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Effects of COVID–19 Lockdown on the Distribution and Supply of Agricultural and Farm Inputs in Southeast; Nigeria

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ABSTRACT

This study investigated the effect of COVID-19 lockdown on the distribution and supply of agricultural and farm inputs in Southeast Nigeria. It therefore, assessed the impact of COVID-19 lockdown on the distribution and supply of agricultural inputs, identified agricultural inputs distributed during the COVID-19 lockdown, examined the challenges encountered in the distribution of agricultural inputs during the COVID-19 lockdown, evaluated the implications of shortage of agricultural inputs on agricultural production, and proposed strategies for effective distribution of agricultural inputs during COVID-19 or other disasters. Descriptive survey design was used for this study. A well-structured questionnaire was administered to 400 respondents. Data collected were analysed using frequency counts, percentages, mean and standard deviation. The study established that the COVID-19 lockdown adversely affected the distribution of agricultural and farm inputs in the study area. The most distributed agricultural inputs during the COVID-19 lockdown include improved seeds, fertilizers, pesticides, herbicides, veterinary drugs, animal feeds, and farm equipment. The effect of lockdown on the distribution of agricultural inputs resulted in production constraints such as low yield, high production costs, low income, low agricultural productivity, and food insecurity. The challenges faced in the distribution of agricultural and farm inputs during the COVID-19 lockdown comprised of disruption to transportation routes, disruption to supply chains, high transportation costs, and limited access to agro-inputs markets. The respondents suggested that boosting agricultural production requires strengthening agricultural supply chains, promoting local production of farm inputs, developing efficient transportation systems, creating agricultural input stockpiles, enhancing government agricultural support programmes, adopting digital platforms for agricultural input distribution, and encouraging partnership between the public and private sectors. The study concludes that there is a need to ensure effective agricultural input distribution system and emergency preparedness to avert the adverse effects of agricultural input shortage on agricultural production during emergencies such as the COVID-19 pandemic.

Keywords: *COVID-19 lockdown, agricultural inputs, farm input distribution, agricultural production, supply chain, Southeast Nigeria.*

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Introduction

Agriculture is one of the most important sectors of the Nigerian economy as it contributes significantly to employment, food security, poverty reduction, and overall livelihood. According to the [1], agriculture nurtures millions of people in sub-Saharan Africa, providing a primary source of livelihood and ensuring food security. For instance, agriculture occupies about a quarter of Nigeria's Gross Domestic Product (GDP) and contributes to the employment of more than a third of Nigeria's workforce [2]. Farm inputs play a critical role in agricultural production by supplying farm inputs such as improved seeds, fertilizers, herbicides, pesticides, farm equipment, animal feed, veterinary products, and farm advisory services.

Access to farm inputs ensures farms produce food for domestic consumption and surplus for commercial purposes [3]. The COVID-19 pandemic, which was declared a global health emergency by the World Health Organization (WHO) in March 2020, triggered nations to enforce strict lockdown measures to prevent the spread of the disease [4]. Lockdown restrictions caused disruption to transportation routes, free movement of people, commerce, and trade both within and outside Nigeria.

Southeast consists of Abia, Anambra, Ebonyi, Enugu, and Imo states and is one of the geopolitical zones that promote commercial agriculture, livestock production, agro-based industries, and intensive cropping.

Agricultural input dealers in the study area reported disruptions to transportation networks and high logistics costs, leading to limited farm input supplies, especially of imported products, during the COVID-19 lockdown. Farmers faced adverse effects of the prolonged COVID-19 lockdown, including an inability to purchase quality farm inputs during the planting season [2] While several studies have shown the impact of COVID-19 on agricultural production, little is known on how the COVID-19 lockdown influenced the distribution and supply of agricultural and farm inputs in Southeast Nigeria. This study, therefore, examines the effect of the COVID-19 lockdown on the distribution and supply of agricultural and farm inputs in Southeast Nigeria.

The COVID-19 pandemic, which was declared a global health emergency by the World Health Organization (WHO) in March 2020, resulted in the implementation of strict lockdown regulations to prevent the spread of the disease. The lockdown restrictions affected transportation routes, free movement of people and commerce, and disrupted international and local trade of agricultural products. Farm input dealers and farmers in Southeast Nigeria experienced adverse effects of the COVID-19 lockdown, ranging from limited access to quality farm inputs during the planting season to high input costs [4]. Additionally, agricultural production was disrupted due to the restrictions on free movement of people and goods, resulting in limited land under cultivation, poor crop yields, and reduced crop production. Being one of the geo-political zones that promote commercial farming, Southeast relies on private dealers and agro-dealers to provide farm inputs to farmers compared to other parts of the country. The disruptions to farm input supply chains affected farmers' ability to purchase farm inputs from their private suppliers in response to the surge in demand for agricultural products due to the disease.

