

# The Impact of Covid 19 Pandemic on the Grains Sector

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**Abstract:- COVID-19 has affected every sector of the domestic and global economy, of which the agricultural sector is not left out. The pandemic has resulted in the adoption of various approaches, including restriction of movement, social distancing and lockdown of measures to curb the spread of the virus. As a result, agricultural activities were slowed down. The main goal was to demonstrate the different ways in which the lockdown and social distance measures have affected the grain supply chain and the prospects of the grain sector during and after the pandemic. The study used a qualitative approach to determine the impact of COVID-19 on grain production by analyzing secondary data. The impact of the COVID-19 lockout on the global agriculture and overall food system was also examined. The study findings revealed the full magnitude of the pandemic's impact and illuminated the argument over on-grain production and food security in the future by identifying the short-, medium-, and long-term impact of COVID-19 on grain production. The conclusion of this paper outlined the future of grain production during and after the pandemic of COVID-19.**

**Keywords:- Grain Production, Food Supply, COVID-19 Pandemic.**

## I. INTRODUCTION

Nigeria's economy is mostly based on farming. Small-scale farmers spread throughout a large amount of land, with each farm possessing between 0.5 and 3.0 hectares of land. Low capitalization and a low yield per hectare describe this type of farming (Ismaila *et al.*, 2010). Despite the critical importance of the oil sector in Nigeria's economy, agriculture continues to play a vital role. Nigeria's largest source of employment is agriculture, which accounts for more than a third of the country's GDP and labour force (Ismaila *et al.*, 2010).

Cereals are the Poaceae family of grasses, which have been the world's primary food source for the past 10,000 years (Pu and Zhong, 2020). Cereals such as wheat and barley have been grown for millennia. They were first cultivated 10,000 years ago in Mesopotamia's fertile crescent, covering portions of Turkey, Syria, Iraq, and Iran (Pu and Zhong, 2020). More than two-thirds of the people eat some form of grain every day, whether it is rice, maize, wheat, oats, or sorghum (Awika, 2011). Africa is a major supplier of various grains (cereals) to the world, according to Taylor (2016). Rice, finger millet, pearl millet, and sorghum are among the most common grains in Africa. Grain crops are grown on 98.6 million acres (ha) worldwide and yield 162 million tons (Taylor, 2016). Sorghum is the

world's second-largest cereal crop, accounting for 22% of all cereal land. Pearl millet is only appropriate for use as a subsistence crop, despite its hardness. Over a 20-million-hectare area in Africa's semi-arid areas, 19% of the world's pearl millet is harvested. In Nigeria, significant cereal crops such as millet (wheat), sorghum (sorghum), maize (corn), and rice are grown, with rice accounting for the sixth largest land area and sorghum accounting for half of total cereal production (Fakayode *et al.*, 2014).

In addition to providing calories, cereals are rich sources of protein, minerals (potassium and calcium), as well as a variety of vitamins (vitamin A and C) (McKevith, 2004). Foods made from cereals can be eaten in various ways depending on their ethnicity or religious affiliation. It can be used as a source of protein for livestock and the cultivation of microorganisms. For industrial use, wax syrup and gum are produced from cereals. Cereal crop wastes are used in a variety of ways by ethnic groups in Nigeria. The agricultural sector employs more than 70 percent of Nigeria's working adults directly or indirectly, and more than 90 percent of Nigeria's agricultural production originates from peasant farmers who reside in rural areas where 60 percent of the population reside. Farmers in this region are largely reliant on state assistance to obtain modern inputs like herbicides, fertilizers, hybrid seeds and irrigation (Ahmad *et al.*, 2015).

Farmers in rural areas can earn a living by selling excess food grains, proving that increased grain production has a direct impact on the socioeconomic values of rural areas (Ahmad *et al.*, 2015). The Covid 19 outbreak has wrecked havoc on the grain industry as well as the rest of the economy (Eftimovet *et al.*, 2020). Because of Nigeria's economic and social isolation, modern inputs like insecticides, fertilizers, hybrid seeds, and irrigation, typically imported, were unavailable to the vast majority of the country's farmers (Ajala & Gana, 2015). The goal of this study was to look at the long-term consequences of the COVID-19 epidemic on the grain crop. A research will be conducted in this regard to assess the grain supply chain prior to and during the COVID 19 epidemic, as well as the economic effects on participants. The following questions were the focus of this research: What impact has the COVID 19 epidemic had on grain production, availability, and distribution? What are the prospects for Nigeria's grain sector following the COVID 19 pandemic?

