crop rotations, etc. Such measures will strengthen and promote sustainable and effective farming methods.

Investment in Sustainable Fertilizers and Sustainable Agriculture

Investing in climate-resilient agriculture, through the development of sustainable and environmentally friendly fertilizers will be fundamental to increasing future harvests. Member States are encouraged to support UN-coordinated efforts to develop innovative systems that promote an increase in organic and bio-fertilizers, and fund research programs on new sustainable production methods. Furthermore, the IFA could monitor the fertilizers' sustainable production, evaluate the progress made by its members in this field and make needed recommendations.

Collaboration with the relevant UN Agencies, including FAO, the UN Development Programme (UNDP), and UNEP could help member states increase their capacity and become prepared to encounter the adverse environmental impact of fertilizers, as well as the effects of climate change. A suitable measure would be to focus on low-cost, high-impact actions, such as investing in new crop varieties, improving water management, and information dissemination. The promotion and use of soil nutrient maps would also be essential in improving the efficiency of fertilizer use. This could help farmers deal with the rising prices of fertilizers while boosting productivity. Additionally, governments could take appropriate measures to invest in global research partnerships to develop innovations and other alternatives to chemical fertilizers.

Providing financial aid and enhancing farmers' role in the decision-making process

Amid the ongoing energy and fertilizer crisis, members of the farming industry could receive financial aid from their governments and Intergovernmental Organizations or other NGOs, to face the challenges of rising prices in the agriculture sector. Especially farming communities in LEDCs could be financially supported through the monthly distribution of a certain amount of money. This will offer them the opportunity to purchase new technological equipment and bio-fertilizers that will help boost their production while respecting the environment.

Additionally, farmers' participation in the decision-making process could be further enhanced. For instance, the World Farmers' Organization, in collaboration with governments, national farmers' organizations, and global agricultural cooperatives could establish a framework for the farmers' active involvement in policy-making meetings.

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