Although the Nigerian government has taken several initiatives to ensure that agricultural production is not disrupted during the COVID-19 pandemic, limited empirical studies examine the impact of COVID-19 lockdown on the distribution and supply of agricultural and farm inputs, especially in Southeast Nigeria. Information on the effects of the COVID-19 lockdown on agricultural input distribution and supply is vital for policymakers and other stakeholders to develop effective strategies for boosting agricultural production in response to future emergencies and controlling costs. This study, therefore, seeks to examine the effect of the COVID-19 lockdown on the distribution and supply of agricultural and farm inputs in Southeast Nigeria.Specifically, the study seeks to: a). examine the perceived effects of the COVID-19 lockdown on the distribution of agricultural inputs in Southeast Nigeria; b). ascertain agricultural and farm inputs distributed and supplied during the COVID-19 lockdown period; c). determine the effects of the COVID-19 lockdown on the supply of farm inputs to farmers; d). Identify the major challenges encountered by agricultural input distributors during the lockdown; e). assess the effects of input shortages on agricultural production in Southeast Nigeria; and f). recommend strategies for improving agricultural input distribution during future emergencies.The findings of this study will contribute to knowledge that will help policy makers, disaster managers and agricultural supply chain managers in Nigeria to make informed decisions regarding agricultural production, disaster management plans and agricultural supply chains. The study will help provide information on the impact of COVID-19 lockdown on agricultural input supply and distribution. This will inform policy formulation to enhance agricultural production in Nigeria.The study will add value to the Federal Ministry of Agriculture and Food Security, State ministries of Agriculture, agricultural input suppliers, development partners, extension agents, researchers and farmers. It will provide empirical evidence on weaknesses in the agricultural supply chain revealed during the COVID-19 lockdown. This will help these groups to improve the agricultural supply chain in Nigeria.The study will also add to knowledge on the impact of COVID-19 on the agricultural supply chain and provide a baseline for future similar studies. It will benefit researchers and students in related fields such as agricultural economics, rural development, food security and supply chain management.

Methodology

The study was conducted in Southeast Nigeria, which included Abia, Anambra, Ebonyi, Enugu, and Imo States. This region spanned approximately 29,525 square kilometers and was predominantly populated by the Igbo ethnic group. Agriculture served as a major economic activity, with farmers producing cassava, yam, rice, maize, vegetables, oil palm, cocoyam, poultry, and livestock. The distribution of agricultural inputs in the region relied on wholesalers, retailers, agro-dealers, transporters, and government agencies. This study adopted a descriptive survey research design, deemed appropriate as it facilitated the collection of quantitative data from respondents regarding their experiences during the COVID-19 lockdown. The survey approach also enabled the examination of relationships between the lockdown measures and disruptions in the distribution and supply of agricultural inputs. The population for the study consisted of registered agricultural input dealers, farm input distributors, extension officers, and smallholder farmers operating within the five states of Southeast Nigeria. A multistage sampling procedure was employed. Initially, the five states in Southeast Nigeria were purposively selected as the study area. Following this, Local Government Areas (LGAs) with significant agricultural activities were chosen. Simple random sampling was then utilized to select respondents from these sampled LGAs. A sample size of 400 respondents, including farmers, agro-input dealers, distributors, and extension officers, was determined using the [5] sample size determination formula to ensure adequate representation. The study utilized both primary and secondary sources of data. Primary data were collected through structured questionnaires administered to farmers, agricultural input dealers, distributors, and extension officers. The questionnaire contained both closed-ended and Likert-scale questions designed to capture respondents' perceptions regarding the effects of the COVID-19 lockdown on agricultural input distribution. Secondary data were obtained from published journal articles, government reports, publications from the National Bureau of Statistics, reports from the Food and Agriculture Organization, World Bank publications, and other relevant academic sources. The validity of the research instrument was established through expert review, while reliability was determined using Cronbach's Alpha reliability coefficient, with a coefficient of 0.70 or above considered acceptable. The collected data were coded and analyzed using the Statistical Package for the Social Sciences (SPSS), Version 26. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the research variables.

Result and Discussions

Perceived Effects of the COVID-19 Lockdown on the Distribution of Agricultural Inputs in Southeast, Nigeria

Table 1 showed that participants generally concurred that the COVID-19 lockdown had a notable negative impact on the supply of farming materials in Southeast Nigeria, with an average score of 3.22 surpassing the threshold of 2.50. They believed that the lockdown caused delays in delivering farming materials, disturbed the distribution of fertilizers and high-quality seeds, raised transportation expenses, limited access to agricultural input markets, and influenced government schemes for providing materials. They also acknowledged a decrease in the availability of pesticides, weed killers, and support services during the lockdown, leading to a decrease in the overall effectiveness of distributing farming materials. The relatively small variations in responses (0.84–0.92) suggest that participants' viewpoints were quite uniform on all aspects. This indicates a widespread agreement that the COVID-19 lockdown significantly disrupted the distribution of farming materials in Southeast Nigeria.

Supporting the above, [6] asserted that the COVID-19 lockdown led to significant changes in agricultural input distribution in most developing countries such as Nigeria. Agricultural production factors include farm inputs used in different stages of cultivation, harvesting and food production processes. These include: hybrid seeds, fertilizer, pesticides, herbicides, animal feed, veterinary drugs and farm equipment. Nevertheless, the lockdown restrictions, movement restrictions and restrictions impeded the free flow of agricultural inputs which resulted in disruptions to the distribution chain, increased prices, reduced accessibility of farmers to certified agro-input dealers and restricted government agricultural interventions in response to the pandemic [6]. Farmers had limited access to the production factors hindering them from engaging in commercial farming activities. Moreover, there was reduced accessibility to agricultural credit facilities and government support schemes for vulnerable farming communities in Southeast Nigeria.

