Global Grains Dilemma Specifically Focusing on Wheat

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Abstract. Global wheat crisis continues to be experienced, something that seems not to end any time soon with the causing factors remaining constant. The report highlights some of the factors that continue to influence wheat crisis across the world. Some of these factors discussed include the increased oil prices which continue to put more pressure on the production cost. There are also major producers holding stock policies that continue to influence the global wheat supply. Another factor discussed is geopolitical factor, specifically the continuing war in Ukraine, one of the biggest producers of wheat around the world. The report further focuses on government interventions, such as tariffs which come with a lot of restrictions that can influence wheat supply. Lastly, the report has focused on demand related to wheat, highlighting factors such as increasing population, growth of income especially in developing countries and values for the United States dollar.

Keywords: Global Grains, Wheat, Supply-Demand Analysis, Geo-political, Government Interventions.

1. Introduction

The Globally, a lot of countries continue to experience shortage of cereals and other food staffs. The reason for this shortage has been blames for various reasons, the recent one being the continuing war in Ukraine. However, in the 21st century, the demand for cereals has been on the rise, while the production has not improved due to factors such as climate change. As such, the increased population continues to put more pressure on the demand, yet production have not improved, and in fact, it continues to reduce, something that has made the cereal crisis even more badly. Cereals remain highly traded commodities globally since they are part of basic foodstuffs. In recent months, the prices for grains, led by wheat, have been on the rise, leading to an increase in the prices of basic food commodities. From early, cereal prices surged by 56.2 percent, with wheat 15 percent off the record high average in April 2010. Even though a lot of focuses have been on the issues of climate change, many non-climate stressors continue to put extreme pressure on our food system. In the recent past, all eyes have been on wheat shortage, as experts warn, this could spark a global food crisis. The global wheat supply in under extreme pressure sues to the continuing conflict in Ukraine and the devastating weather events which continues to threaten wheat production across the world. This report identifies the factors that influence global demand and supply of wheat, with particular attention to production, consumption, trade patterns, and global stocks.

2. Supply related Wheat Dilemma

2.1 Oil prices

Oil prices are closely linked to wheat prices for two main reasons; Firstly, oil is a key input cost for grains considering the levels of mechanization, such as tractors and combined machines. Consequently, higher energy costs increase the cost of manufacturing production elements like fertilizer. In addition, oil affects the price of transporting grains across the world [1].

The oil market influences wheat prices in two ways: first, through production inputs, and second, through the need for biofuels and the ensuing substitutions impacts. The cost of crude oil affects the price of fertilizers, farming equipment, and delivery, influencing the wheat price. We attribute the greatest effect on commodities prices, especially wheat, less to biofuels over the past few decades and more to these factors associated with fluctuating energy costs. However, biofuels can also impact

wheat prices because of how demand for biofuel rises with rising oil prices, diverting resources away from wheat and into energy crops like maize. Due to increased competition for arable land, wheat output has declined, contributing to price increases and volatility [2].

Energy policy has also been in flux due to changes in the market. Incentives like production subsidies and renewable fuel quotas have been put in place in countries like the EU, the US, and others with sizable agricultural sectors to promote biofuels, which has led to a rise in demand for biofuel input crops. Commodities price increases in recent years can be traced back in large part to the effect of biofuel mandates and related policies. Researchers have examined and described agricultural commodities and crude oil prices [2].

2.2 Major producers of wheat stock holding policies

Currently, global wheat consumption exceeds production, and 2022/23 is likely to decline further. International export is projected down compared to 2021/22. Exporters are holding stocks that are correlated with market prices. For example, Russia is projected to decline as export demand for Black Sea wheat remains significantly viable. The United States continued experiencing a six-year decline since 2013/14. Keeping wheat in storage necessitates putting off consumption and spending money on warehouses. The hope that grain will increase in value is essential to any stockholding investment. Several economists have devised optimal storage rules based on straightforward theoretical models to address this problem [3].

If there is a 10% drop in wheat supplies, the bottom 10% of the income distribution will see a 40% reduction in wheat spending due to the higher prices and the resulting loss of jobs. However, the highest 5 percent of the income distribution only saw a 1% real drop in food grain expenditures with the same decline in production. [4] The impoverished, however, are the least able to endure such hardships. The poor spend a disproportionate share of their income on food, so they cannot afford as much wheat when prices rise because of shortages.