## II. LITERATURE REVIEW

### A. Effect of COVID-19 on Agriculture and food system

Ultimately, the impact of COVID-19 on agriculture and the food supply must be examined in terms of supply and demand (Farrellet *al.*, 2020). Despite the lockdowns in many nations, direct repercussions might be seen on the character of agricultural practices (Amjath-Babuet *al.*, 2020). Much economic activity stops when people are unable to move. Agricultural practices, on the other hand, are difficult to curtail. For example, the planting, harvesting and transportation of perishable goods must continue, as well as their sale (Aday S., and Aday M., 2020). Food industry inputs and outputs must be delivered on time. There should be an evaluation of both agricultural production and our food system.

For perishable crops, the immediate impact on agriculture was first noticeable at harvest time (Ceylan and Özkan, 2020). There was a glut of ripe and perishable crops, but the food system could not get them to the end-user (Ceylan and Özkan, 2020). First, the epidemic hit nations with Mediterranean climates (Arounaet *al.*, 2020). As a result, their economies are heavily dependent on agriculture in these countries. Because these countries supplied food to the rest of the world, the outbreak was a severe danger to food security (Farrellet *al.*, 2020).

When harvesting was in jeopardy, lockdown procedures were implemented. As far as the northern hemisphere was concerned, this was not a major issue (Arounaet *al.*, 2020). A lack of labour had led to a decrease in the harvest of perishable crops, such as vegetables and fruits (Ceylan and Özkan, 2020). Agricultural businesses in southern Italy were found to benefit from the use of temporary labour. Based on the findings, farms that relied more on family labour appeared to be more resilient than those that relied on outside labour (Ceylan and Özkan, 2020). It was not just southern Europe that was affected by limits on labour mobility. Some of the farms in the UK that relied largely on seasonal labour, many of which were involved in animal breeding, were severely damaged by the lockdown (Jhaet *al.*, 2021). Farm operators suffered productivity and marketability losses due to these restrictions, but so did their workers. This labour shortage in India affected many agricultural items like watermelons (Ceylan and Özkan, 2020).

Due to this, delayed or disrupted harvests resulted in a loss of farm or labour income and posed a threat to food availability (Harris et *al.*, 2020). In Indonesia, for example, the predicted loss in domestic agricultural supply in 2020 was 6.20 percent, but the expected reduction in agricultural labour was 4.87 percent (Harris et *al.*, 2020). This means that the loss of product value is greater than the loss of labour pays. This will lead to a decrease in agricultural income, which will lead to a rise in farm prices and a decrease in household income. In Pakistan, for example, migrants make about 70% of the workforce needed to cultivate wheat.

Food supply reliant on international transactions was also affected by these difficulties. Exporting countries will face the same issues with labour mobility, transportation issues, and rising pricing. Due to sickness, farmers could not move products and obtain materials such as pesticides or feeds (Henry, 2020). Some nations have announced exemptions for transportation of pesticides and seeds and final products, such as India, while farmers in many other countries are still unable to access input or sales markets (Henry, 2020). However, the routes had been altered, making it difficult to transport perishable fruits and vegetables on time. There was a break in the chain of command between producers and consumers. As a result of marketing and logistical difficulties, farmers have been hesitant to continue production and harvest activities. Similarly, this holds for the production of livestock. 38.5 percent of the challenges faced by Indian breeders as a result of the COVID-19 epidemic were logistics-related, according to a survey. The logistics issues faced by all agricultural businesses were 35.6%, indicating a higher level of devastation for animal breeding industries.

Russia and Romania for wheat, Thailand, Cambodia, and India for rice enacted trade restrictions to ensure national food security (Ceylan and Özkan, 2020). Thirty-five countries applied export restrictions on May 1, 2020 (Ceylan and Özkan, 2020). By the end of March 2020, Vietnam will stop selling rice to rice importer countries, directly impacting rice prices and food security (Ceylan and Özkan, 2020). Even after China and the United States signed a trade agreement in January 2020, the soybean export market in the United States was not fully recovered (Ragasa and Lambrecht, 2020). Due to food security and transportation problems, the key suppliers did not want to export despite the efforts of several countries.