One of the key impacts of the COVID-19 lockdown on agricultural input distribution is disruption of the supply chain. Restrictions on interstate movements and international trade reduced the flow of agricultural inputs from manufacturers and importers to wholesale and retail stores in various farming communities. In addition, Nigeria is highly dependent on imported fertilizers, agrochemicals, hybrid seeds, and farm equipment [3]. Hence, the restricted international trade resulted in limited supply of agricultural production factors in local markets. Agricultural input lockdown also led to increased input prices in most farming communities in Southeast Nigeria. Increased demand for agricultural inputs coupled with limited supply due to restricted interstate movements and international trade resulted in increased input prices. Farmers in Southeast Nigeria are mostly smallholder farmers with limited capital to invest in commercial farming activities. Hence, the surge in agricultural input prices reduced farmers' purchasing capacity hindering them from investing in large-scale commercial farming [7].

Another perceived impact of COVID-19 on agricultural input distribution is reduced accessibility to certified agro-input dealers. Most agro-input dealers were inaccessible to farmers due to the closure of rural routes and restrictions on public transportation during the COVID-19 lockdown period. Farmers in remote rural areas could barely access certified grain dealers hindering them from obtaining quality agricultural inputs [6]. COVID-19 also limited the role of government agricultural intervention programs in supplementing the deficient supply of agricultural production factors during the pandemic period. Government agricultural intervention programs which targeted to promote food production and support vulnerable farming communities were hindered from operating freely due to the restrictions on public gatherings and movements [8. Consequently, agricultural production was highly disrupted during the COVID-19 pandemic.

Moreover, the COVID-19 lockdown restricted the distribution activities of agricultural extension officers hindering them from reaching out to farming communities to sensitize them on agricultural production activities. Agricultural extension officers serve as bridges between farmers and researchers in distributing agricultural technologies and farm inputs to various farming communities. Nevertheless, the restricted movements hindered their activities from promoting commercial farming during the pandemic [9]. The perceived impact of agricultural input lockdown also includes reduced agricultural production rates due to disruptions to the supply of farm inputs, increased input prices and limited extension services affecting farm management practices. Consequently, most farming households recorded minimal profits from their farming activities [1]. The COVID-19 pandemic also brought to light the vulnerability of agricultural production factors distribution systems hence the need to identify alternate distribution mechanisms for future use.

Table 1: Frequency Distribution, Mean and Standard Deviation on the Perceived Effects of COVID-19 Lockdown on the Distribution of Agricultural Inputs (N = 400)

S/N	Statement	Mean	SD	Decision
1	COVID-19 lockdown delayed the supply of agricultural inputs to farmers.	3.23	0.88	Agree
2	The lockdown caused scarcity of improved seeds.	3.15	0.90	Agree
3	Fertilizer distribution was seriously disrupted during the lockdown.	3.19	0.89	Agree
4	Transportation restrictions increased the cost of distributing farm inputs.	3.31	0.84	Agree
5	Agro-input dealers experienced shortages of pesticides and herbicides.	3.15	0.87	Agree
6	Farmers received agricultural inputs later than the normal planting season.	3.23	0.92	Agree
7	Lockdown restrictions reduced access to agro-input markets.	3.25	0.86	Agree
8	Government distribution of subsidized inputs was affected by the lockdown.	3.19	0.87	Agree
9	COVID-19 reduced the availability of extension services related to input distribution.	3.20	0.87	Agree
10	The lockdown negatively affected the overall efficiency of agricultural input distribution.	3.29	0.85	Agree

Agricultural and Farm Inputs Distributed and Supplied During the COVID-19 Lockdown Period

Table 2 showed that the most commonly provided agricultural supplies during the COVID-19 lockdown were enhanced crop seeds (85.5%), fertilizers (82.0%), weed killers (74.0%), and insecticides/pesticides (70.3%). Other frequently given supplies included anti-fungal agents (60.8%), young plants (59.0%), and natural fertilizers (53.5%). About half of the participants mentioned getting farming tools (49.5%), while fewer individuals stated that animal food (43.0%), veterinary medications and vaccines (39.0%), credit/input subsidy vouchers (30.3%), and irrigation tools (24.3%) were handed out during the lockdown.

These findings indicate that efforts to distribute goods during the pandemic were mainly centered on crucial crop cultivation supplies, with lesser attention given to livestock supplies, irrigation systems, and financial aid.

During the COVID-19 lockdown period, governments, development partners, agricultural research institutes, and agro-input dealers played a critical role in distributing and supplying agricultural inputs to farmers to promote food production while minimizing the impact of the pandemic. The key agricultural inputs that were distributed to farmers during the pandemic include: improved seeds, fertilizers, crop protection chemicals, herbicides, fungicides, seedlings, animal feed, veterinary drugs, farm equipment, irrigation machinery, and other production materials [10, 8].