Meanwhile, the well-off respond to the scarcity by cutting back on other purchases, which hurts the economy and makes it harder to hire people. In fact, malnutrition worsens when food supplies drop below a certain level, as they do for the impoverished [3]. In light of this, stabilizing food costs and availability is a crucial step in bettering the lives of the poor. Several facets of this issue have been the focus of IFPRI studies. [4]. During 2020–22, only a small number of developing countries experienced a substantial burden on foreign exchange resources due to fluctuations in world prices of wheat imports. Many more experienced a heavy duty on foreign exchange resources due to changes in domestic production. Even without new global policies, there will likely be significant stockholding in the global wheat market. The outlook for stock holding is not gloomy even though there is room for improvement through measures like information sharing, constraints on export bans, or enhanced responsiveness of developed nation demand to world supply swings.

The commercial stockpiling of wheat will readjust to the new circumstances of the global wheat market. As a result, if the poor were not excluded from the market so easily, their increased demand would cause greater volatility in international prices and a concomitant rise in stockpiling. That is why extreme poverty, rather than market flaws, is the real reason the poor consumption fluctuates. Equities that would have been retained otherwise would be partially replaced by an international effort to raise public stocks. It is important to remember that even if national and international stockpiles are not very effective, they are still better than having no program. Protecting the poor from the hardships brought on by weather and price fluctuations requires a combination of effective domestic and international programs [4].

2.3 Geo-political factors

The invasion of Russia on Ukraine has greatly impacted the wheat supply because Russia is one of the major producers of Wheat among other former Soviet Union countries. According to World in Data, Ukraine exported approximately 8.9% of the world's Wheat, with Russia at 14%. With sanctions, the global supply chain of Wheat from Russia has been affected. A worldwide issue of wheat being

grown in the wrong regions has been identified. Indeed, Ukraine is still producing the grain, at least for the time being [5]. Still, estimates place the fate of more than 55 million tons of wheat, the total quantity produced by Russia and Ukraine combined, in limbo due to the ongoing conflict. And the most pressing issue for the war-torn nation is not how to manufacture it but rather how to export it. Ninety percent or more of Ukraine's wheat exports leave the country via the Black Sea. But now, Russian troops are besieging the ports, so the government has to convey its goods by rail, barge, or truck, which can only handle a fraction of the exports that cargo ships can.

According to a study conducted by McMichael, the globe is preparing for the effects of a possible global wheat crisis as the violence escalates and the situation grows more dangerous. Farmers in Ukraine have been unable to plant crops, putting in danger 30–40% of the autumn 2022 harvest, according to the United Nations. Because of this, between 19 and 34 million tons of export production could be lost this year [6]. And if the conflict drags on, that number may rise to 43 million tons, which is the daily calorie intake of over 150 million people. However, another issue is endangering wheat harvests in Russia and Ukraine. About a third of the ammonia and potassium exports in the world come from these two countries alone. The Ukraine–Russia conflict has caused a shortage of key raw resources, resulting in a nearly 30% price increase. In addition to driving up the price of electricity, sanctions on Russia have also increased the cost of fertilizers.

The Mediterranean basin has a long and troubled history of serving as a flashpoint for international tensions. Because of its strategic location at the crossroads of three continents, Europe, Africa, and Asia have all used it as a gateway and buffer zones of influence for centuries. The hegemonic power projections of its civilizations served as examples in other regions (McMichael). The Mediterranean was a hotspot of combat between the superpowers and their allies during both World Wars, and it continued to be a theater of war during the Cold War. It drew in many of the riparian states in the area. In the twenty-first century, with its shifting landscapes and actors, many scales, and aspects of safety, securitization persisted long after the end of the East-West struggle [5]. Soft security issues, such as those related to energy, environmental degradation, climate change, resource scarcity, development and population increase are typically thought to exacerbate and compound into hard security risks, which may drive instability and violent conflict. According to Herzberger et al., natural disasters, water and food shortages, human migration, competition, energy transition, and cooperation are only some of the many geopolitical dimensions of climate change.

2.4 Government interventions

Some governments are imposing tariffs on wheat importation, which continues to influence the global supply chain. Wheat import tariff shifts have far-reaching connections across the economy. Due to the reduction of the wheat tariff, wheat imports have grown, while imports in other agricultural, industrial, and service sectors have decreased. As a result, the domestic price of wheat might drop if imports increase. The net result is a rise in investment, a fall in private consumption, and a better GDP, trade balance, and investment [7].