### B. The significance of cereal production

The majority of grain crops (cereals) are grown for their edible seeds, which are largely grasses and sedges. Cereal grains provide more nutritional energy to people throughout the world than any other crop (Awika, 2011). Total crop output in 2016 was 2577.85 million tons, according to Papageorgiou and Skendi (2018), while coarse grain production was 1330.02 million tons (cereal grains other than wheat and rice used mostly for animal feed or brewing). Wheat (*Triticum aestivum*), barley (*Avena glauca*), oats (*Avena arvensis*), and triticale (*Sorghum*) are all classified as "cereals" because they belong to the Gramineae family (*Hordeum*). As of 2014, the most common cereals in the world were: corn, rice, wheat, barley, oats andrye (Awika, 2011).

According to Mesterházyet *al.* (2020), grain products account for over 80% of the average diet in most of Africa and Asia, up to 50% in central and western Europe, and between 20% and 25% in the United States. Cereals, which are abundant in protein, minerals (potassium and calcium), vitamins (vitamins A and C), and fibre, provide nutritional energy (Lizarazoet *al.*, 2015). Different ethnic and religious groups consume cereals, from pastes to noodles to cakes to bread to beverages. Raw plant material such as stems and leaves as well as other wastes (after processing). In

producing wax syrup and gum, grains are required (Ingvordsen *et al.*, 2015).

### III. METHODS

The research relied only on secondary data. A secondary source of data is information that is not directly related to the primary source of data. As a result, this study relied on secondary sources such as published works critically studied to grasp the subject matter better. In this study, a qualitative research design was used, which is generally an exploratory research technique. Studying the motivations and beliefs that underlie one's behaviour is an important first step in developing research questions that can be examined in further depth. The non-rigid and flexible aspect of the exploratory design was used to explore various data paths without any severe constraints and applicability, as normally done in quantitative research methods. A descriptive research approach was also used to describe crop protection goods, plant health, and agricultural productivity. The descriptive design was utilized to establish facts and correlations between the variables under investigation.

### IV. FINDINGS

#### A. Impact of COVID-19 on Cereal Production in the Short Term

The present pandemic has had the greatest impact on the poorest and most vulnerable people. Subsistence farmers and smallholder farmers' enterprises are part of this group. In the short term, the COVID-19 pandemic directly influences grain production systems because of governments' nearly universal lockdown response (Nchanjiet *et al.*, 2021). As a result of this, farmers, farm labourers, agricultural service providers, extension agents and other food system actors have been unable to carry out their duties (Brewin, 2021). A lack of timely planting of cereal crops, the use of the best quality and quantity of inputs (such as seeds, fertilizers, pesticides), a variety of cultural approaches, and harvest and post-harvest activities are all limited due to the pandemic (Brewin, 2021). As a result, those who need the predicted agricultural output cannot obtain it when and where they need it most. However, while some have suffered short-term losses, the long-term effects on more vulnerable smallholder farmers are even more severe (Hobbs, 2020).

There are disruptions in the market and related services, such as transportation, resulting from this. High-value cereal producers with labour-intensive supply chains, such as those producing perishable goods, are particularly at risk (Brewin, 2021). Due to decreased labour mobility, high-value crops are left to rot in the fields, and without proper storage facilities, these items become unmarketable before they can be sold (Luckstead, Nayga, and Snell, 2021). Some countries have seen shifts in market demand and consumer behaviour (for example, increased demand for staples and canned food with longer shelf lives). Therefore, COVID-19 increased the risk of food spoilage, especially for fresh produce (Nchanjiet *et al.*, 2021).

Agriculture and food production have been deemed essential services in many countries, and farmers have maintained access to markets and high demand for nutritious food. For the time being, markets for exporting fruits and staple cereal crops like rice, wheat, and sorghum are open, but the global trade performance of other agricultural commodities has been unpredictable (Luckstead, Nayga, and Snell, 2021). Since the shutdown of factories, demand for some cereal commodities, including wheat and millet, has decreased (Panet *et al.*, 2020).