In general, improved seeds were among the most distributed agricultural inputs because of their significant role in food production and security. Governments and development partners distributed improved staple food seeds such as maize, rice, cassava, and improved vegetable and legume seeds to promote continuous cultivation and high yields in farms during the COVID-19 lockdown [1]. Farmers were able to achieve good yields using the distributed improved seeds despite the restrictions imposed by the pandemic. In addition to improved seeds, fertilizers were among the agricultural inputs that were distributed to farmers during the COVID-19 pandemic. Organic and inorganic fertilizers were distributed through government programs, agro-dealers, and cooperatives to improve and maintain high soil fertility and food production during the pandemic [7]. However, fertilizer distribution faced several challenges, including disruptions to global supply chains and transportation restrictions, which caused shortages and prices increases in several countries.

Similarly, government and private agro-input dealers distributed crop protection chemicals such as herbicides, insecticides, fungicides, and pesticides to farmers during the COVID-19 lockdown. The distribution of crop protection chemicals was considered key to improving farm yields and reducing losses in areas affected by pests and diseases during the pandemic [9]. However, the distribution of these agricultural inputs was interrupted in several localities due to restrictions on the movement of individuals and goods. Moreover, livestock farmers received agricultural inputs such as animal feed, veterinary drugs, and vaccines to support animal production and control the spread of diseases among livestock. Livestock farming was considered an essential service by policymakers in many countries, which ensured that animal health, feed, and pharmaceutical supplies were prioritized during the pandemic (World Bank, 2020). As a result, the distribution of veterinary services, medicines, and vaccines was prioritized, minimizing the impact of the pandemic on poultry, dairy, and livestock farming. Besides distributing agricultural production inputs to farms, some governments also distributed irrigation machinery and equipment to promote food production and support farmers who could not afford to purchase new agricultural machinery and implements. Farmers also received input vouchers from agricultural agencies and development partners to purchase key production materials and ensure food security during the COVID-19 pandemic. Agricultural extension services also provided advisory services and distributed planting materials and inputs to farmers. Overall, the distribution of agricultural inputs during the COVID-19 pandemic aimed to support food production and reduce the negative impacts of the pandemic on agricultural productivity and farmers' livelihoods (Federal Ministry of Agriculture and Rural Development [10,9].

Table 2: Agricultural and Farm Inputs Distributed and Supplied During the COVID-19 Lockdown Period

S/N	Agricultural/Farm Input	Frequency (F)	Percentage (%)
1	Improved crop seeds	342	85.5
2	Fertilizers	328	82.0
3	Herbicides	296	74.0
4	Insecticides/Pesticides	281	70.3
5	Fungicides	243	60.8
6	Organic manure	214	53.5
7	Farm implements (hoes, cutlasses, sprayers, etc.)	198	49.5
8	Animal feed	172	43.0
9	Veterinary drugs and vaccines	156	39.0
10	Seedlings (cassava, vegetables, fruit trees, etc.)	236	59.0
11	Irrigation equipment/water pumps	97	24.3
12	Credit vouchers/input subsidy vouchers	121	30.3

Effects of the COVID-19 Lockdown on the Supply of Farm Inputs to Farmers.

Table 3 indicates that participants concurred on the adverse impacts of the COVID-19 lockdown on the provision of agricultural supplies to farmers, with an average score of 3.26, surpassing the threshold of 2.50. They acknowledged that the lockdown resulted in decreased availability of farm inputs, postponed the delivery of fertilizers and quality seeds, disrupted transportation and distribution networks, raised the prices of agricultural supplies, and led to shortages among agro-input vendors. Additionally, they noted delays in government aid programs, reduced accessibility to pesticides and herbicides, a disproportionate impact on small-scale farmers, and an overall decline in the effectiveness of supply systems during the lockdown. The narrow standard deviations, ranging from 0.81 to 0.88, suggest minimal variation in responses, indicating strong consensus among the 400 survey participants. The COVID-19 lockdown has caused significant disruptions to the supply of farm inputs to farmers worldwide. Farm production in developing countries is highly dependent on the availability of farm inputs and the efficient supply chain to ensure continuous availability of production resources. Farm inputs include seeds, fertilizers, pesticides, herbicides, veterinary medicines, animal feed, and farm equipment among others. The COVID-19 lockdown regulations, restrictions on international trade, and reduced commercial activities have disrupted the production, importation, transportation, and distribution of farm inputs [11]. The impact of COVID-19 on farm input supply is manifested in several ways. First, the COVID-19 lockdown led to a reduction in the supply of agricultural inputs. Restrictions on domestic and international travel and trade disrupted the supply chain of agricultural inputs. Consequently, there were delays in the importation of fertilizers, agrochemicals, and improved seeds, and a shortage of agricultural inputs in local markets. Most agro-input dealers experienced a shortage of their products since the manufacturers could not resume production activities due to the COVID-19 restrictions [12].