Wheat consumption rises while domestic output is highly erratic and insufficient to meet growing demand. It is suggested that to reduce wheat consumption, the domestic traditional grain food business should be encouraged to innovate in convenient and fast meals. Maintaining a steady exchange rate that balances fostering sorghum exports and wheat imports is essential. That's why more money needs to be put into stabilizing and expanding wheat output to solve the problems that have plagued agriculture.

According to Cariappa et al., the availability of staple crops is reduced due to trade restrictions, which impacts prices. Several economic and agroecological models have been utilized to investigate the consequences [8]. As a result, it is anticipated that the regions that are already the poorest and have the highest rates of food insecurity will experience the greatest reduction in agricultural incomes.

3. Demand related Wheat Dilemma

3.1 Population Growth

The world population has been increasing, putting a lot of pressure on wheat. Since the supply seems to be reducing, the current production cannot sustain the increasing population. Wheat food needs at current average consumption levels would necessitate an extra 132 M MT yearly by 2050 to accommodate population growth. Simultaneously, the pressures of climate change, a lack of natural resources like land and water, and a rising population are becoming more obvious [9].

Rising land demands mean narrowing yield gaps will remain an ongoing priority. A significant amount of water (1 liter per 1 kilogram of grain) is required to grow wheat. The Indus and Ganges River basins in India, Pakistan, and northeastern China have a very large, unsustainable blue water footprint. The growing water scarcity underscores the ongoing importance of making policy, agricultural, and management changes to maximize water use efficiency and productivity. Environmental concerns have been voiced in response to the increasing use of chemical fertilizers in intensive wheat farming. Improvements in sustainable intensification and climate change mitigation are being sought after in response to low nutrient use efficiency, which has remained at about a third for the past quarter century, especially in China and India [10].

If the growth rate of 1.3% in the global population remains unchanged, the global population will double during the next 50 years [11]. Global cereal yields and agricultural output have fallen since 1961. Food output fell in 51 developing nations between 1979 and 1987, while it rose in only 43.

About one in every ten people on Earth, or about 36 million, are food insecure and struggle to make ends meet daily. Several factors, including climate change, the decline of agricultural diversity, and the spread of cities, impact farm output. Global per capita grain production is falling. Africa is particularly hard hit, with a 12 percent drop in grain production since 1980. Africa can only provide about 80% of its food needs [10].

There should be an increase of 3-5% in agricultural output yearly, as most countries' average yearly population growth rate is around 2-3%. We conclude that if the current pace of production is maintained, crop production per person will fall by the year 2050. It's unlikely that crop yields could be increased by a factor of three. Gutiérrez-Moya et al. argue that Food insecurity may get far worse than anyone anticipates. Different academics have different points of view. Some experts, like the Neo-Malthusians, argue that we can only prevent this disaster by slowing the rate at which our population expands, while others say we need to reduce food production instead.

3.2 Growth of income in developing economies

The majority of low-income countries are now moving to middle-income countries, meaning that the purchasing power of these countries continues to increase. Global Wheat consumption is projected to decrease by 3 million to 788 tons compared to the previous year as feed and Residuals are s offset by higher food, seed, and industries [11].

Russia and Ukraine are critical suppliers of food for certain developing economies. For a select group of nations in Europe, Central Asia, the Middle East, and Africa, these two countries account for more than 75% of their annual wheat imports [2]. If Russia and Ukraine suddenly stopped producing or transporting grains and seeds, these economies would be extremely hard. Increased hunger and food insecurity may result from supply chain disruptions and subsequent price hikes in nations with lower per capita incomes.

Many economies with low and moderate incomes may find it more challenging to recover from the effects of the Ukraine crisis. Trade shocks, financial turmoil, remittances, and the flight of refugees are only some potential pathways for the fallout, in addition to increasing commodity prices. Strong trade, economic, and migration linkages to Russia and Ukraine mean that countries closest to the crisis will likely suffer the greatest immediate hardship. However, the consequences may not stop there [7].

Given the region's reliance on wheat imports from Ukraine and Russia and the spike in costs, which makes it harder for people to afford food, the war has also heightened concerns about food insecurity. Food insecurity is exacerbated for the poor since they spend a larger percentage of their income on necessities like food. As a result, poverty, inequality, and the potential for social instability will all worsen [11].