Pandemic has impacted public services supporting crop production, such as extension diagnostics and official support services such as field visits, coordination meetings and pest monitoring (Panet *et al.*, 2020). For farmers, these services are essential in ensuring that their livelihoods are sustainable. Agriculture has been considered crucial in specific cases, and concessions have been given. Despite this, many countries' support services have been affected by a decrease in people mobility. Many developing countries' ability to monitor crop fields and plant pests and diseases has been significantly impacted due to a drop in staff numbers, reduced state budget, and travel restrictions (Hobbs, 2020).

The COVID-19 pandemic has already wreaked havoc on a large number of low-income and otherwise vulnerable homes. It is possible to reduce the risks to global food security by acting quickly and in concert with other countries. In order to avoid a humanitarian crisis, global food supply systems and trade must be permitted to run freely around the world.

#### B. Impact Of COVID-19 On Grain Production in The Medium and Long Term

The scarcity of inputs has been seen in the medium term as a result of the COVID-19 disruptions. For example, a lack of quality-assured seeds has resulted from not planting or harvesting at the appropriate times or failing to undertake mandatory field inspections (Fan and Zhang, 2020). As their production is disrupted or input-related enterprises go under, this scarcity has been duplicated with other inputs. Research and development have been disrupted because of the potential for catastrophic consequences. A lack of trials and data collection and harvesting at the appropriate times have prevented institutions from releasing novel crop varieties or providing evidence-based extension instructions (Singh *et al.*, 2021). As a result of poor management of genebanks (seed, in vitro, and field), vital sources of characteristics for improving our crops have been lost.

Some of the short-term effects have a long-term effect on the economy. A prolonged economic downturn has impacted farmers' ability to purchase inputs and other goods that they do not produce (Hobbs, 2020). Farmers have lost an important incentive to produce food as consumers no longer can demand it. Many small and medium-sized businesses, especially those that support or rely on crop production, have been wiped out due to the domino effect of COVID-19 (Luckstead, Nayga, and Snell, 2021).

### C. Impact of COVID-19 on Global Supply of Grain Products

Lockdowns in response to the COVID-19 outbreak sparked concerns about food supply chains (Lin and Zhang, 2020). Consumption of quarantine food led to the temporary depletion of shop shelves around the globe and concerns about the availability of food (Gray, 2020). For this reason, this study looked at the impact of export restrictions and transient surges in global demand on three key exporting countries for each of the three main basic crops. Each country contributes more than 13 percent of global wheat, maize, and rice production and more than a third of global rice exports when combined. In accordance with the World Trade Organization's prohibition on export limits, large exporters frequently restrict shipments to safeguard their home markets from global price volatility and as a preventative measure when harvest failures loom (Lin and Zhang, 2020). Food stockpiles presently stand at a high level, but export bans and aggressive stock-up efforts can still skyrocket grain prices (Gray, 2020). From January to October 2020, the International Grains Council's wheat, rice, and maize commodity price indexes grew by 12%, 15%, and 26%.

This article simulated an export ban by assuming that three of the world's top grain exporting countries would impose complete export restrictions, decreasing the amount of grain traded worldwide by their respective percentages of global exports for the entire agricultural year. They predicted a 70 percent spike in wheat prices in this scenario (2020), higher than the increase seen in 2007/08. Price increases of 40 percent and 60 percent would be seen in the case of maize and rice under this scenario. More than a third of the yearly grain supply of many poor and middle-income countries in Africa and Asia would be lost in a quick depletion if domestic stores were depleted (Akbulaev, Mammadov, and Aliyev, 2020). Poverty countries may be unable to compete with richer imports when global markets are constrained. Thus, many low-income nations subject to increased trade restrictions during the COVID-19 outbreak face domestic agricultural production issues due to their large agricultural worker population. Consequently (Ellebyet *al.*, 2020). Wheat, maize, and rice prices would climb by 90 percent, 100 percent, and 50 percent, respectively, if there was a modest increase in demand (say, driven by rich importers storing in addition to export restrictions and production shortages) (Ellebyet *al.*, 2020).

### D. Effect of covid-19 on cereal production in Nigeria

According to a Global Agricultural Information Network (GAIN) report from the US Department of Agriculture (USDA), Nigeria would continue to rely on grain imports for food security as the country is confronted with limits on the coronavirus (COVID-19) and currency devaluation. Wheat production in the United States is expected to decline by 8% in the 2020-21 marketing year to 55,000 tonnes (Ayanlade and Raden, 2020). Wheat is normally planted in November and harvested in April in Nigeria, where farmers do not reside on wheat farms (Obayeluet *al.*, 2021).