Second, COVID-19 increased the prices of agricultural inputs. Transportation restrictions caused by COVID-19 increased the cost of transporting farm inputs, which added up to the prices of farm inputs. In addition, the prices of agricultural inputs such as fertilizers, pesticides, and seeds, had skyrocketed due to the shortage of these materials on the market. Most smallholder farmers who purchased their inputs from local agro-input dealers could not afford to buy the much-needed agricultural production resources.

Third, the COVID-19 lockdown caused a delay in the delivery of farm inputs to farmers. Farm production is a seasonal activity that requires farmers to plant their crops at specific times to ensure they harvest a profitable yield. Therefore, disruptions in the supply of farm inputs such as fertilizers and improved seeds caused significant delays in crop production for most farmers. Farmers were unable to plant their crops at the right time and had to resort to planting using traditional seeds instead of the improved hybrid seeds [13]. Fourth, the COVID-19 lockdown disrupted government agricultural programs. Most government programs that provide subsidized fertilizers, vouchers, and agricultural inputs to farmers faced delays in their operations due to restrictions on domestic travel and international trade. In addition, agricultural extension officers could not visit farms to advise farmers on the best agricultural practices due to restrictions on mass gatherings [13]. The disruption of government agricultural programs hindered the proper utilization of farm inputs by farmers.

Finally, smallholder farmers were the primary recipients of farm inputs from local agro-input dealers. The lockdown caused severe disruptions to the supply of farm inputs to smallholder farmers, who mostly purchased their inputs from local agro-input dealers. The reliance on local dealers to provide farm inputs on credit hindered most farmers from purchasing their farm inputs due to insufficient income during the pandemic [14]. The disruptions to the supply of farm inputs caused by the COVID-19 lockdown will have adverse effects on food production, especially in developing countries. The crisis highlighted the vulnerability of the farm input supply chain and the need for farmers to increase local production of farm inputs, develop efficient rural transportation systems, utilize digital platforms in the distribution of farm inputs, and promote sustainable agricultural production systems that are more resilient to future emergencies.

Table 3: Effects of the COVID-19 lockdown on the supply of farm inputs to farmers

S/N	Statement	Mean	SD	Decision
1	COVID-19 lockdown reduced the availability of farm inputs to farmers.	3.25	0.86	Agree
2	The lockdown caused delays in the supply of fertilizers and improved seeds.	3.29	0.84	Agree
3	Transportation restrictions disrupted the delivery of agricultural inputs.	3.33	0.82	Agree
4	The prices of farm inputs increased because of the lockdown.	3.36	0.81	Agree
5	Agro-input dealers experienced shortages of farm inputs during the lockdown.	3.25	0.84	Agree
6	Farmers received farm inputs after the normal planting period.	3.20	0.88	Agree
7	Government distribution of subsidized farm inputs was delayed.	3.18	0.87	Agree
8	The supply of pesticides and herbicides was negatively affected by the lockdown.	3.19	0.87	Agree
9	Smallholder farmers were more affected by disruptions in farm input supply than large-scale farmers.	3.26	0.85	Agree
10	The COVID-19 lockdown reduced the overall efficiency of farm input supply systems.	3.31	0.83	Agree

Major Challenges Encountered by Agricultural Input Distributors During the COVID-19 Lockdown

The results show that the primary difficulties faced by agricultural input suppliers amid the COVID-19 lockdown were limitations on transportation and movement (89.5%), interruptions in supply chains (86.5%), high expenses related to transportation and logistics (82.8%), and scarcities of agricultural products from suppliers (79.8%). A notable number of participants also mentioned border closures impacting imports (74.3%), rising costs of agricultural inputs (71.5%), and decreased sales due to farmers' limited buying power (66.0%) as major issues. Other challenges reported included trouble reaching rural farming communities (62.8%), a lack of workforce (48.3%), delays in government distribution schemes (44.0%), inadequate storage capacities (37.0%), and concerns about health and safety among employees (34.5%). These findings suggest that movement limitations and disruptions in supply chains were the most significant barriers that impeded the efficient distribution of agricultural inputs during the COVID-19 lockdown. The COVID-19 lockdowns created numerous challenges to agricultural input distributors as they struggled to meet the demand for agricultural input from growers. Agricultural input distributors facilitate the supply of agricultural producers with agricultural commodities such as farm inputs, farm machinery, animal feed, and veterinary products. Nonetheless, the COVID-19 pandemic response measures disrupted the agricultural input distribution process and caused significant challenges in agricultural input distribution networks [20]. First, transportation and logistics were significantly disrupted by the COVID-19 lockdowns, causing agricultural input suppliers to experience delays in getting their products to growers.

Movement of people and goods was highly restricted, thereby disrupting transportation processes and impeding the flow of agricultural inputs from manufacturers to distributors and farmers (World Bank, 2021). Additionally, agricultural input distributors faced shortages of production materials due to disrupted supply chains caused by COVID-19. Most agricultural input manufacturers source their materials locally and internationally, and the lockdowns resulted in the temporary closure of many factories, reducing the supply of raw materials and finished goods. Consequently, agricultural input distributors were unable to meet the demand for agricultural input from growers due to the shortage of materials caused by the pandemic (United Nations, 2022).