The rising commodity prices will severely impact the external accounts of countries relying on oil imports [2]. To the tune of 1% of GDP, we expect a deterioration in the current account balances of these countries. Roughly 1.2 percent of GDP is the average amount low-income countries' current accounts will worsen due to increasing wheat prices.

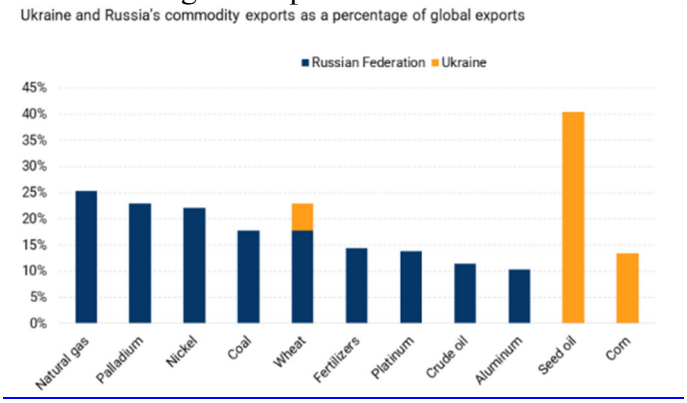

Fig. 1 Some developing economies are heavily reliant on Russia and Ukraine for food

Source: Brookings.edu:https://www.brookings.edu/blog/future-development/2022/03/08/developing-economies-must-act-now-to-dampen-the-shocks-from-the-ukraine-conflict/

3.3 Value of US Dollar

The dollar is the de facto reserve currency of international trade. So, like with other commodities, wheat prices are quoted in US dollars. When the US dollar is strong, grain sellers get paid less for their commodity, and when it's weak, they get paid more. Wheat prices are negatively affected by a strong US currency and a weak US dollar [12]. The United States dollar is the primary reserve currency used throughout the world.

As a consequence, the price of wheat and the price of other commodities is expressed in US dollars. When the value of the US dollar is high, sellers of wheat earn fewer dollars in exchange for their items, whereas buyers of wheat receive more dollars when the value of the US dollar is low. As a result, a strong dollar in the US brings down the price of grain, while a weak dollar in the US brings it up [13]. Wheat prices will continue to be quoted in US dollars for the foreseeable future because the United States is the world's largest wheat exporter.

The dollar's strength typically correlates negatively with commodity costs. Historically, commodity prices had fallen when the dollar strengthened against other major currencies and risen when the dollar's value fell versus other important currencies. It is not an absolute law, and the correlation isn't perfect, but there is typically a substantial inverse link over time. The Commodity Research Bureau (CRB) Index plots the price of a basket of commodities against the U.S. dollar index. This index measures how well the dollar performs compared to other currencies [12].

Most commodities are priced relative to the dollar's value, so fluctuations in the dollar's value significantly impact commodity prices. The dollar is the world's de facto reserve currency. Since the dollar is usually the safest form of foreign exchange, several countries keep large amounts of dollars in reserve. The US dollar is the de facto standard for currency conversion in the global trading of raw resources. When the dollar's value falls, goods cost more to purchase with American currency. And when the dollar declines, other currencies become cheaper to buy.

Commodities are considered global assets, which contribute to the dollar's power. They have a global reach in business. Dollars are used to acquire agricultural and energy products from the United States. With a weaker dollar, people can buy more with their money because a given quantity of their

currency will buy them a larger dollar amount. Demand rises as prices fall, according to conventional economic theory.

4. Conclusion

The global grain dilemma is a widespread issue. Factors contributing to the Dilemma include geo-politics, trading patterns, government interventions, production levels, consumer income that affects the demand and supply, and government policies.

The scenario shifted dramatically in February of 2022 when Russia invaded Ukraine. Wheat shortages have been predicted by analysts ever before the war started. At first, they worried that local and national supply lines would be disrupted because Ukrainian farmers wouldn't be able to harvest all crops or even grow new ones this year. Nearly four months into the conflict, though, its influence is becoming more apparent and may threaten wheat supply worldwide. While wars cause starvation in the countries immediately involved, their effects on the global food supply will only become evident much later. There is about to be a worldwide food shortage. However, things are more difficult than they appear at first glance.

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