According to the USDA, on March 30, 2020, Nigeria was placed under a COVID-19 lockdown, which restricted access to wheat farms and caused increased post-harvest losses. In the 2020-21 marketing year, wheat imports are estimated to reach 4.9 million tonnes. The Nigerian government's restrictions on wheat imports are driving up the price of flour and reducing demand for bread and other wheat-based products. Lockdown measures imposed by COVID-19 also affected Nigeria's ability to produce corn (Ayanlade and Raden, 2020).

According to Obayeluet *al.* (2021), to meet the food need in the future, it would be necessary to import 5.6 million tonnes of grain from abroad. According to the USDA, the shortage of storage space in Nigeria and the import ban that went into effect in July 2020 are causing problems. Imports of corn allowed by the USDA are used to make the USDA's current projection. Compared to the previous year, rice production is predicted to fall 3% to 7.8 million tonnes in the 2020-21 marketing year. Measures from COVID-19 restricted access to rice fields throughout the planting period of March and April of this year. For the 2020-21 marketing year, Nigeria's rice exports are predicted to rise marginally to 1.75 million tonnes, compared to the 1.2 million tonnes exported in the 2019-20 marketing year.

### E. Prospects In Grain Production in Nigeria

#### a) Economic Stability

Rice demand is expected to continue to grow at a rapid pace. Demand for rice is expected to expand by an extra 116 million tons by 2035. About 30 million tons more rice would be needed in Africa by 2035, representing a 130 percent increase in rice consumption from 2010. One-third of this additional rice will be needed in Nigeria alone (Uchenunu and Ngonso, 2020).

Recent years have seen a 9.3% yearly growth in Nigerian grain production, primarily due to an increase in rice area (7.9% annually) and a slight yield improvement (1.4% annually) (Ayanlade and Radeny, 2020). Despite this, Nigeria's increased grain production falls short of meeting the country's rising demand for grain (Ojediranet *al.*, 2021).

Due to the commodity's strategic importance, the Nigerian government has been aggressively intervening in the country's rice economy for more than forty years. Because of regime shifts and shifting priorities, these policies have not been consistent. Example: Imports were considered prohibited between 1986 and 1990 but authorized in 1995 at 100% duty. Import taxes were cut in half in 1996 before being raised to an even higher rate in 2001, a whopping 85 percent (Ojediranet *al.*, 2021). Because of currency shortages and the country's economic downturn, rice-growing became a top focus for many of the country's businessmen as the tariffs rose and fell. In 2016, the government finally decided to restrict rice imports altogether. Although rice is still being imported illegally, the federal government takes appropriate steps to combat this through Nigerian customs. If this program is maintained, Nigeria might become self-sufficient in rice production and export it to other countries.

## b) Job Opportunities

In Nigeria, agriculture is a major source of employment for a large number of people. Approximately 70 percent of Nigerians earn their living as local farmers, traders, labourers, makers of fertilizer, farm implements and machinery, among others (Ayanlade and Radeny, 2020).

## V. CONCLUSION

This study sets out to assess the impact of the COVID-19 pandemic on the grain sector. It additionally examined how COVID-19 affects agriculture and the food system. As a result of the global pandemic's considerable impact on the supply chain of agriculture and agricultural inputs, it is vital to conduct studies on its overall impact on agriculture. There is a need to examine how the pandemic's actors dealt with this dynamic environment. The actual effects and patterns of interruptions induced by the pandemic, as well as probable future trajectories of progression, must be outlined in order to achieve this properly and accurately. Due to population and affluence-induced strains on food supply, grain production studies are also relevant worldwide and regionally.

There is no way to foresee how COVID-19 would affect our grain supply chains, but Nigeria has a significant advantage in terms of natural resources to grow grains and process and transport these crops. Near-normal production is expected based on current forecasts of grain production and market pricing. Roundtables established by the government to address supply chain issues of the past are ideal for coordinating supply chain activities within the business and between industry and government. The existing evidence is that Nigeria has a well-functioning grains industry and a good government actively engaged in growing the agriculture sector, which suggests that there is room for hope in the face of our uncertain future.

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