Third, agricultural input distributors experienced increased transportation costs as a result of the pandemic lockdowns. The restricted movement of people and goods, limited fuel supply, additional health safety measures, and long distances increased the cost of transporting agricultural inputs, thus increasing the selling price of the products. As a result, farmers faced higher prices of agricultural input due to the additional costs incurred by agricultural input distributors during transportation (International Labour Organization, 2021). Fourth, agricultural input distribution faced challenges caused by a shortage of labour during the COVID-19 lockdowns. Most agricultural input distributors experienced a deficit of skilled and unskilled labour due to the restrictions imposed on movement of people. The workers were reluctant to come to work due to the higher risks of being infected with COVID-19 and thus limiting the number of workers available at the worksites. Consequently, the shortage of workers disrupted the packing, storage, and distribution of agricultural input to growers (Organisation for Economic Co-operation and Development, 2021).

In addition, agricultural input distributors faced challenges brought about by reduced sales of their products due to the lower purchasing power of farmers. The COVID-19 pandemic caused significant financial challenges to most people, therefore limiting their ability to purchase agricultural input. Farmers were unable to acquire farm machinery, animal feed, fertilizers, agrochemicals, and improved seeds due to insufficient income (International Fund for Agricultural Development, 2021). Additionally, most agricultural input dealers faced increased expenditure due to the implementation of coronavirus health safety measures, thus reducing their profit margins (United Nations Development Programme, 2021).

Table 4: Major Challenges Encountered by Agricultural Input Distributors During the COVID-19 Lockdown

S/N	Challenge Encountered	Frequency	Percentage
1	Transportation restrictions and movement bans	358	89.5
2	Disruption of supply chains	346	86.5
3	High transportation and logistics costs	331	82.8
4	Shortage of agricultural inputs from suppliers	319	79.8
5	Border closures affecting importation of inputs	297	74.3
6	Increased prices of agricultural inputs	286	71.5
7	Reduced patronage due to farmers' low purchasing power	264	66.0
8	Difficulty accessing rural farming communities	251	62.8
9	Shortage of labour/workforce	193	48.3
10	Delays in government approval and distribution programmes	176	44.0
11	Limited storage and warehousing facilities	148	37.0
12	Health and safety concerns among workers	138	34.5

Effects of input shortages on agricultural production in Southeast Nigeria

The results indicate that input shortages during the COVID-19 period significantly impacted agricultural production in Southeast Nigeria, primarily through reduced crop yields (87.8%), delays in planting (84.5%), higher production costs (81.0%), and a decline in the area of land cultivated (75.5%). Many respondents also noted a rise in crop pests and diseases (71.5%), lower farm incomes (69.5%), and food scarcity or diminished food availability (66.3%) as major outcomes. Additional consequences included limited use of improved farming technologies (62.3%), decreased farmer productivity (59.5%), increased reliance on traditional or local inputs (54.3%), fewer agricultural job opportunities (46.0%), and heightened household food insecurity (42.8%). Overall, these outcomes highlight the broad adverse effects of input shortages on farming activities, rural livelihoods, and food security in the region. Agricultural input shortages have several effects on agricultural production, especially on smallholder farmers. In Southeast Nigeria, for example, the availability of agricultural inputs such as improved seeds, fertilizers, agrochemicals, farm equipment, veterinary products, and other production materials plays a critical role in enhancing agricultural production by smallholder farmers. These farmers face the risks and uncertainty of weather conditions during planting and harvesting times.

The COVID-19 pandemic, therefore, compounded the problem of agricultural production by smallholder farmers because it disrupted agricultural input supply chains, affecting their access to credit, agricultural produce markets, and other essential services. Moreover, input shortages caused by disruptions to transportation, marketing, and distribution networks decreased crop and livestock production, farm incomes, and family food security [15]. Agricultural production in Southeast Nigeria is significantly affected by input shortages because they reduce yield, lower farm production, and increase input costs. Farmers cannot buy or access improved seeds, fertilizers, and crop protection chemicals during the planting season. Therefore, the widespread absence of agricultural inputs during the planting season contributes to poor yields and lower production in Southeast Nigeria (Food and Agriculture Organization [16].

Moreover, shortages of agricultural inputs, including fertilizers, pesticides, herbicides, and improved seeds, increase the cost of production because their scarcity can drive their prices upward, limiting the amount of agricultural inputs smallholder farmers can use to boost production. Accordingly, farmers are forced to use less of these agricultural inputs, reduce the amount of land under cultivation, and consequently experience lower farm production and incomes [17]. Another effect of input shortages is that they cause a rise in crop pests, diseases, and livestock parasites as well as livestock diseases. Farmers face the challenge of accessing agricultural inputs such as pesticides, herbicides, and fungicides and veterinary products to control pests, weeds, livestock parasites, and diseases. As a result, there is low crop and livestock production due to the damage and mortality caused by pests and livestock parasites [18].

Besides decreasing crop and livestock production, input shortages lead to food insecurity in farming communities. Low agricultural production causes food shortages in the farmer's household and reduces farm income, affecting the farmer's ability to purchase other goods and services. These effects are more acute in Southeast Nigeria because most farmers depend on agriculture as their primary livelihood [19]. Finally, agricultural input shortages discourage farmers from adopting modern technology and new varieties of seeds. Farmers who cannot access agricultural inputs such as improved seeds and fertilizers during the planting season are forced to use traditional farming methods, resulting in low agricultural production [17].

Table 5: Effects of Input Shortages on Agricultural Production in Southeast Nigeria

S/N	Effect of Input Shortages	Frequency	Percentage
1	Reduction in crop yield	351	87.8
2	Delay in planting operations	338	84.5
3	Increase in cost of agricultural production	324	81.0
4	Reduced farm size cultivated	302	75.5
5	Increased incidence of crop pests and diseases	286	71.5
6	Low farm income	278	69.5
7	Food shortages and reduced food availability	265	66.3
8	Reduced adoption of improved farming technologies	249	62.3
9	Decline in farmers' productivity	238	59.5
10	Increased dependence on local/traditional farm inputs	217	54.3
11	Loss of employment opportunities in agriculture	184	46.0
12	Increased household food insecurity	171	42.8

Recommended Strategies for Improving Agricultural Input Distribution During Future Emergencies

The findings show that participants proposed various approaches to enhance the distribution of agricultural supplies in upcoming crises. The most commonly suggested measures included enhancing the supply chains for agricultural inputs (89.0%), upgrading rural transportation and logistical structures (87.0%), boosting local manufacturing of agricultural inputs (84.3%), and creating reserves and buffer stocks for emergency inputs (80.5%). Additionally, respondents highlighted the importance of expanding government subsidies and support schemes (77.8%), advocating for digital platforms for input procurement and distribution (72.3%), and fostering

collaborations between the public and private sectors in input distribution (69.0%). Other recommendations involved empowering agricultural extension officers (65.3%), improving access to affordable credit for farmers and agro-dealers (60.8%), dispersing input distribution through farmer cooperatives (56.8%), formulating emergency response policies for agriculture (53.8%), and enhancing storage and warehouse facilities (48.5%). These results indicate that reinforcing supply systems, investing in infrastructure, encouraging local production, and enhancing institutional backing are widely recognized as crucial steps to ensure resilient agricultural input distribution in future crises. The COVID-19 pandemic has revealed the need for enhanced agricultural input distribution systems that continue to operate during pandemics, natural disasters, conflicts, and economic crises. By ensuring the availability of agricultural inputs such as improved seeds, fertilizers, pesticides, veterinary products, farm machinery, and animal feed, governments, development partners, and private entities can increase agricultural production and guarantee food security. The governments and development partners should therefore consider adopting the following strategies to building resilient agricultural input supply chains: a). Strengthening agricultural supply chains by enhancing transportation and logistics: The most effective way of ensuring continuous agricultural production during a disaster is by improving roads and promoting alternative transportation routes. Governments should also consider designating agricultural input transportation as a priority during times of emergency to ensure that agricultural inputs keep flowing to farmers [20]. Promoting local production of agricultural inputs will also reduce reliance on external suppliers during times of emergency. Local production of fertilizers, improved seeds, agrochemicals, animal feed, and farm equipment will alleviate shortages of agricultural inputs during emergencies and pandemics; b). Adopting digital technologies in the distribution of agricultural inputs to farmers; Digital technologies such as electronic vouchers, mobile phones, online platforms, and electronic markets will facilitate fast distribution of agricultural inputs and support agricultural production during emergencies and pandemics. The use of digital technologies will alleviate the limitations caused by physical contact, increase transparency in the distribution process, and reduce transaction costs of purchasing agricultural inputs [7]; c). Strengthening agricultural extension services and cooperatives; Extension services can provide farmers with information on the availability and use of agricultural inputs during a pandemic. Cooperatives, on the other hand, will aggregate demand and help distribute agricultural input supplies to farmers during emergencies. Moreover, cooperatives and extension services will serve as effective dissemination channels for the government and agricultural input dealers, thus enhancing communication and promoting agricultural production during pandemics [20]. The government should also create strategic reserves nd build buffer stocks of agricultural inputs to ensure continuous supply to farmers during emergencies. By maintaining reserves of fertilizers, improved seeds, pesticides, veterinary products, and other agricultural inputs, the government can respond quickly to agricultural production demands after a disaster. The authorities should also formulate contingency plans while ensuring that financing for agricultural inputs remains available even during emergencies [21].

Expanding credit, providing subsidies, and promoting insurance schemes for farmers and agricultural input dealers will also enhance agricultural production by supporting the procurement of agricultural inputs by farmers and dealers. The government should facilitate access to credit and provide input subsidies to support the purchase of agricultural inputs by farmers and sustain production during emergencies and pandemics. Similarly, insurance programs for agricultural input dealers and farmers will enable them to continue buying and selling agricultural inputs and food, respectively, even during economic emergencies [19].

Table 6: Recommended Strategies for Improving Agricultural Input Distribution During Future Emergencies

S/N	Recommended Strategy	Frequency	Percentage
1	Strengthen agricultural input supply chains	356	89.0
2	Improve rural transportation and logistics infrastructure	348	87.0
3	Increase local production of agricultural inputs	337	84.3
4	Establish emergency input reserves and buffer stocks	322	80.5
5	Expand government subsidy and support programmes	311	77.8
6	Promote digital platforms for input ordering and distribution	289	72.3
7	Strengthen public-private partnerships in input distribution	276	69.0
8	Enhance the role of agricultural extension agents in input delivery	261	65.3
9	Improve access to affordable credit for farmers and agro-dealers	243	60.8
10	Decentralize input distribution through farmer cooperatives	227	56.8
11	Develop emergency response policies for the agricultural sector	215	53.8
12	Improve storage and warehousing facilities for agricultural inputs	194	48.5

Conclusion

The COVID-19 lockdown created adverse effects on the distribution chain of agricultural and farm inputs in Southeast Nigeria. The restriction of movement, restrictions on the use of transportation, and increased logistic costs disrupted the supply of fertilizers, improved seeds, pesticides, herbicides, and other agricultural inputs to farmers. The dealers also faced several challenges, including lack of supply, border closures, rising operating costs, and poor purchasing power, which affected the input distribution network. Consequently, the disruptions caused derision in planting schedules, poor crop yields, increased costs of production, low farm income, reduced agricultural production, and food insecurity. The study recommends the need for developing efficient agricultural input distribution systems that can cushion the impacts of similar shocks in the future. Some of the strategies proposed include enhancing value chains, developing efficient rural and agricultural transportation systems, promoting the local production of agricultural inputs, developing seed and input banks, leveraging modern technology in agricultural input distribution, and enhancing government-sponsored programs. There is a need for government agencies, the private sector, research institutes, cooperatives, agricultural societies, and farmers' associations to deliberate on ways of ensuring that agricultural production is not disrupted during emergencies while also discussing the strategies suitable for boosting food security during such periods.

References

1. Food and Agriculture Organization. (2021). *The state of food and agriculture 2021: Making agrifood systems more resilient to shocks and stresses*. FAO. https://doi.org/10.4060/cb4476en
2. National Bureau of Statistics. (2021). *Nigerian gross domestic product report (Q4 2021).* https://www.nigerianstat.gov.ng
3. World Bank. (2020). *Food security and COVID-19*. https://www.worldbank.org/en/topic/agriculture/brief/food-security-and-covid-19
4. World Health Organization. (2020). *WHO Director-General's opening remarks at the media briefing on COVID-19—11 March 2020.* https://www.who.int/director-
5. Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). John Wiley & Sons.
6. Food and Agriculture Organization. (2020). *COVID-19 and the risk to food supply chains: How to respond?* Rome, Italy: FAO.
7. International Food Policy Research Institute. (2020). *COVID-19 and global food security.* Washington, DC: IFPRI.
8. Federal Ministry of Agriculture and Rural Development. (2020). *National Action Committee on COVID-19: Agriculture sector response to COVID-19.* Abuja, Nigeria: FMARD.
9. Ayanlade, A., & Radeny, M. (2020). COVID-19 and food security in Sub-Saharan Africa: Implications of lockdown during agricultural planting seasons. *NPJ Science of Food, 4*(13), 1–6.
10. Food and Agriculture Organization. (2020). *COVID-19 and the risk to food supply chains: How to respond?* Rome, Italy: FAO.
11. Laborde, D., Martin, W., Swinnen, J., & Vos, R. (2020). COVID-19 risks to global food security. *Science, 369*(6503), 500–502.
12. Reardon, T., Bellemare, M. F., & Zilberman, D. (2021). How COVID-19 may disrupt food supply chains in developing countries. *IFPRI Discussion Paper*. Washington, DC: International Food Policy Research Institute.
13. United Nations Conference on Trade and Development. (2022). *The impact of the COVID-19 pandemic on trade and development: Lessons learned*. Geneva, Switzerland: UNCTAD.
14. Organisation for Economic Co-operation and Development. (2020). *COVID-19 and the food and agriculture sector: Issues and policy responses*. Paris, France: OECD.
15. African Development Bank. (2022). *African Economic Outlook 2022: Supporting climate resilience and a just energy transition in Africa*. Abidjan, Côte d'Ivoire: African Development Bank.
16. Food and Agriculture Organization. (2023). *The State of Food Security and Nutrition in the World 2023*. Rome, Italy: FAO.
17. International Fertilizer Development Center. (2022). *Fertilizer market and food security outlook for sub-Saharan Africa*. Muscle Shoals, AL: IFDC.
18. Alliance for a Green Revolution in Africa. (2023). *Africa agriculture status report 2023: Building resilient agrifood systems in Africa*. Nairobi, Kenya: AGRA.
19. United Nations Food Systems Coordination Hub. (2024). *Food systems transformation: Progress report 2024*. New York, NY: United Nations.
20. World Bank. (2024). *Nigeria Development Update: Building resilience through agricultural transformation*. Washington, DC: World Bank.
21. Organisation for Economic Co-operation and Development. (2023). *Policies for resilient food systems: Lessons from recent global crises*. Paris, France: OECD.